INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT
OF THE
REACTION CONTROL
SYSTEM
Vol. 1 of 5

26 FEBRUARY 1988

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

WORKING PAPER NO. 1.0-WP-VA88003-12

INDEPENDENT ORBITER ASSESSMENT
ASSESSMENT OF THE REACTION CONTROL SYSTEM FMEA/CIL

26 FEBRUARY 1988

This Working Paper is Submitted to NASA under
Task Order No. VA88003, Contract NAS 9-17650

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1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986.

The IOA effort first completed an analysis of the aft and forward Reaction Control System (RCS) hardware and electrical power distribution and control (EPD&C), generating draft failure modes and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. The IOA results were then compared to the proposed post 51-L NASA FMEA/CIL baseline. This report documents the results of that comparison for the Orbiter RCS hardware and EPD&C systems.

The IOA product for the RCS analysis consisted of two hundred eight (208) hardware and two thousand sixty-four (2064) EPD&C failure mode worksheets that resulted in one hundred forty-one (141) hardware and four hundred forty-nine (449) EPD&C potential critical items (PCIs) being identified. A comparison was made of the IOA product to the NASA FMEA/CIL baseline as of 23 December 1987 which consisted of ninety-nine (99) hardware and five hundred twenty-four (524) EPD&C FMEAs, and sixty-two (62) hardware and one hundred forty-four (144) EPD&C CIL items. In order to facilitate comparison, additional IOA analysis worksheets were generated as required. IOA mapped one hundred sixty-six (166) hardware and five hundred ninety-seven (597) EPD&C FMEAs, and one hundred thirty-three (133) hardware and one hundred sixteen (116) EPD&C CILs and PCIs into the NASA FMEAs and CILs. After comparison of the IOA baseline to the NASA FMEA/CIL baseline and discussions with the NASA subsystem manager, ninety-six (96) hardware issues, eighty-three (83) of which concern CIL items or PCIs, and two hundred eighty (280) EPD&C issues, one hundred fifty-eight (158) of which concern CIL items or PCIs, remain unresolved. These three hundred seventy-six (376) issues can be grouped into three categories: NSTS 22206 interpretation differences, IOA failure modes not currently addressed on the NASA FMEA/CIL, and RCS subsystem analysis differences.

One hundred seven (107) of the unresolved EPD&C issues result because of differences in interpretation of NSTS 22206. The NASA/RI definition of redundancy allowed the selection of specific unrelated failures which were required to cause known problems, e.g., failures required to cause continuous power to a valve. The IOA redundancy string included only items that were also capable of performing the specific function of the item

being analyzed. IOA considers many NASA/RI redundancy strings to include multiple unrelated failures, thus making criticalities too severe or masking other critical failures found by IOA.

One hundred twenty-eight (128) of the unresolved hardware and EPD&C issues involve failure modes identified by IOA which are not currently addressed on the NASA FMEA/CIL baseline. IOA considers each of these failure modes to be credible, and recommends that they be added.

The remaining unresolved RCS issues result because of differences between the IOA and NASA/RI analyses of the RCS subsystem. Many of these issues are linked to a few general differences in the analyses performed by IOA and NASA/RI. For example, seventeen (17) of the FRCS hardware issues are linked to the fact that IOA considered the inability to deplete (dump) FRCS propellant to be critical for entry. NASA/RI considered it critical only for ET separation. Six (6) of the ARCS hardware issues result because IOA considered any failure which resulted in the loss of primary thrusters to be a crit 1 during RTLS and TAL aborts due to the resulting reduced OMS and RCS propellant dump rates. Several of the RCS hardware issues are related to failures which result in propellant leakage. Per NSTS 22206, IOA considered <u>any</u> leakage of propellant to be critical, regardless of where it occurred. NASA/RI did not apply this philosophy to all propellant leakage failues. Fifty (50) of the unresolved EPD&C issues result because IOA considered the inability to determine the actual position of a valve to be a 3/2R. Loss of all redundancy could lead to falsely failing the valve closed, thus affecting mission operations. NASA/RI classified such failures as 3/3's. The remainder of the unresolved analysis-difference issues exist independently and cannot, for the most part, be linked to any general differences.

IOA recommends that the unresolved issues presented in this report be considered for incorporation into the NASA FMEA/CIL baseline.

Figures 1 and 2 present comparisons of the proposed post 51-L NASA hardware and EPD&C baselines with the IOA recommended hardware and EPD&C baselines, respectively, and associated issues.

RCS HARDWARE OVERVIEW

RCS HARDWARE ASSESSMENT SUMMARY

	IOA	NASA[1]	ISSUES
FMEA	166	99	96
CIL	133	62	83

FORWARD RCS

HELIUM PRESSURIZATION

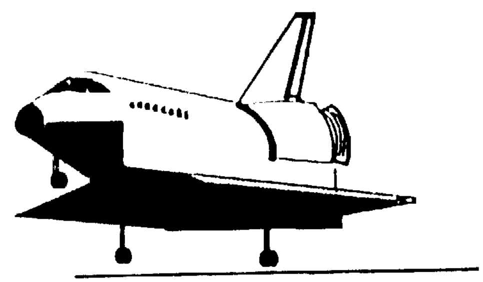
	IOA	NASA	ISSUES
FMEA	25	15	16
CIL	20	8	14

PROPELLANT STORAGE & DISTRIBUTION

	IOA	NASA	ISSUES
FMEA	39	25	23
CIL	28	14	18

THRUSTERS

	IOA	NASA	ISSUES
FMEA	14	8	10
CIL	14	7	10



AFT RCS

HELIUM PRESSURIZATION

	IOA	NASA	ISSUES
FMEA	26	15	14
CIL	20	10	11

PROPELLANT STORAGE & DISTRIBUTION

	IOA	NASA	ISSUES
FMEA	48	28	23
CIL	37	18	20

THRUSTERS

	IOA	NASA	ISSUES
FMEA	14	8	10
CIL	14	7	10

1. NASA BASELINE AS OF 23 DECEMBER 1987.
IOA AND NASA TOTALS DO NOT INCLUDE RCS INSTRUMENTATION AND THERMAL CONTROL ITEMS.
IOA ANALYZED AND ASSESSED THESE ITEMS AS EPD&C ITEMS.

Figure 1 - RCS HARDWARE OVERVIEW

RCS EPD&C OVERVIEW

RCS EPD&C ASSESSMENT SUMMARY

	IOA	NASA[1]	ISSUES
FMEA	597	524	280
CIL	116	144	158

FORWARD RCS

HELIUM PRESSURIZATION

	IOA	NASA	ISSUES
FMEA	31	28	12
CIL	3	2	4

PROPELLANT STORAGE & DISTRIBUTION

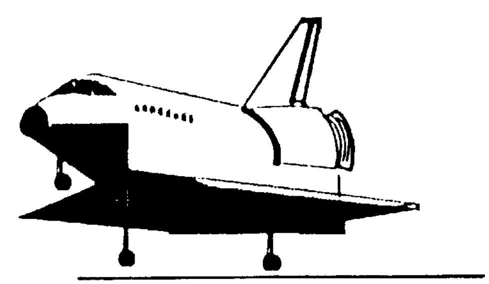
	IOA	NASA	ISSUES
FMEA	159	146	91
CIL	21	33	46

THRUSTERS

	IOA	NASA	ISSUES
FMEA	69	54	31
CIL	34	18	26

THERMAL CONTROL

	IOA	NASA	ISSUES
FMEA	28	27	3
CIL	5	4	1



AFT RCS

HELIUM PRESSURIZATION

	IOA	NASA	ISSUES
FMEA	30	27	10
CIL	3	3	2

PROPELLANT STORAGE & DISTRIBUTION

	IOA	NASA	ISSUES
FMEA	196	176	112
CIL	24	57	68

THRUSTERS

	IOA	NASA	ISSUES
FMEA	61	51	13
CIL	15	20	7

THERMAL CONTROL

	IOA	NASA	ISSUES
FMEA	23	15	8
CIL	11	7	4

1. NASA BASELINE AS OF 21 DECEMBER 1987

IOA AND NASA TOTALS INCLUDE RCS INSTRUMENTATION AND THERMAL CONTROL ITEMS.

IOA ANALYZED AND ASSESSED THESE ITEMS AS EPD&C ITEMS.

Figure 2 - RCS EPD&C OVERVIEW

2.0 INTRODUCTION

2.1 Purpose

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the Orbiter FMEA/CIL reevaluation results for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, EPD&C, functions, internal and external interfaces, and operational requirements for all mission phases.

2.3 Analysis Approach

The independent analysis approach is a top-down analysis utilizing as-built drawings to divide the respective subsystem into components and low-level hardware items. Hardware and EPD&C items are evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the NASA and Prime Contractor FMEA/CIL reevaluation results. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEAs/CILs which is documented in this report.

Step 1.0 Subsystem familiarization
- 1.1 Define subsystem functions
- 1.2 Define subsystem components
- 1.3 Define subsystem specific ground rules and assumptions

Step 2.0 Define subsystem analysis diagram
- 2.1 Define subsystem
- 2.2 Define major assemblies
- 2.3 Develop detailed subsystem representations

Step 3.0 Failure events definition
- 3.1 Construct matrix of failure modes
- 3.2 Document IOA analysis results

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL
4.1 Resolve differences
4.2 Review in-house
4.3 Document assessment issues
4.4 Forward findings to Project Manager

2.4 RCS Ground Rules and Assumptions

The RCS specific ground rules and assumptions used in the IOA analysis are presented in Appendix B.

3.0 SUBSYSTEM DESCRIPTION

3.1 Functional and Hardware Description

The Shuttle Orbiter includes three RCS packages, one forward and two aft, one in each of the left and right OMS/RCS pods (Figure 3). Each RCS package consists of the following subsystems:

- o Helium Pressurization
- o Propellant Storage and Distribution
- o Thruster
- o Electrical Power Distribution and Control

Figures 4 through 7 present an overview of the RCS breakdown hierarchy utilized in this analysis and assessment.

During a typical Shuttle mission, the RCS jets are used during External Tank (ET) separation, orbit insertion, orbital operations, deorbit maneuver, and entry. The Aft RCS (ARCS) is active from prelaunch through the transition to aerosurface control during entry. The Forward RCS (FRCS) is active from prelaunch through the post-deorbit propellant dump and is disabled for entry. Figures 8 and 9 are hardware schematics of the FRCS and ARCS, respectively.

The RCS jets are first used in the mission after Main Engine Cutoff (MECO) to maintain vehicle attitude until ET separation. The RCS provides a translation maneuver during ET separation to ensure Orbiter separation from the ET. The RCS is also used to control roll in the event of the failure of two main engines during ascent.

After OMS-1 burn cutoff, the vehicle goes into attitude hold. The crew uses the Translational Hand Controller (THC) to command RCS translational maneuvers to null any residual velocity. Attitude hold is maintained until the maneuver to OMS-2 burn attitude which is performed manually by the crew using the Rotational Hand Controller (RHC). The RCS +X jets can be used to complete either the OMS-1 or OMS-2 burns or to perform the OMS-2 burn entirely in the case of OMS engine failures. In this case, the OMS-to-RCS interconnect capability will be used to feed OMS propellant to the four +X RCS thrusters.

Once in orbit, after the OMS-2 burn is completed, RCS maneuvers are performed to control the vehicle attitude according to the flight plan. For onorbit attitude control the crew may select either primary or vernier jets.

During deorbit, the RCS is used to maneuver to the OMS deorbit burn attitude, null any residual velocity, dump excess propellant for center-of-gravity control, and maneuver to the Entry Interface (EI) attitude. In case both OMS engines malfunction, the RCS can be used to perform or complete the deorbit burn. In this case, the OMS-to-RCS interconnect will be selected to feed OMS propellant to the four +X RCS thrusters.

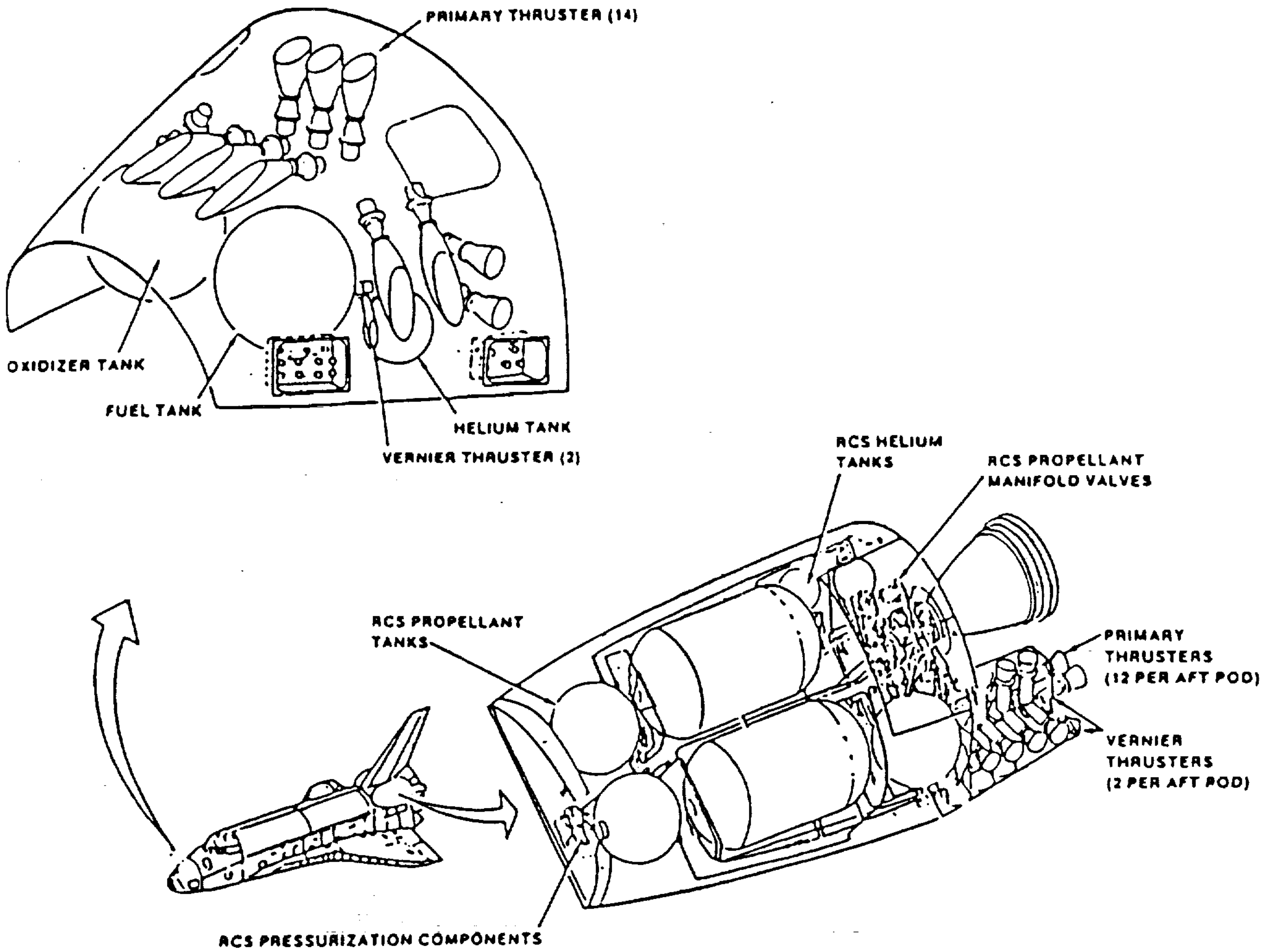


Figure 3 - REACTION CONTROL SYSTEM (RCS)

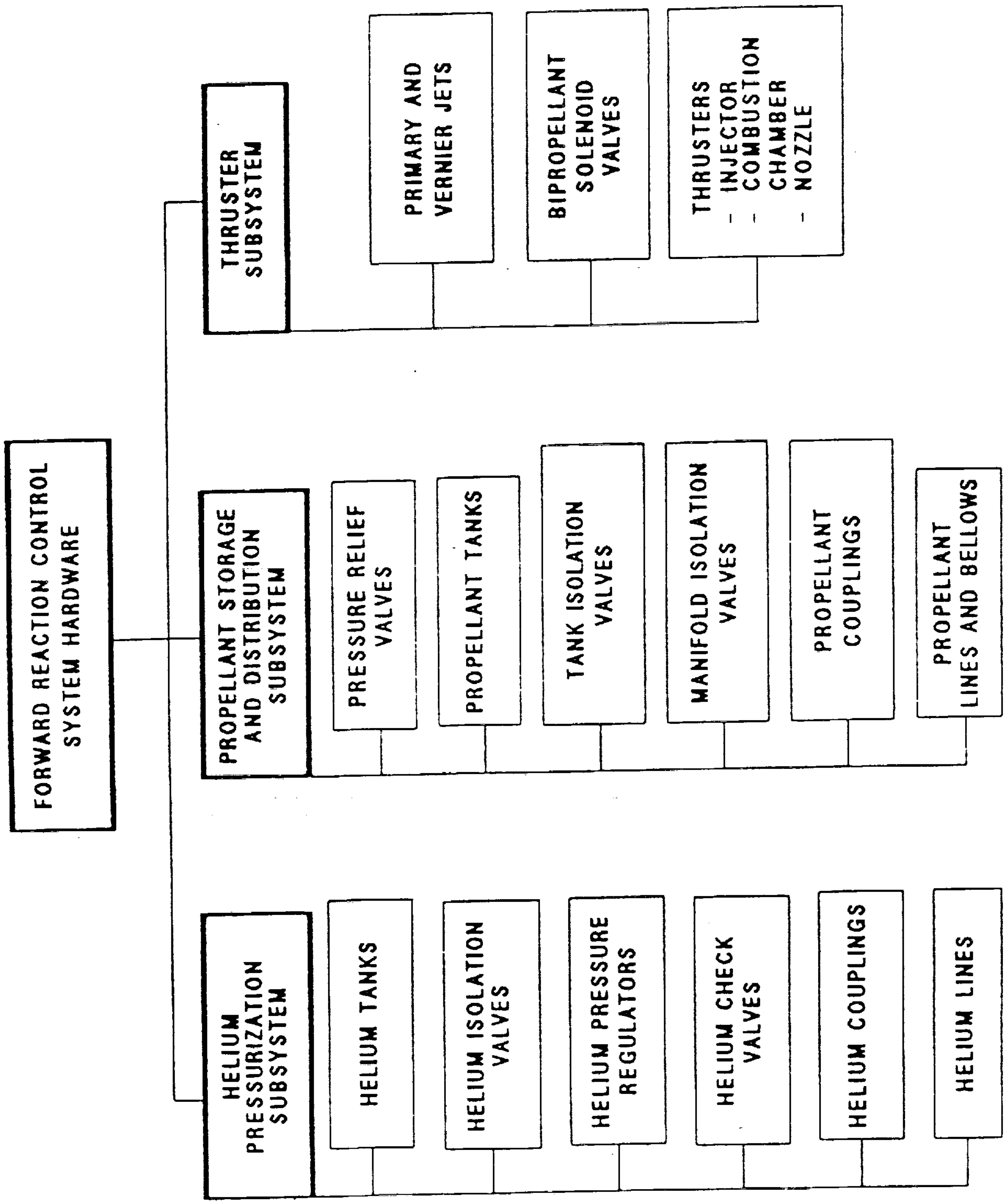


Figure 4 - FORWARD RCS HARDWARE BREAKDOWN HIERARCHY

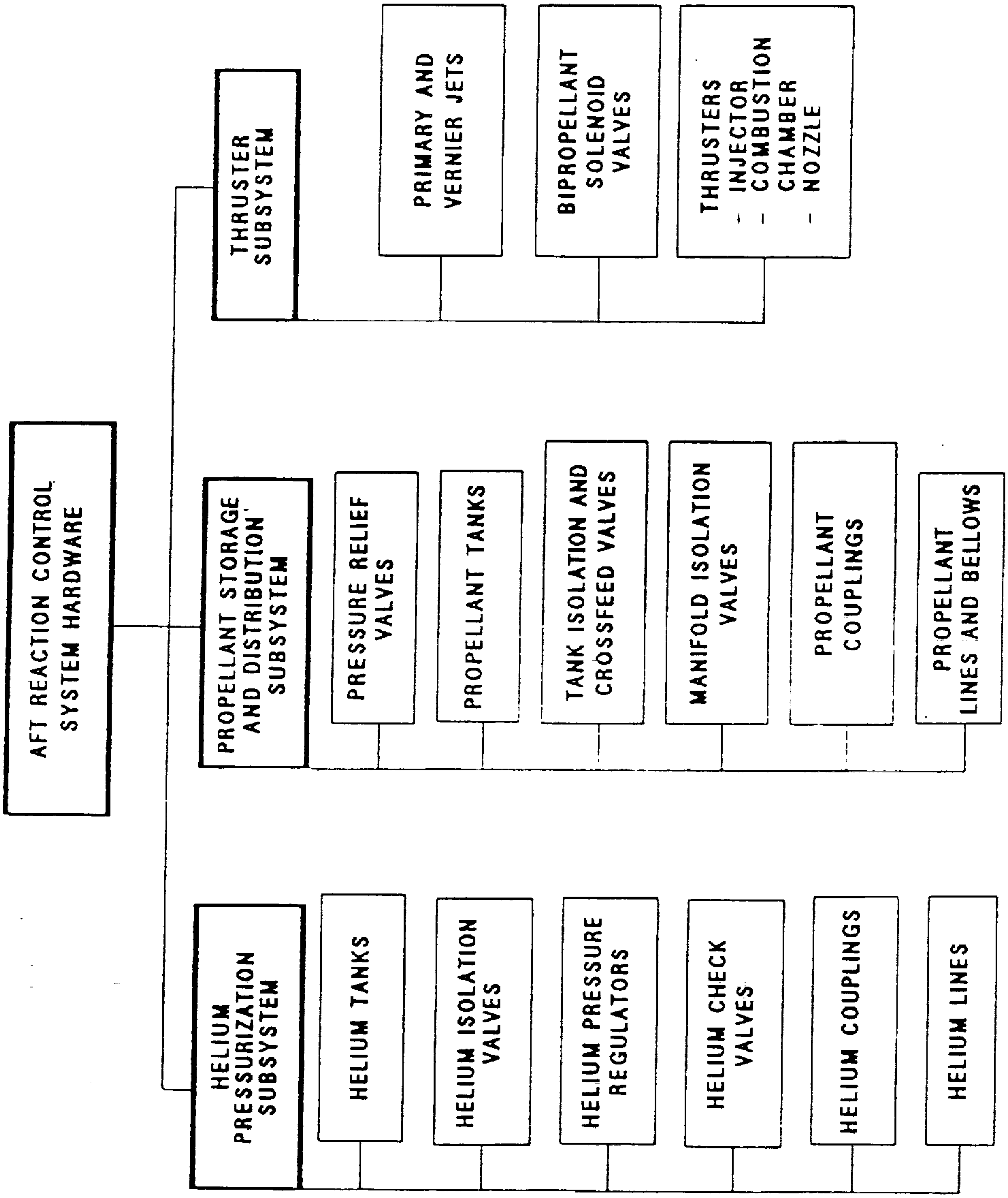


Figure 5 - AFT RCS HARDWARE BREAKDOWN HIERARCHY

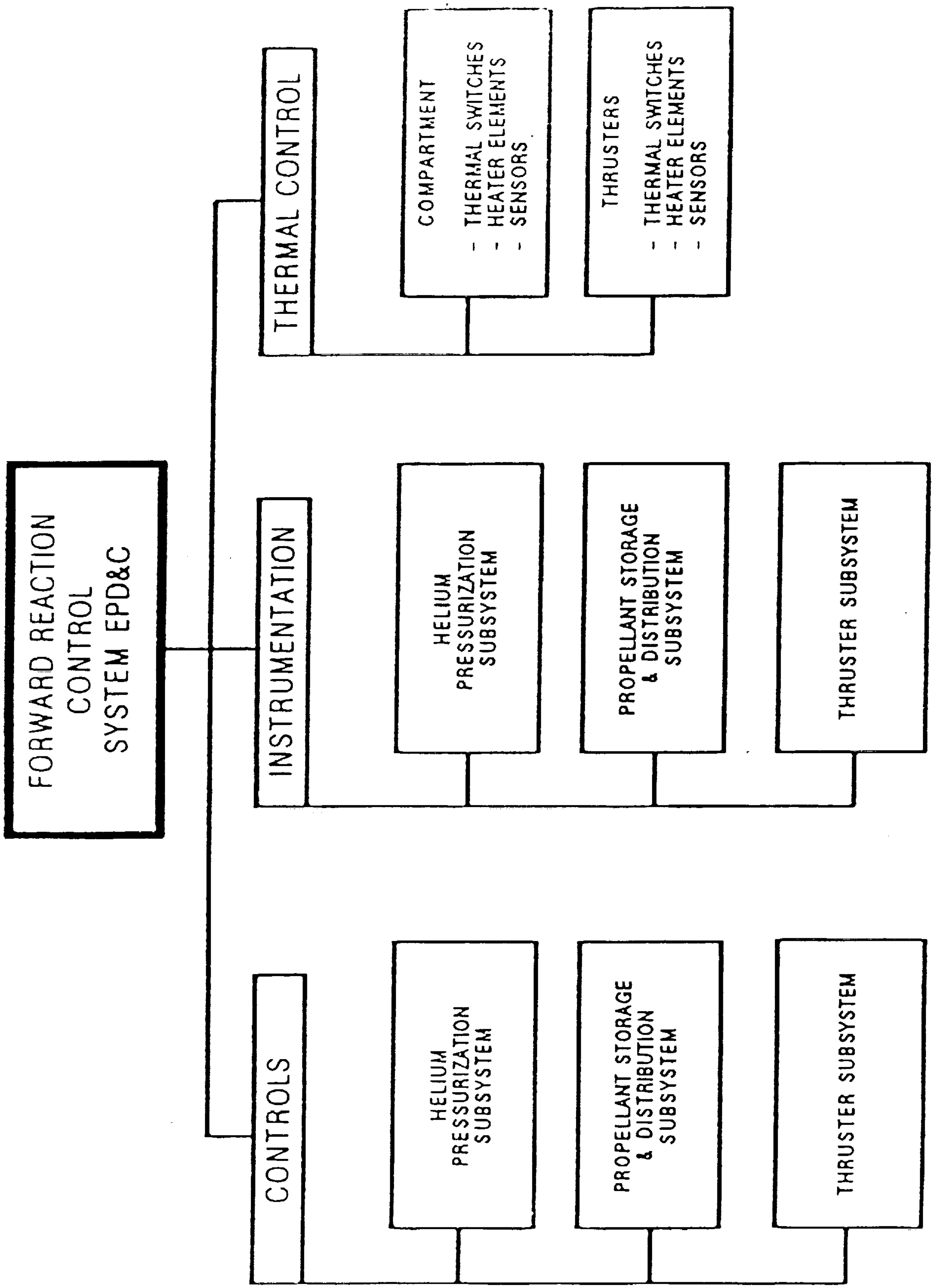


Figure 6 - FORWARD RCS EPD&C BREAKDOWN HIERARCHY

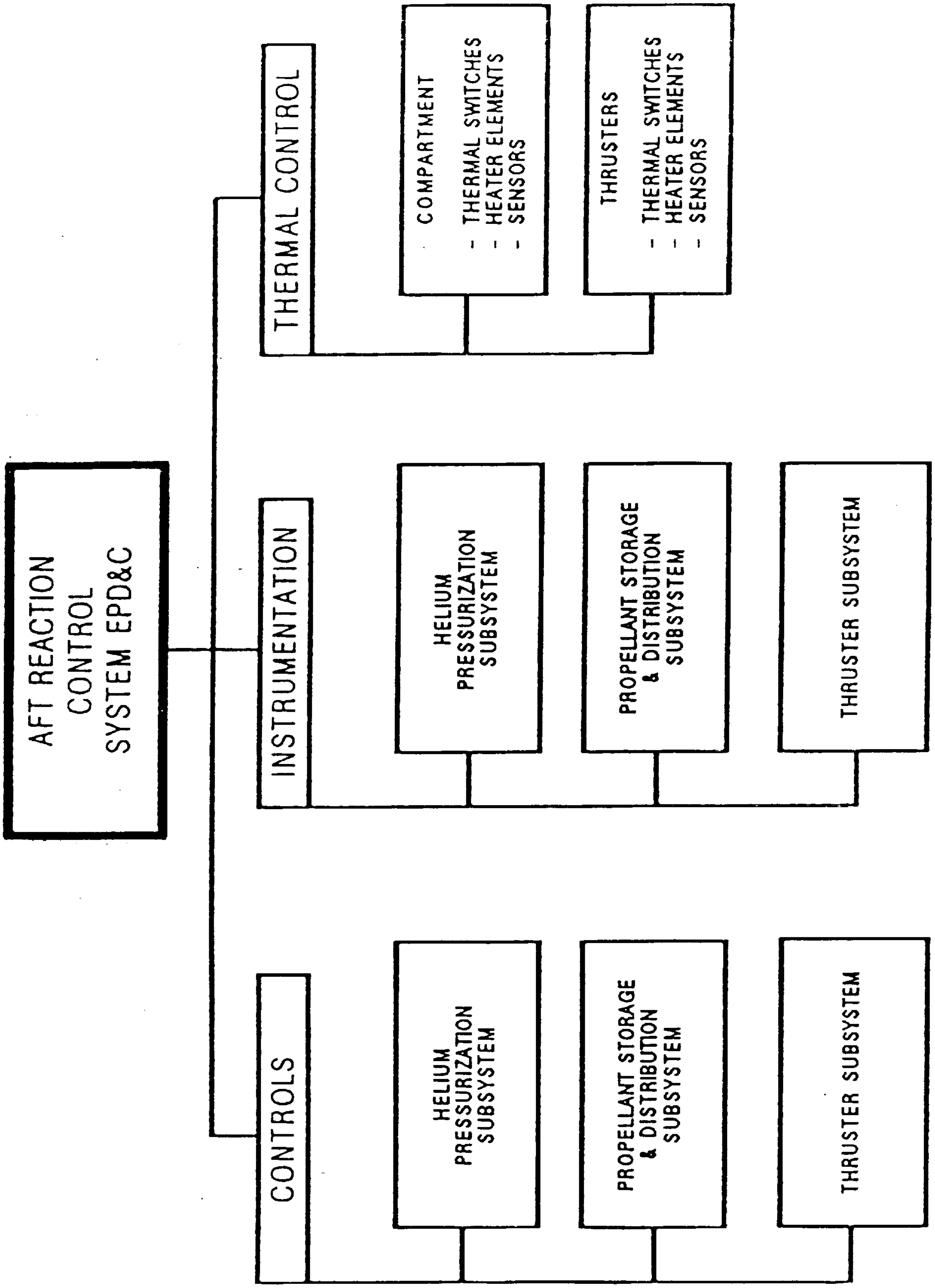


Figure 7 - AFT RCS EPD&C BREAKDOWN HIERARCHY

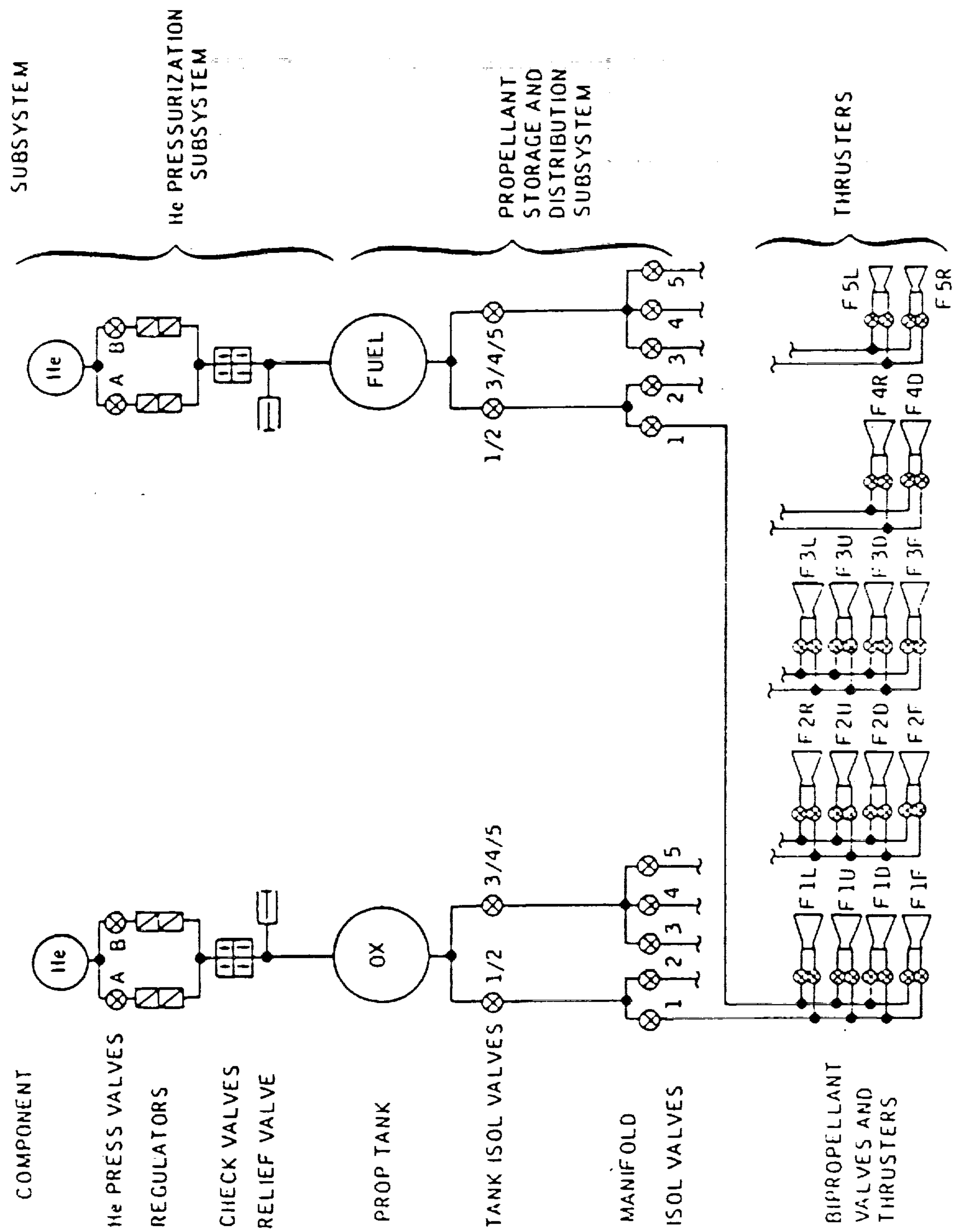


Figure 8 - FORWARD RCS SCHEMATIC

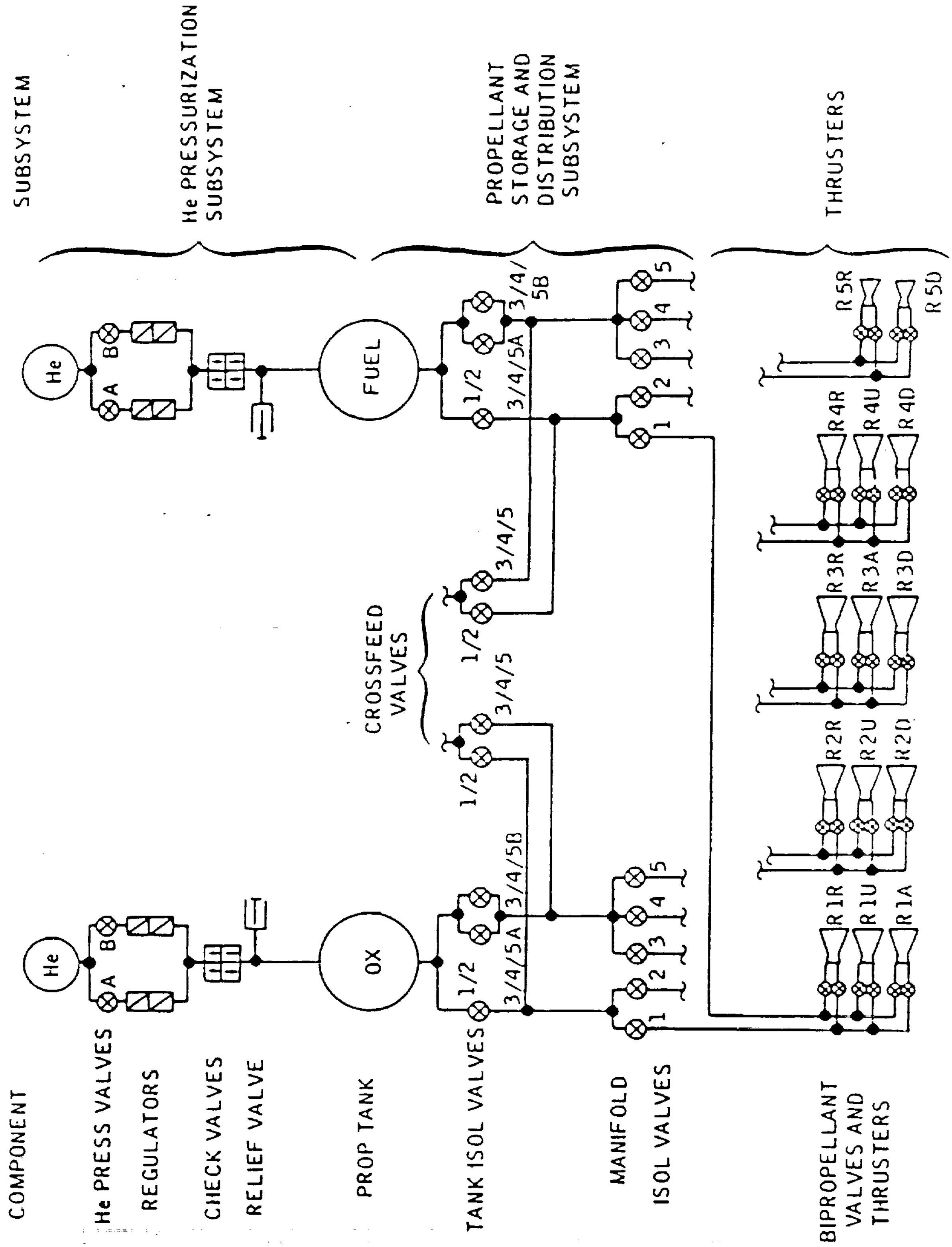


Figure 9 - AFT RCS SCHEMATIC

Once the deorbit burn is completed, the vehicle is maneuvered to the EI attitude.

From EI (400,000 ft) to approximately 262,000 ft, the vehicle is controlled in roll, pitch, and yaw with the ARCS jets. The GPCs disable the roll thrusters below this altitude, since the vehicle is captured and stable in the roll axis. Shortly after entering blackout, the pitch thrusters are disabled. From this time on, the elevons are used to control pitch and banking. The yaw thrusters are still used to assist the rudder. This mode of control will be used until the vehicle slows to Mach 1 where the yaw thrusters are disabled. Total vehicle control is then accomplished by the aerodynamic control surfaces through landing.

3.1.1 Helium Pressurization Subsystem

The pressurization subsystem regulates and distributes helium to the propellant tanks. This subsystem consists of two helium storage tanks, isolation valves, pressure regulators, check valves, and the lines necessary for filling, draining, and distributing the helium.

3.1.1.a Helium Storage Tanks

The high pressure helium supply is contained in two 1.761 cubic ft spherical storage tanks in each module. The tanks are made of a titanium liner overwrapped with fiberglass. One tank supplies helium pressure to the fuel propellant tank while the other helium tank supplies pressure to the oxidizer propellant tank. The helium tank's maximum operating pressure is 4000 psig and is proof-pressure tested to 4480 psig.

3.1.1.b Helium Isolation Valve

For each propellant there are two helium isolation valves in parallel between the helium tanks and the pressure regulators which are used to isolate the high-pressure gaseous helium from the remainder of the pressurization subsystem (Figure 10).

The helium isolation valves are operated by two solenoids, one of which is momentarily energized to magnetically latch the valve open. The second solenoid magnetically unlatches the valve, allowing spring and helium pressure to force the valve closed.

The switching logic for the helium isolation valves is contained in the Forward and Aft Load Control Assemblies (FLCA and ALCA). Solenoid and power logic is provided by the Power Control Assemblies (PCA), which are located within the LCAs. The LCAs and PCAs must be powered up in order to operate the helium isolation valves.

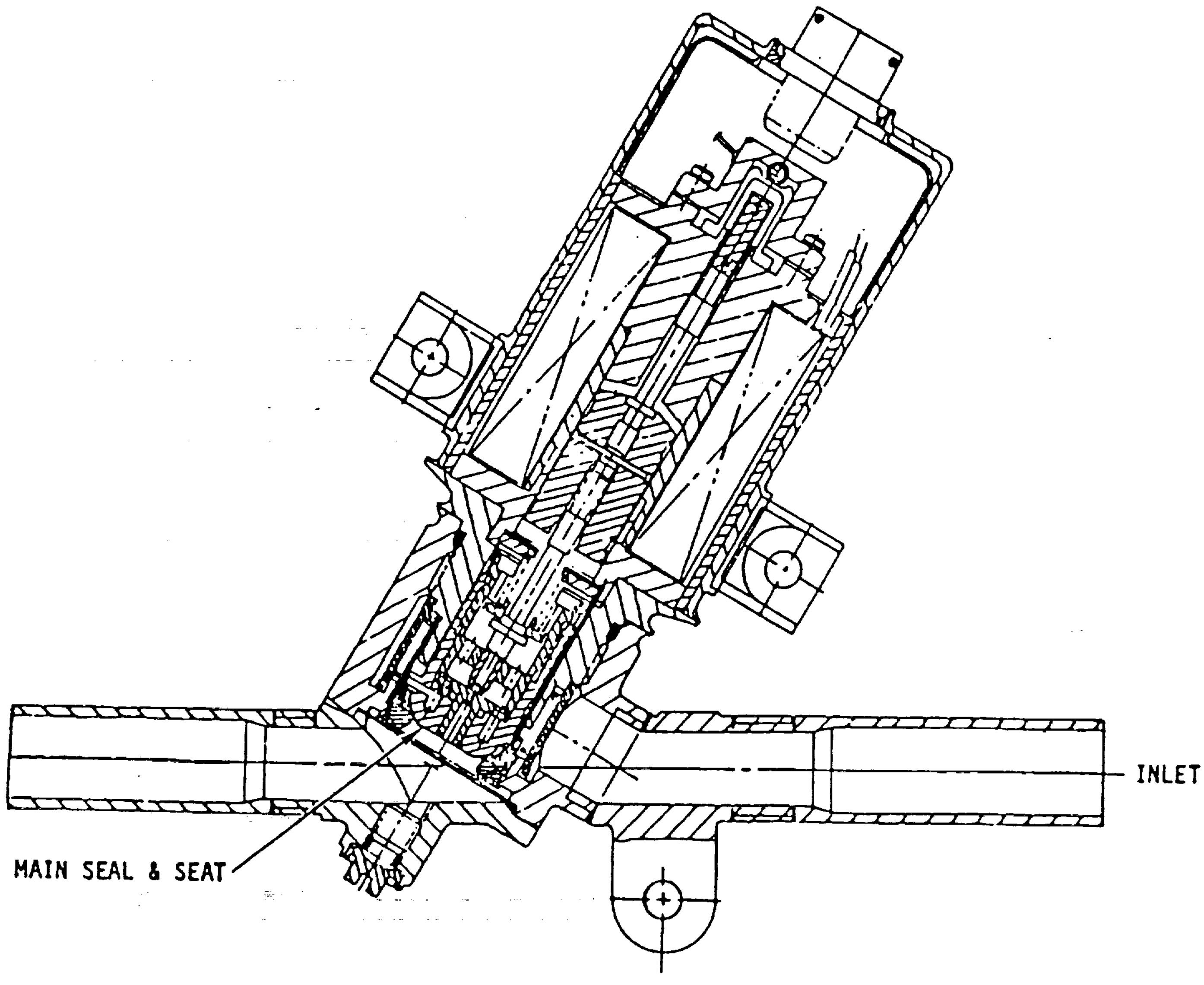


Figure 10 - HELIUM ISOLATION VALVE

The helium isolation valves are controlled by the FWD RCS, AFT LEFT RCS, and AFT RIGHT RCS HE PRESS A/B switches on panels O7 and O8. These are permanent position switches (OPEN, GPC, CLOSE), but only apply momentary power to the solenoid due to the logic in the LCA. Each switch controls two isolation valves, one in the helium oxidizer line and one in the helium fuel line.

These valves contain microswitches which are activated when the valves are fully open or closed. When commanded, the switch logic allows a one-second delay for the valves to reach the command position before sending a position indication signal to the GPCs, telemetry, and a position indicator (talkback) above each switch. Power is then removed from the solenoids. The talkback logic displays barberpole when the valves are in motion or when there is a position mismatch between the fuel and oxidizer helium valves. Otherwise, the talkback shows OP for open valves and CL for closed valves.

The GPC can command the isolation valve to open and close to maintain the system pressurization and to prevent overpressurization when the isolation valve switch is in the GPC position. In the event of a switch failure in the GPC position, the crew can open or close the valves using the GPC memory read/write procedures.

The valve's nominal operating pressure is 200 to 4000 psig and limits the flow to 81 scfm.

3.1.1.c Pressure Regulator Assembly

Helium pressure regulation is accomplished by two regulator assemblies connected in parallel and located downstream of each helium isolation valve (Figure 11). Each assembly contains two regulators, primary and secondary, connected in series so that if the primary regulator fails open, the secondary regulator can regulate the pressure within acceptable limits. The regulators cannot be controlled manually or by the GPC.

The primary and secondary regulators regulate the tank pressure to 245 psig and 256 psig, respectively. The flow rate is limited to 81 scfm for 500 to 1400 psig inlet pressure, and 150 scfm for 1400 to 4000 psig inlet pressure.

3.1.1.d Check Valve Assembly

A check valve assembly, located between the pressure regulator assemblies and each relief valve, is used to preclude backflow of helium or propellant vapors or

liquids (Figure 12). Each assembly contains four independent check valves connected in series-parallel. The check valves cannot be controlled manually or by the GPC.

The valve's normal operating pressure is 355 psig, with a maximum of 370 psig.

3.1.2 Propellant Storage and Distribution Subsystem

The propellant subsystem distributes the fuel and oxidizer to the thrusters. This subsystem consists of propellant tanks, pressure relief valves, tank isolation valves, crossfeed valves, manifold isolation valves, and the lines and couplings necessary for filling, draining, and distributing the propellant.

3.1.2.a Propellant Tanks

Each RCS module contains two titanium 39.2-inch spherical propellant tanks, one for fuel and one for oxidizer (Figure 13). Each tank contains an internally-mounted surface-tension screen Propellant Acquisition Device (PAD) which acquires and delivers the propellant to the RCS thrusters on demand. The surface-tension device also prevents the helium pressurant gas from entering the propellant or the propellant distribution lines prior to propellant depletion. The forward propellant tanks have PADs which are designed to operate primarily in a low-g environment. The aft propellant tanks are designed to operate in both high and low-g regimes.

3.1.2.b Pressure Relief Valve Assembly

The helium pressure relief valve assembly is located between each check valve assembly and the propellant tank, and will vent excess pressure overboard before it can over pressurize the propellant tanks (Figure 14). The assembly consists of a burst diaphragm, filter, and relief valve. The burst diaphragm is of the non-fragmentation type, but the filter is further insurance that fragmentation or particles will not reach the relief valve seat. The relief valve cannot be controlled manually or by the GPC.

The burst disk ruptures at 332 psig. The relief valve reseats at 310 psig.

3.1.2.c Tank Isolation, Crossfeed, and Manifold 1/2/3/4 Isolation Valves

The RCS propellant tank isolation, crossfeed, and manifold 1/2/3/4 isolation valves are all AC motor valves. Once a valve reaches the open or closed

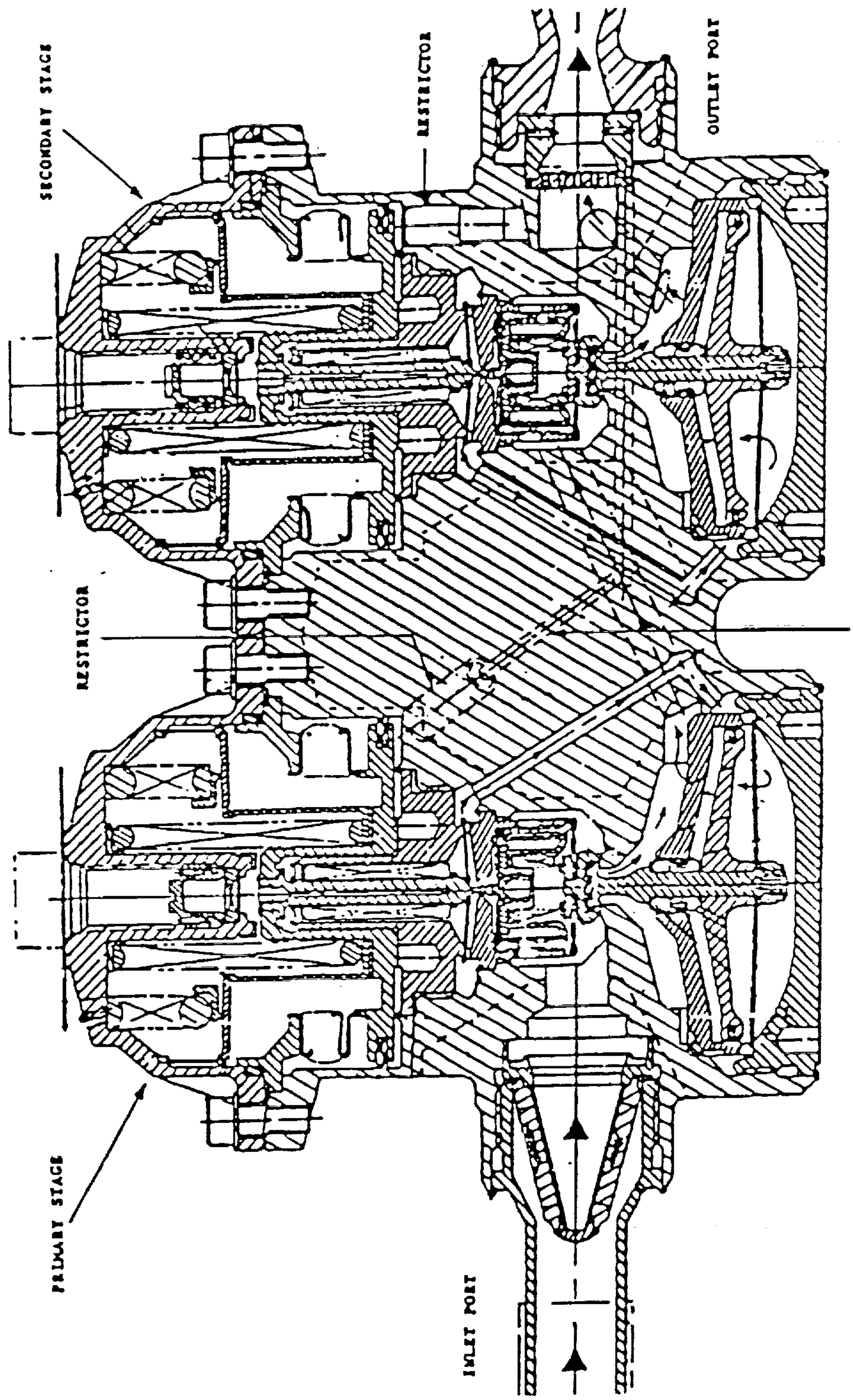


Figure 11 - HELIUM PRESSURE REGULATOR ASSEMBLY

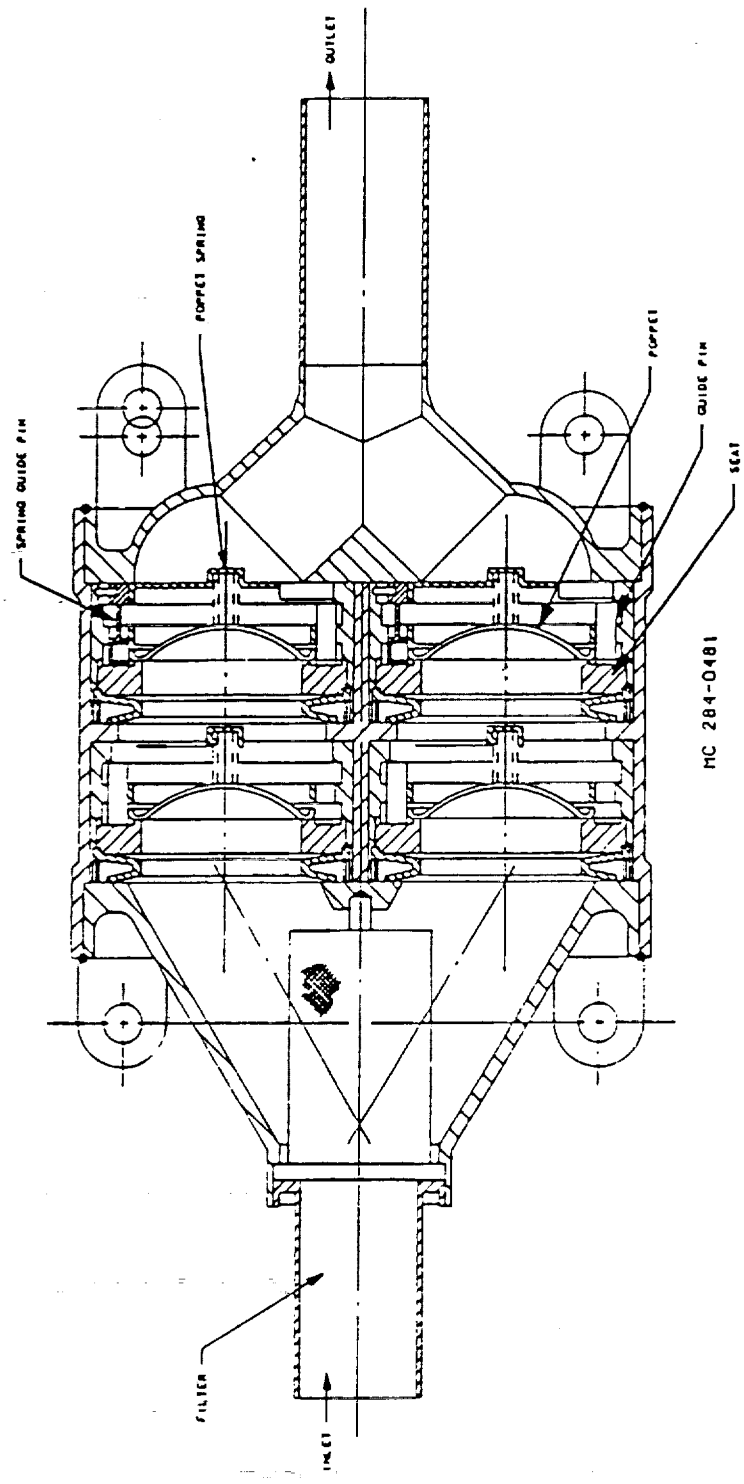


Figure 12 - QUAD CHECK VALVE ASSEMBLY

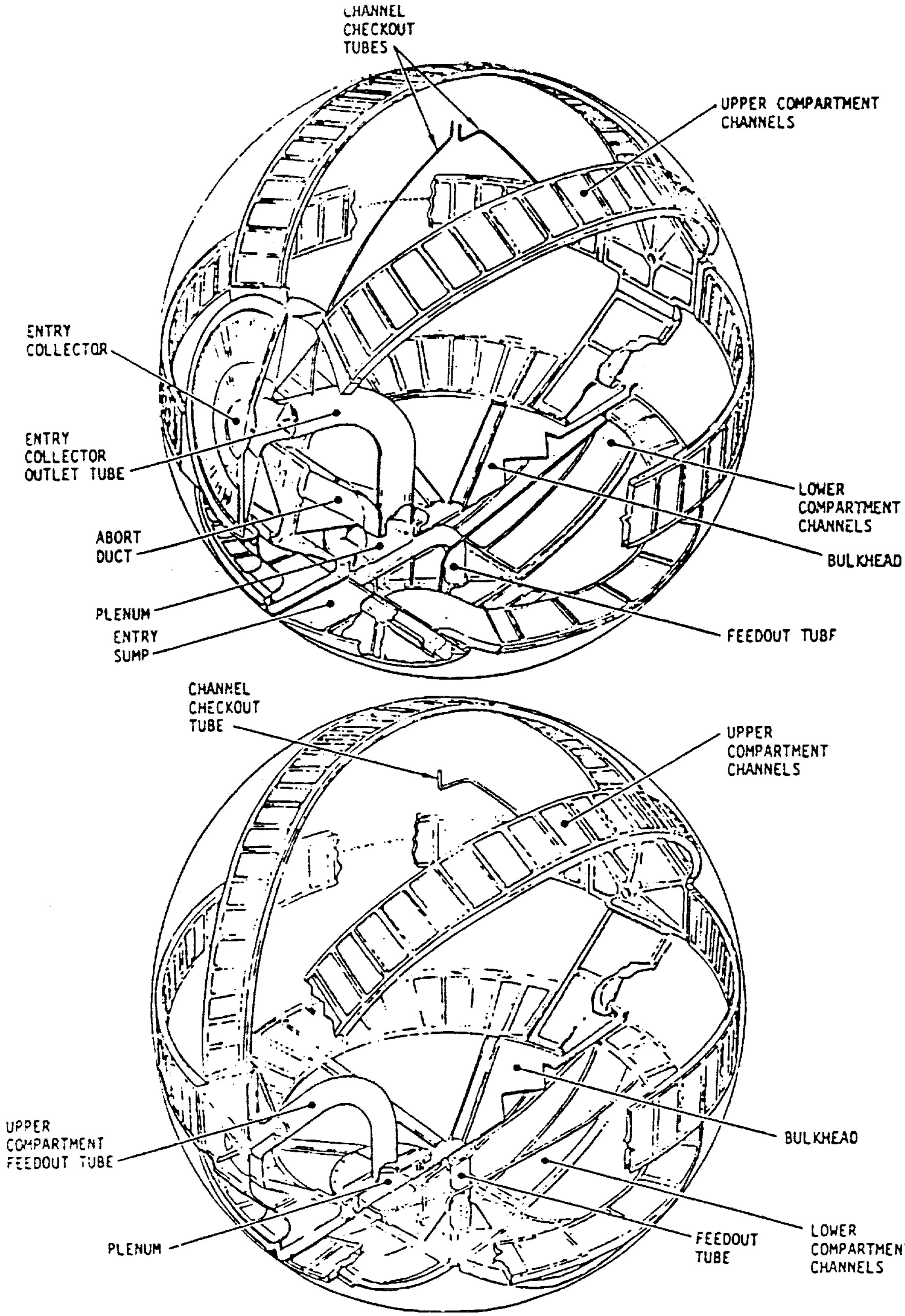


Figure 13 - AFT AND FORWARD RCS PROPELLANT TANKS

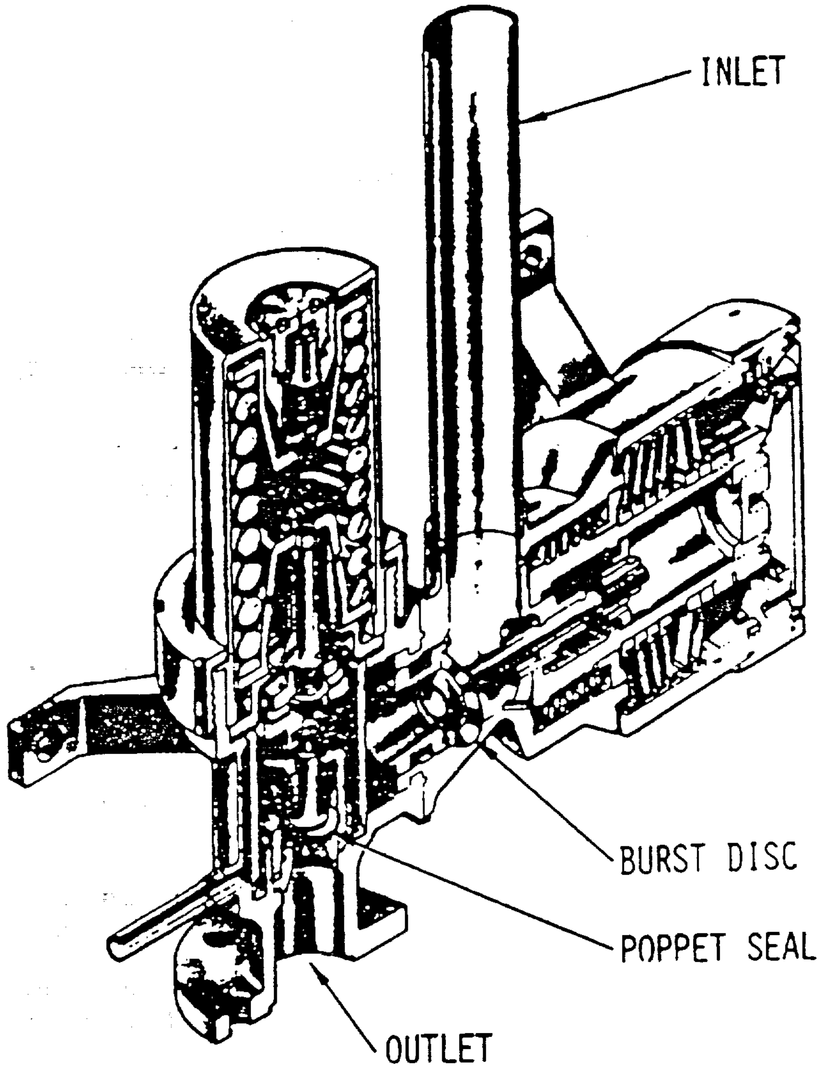


Figure 14 - PRESSURE RELIEF VALVE ASSEMBLY

position, an open or close microswitch is automatically activated to remove AC power from the valve motor. A signal is also sent to the GPC, to the ground, and to the valve position indicator (talkback), located above each switch. The talkback logic displays barberpole when the valves are in motion or when there is a position mismatch between the fuel and the oxidizer valves. Otherwise, the talkback shows "OP" for open valves and "CL" for closed valves.

The tank isolation valves are located between the propellant tanks and the manifold isolation valves, and are used to isolate the propellant tanks from the remainder of the subsystem (Figure 15).

The tank isolation valves are AC motor-operated and contain a lift-off ball-flow control device. For each module, one valve isolates each propellant tank from the 1/2 manifold. Two valves in parallel isolate each propellant tank from the 3/4/5 manifold line in the aft modules, and one valve isolates each propellant tank from the 3/4/5 manifold line in the forward module.

The tank isolation valves are controlled by the FWD RCS, AFT LEFT RCS, and AFT RIGHT RCS TANK ISOLATION 1/2 and 3/4/5 switches on panels O7 and O8. These are permanent position switches (OPEN, GPC, CLOSE). Switch logic, relay logic, and motor logic for the isolation valves are contained in the Forward and Aft Motor Control Assemblies (FMCA and AMCA). Therefore, it is necessary to have the MCAs powered up to operate the tank isolation valves.

The FRCS tank isolation valves are normally maintained open throughout the mission with the switch in the open position. The ARCS tank isolation valves are in the GPC position. With the switch in the GPC position, the logic in the MCA is designed to receive computer commands to control the valves. The GPC reconfigures the aft tank isolation valves and the RCS and OMS crossfeed valves in case of OMS-to-RCS interconnect, or for RCS/RCS crossfeed operations. Manual configuration is required in the case of manual RCS/RCS crossfeed and on orbit/deorbit OMS-to-RCS interconnect. In the event of a switch failure in the GPC position, the crew can open or close the valves using GPC memory read/write procedures.

The RCS crossfeed valves are contained only in the ARCS pods, and are used to isolate the RCS propellant cross-feed lines from the OMS interconnect lines (Figure 15). They are located between the tank isolation valves and the manifold isolation valves.

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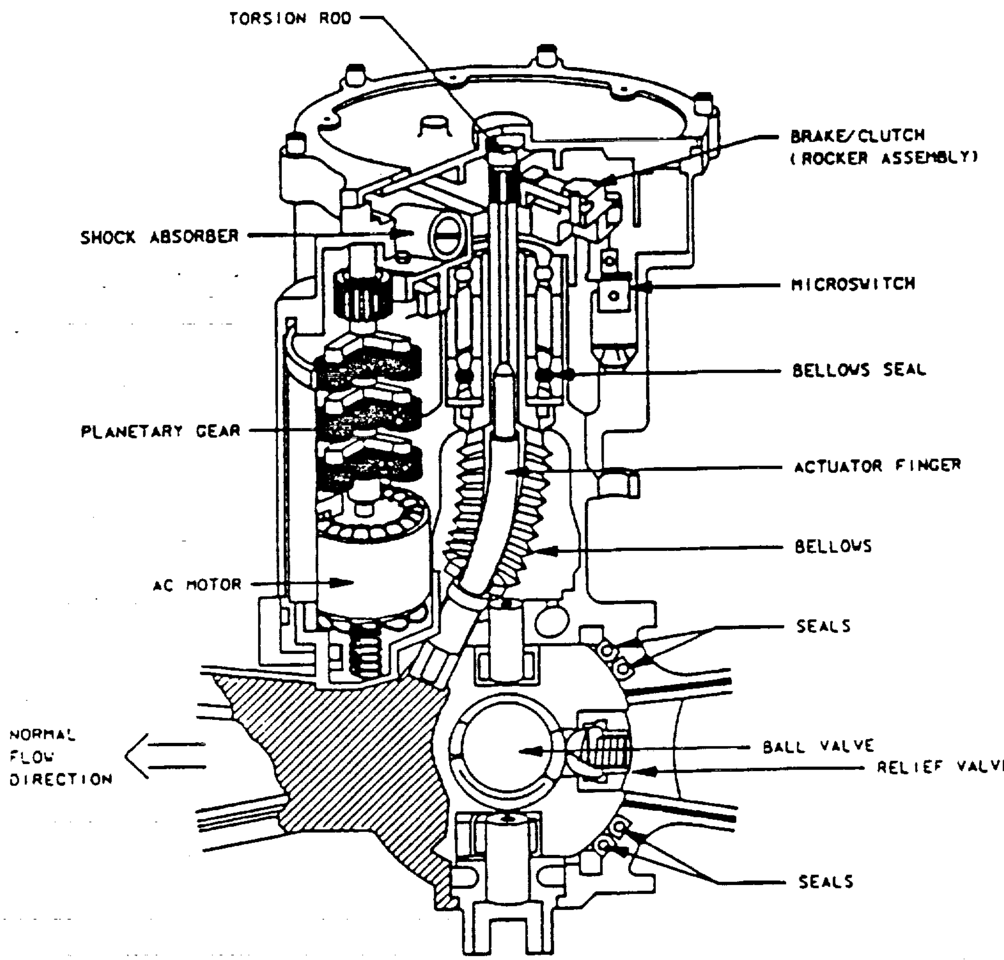

Figure 15 - AC MOTOR VALVE

The RCS crossfeed valves are AC motor-operated and contain a lift-off ball-flow control device. One pair of valves, one fuel and one oxidizer valve, isolate the RCS crossfeed lines from the 1/2 propellant lines. One pair of valves isolate the RCS crossfeed lines from the 3/4/5 propellant lines. The RCS crossfeed valves are

controlled by the LEFT, RIGHT RCS CROSSFEED 1/2 and 3/4/5 switches on panel O9. These are permanent position switches (OPEN, GPC, CLOSE). Switch logic, relay logic, and motor logic for the isolation valves are contained in the AMCA. Therefore, it is necessary to have the MCAs powered up to operate the RCS crossfeed valves.

The RCS crossfeed valves are normally maintained closed throughout the mission, with the switch in the GPC position. With the switch in the GPC position, the logic in the MCA is designed to receive computer commands to control the valves. The GPC reconfigures these valves, the OMS crossfeed valves, and the tank isolation valves in case of OMS-to-RCS interconnect during aborts, or for RCS/RCS crossfeed operations. Manual configuration is required in the case of manual RCS/RCS crossfeed and on orbit/deorbit OMS-to-RCS interconnect. In the event of a switch failure in the GPC position, the crew can open or close the valves using GPC memory read/write procedures.

The primary manifold isolation valves are located between the tank isolation valves, downstream of the RCS crossfeed valves, and the primary thrusters (Figure 15). They are used to isolate the primary thrusters from the propellant subsystem.

The primary manifold isolation valves are AC motor-operated and contain a lift-off ball flow control device. For each module, one valve isolates each manifold from each propellant. The primary manifold isolation valves are controlled by the FWD RCS, AFT LEFT RCS, and AFT RIGHT RCS MANIFOLD ISOLATION 1, 2, 3, and 4 switches on panels O7 and O8. These are permanent position switches (OPEN, GPC, CLOSE). Switch logic, relay logic, and motor logic for the isolation valves are contained in the FMCA and AMCA. Therefore, it is necessary to have the MCAs powered up to operate the manifold isolation valves.

Redundancy Management (RM) is used to monitor the microswitches in these valves, and can cause the valves to be declared closed, and the jets on that manifold to be removed from the Jet Available Table. The crew can override the RM by CRT keyboard entries and reselect the manifold and its jets.

The primary manifold isolation valves are normally maintained open throughout ascent and entry, with the switch in the GPC position. With the switch in the GPC position, the logic in the MCA is designed to receive computer commands to control the valves. These valves are controlled by the GPC during aborts and are controlled by RM at all times. In the event of a switch failure in the GPC position, the crew can open or close the valves using GPC memory read/write procedures.

3.1.2.d Vernier Manifold Isolation Valves

The vernier manifold isolation valves are located between the tank isolation valves, downstream of the RCS crossfeed valves, and the vernier thrusters (Figure 16). They are used to isolate the thrusters from the propellant subsystem.

The vernier manifold isolation valves are DC solenoid operated. One valve isolates each vernier manifold from each propellant. The manifold isolation valves are controlled by the FWD RCS, AFT LEFT RCS, and AFT RIGHT RCS MANIFOLD 5 ISOLATION switches on panels O7 and O8. These are momentary position switches (OPEN, GPC, CLOSE). Switch logic for the vernier manifold valves is contained in the FLCA and ALCA. Solenoid logic and power logic is provided by the Power Control Assemblies (PCAs). Therefore, it is necessary to have the LCAs powered up to operate the manifold isolation valves.

The circuitry to control the valve has been changed since 51-L (Figure 17). The switches have been changed from permanent position switches to momentary switches. To prevent effects of an internal short in the switch, diodes have been added to direct the current to ground (thus blowing the associated fuse). A circuit breaker and a Type IV hybrid driver have been added for additional circuit control. The driver can receive commands from either the switch panel or the GPC. These changes have been implemented to prevent continuous power from being applied to the solenoids. Continuous power to these solenoids have been found to cause valve overheating thus fuel decomposition leading to valve rupture and propellant release.

Once a valve reaches the open or closed position, a microswitch is automatically closed to remove DC power from the valve solenoid. A signal is also sent to the GPC, to the ground, and to the valve position indicator (talkback) located above each switch. The talkback logic displays barberpole when the valves are in motion or when there is a position mismatch between the fuel and the oxidizer valves. Otherwise, the talk-

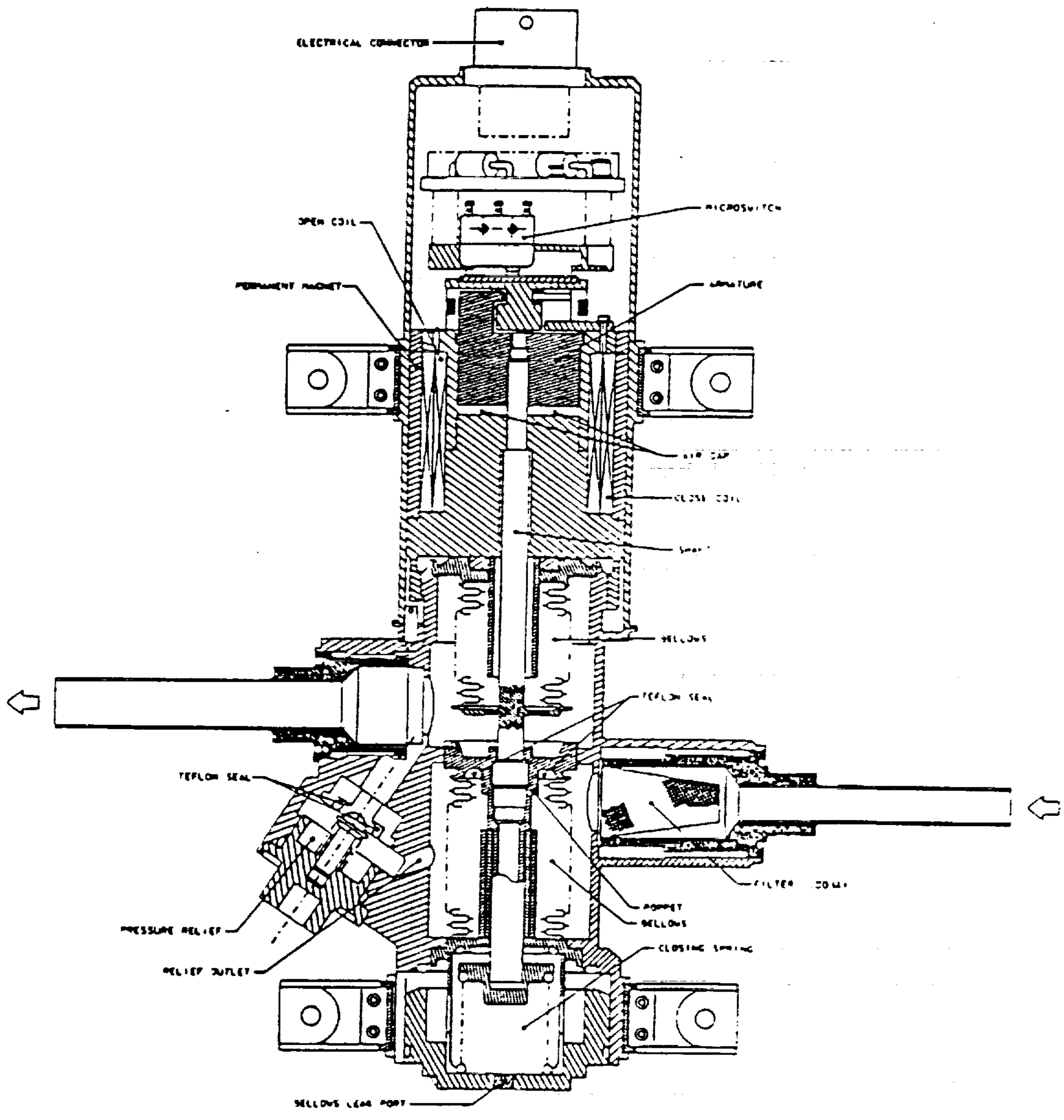

Figure 16 - VERNIER MANIFOLD ISOLATION VALVE

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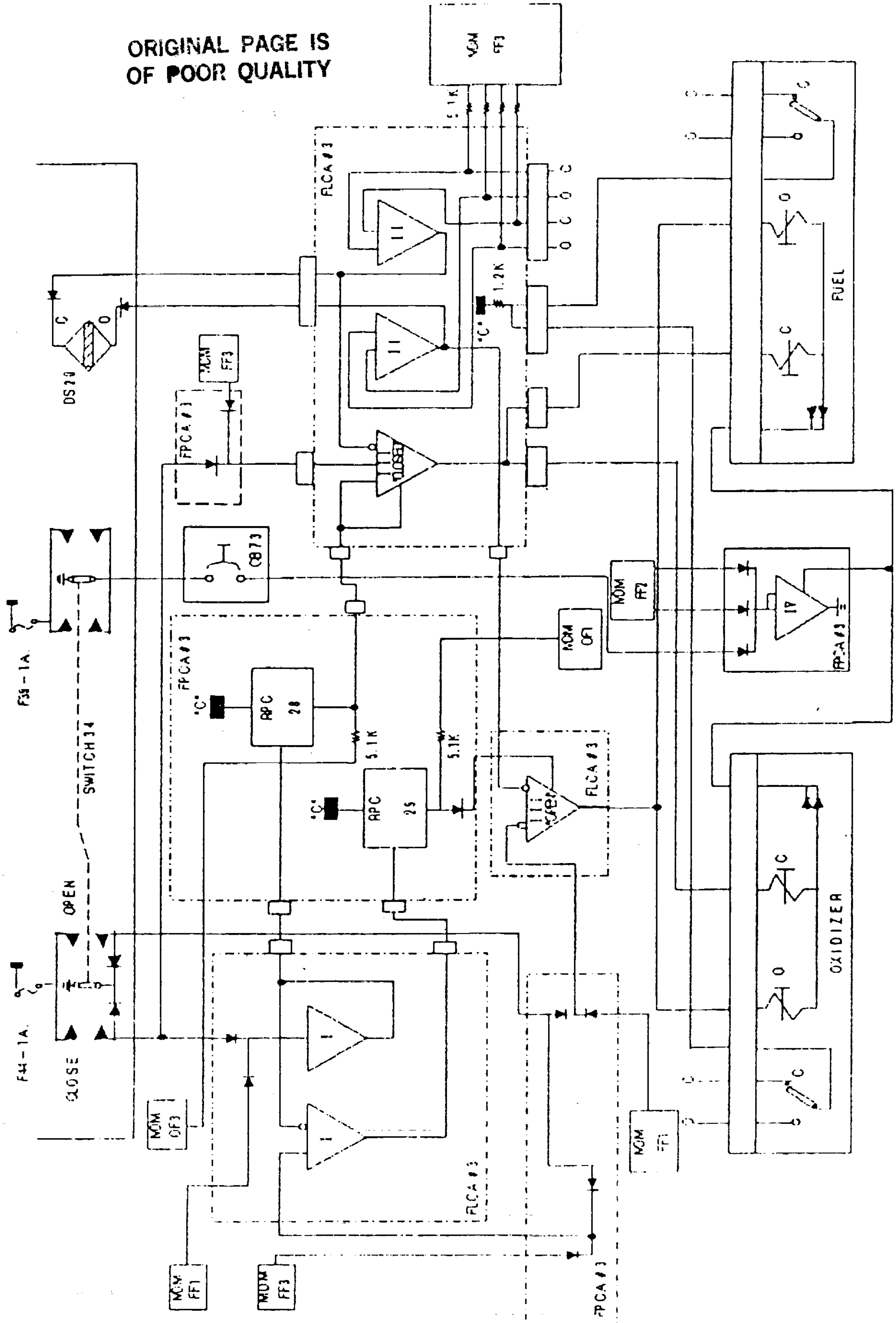


Figure 17 - MANIFOLD 5 ELECTRICAL SCHEMATIC

back shows "OP" for open valves and "CL" for closed valves. Redundancy Management (RM) is used to monitor the microswitches in these valves, and can cause the valves to be declared closed, and the vernier jets to be deselected. The crew can override the RM by CRT keyboard entries and reselect the vernier jets.

The vernier manifold isolation valves are normally maintained open throughout orbit and closed during ascent and entry, with the switch in the GPC position. With the switch in the GPC position, the logic in the LCAs and PCAs is set up to receive computer commands to control the valves. The GPC controls these valves by RM at all times. In the event of a switch failure in the GPC position, the crew can open or close the valves using the GPC memory read/write procedures.

3.1.3 Thruster Subsystem

The RCS jet thrusters are pressure-fed, bipropellant, hypergolic engines. There are two types of thrusters in the Shuttle: the primary thrusters, and the vernier thrusters (Figure 18). Both types of thrusters contain a fuel and oxidizer bipropellant solenoid valve, injector head assembly, combustion chamber, expansion nozzle, and an electrical junction box and can be operated in either pulse mode or steady-state mode.

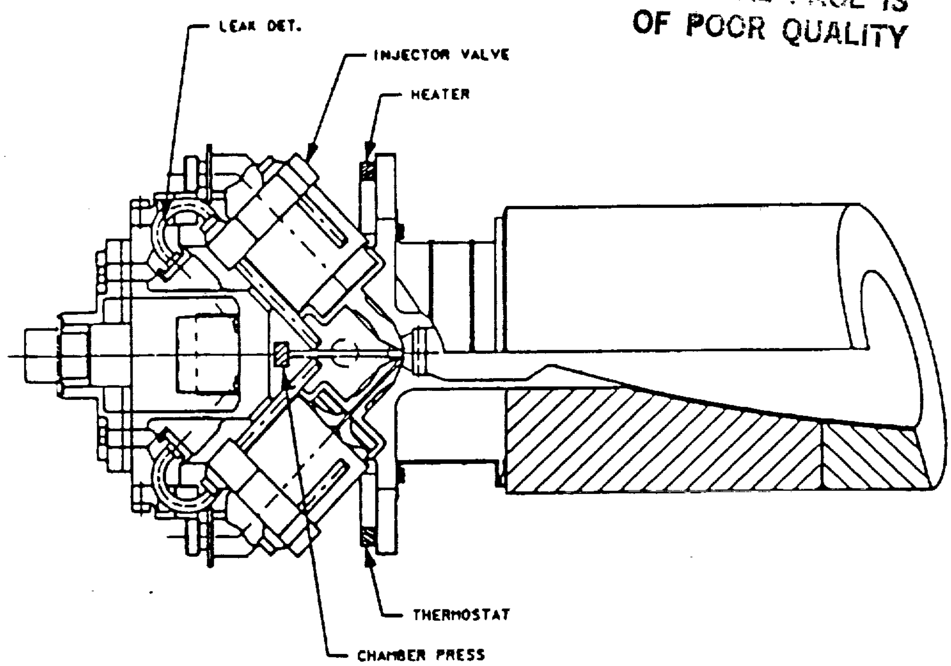
3.1.3.a Bipropellant Valves

The bipropellant control valves control the flow of propellants to the thrusters by opening and closing in response to electrical fire commands (Figure 19). Each primary jet engine assembly contains two injector solenoid pilot poppet valves, one for fuel and one for oxidizer. They are operated by coaxially-wound coils which are energized open by a fire command, and are spring-loaded closed. When the pilot valves open, the propellant's hydraulic pressure opens the main poppet valves to allow the propellants into the injector. The vernier jets use single-stage, solenoid-operated poppet valves.

The fuel and oxidizer valves on the primary jet thrusters are mechanically linked. The pilot valve is activated by a 80 msec pulse sent from the Reaction Jet

Driver. Commands are issued every 80 msec, so the minimum on or off time is 80 msec. The vernier bipropellant valves are operated similarly by a mechanically linked torque motor.

During normal operations, if the isolation and manifold valves are properly configured, a fire command to a jet



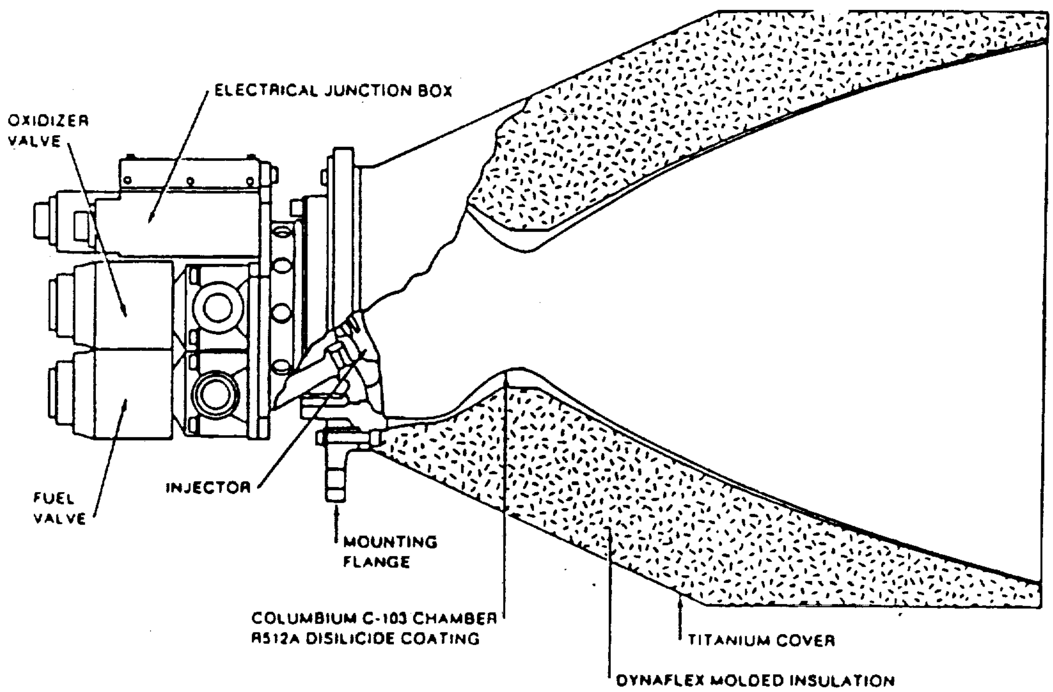


Figure 18 - VERNIER AND PRIMARY THRUSTERS

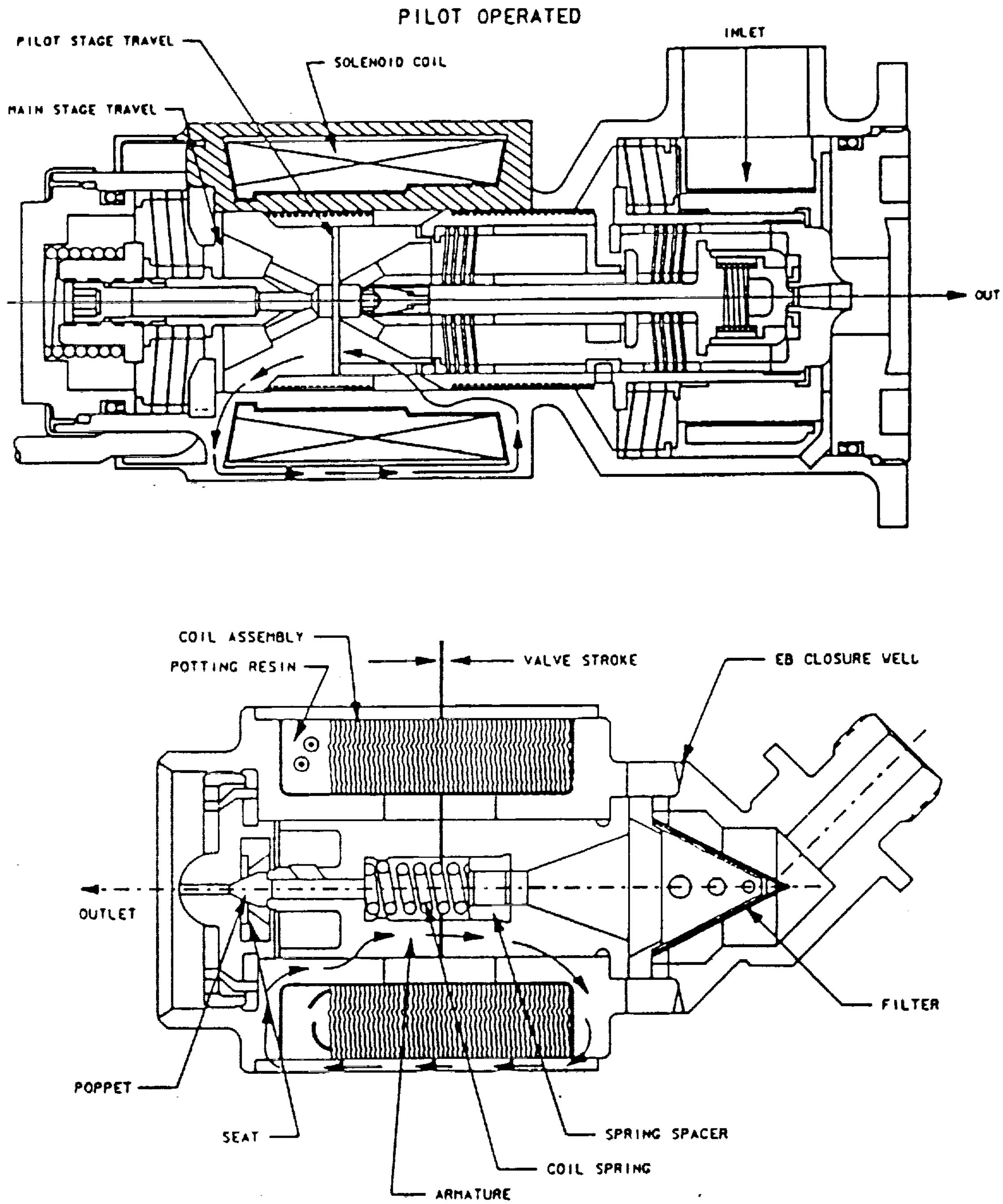


Figure 19 - PRIMARY AND VERNIER THRUSTER VALVES

will cause that jet's bipropellant valves to open. Removal of the fire command will cause the bipropellant valves to close.

3.1.3.b Injector Head Assembly

Each RCS jet contains an injector head assembly which directs the propellant flow from the bipropellant control valves to the combustion chamber (Figure 20). The injector is welded to the combustion chamber.

For the primary jets, injector holes are arranged in two concentric rings (outer fuel, inner oxidizer) which are canted to cause impingement of the hypergolic propellants within the combustion chamber. Separate fuel holes near the outer edge of the injector plate provide cooling for the combustion chamber wall. Spaced between these fuel inlet holes are acoustic cavities which are of varied depth to prevent acoustic resonance when the jet is fired.

For the vernier jets, fuel and oxidizer enter the combustion chamber through a single pair of injector holes which are also canted to provide impingement of the fuel and oxidizer streams for combustion. The combustion chamber wall is cooled by making the fuel stream more divergent than the oxidizer stream.

Unlike stream impingement is used to improve propellant mixing in the combustion chamber with a mixture ratio of 1.6 lbs oxidizer to 1.0 lbs fuel for both the primary and vernier jets.

The primary jets operate at 152 psia, produce 870 lbs (vacuum) thrust, and have a specific impulse of 280 seconds. The vernier jets operate at 106 psia, produce 25 lbs (vacuum) thrust, and have a specific impulse of 265 seconds.

3.1.3.c Combustion Chamber and Nozzle

The combustion chamber and nozzle are made of columbium C-103 with a R512A Disilicide coating 0.003-inches thick. Behind the columbium is Dynaflex molded insulation covered with 0.02-inch thick titanium on the outside.

3.1.4 Electrical Power Distribution and Control Subsystem

3.1.4.a Electrical Junction Box

The electrical junction box on each RCS thruster contains an electric heater and thermostat, a chamber pressure transducer, a propellant leak detection

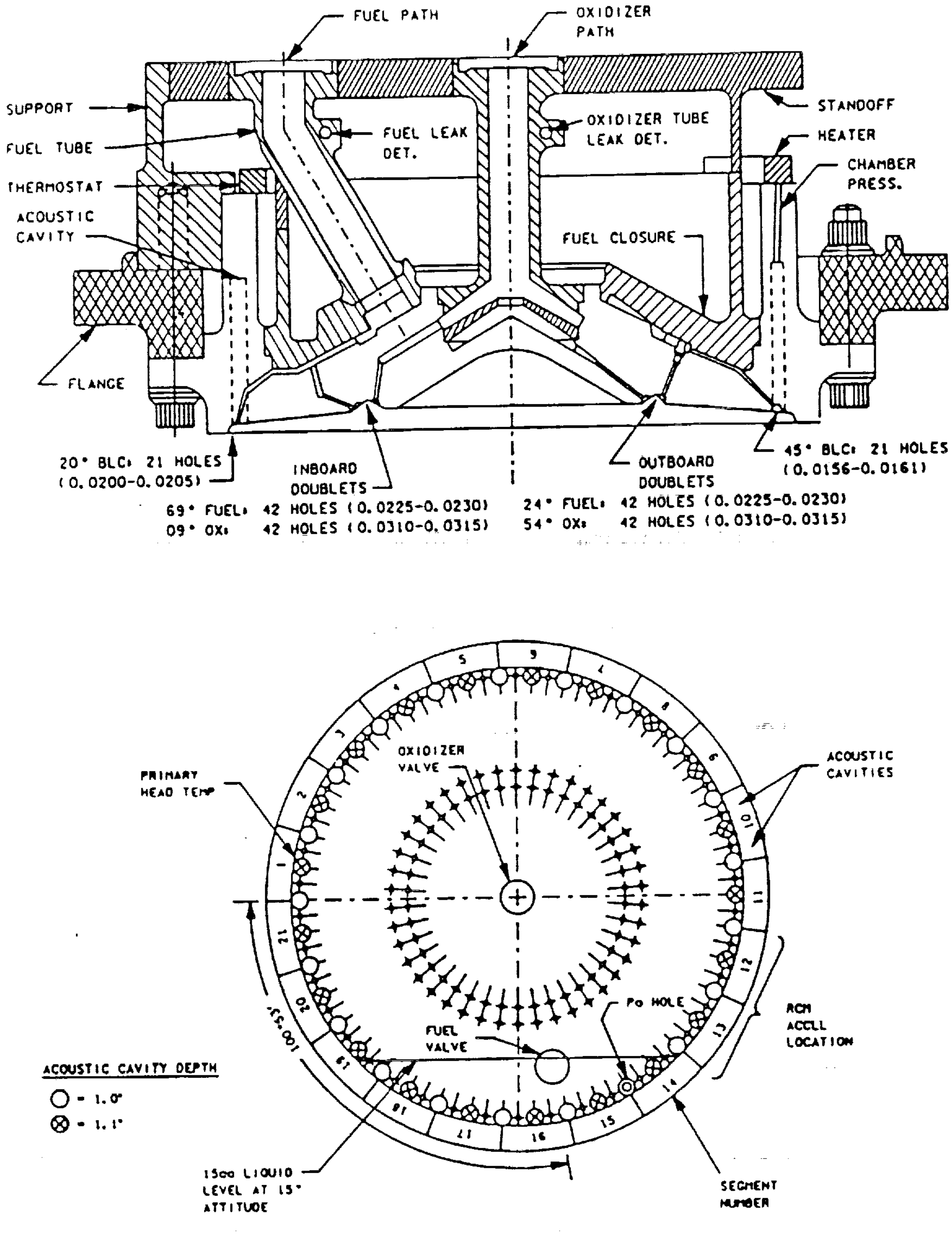


Figure 20 - INJECTOR HEAD ASSEMBLY

device, and the electrical connections to the bipropellant valves. The electrical heater contains one heating element and is thermostatically controlled.

The thermostat is set to a predetermined range, and will regulate the on and off cycles of the heater as

long as voltage is present. The heaters are controlled by the RCS/OMS HEATERS switches on panel A14. These are two-position switches, OFF and AUTO, and the heater is controlled by the thermostat when this switch is in the AUTO position.

3.2 Redundancy Management

The RCS Redundancy Management (RM) monitors the RCS jets' chamber pressures, temperatures, reaction jet driver output discretes and jet fire commands, and manifold valves status. It also provides a limited amount of automatic jet deselection and alerts the crew when a fault is detected.

The Data Processing System (DPS) software provides status information on I/O errors to the RCS RM software, referred to as commfaults (communications faults). Commfault indicators are set as the result of bus masking, Bus Control Element (BCE) bypasses, and Bus Terminal Unit (BTU) bypasses. When an I/O error is detected on a BCE chain by any GPC, the data on the entire chain is flagged as invalid (commfaulted) for the applications software. On subsequent transactions, if the problem is isolated, only the faulty element is flagged as invalid. In a similar way, if a bus mask is set all BCEs and data associated with that bus is indicated via commfault as being in error. In any case, the commfault will be set or latched when it is present for two consecutive passes.

Commfaults are included in the RCS RM requirements to help prevent the redundant GPCs from moding to dissimilar software, to optimize the number of jets available for use, and to prevent the RCS RM from generating additional alerts to the Flight Control Operational Software (FCOS) generated alerts associated with commfaults. The RCS RM uses the MDM and Line Replaceable Unit (LRU) commfaults (where LRU is defined to be either one RCS jet or one RCS manifold), and will reconfigure for commfaults, regardless of whether the commfault is permanent, permanent and subsequently removed, or transient. The MDM and LRU commfaults are set in the FCOS software when a commfault is present for two cycles. There are 44 jet LRU commfaults and 15 manifold LRU commfaults.

All input signals associated with any one LRU (where LRU is defined as either one RCS jet or one RCS manifold) will be within the same BCE, and the FCOS will set a BCE flag for a BCE if it determines an I/O problem at the BCE level. This flag will be used by the manifold status monitor in determining the commfault state of the RCS LRU, and/or input signals for the LRU. A jet

with an LRU commfault will not have any of its status flags or counters modified as long as the fault exists, except by subsequent crew action. An MDM commfault will set all LRU commfaults for each BCE associated with the MDM commfault, thus suspending the operation of the RCS RM failure monitors. An I/O reset on a CRT keyboard will reset any latched commfaults. LRU commfaults or transducer failures will cause the quantity monitor to use substitute measurements or constants, and the CRTs will shown on "M" to indicate missing data. If a substitute is not available or a constant is used, the calculations are suspended, a down arrow appears on the CRT, and a class 3 alarm is output.

All input signals associated with an LRU are required to be within the same BCE. The input signals associated with each RCS jet are a chamber pressure discrete, fuel and oxidizer injector temperatures, and reaction jet driver output discrete. The input signals associated with each manifold are the open and close discretes for the fuel and oxidizer manifold isolation valves.

3.2.1 Jet Failed-On Monitor

The Jet Failed Monitor uses the Reaction Jet Driver (RJD) output discretes and the jet fire command discretes provided by the RCS CMD SOP to detect jets failed on.

The Jet Failed-On Monitor uses the jet fire command A discretes, the reaction jet driver output discretes, the jet RM inhibit discretes, and the jet LRU commfault discretes as inputs, and outputs the jet failed-on indicator discretes and the jet failed on counter discretes. There are 44 of each of these discretes.

The Jet Failed-On Monitor's logic ANDs the reaction jet driver output discrete with the complement of the jet fire command A discrete, and declares the jet failed-on if this calculation is true for three consecutive cycles. Consecutive passes are not affected by commfaults or by cycles in which there are fire commands for the affected jets. The three consecutive cycle logic will be reset; however, if the noncommanded jet has its reaction jet driver output discrete reset to indicate the jet is not firing. A jet failed-on declaration will not cause automatic deselection of the jet by RM, nor will the Digital Autopilot (DAP) reconfigure the Jet Priority Table.

A jet failed-on determination will set the jet failed-on indicator discrete and the jet failed-on counter discrete. These discretes will be reset when the associated jet's RM inhibit discrete is reset. The Jet Failed-On Monitor outputs the jet failed-on indicators to displays and controls and to the Jet Fault Limit Module.

The Jet Failed-On Monitor's design is valid for a minimum jet fire command pulse of 80 msec on and 80 msec off. The crew will be alerted by a class 2 alarm, the backup C&W

lights and RCS jet light on the C&W matrix on panel F7, a fault message on the CRT fault message line, and jet-on indications on the RCS SPEC display and the GNC SYS SUM 1 and 2 displays.

The Jet Failed-On Monitor is active in OPS 1, 2, 3, 6, and 8 in the PASS, and 1, 3, and 6 for the BFS, but only if BFS is engaged.

3.2.2 Jet Failed-Off Monitor

The Jet Failed-Off Monitor uses the jet fire command discretes provided by the RCS Command SOP, and the jet chamber pressure feedback discretes provided by the RJDs to detect jets failed off.

The Jet Failed-Off Monitor uses the jet fire command A discretes, the jet chamber pressure discretes, the jet RM inhibit discretes, and the jet LRU commfault discretes as inputs, and outputs the jet failed-off indicator discretes and the jet failed-off counter discretes. There are 44 of each of these discretes.

The Jet Failed-Off Monitor's logic ANDs the jet fire command A discrete with the complement of the jet chamber pressure discrete, and declares the jet failed off if this calculation is true for three consecutive cycles. Consecutive passes are not affected by commfaults or by cycles in which there are no fire commands for the affected jets. However, consecutive passes leading to a failed-off indication must begin anew if, prior to reaching the third consecutive cycle, the fire command and its associated pressure discrete indicates that the jet has fired. The RCS RM will automatically deselect a jet which has failed off, and the DAP will reconfigure jet selection accordingly. (See section 3.6.1 for the DAP Jet Select Logic description.)

A failed-off jet determination will set the associated jet failed-off indicator and the jet failed-off counter discretes. These discretes will be reset when the associated jet's RM inhibit discrete is reset. The Jet Failed-Off Monitor outputs these jet failed-off indicator discretes to the Jet Fault Limit Module and to displays and controls. The Jet Failed-Off Monitor will be inhibited for the jet which has failed off until the crew resets the RM inhibit discrete.

The Jet Failed-Off Monitor design is valid for a minimum jet fire command pulse mode of 80 msec on and 80 msec off. The crew is alerted to a failure by a class 2 alarm, the backup C&W light and RCS jet light on the C&W matrix on panel F7, a fault message on the CRT fault message line, and a jet-off indication on the RCS SPEC display and the GNC SYS SUM 1 and 2 displays. The Jet Failed Off Monitor is active in OPS 2, 3, 6, and 8 in the PASS, and 1, 3, and 6 for the BFS, but

only if BFS is engaged.

3.2.3 Jet Leak Monitor

The Jet Leak Monitor uses the jet fuel and oxidizer injector temperature transducer outputs of each jet to detect a leaking jet.

The Jet Leak Monitor uses the jet fuel and oxidizer injector temperatures, the jet RM inhibit discretes, and the jet LRU commfault discretes as inputs, and outputs the jet failed leak indicator discretes and the jet failed leak counter discretes. There are 44 of each of these discretes.

The Jet Leak Monitor's Logic compares the jet fuel and oxidizer injector temperatures with the specified temperature limit of 30 degrees F, and declares the Jet Failed Leak if either of the temperatures are less than 30 degrees F for three consecutive cycles. Consecutive passes leading to a Jet Failed Leak indication will begin anew if the fuel and oxidizer temperatures are both greater than 30 degrees F before the jet leak counter reaches three. The RCS RM will automatically deselect a jet which is declared leaking and the DAP will reconfigure jet selection accordingly.

A Jet Failed Leak determination will set the associated jet failed leak indicator and jet failed leak counter discretes. These discretes will be reset when the associated jets RM inhibit discrete is reset. The Jet Leak Monitor outputs the Jet Failed Leak indicator discretes to the Jet Fault Limit Module and to crew displays.

The crew is alerted to a failure by a class 2 alarm, the backup C&W light and the RCS jet light on the C&W matrix on panel F7, a fault message on the CRT fault message line, and a Jet Failed Leak indication on the RCS SPEC display and the GNC SYS SUM 1 and 2 displays.

The Jet Leak Monitor is active in OPS 2, 3, and 8 for the PASS, and 1, 3, and 6 for the BFS, but only if BFS is engaged.

3.2.4 Jet Fault Limit Module

The Jet Fault Limit module limits the number of jets which can be automatically deselected in response to failures detected by RCS RM. The limits are modifiable by crew input on the RCS SPEC display (RCS F, L, R Jet Fail Limit integers - one integer per pod). This module also reconfigures a jet's availability status (jet deselect output discretes (44)) in response to crew inputs on the RCS SPEC display (jet RM inhibit discretes (44) and jet deselect input discretes (44)).

An automatic deselection of a jet occurs if all of the following are satisfied:

- o Jet Failed-Off or Jet Failed Leak (Jet Failed-On failures do not result in automatic deselection)
- o Jet select/deselect status is "SELECT"
- o Jet's manifold status is "OPEN"
- o RM is not inhibited for this jet
- o Jet failure has not been overridden
- o The number of automatic deselections of primary jets on this pod is less than the associated Jet Fail Limit (no limit on vernier jets)

All jet failures detected will be announced to the crew even if they do not cause automatic jet deselection. If multiple failures occur on a jet, only the last failure will be annunciated. Failure indicators are the same as in the Jet Failed Off and Jet Failed Leak Monitors.

The jet fail limit counter is incremented by the number of jets which have been automatically deselected for that pod by the RCS RM and is decremented by one for each automatically deselected jet that is reselected. The vernier jets do not increment or decrement the jet fail limit counter. The Jet Fail Limit valves are individually changeable in major modes 2 and 3 on the RCS SPEC display. An increase in the Jet Fail Limit allows previously failed jets to be deselected, providing the above requirements are met. A decrease in the Jet Fail Limit will not cause a change in the status of any jet. Note that setting the Jet Fail Limit equal to or less than the number of jets which have been automatically deselected will effectively inhibit the RCS RM for that pod.

A jet's status can be changed from deselect to select only by item entry on the RCS SPEC page. Failure resets or reductions in the Jet Fail Limit will not cause the status to be reset to select. The select item entries cause the override to be invoked if there is a declared failure for that jet, and will make those failures inoperative in the Jet Fault Limit module. An overridden failure will remain overridden until the applicable failure is reset.

Automatic deselection of a jet can be prevented by the use of the Inhibit item entries on the RCS SPEC page. Changing the Inhibit to Not Inhibited will reset a jet's failures, but will not cause the Jet Fail Limit to be incremented or decremented. Reset by use of the RM Inhibit of a failure which has been overridden will reset the override. Jet failures are unordered; that is, if there are more candidates for automatic deselection than is permitted by the Jet Fail Limit, there is no preference as to which of the candidates will be deselected.

3.2.5 Manifold Status Monitor

The Manifold Status Monitor uses the open and close discretes of the oxidizer and fuel manifold isolation valves (provided by the monitor control assemblies) to determine the open/close status for each jet manifold.

The Manifold Status Monitor uses the fuel and oxidizer manifold valve open discretes (15 of each discrete), the fuel and oxidizer close discretes (15 of each), the manifold status discrete (15 discretes), the manifold LRU commfault discretes (15 discretes), the MDM commfault discretes (8 discretes), and the manifold status override discrete (one discrete) as inputs, and outputs the manifold open/close status discretes (15 discretes), the RCS manifold RM dilemma discretes (15 discretes), and the RM power fail discrete (one discrete).

The Manifold Status Monitor monitors the open and close discretes for each manifold for any changes of state. A change of state in any one or more of these discretes will cause a redetermination of that manifold's open/close status, independent of status changes made by the crew. This redetermination also contains logic which will determine if a power failure has occurred and will determine whether a dilemma exists on a manifold (tables 3-I and 3-II). A power failure condition exists when all of the open and close discretes on a manifold are false for three consecutive cycles, and will cause the RM Power Fail Flag to be set. The manifold sets identified in Table 3-II are the only manifolds which require power failure determination. This flag will remain set until the GNC FDA module honors it, when it will then be reset. There is only one RM Power Fail Flag and all manifolds are capable of setting it, but each can set the flag only once. Whenever a dilemma exists for three consecutive passes, the RCS manifold RM Dilemma Flag for that manifold will be set. MDM or LRU commfaults will not modify the dilemma pass counter or the RM Dilemma Flag. The flag will be reset, however, if any of the four manifold open/close discretes change state.

The transition of an MDM commfault discrete from false to true will cause the status of all affected manifolds to be set to close in all major modes. In major mode 1, the same is true of an LRU commfault. In major modes 2 and 3, the transition of an LRU commfault will cause no change in manifold statuses.

The crew is able to override the status of all manifolds on an individual basis by item entries on the RCS SPEC display via the Manifold Status Override. The setting of this discrete for a manifold will change the manifold's status to its complementary state and will then reset the discrete. The use of the Manifold Status Override feature will not inhibit or modify any of the other functions of the manifold

status monitor. The module will continue to honor subsequent changes in the affected manifold's input signals (open/close discretes, commfaults, override discrete) as specified in this section.

The Manifold Close Status Override is used in Major Modes 1 and 3 open all manifolds whose status is closed and whose open/close discretes are in dilemma. This discrete can be set by item entry on the Override page, and will be reset to false after the reconfiguration is complete. The use of the Manifold Close Status Override feature will not inhibit or modify any of the other functions of the Manifold Status Monitor.

3.2.6 Available Jet Status Table

The Available Jet Status table module provides a list of jets available for use to the Jet Select Logic Module in the Flight Control System software.

The Available Jet Status Table uses the manifold open/close discretes (15 discretes) from the Manifold Status Monitor, and the jet deselect output discretes (44 discretes) from the Jet Fault Limit Module as inputs, and outputs the jet available discretes (44 discretes) and the jet status change discrete (one discrete).

The Available Jet Status Table's logic "AND"s the jet deselect output discrete with the manifold open/close status discrete and statuses a jet as available to the Flight Control System if the discretes indicate select and open, respectively. The Available Jet Status Table will be computed each time that the jet status change discrete is true.

In the BFS, jet failures are detected only when BFS is engaged. The Jet Failed Leaking and Jets Failed-Off detection in the BFS is the same as in the PASS, but the jet chamber pressure feedback discrete is used for Jet Fail-On detection in the BFS rather than the RJD output discrete which is used in the PASS.

3.3 Interfaces and Locations

The RCS interfaces with the following systems: Data Processing System, Displays and Controls, Caution and Warning, Orbital Maneuvering System, Electrical Power Distribution and Control, and the Pulse Code Modulator. In addition, the RCS interfaces with the crew.

3.3.1 Data Processing System

The RCS sends data consisting of pressures, temperatures, and valve positions to the Data Processing System (DPS) through the flight-critical Multiplexer Demultiplexers (MDMs) to have the data processed by the GPCs. The GPCs use this data

to monitor and display the configuration and status of the RCS. The GPCs also provide valve configuration commands to the RCS and jet on/off commands to the RCS via the Reaction Jet Drivers Aft and Forward (RJDA and RJDF).

The Flight Control software uses the RCS Digital Automatic Pilot (DAP) to hold attitude or to accomplish an attitude maneuver by virtue of an error correction method. The State Estimator takes IMU data from the Attitude Processor software (ATT PROC), filters it, and sends it to a module called RCS Errors Phase Plane. In the RCS Errors module, attitude commands coming from the hand controller or from the Universal Pointing software (which runs the display by the same name) are compared with the actual attitude as computed by the State Estimator. The result is an attitude error and rate error which are passed on to the Phase Plane module. The Phase Plane Module generates positive or negative rate commands for each axis. These commands are sent to the RCS Activity Lights and to the Jet Select module.

The Jet Select Module uses a look-up table to determine how many jets are needed from each directional cluster. (A "directional cluster" is a group of jets located within the same pod, forward, left, or right, which provide thrust in the same axis and direction.) There are several such tables which take into account jet failures, propellant feed constraints, and usage of OMS propellant. A Jet Priority Table is used to determine the particular jets to be fired. Each jet in a directional cluster is assigned a priority permission. If RCS RM removes a jet from the Available Jet Status Table, the jet will be removed from the Jet Priority Table. Thus, the Jet Select Module logic will automatically select the next highest priority jet in that directional cluster. The crew has the capability to change a jet's priority on the Jet Priority Table or to override RM deselection of a jet from the Available Jet Status Table.

3.3.2 Displays and Controls

RCS data is sent to the Displays and Controls (D&C) to be displayed on dedicated displays. Switches and circuit breakers in the D&C panels are used for manual valve configuration and power routing to the RCS.

3.3.3 Caution and Warning

A selected portion of the RCS parameters are sent to the Caution and Warning (C&W) unit, where they are limit sensed to determine if RCS anomalies exist. If system anomalies are found, the C&W issues signals that illuminate the proper light on the C&W panel, the master alarm pushbutton indicators (pbis), and turn on the C&W tone.

3.3.4 Orbital Maneuvering System

The ARCS modules are connected with each other and with the OMS by propellant interconnect lines so that either or both OMS module's propellants can be fed to either or both of the ARCS modules.

3.3.5 Electrical Power Distribution and Control System

The Electrical Power Distribution and Control System (EPD&C) provides both AC and DC power to the RCS.

3.3.6 Pulse Code Modulator

Data from the RCS is routed through the Input/Output (I/O) MDMs to the Pulse Code Modulator (PCM) for incorporation in the telemetry downlink to be sent to the ground and to the onboard recorders.

3.3.7 Crew

The crew monitors and controls the RCS performance through CRT displays, fault messages, keyboard item entries, C&W indications, and associated switches and indicators.

3.4 Hierarchy

Figures 4 through 7 illustrate the hierarchy of the RCS hardware components. Figures 8 through 20 depict the functional details of the RCS subsystem components.

4.0 ASSESSMENT RESULTS

The IOA analysis of the RCS hardware initially generated two hundred eight (208) failure mode worksheets and identified one hundred forty-one (141) potential critical items (PCIs) before starting the assessment process. The EPD&C subsystem analysis initially generated two thousand sixty-four (2064) worksheets with four hundred forty-nine (449) PCIs. These analysis results along with additional analysis results generated during the assessment (Appendix E) were compared to the proposed NASA baseline of ninety-nine (99) hardware and five hundred twenty-four (524) EPD&C FMEAs, and sixty-two (62) hardware and one hundred forty-four (144) EPD&C CIL items. IOA mapped one hundred sixty-six (166) hardware and five hundred ninety-seven (597) EPD&C FMEAs, and one hundred thirty-three (133) hardware and one hundred sixteen (116) EPD&C CILs and PCIs into the NASA FMEAS and CILs. Upon completion of the assessment, and after discussions with the NASA subsystem manager, ninety-six (96) hardware issues, eighty-three (83) of which concern CIL items or PCIs, and two hundred eighty (280) EPD&C issues, one hundred fifty-eight (158) of which concern CIL items or PCIs, remain unresolved. Each of these unresolved issues are presented in subsequent section 4 paragraphs as well as in the detailed assessment worksheets (Appendix C). Any IOA issues which were resolved with the NASA subsystem manager are documented as such on the detailed assessment worksheets, but are not discussed in section 4.

Appendix C presents detailed assessment worksheets for each failure mode identified and assessed. These worksheets detail the assessments of each failure mode and document unresolved issues, resolved issues, plus any additional non-issue recommendations and comments. Appendix D highlights the IOA recommended critical items list and corresponding IOA worksheet ID. Appendix E contains IOA analysis worksheets supplementing previous analysis results reported in Space Transportation System Engineering and Operations Support (STSEOS) Working Paper No. 1.0-WP-VA86001-27, Analysis of the Reaction Control System, January 19, 1987. Appendix F provides a cross reference between the NASA FMEAs and corresponding IOA worksheet(s) along with IOA recommendations and an issues "flag" to denote the FMEAs with which IOA has unresolved issues. Appendix G identifies IOA analysis worksheets that have been superseded by the re-analysis shown in Appendix E.

Following the hierarchy breakdown shown in Figures 4-7, the RCS assessment results are summarized in the tables below.

Tables I-A.1, I-B.1, I-A.2, and I-B.2 present summaries of the IOA FMEA assessments for the forward RCS hardware, forward RCS EPD&C, aft RCS hardware, and aft RCS EPD&C, respectively. The IOA INTL column is the initial number of IOA failure modes for each RCS component. The recommended IOA FMEA baseline (IOA MAP) versus the NASA FMEA baseline, and resulting unresolved issues are presented in the subsequent columns. The unresolved failure mode issues for each RCS component are discussed in the associated section 4 paragraph referenced in the final column.

Tables II-A.1, II-B.1, II-A.2, and II-B.2 present summaries of the IOA CIL assessments for the forward RCS hardware, forward RCS EPD&C, aft RCS hardware, and aft RCS EPD&C, respectively. The IOA INTL column is the initial number of IOA PCIs for each RCS component. The recommended IOA CIL baseline (IOA MAP) versus the NASA CIL baseline, and resulting unresolved issues are presented in the subsequent columns. Again, the unresolved failure mode issues for each RCS component are discussed in the associated section 4 paragraph referenced in the final column.

Tables III-A.1, III-B.1, III-A.2, and III-B.2 present summaries of the recommended IOA FMEA baselines for the forward RCS hardware, forward RCS EPD&C, aft RCS hardware, and aft RCS EPD&C, respectively.

Tables IV-A.1, IV-B.1, IV-A.2, and IV-B.2 present summaries of the recommended IOA CIL baselines for the forward RCS hardware, forward RCS EPD&C, aft RCS hardware, and aft RCS EPD&C, respectively.

TABLE I-A.1 Summary of IOA FMEA Assessment - FRCS Hardware					
Components	IOA INTL	IOA MAP	NASA FMEAS	ISSUES	PARAGRAPHS FOR ISSUES
HE PRESS SUBSYSTEM					4.1.2.1.A
STORAGE TANK	1	1	1	0	
TANK ISOLATION VALVES	2	5	2	5	4.1.2.1.A.1
REGULATOR ASSEMBLIES	6	5	2	4	4.1.2.1.A.2
QUAD CHECK VALVE ASSEMBLY	2	4	3	4	4.1.2.1.A.3
COUPLINGS (SINGLE SEAL)	6	5	4	1	4.1.2.1.A.4
COUPLINGS (DOUBLE SEAL)	2	4	2	2	4.1.2.1.A.4
LINES AND FITTINGS	4	1	1	0	
PROP STOR & DIST SUBSYSTEM					4.1.2.2.A
PROPELLANT TANKS	1	1	1	0	
PROPELLANT CHANNEL SCREENS	1	1	1	1	4.1.2.2.A.1
PROPELLANT FEEDOUT TUBES	1	0	0	0	
PRESSURE RELIEF ASSEMBLIES	2	8	5	3	4.1.2.2.A.2
GROUND MANUAL ISOL VALVES	3	2	1	1	4.1.2.2.A.3
GIMBAL BELLOWS	2	1	1	0	
TANK ISOL VALVES	6	6	4	5	4.1.2.2.A.4
MANIFOLD ISOL VLVS, PRIMARY	10	5	4	4	4.1.2.2.A.5
MANIFOLD ISOL VLVS, VERNIER	2	5	3	4	4.1.2.2.A.6
JET ALIGNMENT BELLOWS, PRIMARY	2	1	1	1	4.1.2.2.A.7
JET ALIGNMENT BELLOWS, VERNIER	2	0	0	0	
COUPLINGS (SINGLE SEAL)	24	4	2	2	4.1.2.2.A.8
COUPLINGS (DOUBLE SEAL)	2	4	2	2	4.1.2.2.A.8
LINES AND FITTINGS	2	1	1	0	
THRUSTER SUBSYSTEM					4.1.2.3.A
PRIMARY JETS					
BIPROP SOLENOID VALVES	9	6	3	6	4.1.2.3.A.1
INJECTOR HEAD	0	2	0	2	4.1.2.3.A.2
COMBUSTION CHAMBER OR NOZZLE	1	2	2	0	
VERNIER JETS					
BIPROP SOLENOID VALVES	5	3	2	2	4.1.2.3.A.3
COMBUSTION CHAMBER OR NOZZLE	1	1	1	0	
TOTAL	99	78	49	49	

TABLE I-B.1 Summary of IOA FMEA Assessment - FRCS EPD&C

Components	IOA INTL	IOA MAP	NASA FMEAS	ISSUES	PARAGRAPHS FOR ISSUES
HE PRESS SUBSYSTEM					4.1.2.1.B
CONTROLS					
VALVES					
CONTROLLER	8	4	4	0	
DIODE	16	9	7	5	4.1.2.1.B.1
DRIVER	12	8	8	2	4.1.2.1.B.2
FUSE	2	1	1	0	
RESISTOR	16	3	3	2	4.1.2.1.B.3
SWITCH, TOGGLE	5	2	2	1	4.1.2.1.B.4
MICROSWITCH	1	1	0	1	4.1.2.1.B.5
INSTRUMENTATION					
INDICATOR, POSITION	1	1	1	1	4.1.2.1.B.6
SENSOR, PRESSURE	8	1	1	0	
SENSOR, TEMPERATURE	4	1	1	0	
PROP STOR & DIST SUBSYSTEM					4.1.2.2.B
CONTROLS					
VALVES					
CONTROLLER	4	4	4	4	4.1.2.2.B.1
DIODE	197	71	67	27	4.1.2.2.B.2
DRIVER	38	20	20	20	4.1.2.2.B.3
FUSE	10	4	4	1	4.1.2.2.B.4
RELAY	40	12	12	9	4.1.2.2.B.5
RESISTOR	100	16	16	10	4.1.2.2.B.6
SWITCH, TOGGLE	35	8	8	3	4.1.2.2.B.7
MICROSWITCH	8	8	0	8	4.1.2.2.B.8
CIRCUIT BREAKER	2	2	2	1	4.1.2.2.B.9
METERS/ROTARY SWITCH	5	4	4	2	4.1.2.2.B.10
INSTRUMENTATION					
INDICATOR, POSITION	12	6	6	6	4.1.2.2.B.11
SENSOR, PRESSURE	24	2	2	0	
SENSOR, TEMPERATURE	14	1	1	0	
THRUSTER SUBSYSTEM					4.1.2.3.B
CONTROLS					
VALVES					
CONTROLLER	24	10	10	5	4.1.2.3.B.1
DIODE	46	17	12	7	4.1.2.3.B.2
DRIVER	12	4	4	3	4.1.2.3.B.3
FUSE	13	4	4	3	4.1.2.3.B.4
RELAY	6	2	2	2	4.1.2.3.B.5
RESISTOR	80	11	10	1	4.1.2.3.B.6
SWITCH, TOGGLE	42	6	6	5	4.1.2.3.B.7
SIGNAL CONDITIONER	3	3	2	1	4.1.2.3.B.8
INSTRUMENTATION					
SENSOR, CONTINUITY	4	4	0	0	
SENSOR, PRESSURE	10	4	2	2	4.1.2.3.B.9
SENSOR, TEMPERATURE	10	4	2	2	4.1.2.3.B.10

TABLE I-B.1 Summary of IOA FMEA Assessment - FRCS EPD&C (cont'd)					
Components	IOA INTL	IOA MAP	NASA FMEAS	ISSUES	PARAGRAPHS FOR ISSUES
<u>THERMAL CONTROL SUBSYSTEM</u>					4.1.2.4.B
THRUSTERS					
FUSE	5	3	3	0	
HEATER	8	4	4	0	
RESISTOR	10	1	1	0	
SWITCH, THERMAL	12	4	3	2	4.1.2.4.B.1
SWITCH, TOGGLE	25	4	4	0	
POD					
DRIVER	24	2	2	1	4.1.2.4.B.2
FUSE	12	2	2	0	
HEATER	12	1	1	0	
RELAY	4	2	2	0	
RESISTOR	16	3	3	0	
SWITCH, TOGGLE	5	2	2	0	
TOTAL	945	287	254	137	

TABLE I-A.2 Summary of IOA FMEA Assessment - ARCS Hardware					
Components	IOA INTL	IOA MAP	NASA FMEAS	ISSUES	PARAGRAPHS FOR ISSUES
HE PRESS SUBSYSTEM					4.2.2.1.A
STORAGE TANK	1	1	1	0	
TANK ISOLATION VALVES	2	5	2	4	4.2.2.1.A.1
REGULATOR ASSEMBLIES	6	4	2	3	4.2.2.1.A.2
QUAD CHECK VALVE ASSEMBLY	2	4	3	2	4.2.2.1.A.3
COUPLINGS (SINGLE SEAL)	4	7	4	3	4.2.2.1.A.4
COUPLINGS (DOUBLE SEAL)	4	4	2	2	4.2.2.1.A.4
LINES AND FITTINGS	4	1	1	0	
PROP STOR & DIST SUBSYSTEM					4.2.2.2.A
PROPELLANT TANKS	1	1	1	0	
PROPELLANT CHANNEL SCREENS	1	1	1	1	4.2.2.2.A.1
PROPELLANT FEEDOUT TUBES	1	0	0	0	
PRESSURE RELIEF ASSEMBLIES	2	8	5	3	4.2.2.2.A.2
GROUND MANUAL ISOL VALVES	3	2	1	1	4.2.2.2.A.3
GIMBAL BELLOWS	2	1	1	0	
TANK ISOL VALVES	6	8	4	5	4.2.2.2.A.4
CROSSFEED VALVES	6	6	4	3	4.2.2.2.A.5
MANIFOLD ISOL VLVS, PRIMARY	10	6	4	4	4.2.2.2.A.6
MANIFOLD ISOL VLVS, VERNIER	2	5	3	2	4.2.2.2.A.7
JET ALIGNMENT BELLOWS, PRIMARY	2	1	1	0	
JET ALIGNMENT BELLOWS, VERNIER	2	0	0	0	
COUPLINGS (SINGLE SEAL)	20	4	2	2	4.2.2.2.A.8
COUPLINGS (DOUBLE SEAL)	8	4	2	2	4.2.2.2.A.8
LINES AND FITTINGS	4	1	1	0	
THRUSTER SUBSYSTEM					4.2.2.3.A
PRIMARY JETS					
BIPROP SOLENOID VALVES	9	6	3	6	4.2.2.3.A.1
INJECTOR HEAD	0	2	0	2	4.2.2.3.A.2
COMBUSTION CHAMBER OR NOZZLE	1	2	2	0	
VERNIER JETS					
BIPROP SOLENOID VALVES	5	3	2	2	4.2.2.3.A.3
COMBUSTION CHAMBER OR NOZZLE	1	1	1	0	
TOTAL	109	88	53	47	

TABLE I-B.2 Summary of IOA FMEA Assessment - ARCS EPD&C

Components	IOA INTL	IOA MAP	NASA FMEAS	ISSUES	PARAGRAPHS FOR ISSUES
<u>HE PRESS SUBSYSTEM</u>					4.2.2.1.B
CONTROLS					
VALVES					
CONTROLLER	16	4	4	0	
DIODE	25	9	7	4	4.2.2.1.B.1
DRIVER	24	7	7	2	4.2.2.1.B.2
FUSE	4	1	1	0	
RESISTOR	32	3	3	2	4.2.2.1.B.3
SWITCH, TOGGLE	5	2	2	0	
MICROSWITCH	1	1	0	1	4.2.2.1.B.4
INSTRUMENTATION					
INDICATOR, POSITION	1	1	1	1	4.2.2.1.B.5
SENSOR, PRESSURE	8	1	1	0	
SENSOR, TEMPERATURE	4	1	1	0	
<u>PROP STOR & DIST SUBSYSTEM</u>					4.2.2.2.B
CONTROLS					
VALVES					
CONTROLLER	4	4	4	3	4.2.2.2.B.1
DIODE	177	87	83	35	4.2.2.2.B.2
DRIVER	54	25	25	21	4.2.2.2.B.3
FUSE	17	6	6	0	
RELAY	48	16	16	11	4.2.2.2.B.4
RESISTOR	139	25	19	19	4.2.2.2.B.5
SWITCH, TOGGLE	50	12	12	4	4.2.2.2.B.6
MICROSWITCH	9	9	0	9	4.2.2.2.B.7
CIRCUIT BREAKER	2	2	2	2	4.2.2.2.B.8
INSTRUMENTATION					
INDICATOR, POSITION	8	8	8	8	4.2.2.2.B.9
SENSOR, PRESSURE	8	1	1	0	
SENSOR, TEMPERATURE	4	1	1	0	
<u>THRUSTER SUBSYSTEM</u>					4.2.2.3.B
CONTROLS					
VALVES					
CONTROLLER	36	6	6	2	4.2.2.3.B.1
DIODE	90	12	12	0	
DRIVER	24	6	6	3	4.2.2.3.B.2
FUSE	19	3	3	0	
RELAY	6	2	2	1	4.2.2.3.B.3
RESISTOR	122	10	10	0	
SWITCH, TOGGLE	40	4	4	2	4.2.2.3.B.4
SIGNAL CONDITIONER	4	2	2	0	
INSTRUMENTATION					
SENSOR, CONTINUITY	5	5	0	0	
SENSOR, PRESSURE	20	6	3	3	4.2.2.3.B.5
SENSOR, TEMPERATURE	12	5	3	2	4.2.2.3.B.6

TABLE I-B.2 Summary of IOA FMEA Assessment - ARCS EPD&C (cont'd)					
Components	IOA INTL	IOA MAP	NASA FMEAS	ISSUES	PARAGRAPHS FOR ISSUES
<u>THERMAL CONTROL SUBSYSTEM</u>					4.2.2.4.B
THRUSTERS					
FUSE	5	2	2	0	
HEATER	8	4	4	0	
RESISTOR	10	1	1	0	
SWITCH, THERMAL	8	8	0	8	4.2.2.4.B.1
SWITCH, TOGGLE	25	4	4	0	
DRIVER	10	4	4	0	
TOTAL	1083	310	270	143	

TABLE II-A.1 Summary of IOA CIL Assessment - FRCS Hardware					
Components	IOA INTL	IOA MAP	NASA CILS	ISSUES	PARAGRAPHS FOR ISSUES
<u>HE PRESS SUBSYSTEM</u>					4.1.2.1.A
STORAGE TANK	1	1	1	0	
TANK ISOLATION VALVES	1	5	0	5	4.1.2.1.A.1
REGULATOR ASSEMBLIES	5	5	1	4	4.1.2.1.A.2
QUAD CHECK VALVE ASSEMBLY	2	4	2	4	4.1.2.1.A.3
COUPLINGS (SINGLE SEAL)	3	2	2	0	
COUPLINGS (DOUBLE SEAL)	0	2	1	1	4.1.2.1.A.4
LINES AND FITTINGS	4	1	1	0	
<u>PROP STOR & DIST SUBSYSTEM</u>					4.1.2.2.A
PROPELLANT TANKS	1	1	1	0	
PROPELLANT CHANNEL SCREENS	1	1	1	1	4.1.2.2.A.1
PROPELLANT FEEDOUT TUBES	1	0	0	0	
PRESSURE RELIEF ASSEMBLIES	2	7	4	3	4.1.2.2.A.2
GROUND MANUAL ISOL VALVES	2	1	0	1	4.1.2.2.A.3
GIMBAL BELLOWS	2	1	1	0	
TANK ISOL VALVES	4	3	1	3	4.1.2.2.A.4
MANIFOLD ISOL VLVS, PRIMARY	6	4	1	4	4.1.2.2.A.5
MANIFOLD ISOL VLVS, VERNIER	1	4	2	3	4.1.2.2.A.6
JET ALIGNMENT BELLOWS, PRIMARY	2	1	1	1	4.1.2.2.A.7
JET ALIGNMENT BELLOWS, VERNIER	2	0	0	0	
COUPLINGS (SINGLE SEAL)	12	2	1	1	4.1.2.2.A.8
COUPLINGS (DOUBLE SEAL)	0	2	1	1	4.1.2.2.A.8
LINES AND FITTINGS	2	1	1	0	
<u>THRUSTER SUBSYSTEM</u>					4.1.2.3.A
PRIMARY JETS					
BIPROP SOLENOID VALVES	7	6	2	6	4.1.2.3.A.1
INJECTOR HEAD	0	2	0	2	4.1.2.3.A.2
COMBUSTION CHAMBER OR NOZZLE	1	2	2	0	
VERNIER JETS					
BIPROP SOLENOID VALVES	5	3	2	2	4.1.2.3.A.3
COMBUSTION CHAMBER OR NOZZLE	1	1	1	0	
TOTAL	68	62	30	42	

TABLE II-B.1 Summary of IOA CIL Assessment - FRCS EPD&C

Components	IOA INTL	IOA MAP	NASA CILS	ISSUES	PARAGRAPHS FOR ISSUES
HE PRESS SUBSYSTEM					4.1.2.1.B
CONTROLS					
VALVES					
CONTROLLER	0	0	0	0	
DIODE	3	2	2	3	4.1.2.1.B.1
DRIVER	0	0	0	0	
FUSE	0	0	0	0	
RESISTOR	0	0	0	0	
SWITCH, TOGGLE	2	1	0	1	4.1.2.1.B.4
MICROSWITCH	0	0	0	0	
INSTRUMENTATION					
INDICATOR, POSITION	0	0	0	0	
SENSOR, PRESSURE	0	0	0	0	
SENSOR, TEMPERATURE	0	0	0	0	
PROP STOR & DIST SUBSYSTEM					4.1.2.2.B
CONTROLS					
VALVES					
CONTROLLER	1	1	2	3	4.1.2.2.B.1
DIODE	10	4	9	11	4.1.2.2.B.2
DRIVER	8	5	8	12	4.1.2.2.B.3
FUSE	0	0	0	0	
RELAY	20	7	6	9	4.1.2.2.B.5
RESISTOR	0	0	4	4	4.1.2.2.B.6
SWITCH, TOGGLE	10	2	1	2	4.1.2.2.B.7
MICROSWITCH	2	2	0	2	4.1.2.2.B.8
CIRCUIT BREAKER	0	0	1	1	4.1.2.2.B.9
METERS/ROTARY SWITCH	0	0	0	0	
INSTRUMENTATION					
INDICATOR, POSITION	0	0	2	2	4.1.2.2.B.11
SENSOR, PRESSURE	0	0	0	0	
SENSOR, TEMPERATURE	0	0	0	0	
THRUSTER SUBSYSTEM					4.1.2.3.B
CONTROLS					
VALVES					
CONTROLLER	9	3	3	4	4.1.2.3.B.1
DIODE	23	11	7	8	4.1.2.3.B.2
DRIVER	4	2	3	3	4.1.2.3.B.3
FUSE	12	5	1	3	4.1.2.3.B.4
RELAY	3	1	0	1	4.1.2.3.B.5
RESISTOR	6	2	2	0	
SWITCH, TOGGLE	17	3	1	2	4.1.2.3.B.7
SIGNAL CONDITIONER	2	2	1	1	4.1.2.3.B.8
INSTRUMENTATION					
SENSOR, CONTINUITY	0	0	0	0	
SENSOR, PRESSURE	2	2	0	2	4.1.2.3.B.9
SENSOR, TEMPERATURE	2	2	0	2	4.1.2.3.B.10

TABLE II-B.1 Summary of IOA CIL Assessment - FRCS EPD&C (cont'd)					
Components	IOA INTL	IOA MAP	NASA CILS	ISSUES	PARAGRAPHS FOR ISSUES
<u>THERMAL CONTROL SUBSYSTEM</u>					4.1.2.4.B
THRUSTERS					
FUSE	1	1	1	0	
HEATER	1	1	1	0	
RESISTOR	0	0	0	0	
SWITCH, THERMAL	1	1	0	1	4.1.2.4.B.1
SWITCH, TOGGLE	3	1	1	0	
POD					
DRIVER	0	0	0	0	
FUSE	0	0	0	0	
HEATER	0	0	0	0	
RELAY	0	0	0	0	
RESISTOR	0	0	0	0	
SWITCH, TOGGLE	3	1	1	0	
TOTAL	145	62	57	77	

TABLE II-A.2 Summary of IOA CIL Assessment - ARCS Hardware					
Components	IOA INTL	IOA MAP	NASA CILS	ISSUES	PARAGRAPHS FOR ISSUES
<u>HE PRESS SUBSYSTEM</u>					4.2.2.1.A
STORAGE TANK	1	1	1	0	
TANK ISOLATION VALVES	1	5	1	4	4.2.2.1.A.1
REGULATOR ASSEMBLIES	5	4	2	3	4.2.2.1.A.2
QUAD CHECK VALVE ASSEMBLY	2	4	2	2	4.2.2.1.A.3
COUPLINGS (SINGLE SEAL)	2	3	2	1	4.2.2.1.A.4
COUPLINGS (DOUBLE SEAL)	0	2	1	1	4.2.2.1.A.4
LINES AND FITTINGS	4	1	1	0	
<u>PROP STOR & DIST SUBSYSTEM</u>					4.2.2.2.A
PROPELLANT TANKS	1	1	1	0	
PROPELLANT CHANNEL SCREENS	1	1	1	1	4.2.2.2.A.1
PROPELLANT FEEDOUT TUBES	1	0	0	0	
PRESSURE RELIEF ASSEMBLIES	2	7	4	3	4.2.2.2.A.2
GROUND MANUAL ISOL VALVES	2	1	0	1	4.2.2.2.A.3
GIMBAL BELLOWS	2	1	1	0	
TANK ISOL VALVES	5	7	2	5	4.2.2.2.A.4
CROSSFEED VALVES	6	4	2	2	4.2.2.2.A.5
MANIFOLD ISOL VLVS, PRIMARY	6	5	1	4	4.2.2.2.A.6
MANIFOLD ISOL VLVS, VERNIER	1	4	2	2	4.2.2.2.A.7
JET ALIGNMENT BELLOWS, PRIMARY	2	1	1	0	
JET ALIGNMENT BELLOWS, VERNIER	2	0	0	0	
COUPLINGS (SINGLE SEAL)	10	2	1	1	4.2.2.2.A.8
COUPLINGS (DOUBLE SEAL)	0	2	1	1	4.2.2.2.A.8
LINES AND FITTINGS	4	1	1	0	
<u>THRUSTER SUBSYSTEM</u>					4.2.2.3.A
PRIMARY JETS					
BIPROP SOLENOID VALVES	6	6	2	6	4.2.2.3.A.1
INJECTOR HEAD	0	2	0	2	4.2.2.3.A.2
COMBUSTION CHAMBER OR NOZZLE	1	2	2	0	
VERNIER JETS					
BIPROP SOLENOID VALVES	5	3	2	2	4.2.2.3.A.3
COMBUSTION CHAMBER OR NOZZLE	1	1	1	0	
TOTAL	73	71	35	41	

TABLE II-B.2 Summary of IOA CIL Assessment - ARCS EPD&C					
Components	IOA INTL	IOA MAP	NASA CILS	ISSUES	PARAGRAPHS FOR ISSUES
HE PRESS SUBSYSTEM					4.2.2.1.B
CONTROLS					
VALVES					
CONTROLLER	0	0	0	0	
DIODE	4	2	2	2	4.2.2.1.B.1
DRIVER	0	0	0	0	
FUSE	0	0	0	0	
RESISTOR	0	0	0	0	
SWITCH, TOGGLE	4	1	1	0	
MICROSWITCH	0	0	0	0	
INSTRUMENTATION					
INDICATOR, POSITION	0	0	0	0	
SENSOR, PRESSURE	0	0	0	0	
SENSOR, TEMPERATURE	0	0	0	0	
PROP STOR & DIST SUBSYSTEM					4.2.2.2.B
CONTROLS					
VALVES					
CONTROLLER	0	0	3	3	4.2.2.2.B.1
DIODE	15	9	22	25	4.2.2.2.B.2
DRIVER	5	5	13	15	4.2.2.2.B.3
FUSE	0	0	0	0	
RELAY	10	5	9	10	4.2.2.2.B.4
RESISTOR	0	0	5	5	4.2.2.2.B.5
SWITCH, TOGGLE	10	3	2	4	4.2.2.2.B.6
MICROSWITCH	1	1	0	1	4.2.2.2.B.7
CIRCUIT BREAKER	1	1	1	2	4.2.2.2.B.8
INSTRUMENTATION					
INDICATOR, POSITION	0	0	3	3	4.2.2.2.B.9
SENSOR, PRESSURE	0	0	0	0	
SENSOR, TEMPERATURE	0	0	0	0	
THRUSTER SUBSYSTEM					4.2.2.3.B
CONTROLS					
VALVES					
CONTROLLER	2	1	3	2	4.2.2.3.B.1
DIODE	62	6	6	0	
DRIVER	4	2	5	3	4.2.2.3.B.2
FUSE	8	1	1	0	
RELAY	0	0	0	0	
RESISTOR	9	2	2	0	
SWITCH, TOGGLE	4	1	1	2	4.2.2.3.B.4
SIGNAL CONDITIONER	2	2	2	0	
INSTRUMENTATION					
SENSOR, CONTINUITY	0	0	0	0	
SENSOR, PRESSURE	0	0	0	0	
SENSOR, TEMPERATURE	0	0	0	0	

TABLE II-B.2 Summary of IOA CIL Assessment - ARCS EPD&C (cont'd)					
Components	IOA INTL	IOA MAP	NASA CILS	ISSUES	PARAGRAPHS FOR ISSUES
THERMAL CONTROL SUBSYSTEM					4.2.2.4.B
THRUSTERS					
FUSE	5	2	2	0	
HEATER	1	1	1	0	
RESISTOR	0	0	0	0	
SWITCH, THERMAL	4	4	0	4	4.2.2.4.B.1
SWITCH, TOGGLE	15	2	2	0	
DRIVER	5	2	2	0	
TOTAL	171	54	87	81	

TABLE III-A.1 IOA Recommended Criticalities - FRCS Hardware							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
HE PRESS SUBSYSTEM							
STORAGE TANK	1	0	0	0	0	0	1
TANK ISOLATION VALVES	1	2	0	2	0	0	5
REGULATOR ASSEMBLIES	1	2	0	1	1	0	5
QUAD CHECK VALVE ASSEMBLY	2	2	0	0	0	0	4
COUPLINGS (SINGLE SEAL)	0	2	0	0	0	3	5
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2	4
LINES AND FITTINGS	1	0	0	0	0	0	1
PROP STOR & DIST SUBSYSTEM							
PROPELLANT TANKS	1	0	0	0	0	0	1
PROPELLANT CHANNEL SCREENS	1	0	0	0	0	0	1
PRESSURE RELIEF ASSEMBLIES	2	3	0	3	0	0	8
GROUND MANUAL ISOL VALVES	1	0	0	0	0	1	2
GIMBAL BELLOWS	1	0	0	0	0	0	1
TANK ISOL VALVES	1	2	0	3	0	0	6
MANIFOLD ISOL VLVS, PRIMARY	2	2	0	1	0	0	5
MANIFOLD ISOL VLVS, VERNIER	2	1	1	1	0	0	5
JET ALIGNMENT BELLOWS, PRIMARY	1	0	0	0	0	0	1
COUPLINGS (SINGLE SEAL)	0	2	0	0	0	2	4
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2	4
LINES AND FITTINGS	1	0	0	0	0	0	1
THRUSTER SUBSYSTEM							
PRIMARY JETS							
BIPROP SOLENOID VALVES	4	2	0	0	0	0	6
INJECTOR HEAD	2	0	0	0	0	0	2
COMBUSTION CHAMBER OR NOZZLE	2	0	0	0	0	0	2
VERNIER JETS							
BIPROP SOLENOID VALVES	2	0	1	0	0	0	3
COMBUSTION CHAMBER OR NOZZLE	1	0	0	0	0	0	1
TOTAL	30	20	2	15	1	10	78

TABLE III-B.1 IOA Recommended Criticalities - FRCS EPD&C							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
<u>HE PRESS SUBSYSTEM</u>							
CONTROLS							
VALVES							
CONTROLLER	0	0	0	3	0	1	4
DIODE	0	1	0	3	1	4	9
DRIVER	0	0	0	5	2	1	8
FUSE	0	0	0	1	0	0	1
RESISTOR	0	0	0	0	2	1	3
SWITCH, TOGGLE	0	1	0	0	0	1	2
MICROSWITCH	0	0	0	0	1	0	1
INSTRUMENTATION							
INDICATOR, POSITION	0	0	0	0	1	0	1
SENSOR, PRESSURE	0	0	0	0	1	0	1
SENSOR, TEMPERATURE	0	0	0	0	0	1	1
<u>PROP STOR & DIST SUBSYSTEM</u>							
CONTROLS							
VALVES							
CONTROLLER	0	0	1	1	0	2	4
DIODE	0	2	2	12	11	44	71
DRIVER	0	1	4	4	7	4	20
FUSE	0	0	0	4	0	0	4
RELAY	0	6	0	6	0	0	12
RESISTOR	0	0	0	0	10	6	16
SWITCH, TOGGLE	0	1	0	7	0	0	8
MICROSWITCH	0	2	0	0	6	0	8
CIRCUIT BREAKER	0	0	0	1	0	1	2
METERS/ROTARY SWITCH	0	0	0	0	2	2	4
INSTRUMENTATION							
INDICATOR, POSITION	0	0	0	0	6	0	6
SENSOR, PRESSURE	0	0	0	0	2	0	2
SENSOR, TEMPERATURE	0	0	0	0	1	0	1
<u>THRUSTER SUBSYSTEM</u>							
CONTROLS							
VALVES							
CONTROLLER	0	2	1	2	0	5	10
DIODE	0	5	1	5	0	6	17
DRIVER	0	1	1	0	0	2	4
FUSE	0	3	1	0	0	0	4
RELAY	0	1	0	0	0	1	2
RESISTOR	0	0	0	1	2	8	11
SWITCH, TOGGLE	0	2	1	0	0	3	6
SIGNAL CONDITIONER	0	0	1	1	1	0	3
INSTRUMENTATION							
SENSOR, CONTINUITY	0	0	0	0	0	4	4
SENSOR, PRESSURE	0	0	0	0	4	0	4
SENSOR, TEMPERATURE	0	0	0	0	4	0	4

TABLE III-B.1 IOA Recommended Criticalities - FRCS EPD&C (cont'd)							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
<u>THERMAL CONTROL SUBSYSTEM</u>							
THRUSTERS							
FUSE	0	0	1	0	2	0	3
HEATER	0	0	1	0	1	2	4
RESISTOR	0	0	0	0	1	0	1
SWITCH, THERMAL	0	0	1	0	3	0	4
SWITCH, TOGGLE	0	0	1	0	1	2	4
POD							
DRIVER	0	0	0	0	2	0	2
FUSE	0	0	0	0	2	0	2
HEATER	0	0	0	0	1	0	1
RELAY	0	0	0	0	1	1	2
RESISTOR	0	0	0	0	1	3	4
SWITCH, TOGGLE	0	0	1	0	0	1	2
TOTAL	0	28	18	56	79	106	287

TABLE III-A.2 IOA Recommended Criticalities - ARCS Hardware							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
HE PRESS SUBSYSTEM							
STORAGE TANK	1	0	0	0	0	0	1
TANK ISOLATION VALVES	1	2	0	2	0	0	5
REGULATOR ASSEMBLIES	1	1	0	1	1	0	4
QUAD CHECK VALVE ASSEMBLY	2	2	0	0	0	0	4
COUPLINGS (SINGLE SEAL)	0	3	0	0	0	4	7
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2	4
LINES AND FITTINGS	1	0	0	0	0	0	1
PROP STOR & DIST SUBSYSTEM							
PROPELLANT TANKS	1	0	0	0	0	0	1
PROPELLANT CHANNEL SCREENS	1	0	0	0	0	0	1
PRESSURE RELIEF ASSEMBLIES	2	3	0	3	0	0	8
GROUND MANUAL ISOL VALVES	1	0	0	0	0	1	2
GIMBAL BELLOWS	1	0	0	0	0	0	1
TANK ISOL VALVES	2	1	1	4	0	0	8
CROSSFEED VALVES	2	0	2	2	0	0	6
MANIFOLD ISOL VLVS, PRIMARY	2	1	0	3	0	0	6
MANIFOLD ISOL VLVS, VERNIER	3	0	1	1	0	0	5
JET ALIGNMENT BELLOWS, PRIMARY	1	0	0	0	0	0	1
COUPLINGS (SINGLE SEAL)	0	2	0	0	0	2	4
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2	4
LINES AND FITTINGS	1	0	0	0	0	0	1
THRUSTER SUBSYSTEM							
PRIMARY JETS							
BIPROP SOLENOID VALVES	4	0	0	2	0	0	6
INJECTOR HEAD	2	0	0	0	0	0	2
COMBUSTION CHAMBER OR NOZZLE	2	0	0	0	0	0	2
VERNIER JETS							
BIPROP SOLENOID VALVES	2	0	1	0	0	0	3
COMBUSTION CHAMBER OR NOZZLE	1	0	0	0	0	0	1
TOTAL	34	15	5	22	1	11	88

TABLE III-B.2 IOA Recommended Criticalities - ARCS EPD&C							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
<u>HE PRESS SUBSYSTEM</u>							
CONTROLS							
VALVES							
CONTROLLER	0	0	0	3	0	1	4
DIODE	0	1	0	3	1	4	9
DRIVER	0	0	0	5	2	0	7
FUSE	0	0	0	1	0	0	1
RESISTOR	0	0	0	0	2	1	3
SWITCH, TOGGLE	0	1	0	1	0	0	2
MICROSWITCH	0	0	0	0	1	0	1
INSTRUMENTATION							
INDICATOR, POSITION	0	0	0	0	1	0	1
SENSOR, PRESSURE	0	0	0	0	1	0	1
SENSOR, TEMPERATURE	0	0	0	0	0	1	1
<u>PROP STOR & DIST SUBSYSTEM</u>							
CONTROLS							
VALVES							
CONTROLLER	0	0	1	1	0	2	4
DIODE	0	0	4	22	12	49	87
DRIVER	0	0	4	4	10	7	25
FUSE	0	0	0	5	0	1	6
RELAY	0	1	2	10	1	2	16
RESISTOR	0	0	0	0	13	12	25
SWITCH, TOGGLE	0	0	3	7	0	2	12
MICROSWITCH	0	0	1	3	5	0	9
CIRCUIT BREAKER	0	0	1	0	0	1	2
INSTRUMENTATION							
INDICATOR, POSITION	0	0	0	0	8	0	8
SENSOR, PRESSURE	0	0	0	0	1	0	1
SENSOR, TEMPERATURE	0	0	0	0	1	0	1
<u>THRUSTER SUBSYSTEM</u>							
CONTROLS							
VALVES							
CONTROLLER	0	0	1	2	0	3	6
DIODE	0	0	1	5	0	6	12
DRIVER	0	0	2	1	0	3	6
FUSE	0	0	0	3	0	0	3
RELAY	0	0	0	1	0	1	2
RESISTOR	0	0	0	2	0	8	10
SWITCH, TOGGLE	0	0	1	1	0	2	4
SIGNAL CONDITIONER	0	2	0	0	0	0	2
INSTRUMENTATION							
SENSOR, CONTINUITY	0	0	0	0	0	5	5
SENSOR, PRESSURE	0	0	0	2	4	0	6
SENSOR, TEMPERATURE	0	0	0	2	1	2	5

TABLE III-B.2 IOA Recommended Criticalities - ARCS EPD&C (cont'd)							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
<u>THERMAL CONTROL SUBSYSTEM</u>							
THRUSTERS							
FUSE	0	0	2	0	0	0	2
HEATER	0	0	1	0	1	2	4
RESISTOR	0	0	0	0	0	1	1
SWITCH, THERMAL	0	0	1	0	3	4	8
SWITCH, TOGGLE	0	0	2	0	0	2	4
DRIVER	0	0	2	0	0	2	4
TOTAL	0	5	29	84	68	124	310

TABLE IV-A.1 IOA Recommended Critical Items - FRCS Hardware						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
HE PRESS SUBSYSTEM						
STORAGE TANK	1	0	0	0	0	1
TANK ISOLATION VALVES	1	2	0	2	0	5
REGULATOR ASSEMBLIES	1	2	0	1	1	5
QUAD CHECK VALVE ASSEMBLY	2	2	0	0	0	4
COUPLINGS (SINGLE SEAL)	0	2	0	0	0	2
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2
LINES AND FITTINGS	1	0	0	0	0	1
PROP STOR & DIST SUBSYSTEM						
PROPELLANT TANKS	1	0	0	0	0	1
PROPELLANT CHANNEL SCREENS	1	0	0	0	0	1
PRESSURE RELIEF ASSEMBLIES	2	3	0	2	0	7
GROUND MANUAL ISOL VALVES	1	0	0	0	0	1
GIMBAL BELLOWS	1	0	0	0	0	1
TANK ISOL VALVES	1	2	0	0	0	3
MANIFOLD ISOL VLVS, PRIMARY	2	2	0	0	0	4
MANIFOLD ISOL VLVS, VERNIER	2	1	1	0	0	4
JET ALIGNMENT BELLOWS, PRIMARY	1	0	0	0	0	1
COUPLINGS (SINGLE SEAL)	0	2	0	0	0	2
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2
LINES AND FITTINGS	1	0	0	0	0	1
THRUSTER SUBSYSTEM						
PRIMARY JETS						
BIPROP SOLENOID VALVES	4	2	0	0	0	6
INJECTOR HEAD	2	0	0	0	0	2
COMBUSTION CHAMBER OR NOZZLE	2	0	0	0	0	2
VERNIER JETS						
BIPROP SOLENOID VALVES	2	0	1	0	0	3
COMBUSTION CHAMBER OR NOZZLE	1	0	0	0	0	1
TOTAL	30	20	2	9	1	62

TABLE IV-B.1 IOA Recommended Critical Items - FRCS EPD&C						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
HE PRESS SUBSYSTEM						
CONTROLS						
VALVES						
CONTROLLER	0	0	0	0	0	0
DIODE	0	1	0	1	0	2
DRIVER	0	0	0	0	0	0
FUSE	0	0	0	0	0	0
RESISTOR	0	0	0	0	0	0
SWITCH, TOGGLE	0	1	0	0	0	1
MICROSWITCH	0	0	0	0	0	0
INSTRUMENTATION						
INDICATOR, POSITION	0	0	0	0	0	0
SENSOR, PRESSURE	0	0	0	0	0	0
SENSOR, TEMPERATURE	0	0	0	0	0	0
PROP STOR & DIST SUBSYSTEM						
CONTROLS						
VALVES						
CONTROLLER	0	0	1	0	0	1
DIODE	0	2	2	0	0	4
DRIVER	0	1	4	0	0	5
FUSE	0	0	0	0	0	0
RELAY	0	6	0	1	0	7
RESISTOR	0	0	0	0	0	0
SWITCH, TOGGLE	0	1	0	1	0	2
MICROSWITCH	0	2	0	0	0	2
CIRCUIT BREAKER	0	0	0	0	0	0
METERS/ROTARY SWITCH						
INSTRUMENTATION						
INDICATOR, POSITION	0	0	0	0	0	0
SENSOR, PRESSURE	0	0	0	0	0	0
SENSOR, TEMPERATURE	0	0	0	0	0	0
THRUSTER SUBSYSTEM						
CONTROLS						
VALVES						
CONTROLLER	0	2	1	0	0	3
DIODE	0	5	1	5	0	11
DRIVER	0	1	1	0	0	2
FUSE	0	3	2	0	0	5
RELAY	0	1	0	0	0	1
RESISTOR	0	0	0	1	1	2
SWITCH, TOGGLE	0	2	1	0	0	3
SIGNAL CONDITIONER	0	0	1	0	1	2
INSTRUMENTATION						
SENSOR, CONTINUITY	0	0	0	0	0	0
SENSOR, PRESSURE	0	0	0	0	2	2
SENSOR, TEMPERATURE	0	0	0	0	2	2

TABLE IV-B.1 IOA Recommended CIL Items - FRCS EPD&C (cont'd)						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
<u>THERMAL CONTROL SUBSYSTEM</u>						
THRUSTERS						
FUSE	0	0	1	0	0	1
HEATER	0	0	1	0	0	1
RESISTOR	0	0	0	0	0	0
SWITCH, THERMAL	0	0	1	0	0	1
SWITCH, TOGGLE	0	0	1	0	0	1
POD						
DRIVER	0	0	0	0	0	0
FUSE	0	0	0	0	0	0
HEATER	0	0	0	0	0	0
RELAY	0	0	0	0	0	0
RESISTOR	0	0	0	0	0	0
SWITCH, TOGGLE	0	0	1	0	0	1
TOTAL	0	28	19	9	6	62

TABLE IV-A.2 IOA Recommended Critical Items - ARCS Hardware						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
<u>HE PRESS SUBSYSTEM</u>						
STORAGE TANK	1	0	0	0	0	1
TANK ISOLATION VALVES	1	2	0	2	0	5
REGULATOR ASSEMBLIES	1	1	0	1	1	4
QUAD CHECK VALVE ASSEMBLY	2	2	0	0	0	4
COUPLINGS (SINGLE SEAL)	0	3	0	0	0	3
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2
LINES AND FITTINGS	1	0	0	0	0	1
<u>PROP STOR & DIST SUBSYSTEM</u>						
PROPELLANT TANKS	1	0	0	0	0	1
PROPELLANT CHANNEL SCREENS	1	0	0	0	0	1
PRESSURE RELIEF ASSEMBLIES	2	3	0	2	0	7
GROUND MANUAL ISOL VALVES	1	0	0	0	0	1
GIMBAL BELLOWS	1	0	0	0	0	1
TANK ISOL VALVES	2	1	1	3	0	7
CROSSFEED VALVES	2	0	2	0	0	4
MANIFOLD ISOL VLVS, PRIMARY	2	1	0	2	0	5
MANIFOLD ISOL VLVS, VERNIER	3	0	1	0	0	4
JET ALIGNMENT BELLOWS, PRIMARY	1	0	0	0	0	1
COUPLINGS (SINGLE SEAL)	0	2	0	0	0	2
COUPLINGS (DOUBLE SEAL)	0	0	0	2	0	2
LINES AND FITTINGS	1	0	0	0	0	1
<u>THRUSTER SUBSYSTEM</u>						
PRIMARY JETS						
BIPROP SOLENOID VALVES	4	0	0	2	0	6
INJECTOR HEAD	2	0	0	0	0	2
COMBUSTION CHAMBER OR NOZZLE	2	0	0	0	0	2
VERNIER JETS						
BIPROP SOLENOID VALVES	2	0	1	0	0	3
COMBUSTION CHAMBER OR NOZZLE	1	0	0	0	0	1
TOTAL	34	15	5	16	1	71

TABLE IV-B.2 IOA Recommended Critical Items - ARCS EPD&C						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
<u>HE PRESS SUBSYSTEM</u>						
CONTROLS						
VALVES						
CONTROLLER	0	0	0	0	0	0
DIODE	0	1	0	1	0	2
DRIVER	0	0	0	0	0	0
FUSE	0	0	0	0	0	0
RESISTOR	0	0	0	0	0	0
SWITCH, TOGGLE	0	1	0	0	0	1
MICROSWITCH	0	0	0	0	0	0
INSTRUMENTATION						
INDICATOR, POSITION	0	0	0	0	0	0
SENSOR, PRESSURE	0	0	0	0	0	0
SENSOR, TEMPERATURE	0	0	0	0	0	0
<u>PROP STOR & DIST SUBSYSTEM</u>						
CONTROLS						
VALVES						
CONTROLLER	0	0	1	0	0	1
DIODE	0	0	4	4	1	9
DRIVER	0	0	4	1	0	5
FUSE	0	0	0	0	0	0
RELAY	0	1	2	2	0	5
RESISTOR	0	0	0	0	0	0
SWITCH, TOGGLE	0	0	3	0	0	3
MICROSWITCH	0	0	1	0	0	1
CIRCUIT BREAKER	0	0	1	0	0	1
INSTRUMENTATION						
INDICATOR, POSITION	0	0	0	0	0	0
SENSOR, PRESSURE	0	0	0	0	0	0
SENSOR, TEMPERATURE	0	0	0	0	0	0
<u>THRUSTER SUBSYSTEM</u>						
CONTROLS						
VALVES						
CONTROLLER	0	0	1	0	0	1
DIODE	0	0	1	5	0	6
DRIVER	0	0	2	0	0	2
FUSE	0	0	0	1	0	1
RELAY	0	0	0	0	0	0
RESISTOR	0	0	0	2	0	2
SWITCH, TOGGLE	0	0	1	0	0	1
SIGNAL CONDITIONER	0	2	0	0	0	2
INSTRUMENTATION						
SENSOR, CONTINUITY	0	0	0	0	0	0
SENSOR, PRESSURE	0	0	0	0	0	0
SENSOR, TEMPERATURE	0	0	0	0	0	0

TABLE IV-B.2 IOA Recommended CIL Items - ARCS EPD&C (cont'd)						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
<u>THERMAL CONTROL SUBSYSTEM</u>						
THRUSTERS						
FUSE	0	0	2	0	0	2
HEATER	0	0	1	0	0	1
RESISTOR	0	0	0	0	0	0
SWITCH, THERMAL	0	0	1	0	3	4
SWITCH, TOGGLE	0	0	2	0	0	2
DRIVER	0	0	2	0	0	2
TOTAL	0	5	29	16	4	54

4.1 Forward RCS Assessment Results

The unresolved forward RCS hardware and EPD&C issues are presented in the following sections. Several general issues are first presented (section 4.1.1), followed by the specific unresolved issues (section 4.1.2).

4.1.1 General Forward RCS Issues

Many of the unresolved issues which exist on individual FMEAs and CILs are linked to several "general" issues identified by IOA during the RCS FMEA/CIL assessment. These general issues concern either the groundrules used by NASA/RI to perform the FMEA/CIL analysis, or the NASA/RI analysis of the RCS subsystem. Each of the general IOA issues results in numerous FMEA and CIL issues.

The general issues identified by IOA in the FRCS hardware and EPD&C assessments are discussed in the following sections.

4.1.1.A Hardware

Four general areas of difference between the IOA and NASA/RI forward RCS subsystem analyses are responsible for many of the unresolved FRCS hardware issues.

4.1.1.A.1 Inability to Deplete FRCS Propellant

IOA considers the inability to deplete FRCS prop to be potentially life and vehicle threatening during entry. Many flights include a nominal FRCS propellant dump after the OMS deorbit burn to achieve an improved X axis center-of-gravity (cg) condition for entry. On flights which would require a post-deorbit FRCS prop dump to meet the forward cg limit (1076.7 inches), inability to complete the dump could result in possible loss of entry control.

Failures which result in loss of propellant tank repressurization capability (loss of helium flow paths, loss of helium due to leakage) or loss of propellant flow paths are the types of failures which result in the inability to deplete FRCS propellant.

The current NASA/RI criticalities assigned to these types of failures are based only on loss of ET sep capability and do not consider possible entry effects. The criticalities assigned based only on ET sep correctly include tank ullage in the redundancy string. IOA agrees with the criticalities assigned by NASA/RI based only on ET sep effects, and agrees that ullage is sufficient to perform ET sep. However, IOA's more severe criticalities on these types of failures are driven by the possible entry effects discussed above. In this case, ullage may not be sufficient to deplete FRCS prop and, therefore, is not

included in the redundancy string.

IOA would concur with the current NASA/RI criticalities on failures which result in the inability to use or deplete FRCS propellant if it could be determined that no flights would be launched which required a nominal post-deorbit FRCS dump to meet the forward cg limit. However, IOA was unable to verify that this is the case. IOA recommends a documented flight rule which prohibits dependence on a nominal post-deorbit burn FRCS prop dump to meet the forward X cg limit.

Seventeen (17) of the FRCS hardware issues are related to this general issue.

4.1.1.A.2 Propellant Leakage

IOA considers any leakage of RCS propellant (MMH or NTO) to be potentially life and vehicle threatening, regardless of where the leakage occurs. NSTS 22206 states that "A single failure resulting in leakage of LO2, LH2, N2H4, or MMH shall be classified as a Criticality 1" (p. 2-11, item h). Therefore, IOA classifies any single failure which results in prop leakage as a 1/1. If redundant items must fail before leakage occurs, IOA classifies the failure as a functional criticality 1R. Propellant leakage can result in contamination and corrosion of other components, fire, explosion, or exposure of EVA and ground crews to propellant or propellant vapors.

Thirteen (13) of the FRCS hardware issues are related to this general issue.

4.1.1.A.3 Isolation Valve Internal Relief Device Failure

The propellant tank isolation valves, primary manifold isolation valves, and vernier manifold isolation valves each have an internal pressure relief device which would relieve a downstream overpressurization condition if the valve was closed. NASA/RI assigns 3/3 criticalities to the FMEAs which address the failure of this device to relieve downstream pressure. IOA contends that it is possible that a failed closed relief device could allow a downstream pressure build-up sufficient to cause a prop line leak. This is supported by the fact that the prop line structural failure FMEA (03-2F-102108-1) lists this failure as a cause. Since this failure could result in line failure and prop leakage, IOA recommends that the current 3/3 FMEAs for the relief device failures be upgraded accordingly.

Three (3) of the FRCS hardware issues are related to this general issue.

4.1.1.A.4 Additional Items and Failure Modes

A number of RCS subsystem items and failure modes identified by IOA during the analysis phase are not covered in the current NASA FMEA/CIL. IOA recommends that these items and failure modes be incorporated into the FMEA/CIL. These issues are identified in Appendix F by issue codes HDW 4 and HDW 5.

Thirty-one (31) of the FRCS hardware issues are related to this general issue.

4.1.1.B EPD&C

IOA has several general EPD&C issues that tend to inflate the number of issues shown in the assessment tables. The following general issues remain unresolved.

4.1.1.B.1 Loss of Talkback Data

IOA considers the loss of data to determine the actual position of a valve to be a 3/2R PPP. Valve position data is provided by the GPC/MDM discretes and the event indicators, which provide redundancy for each other. Loss of all redundancy may lead to falsely failing the valve closed which could effect mission operations. NASA FMEAs have a 3/3 criticality for these failures.

This type of failure mode accounts for 25 open issues shown in the assessment tables for the forward RCS EPD&C (6 issues in the helium pressurization subsystem and 19 in the propellant storage and distribution subsystem). They are identified by issue code EPD&C 1 in Appendix F.

4.1.1.B.2 FMEA Downgrades to 3/3 or 3/2R PPP - NSTS 22206 Interpretations

Numerous issues remain open due to different interpretations of NSTS 22206. All these issues concern the definition of the redundancy string. IOA did not consider multiple or unrelated failures in determining the criticality. IOA considers these FMEAs warrant a 3/2R PPP or 3/3 for the failure mode.

This type of failure mode accounts for 35 open issues shown in the assessment tables for the forward RCS EPD&C (1 issue in the helium pressurization subsystem, 27 issues in the propellant storage and distribution subsystem, and 7 issues in the thruster subsystem). They are identified by issue code EPD&C 2 in Appendix F.

4.1.1.B.3 FMEA Failure Scenario Upgrades - NSTS 22206 Interpretations

These issues also remain open due to the different interpretations of NSTS 22206. All these issues concern the definition of the redundancy string. IOA did not consider multiple or unrelated failures in determining criticality, however, IOA did consider the functional redundancy for the item in question. Based on this, IOA failure scenarios create a 1R or CIL item condition, without using multiple or unrelated failures. IOA recommends these failure scenarios and criticality upgrades be included in the NASA FMEA/CIL.

These failure modes account for 9 open issues in the propellant storage and distribution subsystem as shown in the forward RCS EPD&C assessment tables. They are identified by issue code EPD&C 3 in Appendix F.

4.1.1.B.4 EPD&C Issues Tied to Open IOA Hardware Issues

These issues are directly related to the open IOA hardware issues. These failure modes account for 33 open issues as shown in the assessment tables (1 issue in the helium pressurization subsystem, 21 issues in the propellant storage and distribution subsystem, and 11 in the thruster subsystem). They are identified by issue code EPD&C 4 in Appendix F.

4.1.1.B.5 Additional EPD&C Failure Modes Recommended by IOA

These failure modes are not currently addressed by the NASA FMEA/CIL. IOA recommends these failure modes be incorporated into the FMEA/CIL.

These failures account for 31 open issues shown in the assessment tables for the forward RCS EPD&C (3 issues in the helium pressurization subsystem, 12 issues in the propellant storage and distribution subsystem, 15 issues in the thruster subsystem, and 1 issue in the thermal control subsystem). They are identified by issue code EPD&C 5 in Appendix F.

4.1.2 Specific Forward RCS Issues

The specific forward RCS hardware and EPD&C unresolved issues are presented in the following sections and paragraphs which were referenced in tables I and II. The organization of the sections and paragraphs follow the RCS hierarchy shown in Figures 4-7, and used in tables I and II.

Unresolved issues which are related to general issues discussed in section 4.1.1 contain a reference to the applicable general issue. Each issue is presented in a standard format which gives the failure mode, applicable FMEA number and IOA assessment ID, the NASA and IOA criticality and screen assignments, and the rationale behind the IOA issue. Refer to the detailed assessment sheets in Appendix C for further information on each issue.

4.1.2.1 Helium Pressurization Subsystem (28 issues)

4.1.2.1.A Hardware (16 issues)

4.1.2.1.A.1 Helium Tank Isolation Valves (5 issues)

1) FAILURE: FAILS OPEN

03-2F-101020-3 3/1R PPP
RCS-103 3/1R PFP, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 3/1R PFP. A failure of the redundant secondary regulator would not be detectable in flight (fail B screen). No way to tell that one level of redundancy has been lost.

2) FAILURE: FAILS CLOSED

03-2F-101020-4 3/1R PPP
RCS-104 2/1R PPP, CIL

ISSUE: IOA considers this failure to be a 2/1R. Failure of both valves results in inability to repress prop tank and deplete FRCS propellant. See 4.1.1.A.1.

3) FAILURE: INTERNAL LEAKAGE

NO FMEA
RCS-103A 3/1R PFP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers internal leakage to be a credible failure mode and recommends that it be addressed on the FMEA/CIL. Effects same as "fails open". See issue on 03-2F-101020-3, above.

4) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-10002X 2/1R PFF, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode and recommends that a 2/1R PFF FMEA and CIL be added. Effects same as "failed closed". See issue on 03-2F-101020-4, above, and 4.1.1.A.1. Failure not detectable during dual leg operation (fail B screen). Contamination can affect both valves simultaneously (fail C screen).

5) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-10003X 1/1 ---, CIL

ISSUE: This failure mode is not currently covered on the NASA FMEA/CIL. IOA considers external leakage of the He isol valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressure. See 4.1.1.A.1.

4.1.2.1.A.2 Regulator Assemblies (4 issues)

1) FAILURE: FAILS CLOSED

03-2F-101030-2 3/1R PPP
RCS-112 2/1R PFP, CIL

ISSUE: IOA considers this failure to be a 2/1R PFP. Failure of parallel regulators results in inability to repress prop tank and deplete FRCS propellant. See 4.1.1.A.1. Failure not detectable during dual leg operation (fail B screen).

2) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-113 2/1R PFP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA recommends that restricted flow be addressed as a failure mode for the He regulator. IOA contends that restricted flow is a credible failure mode which should be addressed for components with integral filters and/or orifices. Effects same as "fails closed". See issue on 03-2F-101030-2, above, and section 4.1.1.A. FMEA 03-2F-101030-2 currently lists "partial blockage of pilot screen/sense line" as a cause for a failed closed regulator, however this does not address restricted flow through the regulator.

3) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-114 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the He regulator due to a housing failure to be a credible failure mode (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressure. See 4.1.1.A.1.

4) FAILURE: SENSING PORT LEAKAGE

NO FMEA
RCS-115 3/2R PFP, CIL

ISSUE: This failure mode is not currently addressed on the NASA RCS FMEA/CIL, but is addressed on the NASA OMS FMEA/CIL (03-3-1004-3, sensing port leakage, 3/2R PFP). IOA recommends that this failure mode also be addressed for the RCS regulators, with the same rationale used in the OMS subsystem.

4.1.2.1.A.3 Quad Check Valve Assemblies (4 issues)

1) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2F-101095-1 3/3 ---
RCS-119 2/1R PFP, CIL

ISSUE: IOA recommends that this FMEA be upgraded to a 2/1R PFP. IOA contends that, with series check valve poppets failed open or leaking, the contamination of upstream components by prop or prop vapors during a mission could result in loss of prop tank repressurization capability and subsequent inability to use or deplete FRCS prop. See section 4.1.1.A.1. Contamination by prop could cause parallel regulators to fail closed.

2) FAILURE: FAILS CLOSED

03-2F-101095-2 3/1R PFP, CIL
RCS-120 2/1R PFP, CIL

ISSUE: IOA considers this failure to be a 2/1R PFP. Failed closed parallel check valve poppets results in inability to repress prop tank and deplete FRCS propellant. See 4.1.1.A.1.

3) FAILURE: BLOCKAGE OF SINGLE INLET FILTER

03-2F-101095-3	2/1R	PPP, CIL
RCS-10005X	1/1	---, CIL

<u>ISSUE:</u> This failure mode was added to the FMEA/CIL as a result of an IOA recommendation. However, IOA considers this failure to be a 1/1 since it results in inability to repress prop tank and deplete FRCS prop. See 4.1.1.A.1.

4) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA

RCS-10006X	1/1	---, CIL

<u>ISSUE:</u> This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the quad check valve assembly due to a housing failure to be a credible failure mode (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant (see 4.1.1.A.1), and leakage of prop and/or prop vapors (see 4.1.1.A.2).

4.1.2.1.A.4 Quick Disconnect Couplings (3 issues)

1) FAILURE: EXTERNAL LEAKAGE

03-2F-101091-1	3/1R	FFP, CIL
RCS-109, 117, 121, 142	3/1R	FFP, CIL

<u>ISSUE:</u> IOA recommends that "poppet fails open" be added as a failure mode on this FMEA. This is a credible failure mode and is addressed on other QD coupling FMEAs.

2,3) FAILURE: FAILS TO COUPLE

03-2F-101091-2	3/3	---
03-2F-102150-2	3/3	---
RCS-110, 118, 122, 127, 133, 135, 137, 143, 154, 156	3/3	---

<u>ISSUE:</u> IOA recommends that "restricted flow" be added as a failure mode on the FMEAs listed. This is a credible failure and is addressed on other QD coupling FMEAs.

4.1.2.1.B EPD&C (12 issues)

4.1.2.1.B.1 Diodes (5 issues)

1) FAILURE: FAILS OPEN

NO FMEA
FRCS-11202 2/1R PFP, CIL

ISSUE: The helium isolation valves have two diodes, one in series with each of the open and close solenoid circuits. Diode failing open prevents further valve movement associated with that circuit (open or close). Redundancy provided by other isolation valve. Loss of this, coupled with the loss of all hardware redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Note: Issue above is directly related to the schematics. They may be drawn incorrectly. Manifold isolation valve diodes are in parallel.

2) FAILURE: FAILS SHORT

NO FMEA
FRCS-11203 3/3

ISSUE: The helium isolation valves have two diodes, one in series with each of the open and close solenoid circuits. Diode failing high has no effect. IOA-RCS recommends this failure be included in the FMEAs.

3) FAILURE: FAILS SHORT

05-6KF-2252-2 3/1R PFP, CIL
FRCS-321,323 3/3

ISSUE: NASA FMEA considers unrelated failures. IOA-RCS claims this failed short diode alone has no effect. (see 4.1.1.B.2)

4) FAILURE: FAILS OPEN

05-6KF-2267-1 3/3
FRCS-324,326 3/2R PPP

ISSUE: This failure may lead to falsely failing the valve closed. (see 4.1.1.B.1)

5) FAILURE: FAILS SHORT TO GROUND

05-6KF-2252-3	3/1R	PFP, CIL
FRCS-11211,11212	3/1R	PFP, CIL

ISSUE: NASA FMEA considers unrelated failures. IOA-RCS claims this failed short to ground diode causes inability to open the valve manually. Redundancy provided by the GPC/MDM. Loss of all redundancy causes inability to expel propellants to meet CG limits. (see 4.1.1.B.3)

4.1.2.1.B.2 Hybrid Drivers (2 issues)

1) FAILURE: LOSS OF OUTPUT

05-6KF-2201-1	3/3	
FRCS-336	3/2R	PPP

2) FAILURE: LOSS OF OUTPUT

05-6KF-2201A-1	3/3	
FRCS-334	3/2R	PPP

ISSUE: Both of these issues concern falsely failing the valve closed. (see 4.1.1.B.1)

4.1.2.1.B.3 Resistor (2 issues)

1) FAILURE: FAILS OPEN

05-6KF-2077-1	3/3	
FRCS-348,350,352,354	3/2R	PPP

2) FAILURE: FAILS OPEN

05-6KF-2078-1	3/3	
FRCS-356	3/2R	PPP

ISSUE: Both of these issues concern falsely failing the valve closed. (see 4.1.1.B.1)

4.1.2.1.B.4 Toggle Switches (1 issue)

1) FAILURE: INADVERTENT OPERATION

05-6KF-2026-2	3/1R	PPP	
FRCS-11081,11082	2/1R	PPP	(fails short), CIL
11083	3/3		(inadvertent operation)

ISSUE: IOA-RCS claims a short across contacts 5,6 causes inability to open one leg of the isolation valve. Redundancy provided by the other leg. Loss of all redundancy causes inability to expel propellants in efforts to meet C.G. limits. Inadvertent operation (switch movement) has no effect.

4.1.2.1.B.5 Microswitches (1 issue)

1) FAILURE: ERRONEOUS OUTPUT

NO FMEA		
FRCS-11204	3/2R	PPP

ISSUE: The helium isolation valve A & B solenoid microswitch provides power to the talkback circuitry. A microswitch failure across the either contact will provide an inaccurate talkback. This may lead to falsely failing the valve closed.

4.1.2.1.B.6 Event Indicators (1 issue)

1) FAILURE: FAILS SHORT TO GROUND OR OPEN

05-6KF-2151-1,2	3/3	
FRCS-387	3/2R	PPP

ISSUE: This issue concerns falsely failing the valve closed. (see 4.1.1.B.1)

4.1.2.2 Propellant Storage and Distribution Subsystem (114 issues)

4.1.2.2.A Hardware (23 issues)

4.1.2.2.A.1 Propellant Tank Acquisition Assembly (1 issue)

1) FAILURE: STRUCTURAL FAILURE, HELIUM PASSAGE, SCREEN DRY-OUT

03-2F-111110-3   1/1   ---, CIL
RCS-128   1/1   ---, CIL

ISSUE: IOA recommends that the propellant tank acquisition device components be itemized in the item list or functional description sections to show specifically what is covered by this FMEA (e.g.: upper compartment channels/screens, lower compartment channels/screens, feedout tubes, plenum, bulkhead, etc.). IOA also recommends that the "high G" discussion be removed from the functional description for this FRCS prop tank. The FRCS prop tanks are not designed for high G propellant acquisition.

4.1.2.2.A.2 Pressure Relief Assemblies (3 issues)

1) FAILURE: BURST DISK LEAKAGE

NO FMEA
RCS-140   2/1R PFP, CIL

ISSUE: Internal leakage of the burst disk is a credible failure mode and is not currently addressed on the NASA FMEA/CIL. IOA recommends that this failure mode be added to 03-2F-101060-5 (pressure relief valve assembly, burst disk ruptures prematurely, 2/1R PFP). The failure history of the burst disk includes internal leakage.

2) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-10008X   3/1R FNP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters and/or orifices, and recommends that it be addressed for the pressure relief valve. Failure mode can be added to 03-2F-101060-3 (pressure relief valve assembly, burst disk fails to rupture, 3/1R FNP).

3) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-10009X 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2F-101060-1 addresses only a bellows failure. IOA considers external leakage of the relief assembly due to a housing failure to be a credible failure mode (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant (see 4.1.1.A.1), and leakage of prop or prop vapors (see 4.1.1.A.2).

4.1.2.2.A.3 Ground Manual Isolation Valve (1 issue)

1) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-146 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the ground manual isolation valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant (see 4.1.1.A.1), and leakage of prop and/or prop vapors (see 4.1.1.A.2).

4.1.2.2.A.4 Propellant Tank Isolation Valves (5 issues)

1) FAILURE: RESTRICTED FLOW

03-2F-102120-1 3/1R PPP
RCS-148 2/1R PPF, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 2/1R PPF and placed on a new FMEA, separate from the "fails closed" FMEA. Loss of prop flow through both tank isolation valves would result in inability to perform ET sep and inability to deplete FRCS prop. See 4.1.1.A.1. Contamination could affect both valves simultaneously (fail C screen).

2) FAILURE: FAILS CLOSED

03-2F-102120-1 3/1R PPP
RCS-150, 152 2/1R PPP, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 2/1R. Failure of both FRCS prop tank isol valves results in inability to perform ET sep and inability to deplete FRCS propellant. See 4.1.1.A.1.

3) FAILURE: RELIEF DEVICE FAILS CLOSED

03-2F-102120-3 3/3 ---
RCS-10010X 2/1R PNP, CIL

ISSUE: These valves are nominally open during all phases, and will not be closed unless a downstream failure occurs which requires isolation. Therefore, this failure mode is not applicable until another failure occurs. IOA recommends that the FMEA for this failure mode be upgraded to a 2/1R PNP (not a 1/1, since a previous failure is required for the valve to be closed). See 4.1.1.A.3.

4) FAILURE: INTERNAL LEAKAGE

NO FMEA
RCS-149A, 151A 3/1R PNP

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers "internal leakage" to be a credible failure mode and recommends that it be added as a failure mode on 03-2F-102120-2 (prop tank isol valves, fails open, 3/1R PNP).

5) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-147 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2F-102112-1 addresses only a bellows failure. IOA considers external leakage of a prop tank isolation valve housing to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. This failure would result in leakage of propellant. See 4.1.1.A.2.

4.1.2.2.A.5 Primary Manifold Isolation Valves (4 issues)

1) FAILURE: FAILS CLOSED

03-2F-102110-1 3/1R PPP
RCS-158, 162, 166, 170 2/1R PPP, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 2/1R. Certain combinations of two manifold isolation valves failed closed (#1 & #3, or #2 & #4) would result in loss of yaw jet (null jet) dumping capability and possible inability to deplete FRCS prop. See 4.1.1.A.1.

2) FAILURE: RELIEF DEVICE FAILS CLOSED

03-2F-102110-3 3/3 ---
RCS-10012X 1/1 ---, CIL

ISSUE: These valves are nominally closed during entry. IOA recommends that the FMEA for this failure mode be upgraded to a 1/1. See 4.1.1.A.3

3) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-177 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2F-102112-1 addresses only a bellows failure. IOA considers external leakage of a primary manifold isolation valve housing to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. This failure would result in leakage of propellant. See 4.1.1.A.2.

4) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-178 2/1R PPP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the primary manifold isolation valves. Effects same as "fails closed". See issue on 03-2F-102110-1, above, and 4.1.1.A.1.

4.1.2.2.A.6 Vernier Manifold Isolation Valves (4 issues)

1) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2F-102170-2 3/2R PPP
RCS-173 3/1R PNP

ISSUE: IOA recommends that these failure modes be upgraded to 3/1R PNP. Loss of all redundancy (tank isol valve and thruster valve) results in leakage of propellant. See 4.1.1.A.2.

2) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-177A 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2F-102170-3 addresses only a bellows failure. IOA considers external leakage of a vernier manifold isolation valve housing to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. This failure would result in leakage of propellant. See 4.1.1.A.2.

3) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-178 2/2 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the vernier manifold isolation valves. Effects same as "fails closed". This failure mode can be added to 03-2F-102170-1 (vernier manifold valve, fails closed, 2/2).

4) FAILURE: RELIEF DEVICE FAILS CLOSED

NO FMEA
RCS-10014X 2/1R PNP, CIL

ISSUE: This failure mode is not currently addressed for the FRCS vernier manifold isolation valves, however it is addressed for the ARCS vernier manifold valves. This valve is nominally open during all phases, and will not be closed unless a downstream failure occurs which requires isolation. Therefore, this failure mode is not applicable until another failure occurs. IOA recommends that the FMEA for this failure mode be upgraded to a 2/1R PNP (not a 1/1, since a previous failure is required for the valve to be closed). See 4.1.1.A.3.

4.1.2.2.A.7 Jet Alignment Bellows (1 issue)

1) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

03-2F-121308-1 1/1 ---, CIL
RCS-179 1/1 ---, CIL

ISSUE: IOA recommends that the "effects" on this FMEA be revised. The current effects state that this failure is "no effect after ET separation". IOA considers leakage of prop to be critical during all phases. See 4.1.1.A.2.

4.1.2.2.A.8 Quick Disconnect Couplings (4 issues)

1) FAILURE: EXTERNAL LEAKAGE

03-2F-101080-1	2/1R FFP, CIL
RCS-159, 163, 167, 171, 175	2/1R FFP, CIL

ISSUE: IOA recommends that "poppet fails open" be added as a failure mode on this FMEA. This is a credible failure mode and is addressed on other QD coupling FMEAs.

2) FAILURE: EXTERNAL LEAKAGE

03-2F-101090-1	3/1R FFP, CIL
RCS-130	3/1R FFP, CIL

ISSUE: IOA recommends that "poppet fails open" be added as a failure mode on this FMEA. This is a credible failure mode and is addressed on other QD coupling FMEAs.

3,4) FAILURE: FAILS TO COUPLE

03-2F-101080-2	3/3	---
03-2F-101090-2	3/3	---
RCS-160, 164, 168, 172, 176, 131	3/3	---

ISSUE: IOA recommends that "restricted flow" be added as a failure mode on the FMEAs listed. This is a credible failure and is addressed on other QD coupling FMEAs.

4.1.2.2.B EPD&C (91 issues)

4.1.2.2.B.1 Remote Power Controllers (4 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KF-2177-2	3/1R PFP, CIL
FRCS-11019	3/3

ISSUE: NASA FMEA considers multiple failures (close driver failed on, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this RPC inadvertently operating alone has no effect. (see 4.1.1.B.2)

2) FAILURE: INADVERTENT OPERATION

05-6KF-2178-2	3/1R	PFP, CIL
FRCS-11021	3/3	

ISSUE: NASA FMEA considers multiple failures (open driver failed on, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this RPC inadvertently operating alone has no effect. (see 4.1.1.B.2)

3) FAILURE: LOSS OF OUTPUT

05-6KF-2177-1	3/2R	P P P
FRCS-11018	3/1R	P NA P

ISSUE: This RPC failed open (loss of output) causes inability to close manifold 5 isolation valve. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.4)

4) FAILURE: LOSS OF OUTPUT

05-6KF-2178-1	3/2R	PPP
FRCS-11020	2/2, CIL	

ISSUE: IOA-RCS claims this RPC failed open (loss of output) causes inability to open the valve. This causes loss of vernier jets required for mission operations. (see 4.1.1.B.4)

4.1.2.2.B.2 Diodes (27 issues)

1) FAILURE: FAILS SHORT

05-6KF-2255-2	3/3	
FRCS-573,579,595,601 617,623,639,645	3/2R	PPP

2) FAILURE: FAILS OPEN

05-6KF-2268-1	3/3	
FRCS-580,582,602,604 624,626,646,648	3/2R	PPP

3) FAILURE: FAILS SHORT

05-6KF-2257-2	3/3	
FRCS-11037	3/2R	PPP

4) FAILURE: FAILS SHORT

05-6KF-2257A-2	3/3
FRCS-11039	3/2R PPP

5) FAILURE: FAILS OPEN

05-6KF-2269-1	3/3
FRCS-11056,11058	3/2R PPP

<u>ISSUE:</u> The first five issues concern falsely failing the valve closed. (see 4.1.1.B.1)

6) FAILURE: FAILS OPEN

05-6KF-2253-1	2/1R PFP, CIL
FRCS-388,406,410,420	3/3

<u>ISSUE:</u> NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open diode alone (causing continuous power to the motor) has no effect. (see 4.1.1.B.2)

7) FAILURE: FAILS OPEN

05-6KF-2253E-1	3/1R PFP, CIL
FRCS-408,418	3/3

<u>ISSUE:</u> NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open diode alone (causing continuous power to the motor) has no effect. (see 4.1.1.B.2)

8) FAILURE: FAILS OPEN

05-6KF-2254-1	2/1R PFP, CIL
FRCS-424,442,446,456	3/3

<u>ISSUE:</u> NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open diode alone (causing continuous power to the motor) has no effect. (see 4.1.1.B.2)

9) FAILURE: FAILS OPEN

05-6KF-2255-1 2/1R PFP, CIL
FRCS-572,578,594,600 3/3
616,622,638,644

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open diode alone (causing continuous power to the motor) has no effect. (see 4.1.1.B.2)

10) FAILURE: FAILS OPEN

05-6KF-2255E-1 3/1R PFP, CIL
FRCS-576,598,620,642 3/3

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open diode alone (causing continuous power to the motor) has no effect. (see 4.1.1.B.2)

11) FAILURE: FAILS OPEN

05-6KF-2255F-1 3/1R PFP, CIL
FRCS-568,590,612,634 3/3

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open diode alone (causing continuous power to the motor) has no effect. (see 4.1.1.B.2)

12) FAILURE: FAILS OPEN

05-6KF-2257-1 3/1R PFP, CIL
FRCS-11036 3/3

ISSUE: NASA FMEA considers multiple failures (switch internal short, open driver failed on causing continuous power to the solenoid). IOA-RCS claims this diode failed open alone has no effect. (see 4.1.1.B.2)

13) FAILURE: FAILS OPEN

05-6KF-2257A-1 3/1R PFP, CIL
FRCS-11038 3/3

ISSUE: NASA FMEA considers multiple failures (switch internal short, close driver failed on causing continuous power to the solenoid). IOA-RCS claims this diode failed open alone has no effect. (see 4.1.1.B.2)

14) FAILURE: FAILS SHORT

05-6KF-2257F-2	3/2R	PPP
FRCS-11065	3/3	

ISSUE: NASA FMEA considers multiple failures (switch fails short, circuit breaker failed on causing continuous power to the solenoid). IOA-RCS claims this diode failed short has no effect. (see 4.1.1.B.2)

15) FAILURE: FAILS SHORT

05-6KF-2255E-2	3/1R	PFP, CIL
FRCS-577,599,621,643	2/1R	PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed short diode causes excessive motor operation (continuous power that opens the valve slightly (3 degrees) then closes it, constantly repeating itself). Motor damage would likely cause the valve to close, causing loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes the inability to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.3, 4.1.1.B.4)

16) FAILURE: FAILS SHORT

05-6KF-2255F-2	3/1R	PFP, CIL
FRCS-569,591,613,635	2/1R	PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed short diode causes excessive motor operation (continuous power that opens the valve slightly (3 degrees) then closes it, constantly repeating itself). Motor damage would likely cause the valve to close, causing loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes the inability to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.3, 4.1.1.B.4)

17) FAILURE: FAILS OPEN

05-6KF-2253B-1	3/2R	P P P
FRCS-398,400	3/1R	P NA P

ISSUE: IOA-RCS claims this failed open diode causes inability to open the valve with the GPC/MDM. Manual commanding provides redundancy. Loss of this, coupled with the loss of all hardware redundancy causes inability to expel propellants in efforts to meet C.G. limits.

18) FAILURE: FAILS OPEN

05-6KF-2254B-1	3/2R	P	P	P
FRCS-434,436	3/1R	P	NA	P

ISSUE: IOA-RCS claims this failed open diode causes inability to open the valve with the GPC/MDM. Manual commanding provides redundancy. Loss of this, coupled with the loss of all hardware redundancy causes inability to expel propellants in efforts to meet C.G. limits.

19) FAILURE: FAILS OPEN

05-6KF-2255B-1	3/2R	P	P	P
FRCS-574,596,618,640	3/1R	P	NA	P

ISSUE: This diode failed open causes inability to open the valve with the GPC/MDM. Redundancy provided by manual commanding. Loss of this causes loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits.

20) FAILURE: FAILS OPEN

05-6KF-2257D-1	3/2R	P	P	P
FRCS-11044,11060	3/1R	P	NA	P

ISSUE: This diode failed open causes inability to close isolation valve manually. GPC/MDM close command provides redundancy. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.4)

21) FAILURE: FAILS OPEN

05-6KF-2257F-1	3/2R	P	P	P
FRCS-11064	3/1R	P	NA	P

ISSUE: This diode failed open causes inability to inhibit the ground driver manually to close the valve. Redundancy provided with the GPC/MDM commands. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.4)

C-2

22) FAILURE: FAILS OPEN

05-6KF-2258-1 3/2R PPP
FRCS-11070 2/2, CIL

ISSUE: IOA-RCS claims this failed open diode causes inability to open valve. This causes loss of vernier jets required for mission operations. (see 4.1.1.B.4)

23) FAILURE: FAILS SHORT TO GROUND

05-6KF-2258-3 3/2R PPP
FRCS-11221 2/2, CIL

ISSUE: IOA-RCS claims this failed short to ground diode causes inability to open valve. This causes loss of vernier jets required for mission operations. (see 4.1.1.B.4)

24,25) FAILURE: FAILS OPEN

NO FMEA
FRCS-11072,11074 3/1R P NA P

ISSUE: The manifold isolation valve has two diodes in parallel that completes the circuit to ground. One diode failing open has no effect. Second diode failing open will causes inability to close the valve. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.5)

26,27) FAILURE: FAILS SHORT

NO FMEA
FRCS-11073,11075 3/3

ISSUE: The manifold isolation valve has two diodes in parallel that completes the circuit to ground. Either or both diode failing short has no effect. (see 4.1.1.B.5)

4.1.2.2.B.3 Hybrid Drivers (20 issues)

1) FAILURE: LOSS OF OUTPUT

05-6KF-2206-1 3/3
FRCS-460,462 3/2R PPP

2) FAILURE: INADVERTENT OPERATION

05-6KF-2206-2 3/3
FRCS-461,463 3/2R PPP

3) FAILURE: LOSS OF OUTPUT

05-6KF-2207-1 3/3
FRCS-464,464 3/2R PPP

4) FAILURE: INADVERTENT OPERATION

05-6KF-2207-2 3/3
FRCS-465,467 3/2R PPP

ISSUE: The first four issues concern falsely failing the valve closed. (see 4.1.1.B.1)

5) FAILURE: LOSS OF OUTPUT

05-6KF-2208-1 2/1R PFP, CIL
FRCS-668,670,672,674,676,678,680,682 3/2R PPP

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open driver causes loss of accurate indication of the valve status from the event indicator. GPC/MDM microswitch discretes provide redundancy. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.1.1.B.2)

6) FAILURE: INADVERTENT OPERATION

05-6KF-2113A-2 3/1R PFP, CIL
FRCS-11033 3/3

ISSUE: NASA FMEA contains multiple failures (open driver failed on, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating has no effect. (see 4.1.1.B.2)

7) FAILURE: LOSS OF OUTPUT

05-6KF-2210-1 3/1R PFP, CIL
FRCS-11024 3/2R PPP

ISSUE: NASA FMEA considers multiple failures (switch short, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this driver failed open (loss of output) causes loss of event indicator to determine valve status. GPC/MDM discretes provide redundancy. Loss of all redundancy may lead to falsely failing the valve close causing loss of mission operations. (see 4.1.1.B.2)

8) FAILURE: LOSS OF OUTPUT

05-6KF-2210A-1 3/1R PFP, CIL
FRCS-11022 3/2R PPP

ISSUE: NASA FMEA considers multiple failures (switch short, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this driver failed open (loss of output) causes loss of event indicator to determine valve status. GPC/MDM discretes provide redundancy. Loss of all redundancy may lead to falsely failing the valve close causing loss of mission operations. (see 4.1.1.B.2)

9) FAILURE: INADVERTENT OUTPUT

05-6KF-2211-2 3/1R PFP, CIL
FRCS-11031 3/3

ISSUE: NASA FMEA considers multiple failures (open driver failed on, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.1.1.B.2)

10) FAILURE: INADVERTENT OUTPUT

05-6KF-2213-2 3/1R PFP, CIL
FRCS-11027 3/3

ISSUE: NASA FMEA considers multiple failures (close driver failed on, ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.1.1.B.2)

11) FAILURE: INADVERTENT OUTPUT

05-6KF-2224-2 3/1R PFP, CIL
FRCS-11035 3/3

ISSUE: NASA FMEA considers multiple failures (type I open driver failed on, type III open driver failed on causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.1.1.B.2)

12) FAILURE: INADVERTENT OUTPUT

05-6KF-2212-2	3/1R PFP, CIL
FRCS-11029	2/2, CIL

ISSUE: NASA FMEA contains multiple failures (ground driver failed on causing continuous power to the solenoid). This driver failed high causes inability to open the isolation valve. This causes loss of verniers thus mission objectives. (see 4.1.1.B.3)

13) FAILURE: INADVERTENT OUTPUT

05-6KF-2208-2	3/1R PPP
FRCS-669,673,677,681	2/1R PPP (open driver), CIL
671,675,679,683	3/1R PPP (close driver)

ISSUE: This driver failed short causes inability to open the valve. This causes loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Close driver failed short causes inability to isolate a thruster leak. (see 4.1.1.B.4)

14) FAILURE: INADVERTENT OUTPUT

05-6KF-2210-2	3/2R PPP
FRCS-11025	2/2, CIL

ISSUE: IOA-RCS claims this failed short driver causes inability to open the valve. This causes loss of vernier jets required for mission operations. (see 4.1.1.B.4)

15) FAILURE: INADVERTENT OUTPUT

05-6KF-2210A-2	3/2R PPP
FRCS-11023	3/1R PPP

ISSUE: This driver failed short causes inability to close isolation valve. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.4)

16) FAILURE: LOSS OF OUTPUT

05-6KF-2211-1	3/2R PPP
FRCS-11030	2/2, CIL

ISSUE: IOA-RCS claims this failed open driver (loss of output) causes inability to open the valve. This causes loss of vernier jets required for mission operation. (see 4.1.1.B.4)

17) FAILURE: LOSS OF OUTPUT

05-6KF-2212-1 3/2R P P P
FRCS-11028 3/1R P NA P

ISSUE: This driver failed open (loss of output) causes inability to close the isolation valve. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.4)

18) FAILURE: LOSS OF OUTPUT

05-6KF-2213-1 3/2R P P P
FRCS-11026 3/1R P NA P

ISSUE: This driver failed open (loss of output) causes inability to close the isolation valve. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.4)

19) FAILURE: LOSS OF OUTPUT

05-6KF-2113A-1 3/2R PPP
FRCS-11032 2/2, CIL

ISSUE: IOA-RCS claims this failed open driver causes inability to open the valve. This causes loss of vernier jets required for mission operations. (see 4.1.1.B.4)

20) FAILURE: LOSS OF OUTPUT

05-6KF-2224-1 3/2R PPP
FRCS-11034 2/2, CIL

ISSUE: This driver failed open (loss of output) causes inability to open the isolation valve. Inability to open this valve causes loss of verniers thus loss of mission. (see 4.1.1.B.4)

4.1.2.2.B.4 Fuses (1 issue)

FAILURE: FAILS OPEN

05-6KF-2006-1 3/2R P P P
FRCS-11001,11002 3/1R P NA P

ISSUE: This fuse failed open causes inability to close the valve manually. Redundancy provided with the GPC/MDM commands. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.2)

4.1.2.2.B.5 Relays (9 issues)

1) FAILURE: INADVERTENT OUTPUT

05-6KF-2126-2	2/1R	PFP, CIL
FRCS-473,479	3/1R	PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed closed relay causes inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.3)

2) FAILURE: INADVERTENT OUTPUT

05-6KF-2126A-2	3/1R	PFP, CIL
FRCS-475,481,	3/3	
477,483	2/1R	PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed closed relay causes inability to open the valve. This causes loss of jets on manifolds 1 & 2. Redundancy provided by jets on manifolds 3 & 4. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. First in a series relay failing closed has no effect (475,481). (see 4.1.1.B.3, 4.1.1.B.4)

3) FAILURE: INADVERTENT OUTPUT

05-6KF-2127-2	2/1R	PFP, CIL
FRCS-487,493	3/3	
489,495	2/1R	PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed closed relay causes inability to open the valve. This causes loss of jets on manifolds 3,4 & 5. Redundancy provided by jets on manifolds 1 & 2. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. First series relay failing closed has no effect (487,493). No redundancy for vernier jets on manifold 5 (2/2). (see 4.1.1.B.3, 4.1.1.B.4)

4) FAILURE: INADVERTENT OUTPUT

05-6KF-2127A-2 2/1R PFP, CIL
FRCS-485,491 2/1R PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed closed relay causes inability to open the valve. This causes loss of jets on manifolds 3,4 & 5. Redundancy provided by jets on manifolds 1 & 2. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. No redundancy for vernier jets on manifold 5 (2/2). (see 4.1.1.B.3, 4.1.1.B.4)

5) FAILURE: FAILS TO TRANSFER (LOSS OF OUTPUT)

05-6KF-2127A-1 3/1R PPP
FRCS-484,490 2/1R PFP, CIL

ISSUE: This relay failing to transfer inability to open the 3/4/5 valve. This causes loss of jets on manifolds 3,4, & 5. Redundancy for jets on manifolds 3 & 4 provided on manifolds 1 & 2. Loss of all redundancy causes loss of jets required for to expel propellants in efforts to meet C.G. limits. No redundancy provided for manifold 5 (verniers - 2/2). (see 4.1.1.B.3)

6) FAILURE: INADVERTENT OPERATION

05-6KF-2128-2 2/1R PFP, CIL
FRCS-705,709,713,717 2/1R PPP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this close relay inadvertently operating causes inability to open the valve causing loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes inability to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.3, 4.1.1.B.4)

7) FAILURE: INADVERTENT OUTPUT

05-6KF-2128A-2 2/1R PFP, CIL
FRCS-703,707,711,715 3/1R PFP, CIL

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this open relay failed closed causes inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.3)

8) FAILURE: FAILS TO TRANSFER (LOSS OF OUTPUT)

05-6KF-2126-1 3/1R PPP
FRCS-472,478 2/1R PPP, CIL

ISSUE: IOA-RCS claims this relay failing to transfer causes inability to open the valve. This causes loss of jets on manifolds 1 & 2. Redundancy provided by jets on manifolds 3 & 4. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.4)

9) FAILURE: FAILS TO TRANSFER (LOSS OF OUTPUT)

05-6KF-2128A-1 3/1R PPP
FRCS-702,706,710,714 2/1R PPP, CIL

ISSUE: This relay failing to transfer causes inability to open isolation valve. This causes loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.4)

4.1.2.2.B.6 Resistors (10 issues)

1) FAILURE: FAILS OPEN

05-6KF-2081-1 3/3
FRCS-502,506,510,512 3/2R PPP

2) FAILURE: FAILS OPEN

05-6KF-2082-1 3/3
FRCS-504,508 3/2R PPP

3) FAILURE: FAILS SHORT TO GROUND OR OPEN

05-6KF-2153-1,2 3/3
FRCS-879 3/2R PPP

4) FAILURE: FAILS OPEN

05-6KF-2085-1 3/3
FRCS-522,526 3/2R PPP

5) FAILURE: FAILS OPEN

05-6KF-2086-1 3/3
FRCS-520,524,528,530 3/2R PPP

6) FAILURE: FAILS OPEN

05-6KF-2091-1	3/3	
FRCS-11012,11013,11014,11015	3/2R	PPP

ISSUE: The first six issues concern falsely failing the valve closed. (see 4.1.1.B.1)

7) FAILURE: FAILS OPEN

05-6KF-2083-1	3/1R	PFP, CIL
FRCS-496,498,500	3/2R	PPP

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open resistor causes loss of accurate indication of the valve status from the event indicator or the GPC/MDM microswitch discretes. This may lead to falsely failing the valve closed. (see 4.1.1.B.2)

8) FAILURE: FAILS OPEN

05-6KF-2084-1	3/1R	PFP, CIL
FRCS-514,516,518	3/2R	PPP

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open resistor causes loss of accurate indication of the valve status from the event indicator or GPC/MDM microswitch discretes. This may lead to falsely failing the valve closed. (see 4.1.1.B.2)

9) FAILURE: FAILS OPEN

05-6KF-2089-1	2/1R	PFP, CIL
FRCS-718,732,746,760	3/2R	PPP

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed open resistor causes loss of accurate indication of the valve status from the event indicator or GPC/MDM microswitch discretes. This may lead to falsely failing the valve closed. (see 4.1.1.B.2)

10) FAILURE: FAILS OPEN

05-6KF-2090-1	3/1R	PFP, CIL
FRCS-11008	3/2R	PPP

ISSUE: NASA FMEA considers multiple failures (ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this failed open resistor causes loss of accurate talkback. This may lead to falsely failing the valve closed causing loss of mission operations. (see 4.1.1.B.2)

4.1.2.2.B.7 Toggle Switches (3 issues)

1) FAILURE:INADVERTENT OPERATION

05-6KF-2032-2	3/1R	PFP, CIL
FRCS-11005,11007	3/1R	PFP, CIL

ISSUE: NASA FMEA contains multiple failures (open driver failed on, causing continuous power to the solenoid). The switch inadvertently operating causes inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.3)

2) FAILURE: FAILS TO CONDUCT ONE OR MORE CONTACT SET

05-6KF-2032-1	3/2R	P P P
FRCS-11003,11004,11006	3/1R	P NA P

ISSUE: This switch failed open causes inability to close the valve manually. Redundancy provided with the GPC/MDM commands. Loss of this, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.3)

3) FAILURE: SWITCH FAILS SHORT

05-6KF-2030-2	3/1R	PPP
FRCS-11096,11097,11101,11102 11106,11107,11111,11112	2/1R	PFP, CIL

ISSUE: Switch short across close contacts causes inability to open the valve. Inability to open the valve coupled with the loss of all hardware redundancy may causes loss of jets required to expel propellants to meet CG limits. (see 4.1.1.B.3)

4.1.2.2.B.8 Microswitches (8 issues)

1) FAILURE: ERRONEOUS OUTPUT

NO FMEA
FRCS-11205 3/1R PPP

ISSUE: The tank isolation valve 1/2 solenoid microswitch provides power to the talkback circuitry and to the relay inhibit. A microswitch failure across the close contacts while the valve is open causes inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.5)

2) FAILURE: ERRONEOUS OUTPUT

NO FMEA
FRCS-11206 3/1R PPP

ISSUE: The tank isolation valve 3/4/5 solenoid microswitch provides power to the talkback circuitry and to the relay inhibit. A microswitch failure across the close contacts while the valve is open causes inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.1.1.B.5)

3-6) FAILURE: ERRONEOUS OUTPUT

NO FMEA
FRCS-11207,11208, 11209,11210 3/2R PPP

ISSUE: The manifold isolation valve solenoid microswitch provides power to the talkback circuitry and to the relay inhibit. A microswitch failure across the either contacts will provide an inaccurate talkback. This may lead to falsely failing the valve closed. (see 4.1.1.B.5)

7-8) FAILURE: ERRONEOUS OUTPUT

NO FMEA
FRCS-11078,11079 3/2R PPP

ISSUE: The manifold isolation valve solenoid microswitch provides power to the talkback circuitry. A microswitch failure across the either contact will provide an inaccurate talkback. This may lead to falsely failing the valve closed. (see 4.1.1.B.5)

4.1.2.2.B.9 Circuit Breaker (1 issue)

1) FAILURE: SHORT, FAILED CLOSED

05-6KF-2280-2	3/1R	PFP, CIL
FRCS-11077	3/3	

ISSUE: NASA FMEA considers multiple failures (switch jam, open driver failed on causing continuous power to the solenoid). IOA-RCS claims this circuit breaker failed short alone has no effect. (see 4.1.1.B.2)

4.1.2.2.B.10 Meters / Rotary Switch (2 issues)

1) FAILURE: All Credible Modes

05-6KF-2158-1	3/3	
FRCS-11193,11194	3/2R	PPP

2) FAILURE: All Credible Modes

05-6KF-2034-1	3/3	
FRCS-11191	3/2R	PPP

ISSUE: Both of these issues concern falsely failing the valve closed due to inaccurate switch or meter data. (see 4.1.1.B.1)

4.1.2.2.B.11 Event Indicators (6 issues)

1) FAILURE: FAILS SHORT TO GROUND OR OPEN

05-6KF-2154-1,2	3/3	
FRCS-879	3/2R	PPP

2) FAILURE: FAILS SHORT TO GROUND OR OPEN

05-6KF-2155-1,2	3/3	
FRCS-879A	3/2R	PPP

3) FAILURE: FAILS OPEN

05-6KF-2155-2	3/3	
FRCS-880A,881A,882A,883A	3/2R	PPP

4) FAILURE: FAILS OPEN

05-6KF-2156-2	3/3	
FRCS-11016	3/2R	PPP

ISSUE: The first four issues concern falsely failing the valve closed. (see 4.1.1.B.1)

5) FAILURE: FAILS SHORT TO GROUND

05-6KF-2155-1	2/1R	PFP, CIL
FRCS-880,881,882,883	3/2R	PPP

ISSUE: NASA FMEA considers multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failed short to ground event indicator causes loss of accurate indication of the valve status from the display. GPC/MDM microswitch discretes provide redundancy. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.1.1.B.2)

6) FAILURE: FAILS SHORT TO GROUND

05-6KF-2156-1	3/1R	PFP, CIL
FRCS-11017	3/2R	PPP

ISSUE: NASA FMEA considers multiple failures (ground driver failed on causing continuous power to the solenoid). IOA-RCS claims this event indicator failed short to ground causes loss of accurate indication of valve status from event indicator. Redundancy provided by GPC/MDM discretes. Loss of all redundancy may lead to falsely failing the valve closed causing loss of mission operations. (see 4.1.1.B.2)

4.1.2.3 Thruster Subsystem (41 issues)

4.1.2.3.A Hardware (10 issues)

4.1.2.3.A.1 Primary Thruster Bipropellant Solenoid Valves (6 issues)

1) FAILURE: PREMATURE OPERATION (DURING GROUND C/O TRICKLE CURRENT TEST)

03-2F-121310-1	3/3	---
RCS-10116X	1/1	---, CIL

ISSUE: IOA considers a premature (unexpected) firing of an RCS thruster during ground operations and testing to be a 1/1 failure. Such a failure could result in loss of life due to exposure to prop vapors and/or thruster plume. This failure is the result of a reaction jet driver (RJD) failure. A "failed-on" thruster caused by an RJD failure is covered in the GNC subsystem.

2) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2F-121310-2	3/1R	FPP, CIL
RCS-181	1/1	---, CIL (Fails open)
RCS-185, 187, 189	1/1	---, CIL (Internal leakage)

ISSUE: A thruster biprop valve failed open or leaking due to piece-part structural failure or seal failure results in leakage of propellant. See 4.1.1.A.2. Such a failure could also result in zots upon subsequent thruster use.

3) FAILURE: FAILS CLOSED (ONE OR BOTH VALVES)

03-2F-121310-3	3/1R	FPP, CIL (All FRCS thrusters)
RCS-184	3/2R	FPP, CIL (-X axis)
RCS-186	2/1R	FPP, CIL (+/-Y axis)
RCS-188	3/1R	FPP, CIL (-Z axis)
RCS-10015X	3/2R	FPP, CIL (+Z axis)

ISSUE: IOA recommends that the FRCS primary thrusters be separated by axis since the failure of thrusters in each axis can have different effects. IOA considered thrusters which fire in the same direction to be redundant to each other. Loss of all jets in the -X axis could result in loss of mission only. -X thrusters are not required for ET sep or FRCS prop dumping. Loss of both +Y or both -Y thrusters after the deorbit burn would result in loss of yaw jet (null jet) dumping capability and possible inability to deplete FRCS propellant. See 4.1.1.A.1. Loss of all -Z thrusters on the same side could result in inability to perform ET sep. Loss of all +Z thrusters could

result in loss of mission only. +Z thrusters are not required for ET sep or FRCS prop dumping. IOA recommends either that this FMEA be separated into four new FMEAs, or that this FMEA be upgraded to a 2/1R FPP to cover the worst case.

4) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-182 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the primary thruster biprop solenoid valves assembly due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in leakage of propellant. See 4.1.1.A.2.

5) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-183 2/1R FPP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the thruster biprop valves. Effects same as "failed closed". See issue on 03-2F-121310-3, above, and 4.1.1.A.1.

6) FAILURE: DELAYED OPERATION, ONE VALVE OPENS SLOWLY OR LATE

NO FMEA
RCS-10042X 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers the delayed opening of one biprop valve relative to the other to be a credible failure which should be addressed. Such a failure of the oxidizer valve could result in fuel migration into the oxidizer injector tube and detonation within the tube upon oxidizer flow (zots). Rupture of the valve assembly due to jet zots would result in leakage of propellant. See 4.1.1.A.2. IOA recommends that a 1/1 FMEA be generated for this failure mode.

4.1.2.3.A.2 Primary Thruster Injector Head Assembly (2 issues)

1) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-10018X 1/1 ---, CIL

ISSUE: This item is not currently addressed on the NASA FMEA/CIL. However, a note on 03-2F-121312-1 states that the injector FMEA was deleted and added as a cause on 121312-1. IOA considers the injector assembly to be at the same level of detail as other primary thruster components on the FMEA/CIL, and recommends that a separate 1/1 FMEA be regenerated for this item and failure mode. This will ensure that this critical failure gets the proper amount of attention. Restricted flow leading to an improper mixture ratio or inadequate cooling would probably result in loss of the thruster, and could result in combustion chamber or nozzle extension burn-through.

2) FAILURE: STRUCTURAL FAILURE, BURN-THROUGH

NO FMEA
RCS-10019X 1/1 ---, CIL

ISSUE: This item is not currently addressed on the NASA FMEA/CIL. However, a note on 03-2F-121312-1 states that the injector FMEA was deleted and added as a cause on 121312-1. IOA considers the injector assembly to be at the same level of detail as other primary thruster components on the FMEA/CIL, and recommends that a separate 1/1 FMEA be regenerated for this item and failure mode. This will ensure that this critical failure gets the proper amount of attention. Such a failure of the injector head assembly could result in a fire/explosion potential leading to possible damage to the vehicle.

4.1.2.3.A.3 Vernier Thruster Assembly (2 issues)

1) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2F-131310-2	2/2	---, CIL
RCS-192	1/1	---, CIL (Fails open)
RCS-195	1/1	---, CIL (Internal leakage)

ISSUE: A thruster biprop valve failed open or leaking due to piece-part structural failure or seal failure results in leakage of propellant. See 4.1.1.A.2.

2) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-194 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the vernier thruster biprop valve assembly due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in leakage of propellant. See 4.1.1.A.2.

4.1.2.3.B EPD&C (31 issues)

4.1.2.3.B.1 Remote Power Controllers (5 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KF-2179-2	3/1R	PFP, CIL
FRCS-886,890,894,901	3/3	

ISSUE: NASA FMEA considers multiple failures (RJD bus relays fail on, RJD fails on, manifold isolation valve failed, tank isolation valve failed, main bus off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this RPC inadvertently operating alone has no effect. (see 4.1.1.B.2)

2) FAILURE: INADVERTENT OPERATION

05-6KF-2183-2	3/2R	PFP, CIL
FRCS-906,908	3/3	

ISSUE: NASA FMEA considers multiple failures (RPC failed, spurious RJD command, manifold isolation valve failed, tank isolation valve failed, main bus fails on, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this RPC inadvertently operating alone has no effect. (see 4.1.1.B.2)

3) FAILURE: LOSS OF OUTPUT

05-6KF-2179-1	3/1R	PPP
FRCS-885,889,904	2/1R	PPP, CIL
893	3/1R	PPP (manifold 3)

ISSUE: IOA-RCS claims this failed open RPC causes loss of driver power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Manifold 3 has electrical redundancy for driver power (893). (see 4.1.1.B.4)

4) FAILURE: LOSS OF OUTPUT

05-6KF-2180-1	3/1R	PPP
FRCS-887,891,902	2/1R	PPP, CIL
895	3/1R	PPP (manifold 3)

ISSUE: IOA-RCS claims this failed open RPC causes loss of logic power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Manifold 3 has electrical redundancy for logic power (895). (see 4.1.1.B.4)

5) FAILURE: INADVERTENT OPERATION

05-6KF-2182-2	3/1R	PPP
FRCS-900	3/3	

ISSUE: NASA FMEA considers multiple failures. IOA-RCS claims this failure alone has no effect. (see 4.1.1.B.2)

4.1.2.3.B.2 Diode (7 issues)

1) FAILURE: FAILS OPEN

05-6KF-2259-1	3/1R	PFP, CIL
FRCS-913,919,941	2/1R	PPP, CIL
925,931	3/1R	PPP (manifold 3)

ISSUE: IOA-RCS claims this failed open diode causes loss of driver power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all hardware redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Manifold 3 has additional electrical redundancy (925,931). (see 4.1.1.B.4)

2) FAILURE: FAILS OPEN

05-6KF-2260-1	3/1R	PFP, CIL
FRCS-909,915,943	2/1R	PPP (1/1 ABORT), CIL
921,927	3/1R	PPP (manifold 3)

ISSUE: IOA-RCS claims this failed open diode causes loss of driver power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Loss of one yaw thruster during RTLS/TAL abort could result in inability to complete a propellant dump. Manifold 3 has electrical redundancy (921,927). (see 4.1.1.B.4)

3-7) FAILURE: FAILS SHORT TO GROUND

NO FMEA
FRCS-11213,11214,11217 2/1R PFP, CIL
11215,11216 3/1R PFP (manifold 3), CIL

ISSUE: Diode failed short to ground causes loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Manifold 3 has electrical redundancy for driver power (FMEA for fail open and fail short on 05-6KF-2260-1, -2). (see 4.1.1.B.4)

4.1.2.3.B.3 Hybrid Drivers (3 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KF-2220-2 3/2R PFP, CIL
FRCS-958 3/3

ISSUE: NASA FMEA considers multiple failures (RPC failed, spurious RJD command, manifòld isolation valve failed, tank isolation valve failed, main bus fails on, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.1.1.B.2)

2) FAILURE: LOSS OF OUTPUT

05-6KF-2214-1 3/1R PFP, CIL
FRCS-947,949,956 2/1R PPP, CIL
951,953 3/1R PPP (manifold 3)

ISSUE: IOA-RCS claims this failed open driver causes loss of driver power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Electrical redundancy provided for manifold 3 (951,953). (see 4.1.1.B.4)

3) FAILURE: INADVERTENT OPERATION

05-6KF-2214-2 3/1R PFP, CIL
FRCS-948,950,952,954,955 3/3

ISSUE: NASA FMEA considers multiple failures (RJD bus relays fail on, RJD fails on, manifold isolation valve failed, tank isolation valve failed, main bus off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this relay inadvertently operating alone has no effect. (see 4.1.1.B.2)

4.1.2.3.B.4 Fuses (3 issues)

1) FAILURE: FAILS OPEN

05-6KF-2009-1	3/2R PPP
FRCS-959,962,965	2/1R PPP, CIL

ISSUE: This fuse failed open causes loss of energy to supply driver power to associated relay. Relay "A" provides energy to manifolds 1 & 3. Relay "B" provides energy to manifold 2. Relay "C" provides energy to manifolds 3 & 4. Loss of relay causes loss of jets on associated manifold. Redundancy provided by jets on another manifold. Loss of all hardware redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.4)

2) FAILURE: FAILS OPEN

05-6KF-2007-1	3/1R	PPP
FRCS-961,964,967,	2/1R	PPP, CIL
969	3/1R	PPP (manifold 4)

ISSUE: IOA-RCS claims this failed open fuse causes loss of logic power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Manifold 4 has electrical redundancy for logic power after ascent (969). (see 4.1.1.B.4)

3) FAILURE: FAILS OPEN

05-6KF-2008-1	3/1R	PPP
FRCS-960,963,966,970	2/1R	PPP, CIL

ISSUE: IOA-RCS claims this failed open fuse causes loss driver power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.4)

4.1.2.3.B.5 Relays (2 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KF-2130-2	3/1R	PPP
FRCS-973,975,977	3/3	

ISSUE: NASA FMEA considers multiple failures (RPC fails on, RJD fails on, manifold isolation valve failed, tank isolation valve failed, main bus off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this relay inadvertently operating alone has no effect. (see 4.1.1.B.2)

2) FAILURE: FAILS TO TRANSFER

05-6KF-2130-1	3/1R	PPP
FRCS-972,974,976	2/1R	PPP, CIL

ISSUE: IOA-RCS claims this failed open relay causes loss of driver power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.4)

4.1.2.3.B.6 Resistors (1 issue)

1) FAILURE: FAILS SHORT

NO FMEA	
FRCS-1035	3/3

ISSUE: The RLR42 resistors have been changed to the RWR80 resistors which can short. IOA-RCS recommends this failure be included into the FMEAs. (the open failure mode for this resistor is on 05-6KF-2111-1).

4.1.2.3.B.7 Toggle Switches (5 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KF-2036-2	3/1R	PPP
FRCS-11121,11122,11123,11131 11132,11133,11141,11142, 11143,11151,11152,11153	3/3	

ISSUE: NASA FMEA considers multiple failures (RJD fails on, manifold isolation valve failed, tank isolation valve failed, main bus off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this switch inadvertently operating alone has no effect. (see 4.1.1.B.2)

2) FAILURE: INADVERTENT OPERATION

05-6KF-2041-2	3/2R	PFP, CIL
FRCS-11156,11157,11158	3/3	

ISSUE: NASA FMEA considers multiple failures (spurious RJD command, manifold isolation valve failed, tank isolation valve failed, main bus fails off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this switch inadvertently operating alone has no effect. (see 4.1.1.B.2)

3) FAILURE: FAILS TO CONDUCT ONE OR MORE CONTACT SET

05-6KF-2035-1	3/1R	PPP
FRCS-11115,11119,11125, 11129,11135,11139	2/1R	PPP, CIL
11145,11149	3/1R	PPP (manifold 4)

ISSUE: IOA-RCS claims this failed open toggle switch causes loss of logic power, thus jets, on associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. Manifold 4 has electrical redundancy for logic power after ascent (11145,11149). (see 4.1.1.B.4)

4) FAILURE: FAILS TO CONDUCT ONE OR MORE CONTACT SET

05-6KF-2036-1	3/1R	PPP
FRCS-11120,11124,11130,11134 11140,11144,11150,11154	2/1R	PPP, CIL

ISSUE: IOA-RCS claims this failed open toggle switch causes loss of driver power, thus jets, for associated manifold. Redundancy provided by jets on another manifold. Loss of all redundancy causes loss of jets required to expel propellants in efforts to meet C.G. limits. (see 4.1.1.B.4)

5) FAILURE: INADVERTENT OPERATION

05-6KF-2035-2	3/1R	PPP
FRCS-11126,11127,11128,11116 11117,11118,11136,11137, 11138,11146,11147,11148	3/3	

ISSUE: NASA FMEA considers multiple failures (RJD fails on, manifold isolation valve failed, tank isolation valve failed, main bus off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this switch inadvertently operating alone has no effect. (see 4.1.1.B.2)

4.1.2.3.B.8 Signal Conditioners (1 issue)

1) FAILURE: ERRONEOUS OR LOSS OF OUTPUT

NO FMEA		
FRCS-11196	3/2R	PFP, CIL

ISSUE: The OF3 signal conditioner routes data for the helium oxidizer tank pressure data. This may causes loss of mission due to uncertainty about quantity of propellant.

4.1.2.3.B.9 Pressure Sensors (2 issues)

1) FAILURE: INDICATES LOWER PRESSURE THAN NORMAL

NO FMEA
FRCS-1144 3/2R PFP, CIL

ISSUE: The vernier thrusters' chamber pressure sensors indicating a lower than actual pressure may deselect the vernier jets. Reselection capability available. This may cause loss of some mission operations (primary pressure sensors failures on 03-2F-121314-2). (see 4.1.1.B.5)

2) FAILURE: INDICATES HIGHER PRESSURE THAN NORMAL

NO FMEA
FRCS-1145 3/2R PFP, CIL

ISSUE: The vernier thrusters' chamber pressure sensors indicating a higher than actual pressure may be deselect a jet. Reselection of jet available. This may cause loss of some mission operations (primary pressure sensors failures on 03-2F-121314-1). (see 4.1.1.B.5)

4.1.2.3.B.10 Temperature Sensors (2 issues)

1) FAILURE: INDICATES LOWER TEMPERATURE THAN NORMAL

NO FMEA
FRCS-1154 3/2R PFP, CIL

ISSUE: The vernier thrusters' injector temperature sensors indicating a lower than actual temperature may deselect a jet. Reselection of jet available. This may cause loss of some mission operations (primary injector temperature sensors failures on 03-2F-121315-2). (see 4.1.1.B.5)

2) FAILURE: INDICATES HIGHER TEMPERATURE THAN NORMAL

NO FMEA
FRCS-1155 3/2R PFP, CIL

ISSUE: The vernier thrusters' injector temperature sensors indicating a higher than actual temperature may deselect a jet. Reselection of jet available. This may cause loss of some mission operations (primary injector temperature sensors failures on 03-2F-121315-1). (see 4.1.1.B.5)

4.1.2.4 Thermal Control Subsystem (3 issues)

4.1.2.4.A Hardware

IOA analyzed and assessed thermal control subsystem items as EPD&C items. See 4.1.2.4.B for assessment results.

4.1.2.4.B EPD&C (3 issues)

4.1.2.4.B.1 Thermal Switches (2 issues)

1) FAILURE: FAILS CLOSED (HEATERS REMAIN ON)

NO FMEA	
FRCS-1300	2/2, CIL

ISSUE: Vernier thruster switch not specifically called out on this FMEA. (see 4.1.1.B.5)

2) FAILURE: FAILS OPEN

NO FMEA	
FRCS-1301	3/2R PPP

ISSUE: Vernier thruster switch not specifically called out on this FMEA. (see 4.1.1.B.5)

4.1.2.4.B.2 Hybrid Drivers (1 issue)

1) FAILURE: INADVERTENT OUTPUT

05-6KF-2215-2	3/3
FRCS-1157,1159,1161,1163,1165,1167, 1169,1171,1173,1175,1177,1179	3/2R PPP

ISSUE: This driver failed short causes inability to turn off heater with thermostat. Heater can be turned off with switch. Loss of all redundancy may cause loss of some mission operations due to orbiter pointing deep space for cooling.

4.2 Aft RCS Assessment Results

The unresolved aft RCS hardware and EPD&C issues are presented in the following sections. Several general issues are first presented (section 4.2.1), followed by the specific unresolved issues (section 4.2.2).

4.2.1 General Aft RCS Issues

Many of the unresolved issues which exist on individual FMEAs and CILs are linked to several "general" issues identified by IOA during the RCS FMEA/CIL assessment. These general issues concern either the groundrules used by NASA/RI to perform the FMEA/CIL analysis, or the NASA/RI analysis of the RCS subsystem. Each of the general IOA issues results in numerous FMEA and CIL issues.

The general issues identified by IOA in the ARCS hardware and EPD&C assessments are discussed in the following sections.

4.2.1.A Hardware

Four general areas of difference between the IOA and NASA/RI aft RCS subsystem analyses are responsible for many of the unresolved ARCS hardware issues.

4.2.1.A.1 Inability to Complete Abort Propellant Dumps

During RTLS and TAL aborts, OMS propellant is dumped through the twenty-four ARCS primary thrusters, and RCS propellant is dumped through the four +X primary thrusters. Inability to complete full propellant dumps could result in violations of entry mass properties constraints and/or violations of the OMS or RCS propellant tank landing weight constraints due to the additional amount of undumped propellants remaining in the tanks.

Therefore, IOA has classified each single failure which results in the loss of one or more primary thrusters as a crit 1 during aborts. The current NASA criticalities on these types of failures do not include any abort crit 1 assignments.

For a flight on which an OMS abort dump to the propellant tank landing weight constraint (22%) is planned, loss of one ARCS thruster would reduce the amount of OMS propellant dumped and thus result in some OMS propellant remaining in the tank in excess of the tank landing weight limit. For a flight which has an abort entry X cg approaching the aft limit (1109.0 inches), any additional amount of undumped OMS propellant would move the X cg further aft, possibly resulting in violation of the aft limit.

Similarly, loss of one +X thruster reduces the RCS propellant dump rate by half for one pod and could result in an incomplete RCS dump. The additional amount of undumped propellant in the RCS

tanks could result in violation of the RCS tank landing weight limit (70%) and/or violations of entry mass properties constraints.

Violation of a propellant tank landing weight limit could result in vehicle structural damage and or tank structural failure during entry or landing.

Six (6) of the ARCS issues are related to this general issue.

4.2.1.A.2 Propellant Leakage

IOA considers any leakage of RCS propellant (MMH or NTO) to be potentially life and vehicle threatening, regardless of where the leakage occurs. NSTS 22206 states that "A single failure resulting in leakage of LO2, LH2, N2H4, or MMH shall be classified as a Criticality 1" (p. 2-11, item h). Therefore, IOA classifies any single failure which results in prop leakage as a 1/1. If redundant items must fail before leakage occurs, IOA classifies the failure as a functional criticality 1R. Propellant leakage can result in contamination and corrosion of other components, fire, explosion, or exposure of EVA and ground crews to propellant or propellant vapors.

Twelve (12) of the ARCS hardware issues are related to this general issue.

4.2.1.A.3 Isolation Valve Internal Relief Device Failure

The propellant tank isolation valves, crossfeed valves, primary manifold isolation valves, and vernier manifold isolation valves each have an internal pressure relief device which would relieve a downstream overpressurization condition if the valve was closed. With the exception of the aft RCS vernier manifold isolation valve (03-2A-202140-3, 1/1), NASA/RI assigns 3/3 criticalities to the FMEAs which address the failure of this device to relieve downstream pressure. IOA contends that it is possible that a failed closed relief device could allow a downstream pressure build-up sufficient to cause a prop line leak. This is supported by the fact that the prop line structural failure FMEA (03-2A-202108-1) lists this failure as a cause. Since this failure could result in line failure and prop leakage, IOA recommends that the current 3/3 FMEAs for the relief device failures be upgraded accordingly.

Three (3) of the ARCS hardware issues are related to this general issue.

4.2.1.A.4 Additional Items and Failure Modes

A number of RCS subsystem items and failure modes identified by IOA during the analysis phase are not covered in the current NASA FMEA/CIL. IOA recommends that these items and failure modes be incorporated into the FMEA/CIL. These issues are identified in Appendix F by issue codes HDW 4 and HDW 5.

Thirty-four (34) of the ARCS hardware issues are related to this general issue.

4.2.1.B EPD&C

IOA has several general EPD&C issues that tend to inflate the number of issues shown in the assessment tables. The following general issues remain unresolved.

4.2.1.B.1 Loss of Talkback Data

IOA considers that the loss of data to determine the actual position of a valve to be a 3/2R PPP. Valve position data is provided by the GPC/MDM discretes and the event indicators, which provide redundancy for each other. Loss of all redundancy may lead to falsely failing the valve closed which could effect mission operations. NASA FMEAs have a 3/3 criticality for these failures.

This type of failure mode accounts for 25 open issues shown in the assessment tables for the aft EPD&C (6 issues in the helium pressurization subsystem and 19 in the propellant storage and distribution subsystem). They are identified by issue code EPD&C 1 in Appendix F.

4.2.1.B.2 FMEA Downgrades to 3/3 or 3/2R PPP - NSTS 22206 Interpretations

Numerous issues remain open due to different interpretations of NSTS 22206. All these issues concern the definition of the redundancy string. IOA did not consider multiple or unrelated failures in determining the criticality. IOA claims these FMEAs warrant a 3/2R PPP or 3/3 for the failure mode.

This type of failure mode accounts for 54 open issues shown in the assessment tables for the aft RCS EPD&C (1 issue in the helium pressurization subsystem, 46 issues in the propellant storage and distribution subsystem, and 7 issues in the thruster subsystem). They are identified by issue code EPD&C 2 in Appendix F.

4.2.1.B.3 FMEA Failure Scenario Upgrades - NSTS 22206 Interpretations

These issues also remain open due to the different interpretations of NSTS 22206. All these issues concern the definition of the redundancy string. IOA did not consider multiple or unrelated failures in determining criticality, however IOA did consider the functional redundancy for the item in question. Based on this, IOA failure scenarios create a 1R or CIL item condition, without using multiple or unrelated failures. IOA recommends these failure scenarios and criticality upgrades be included in the NASA FMEA/CIL.

These failure modes account for 9 open issues in the propellant storage and distribution subsystem as shown in the aft RCS EPD&C assessment tables. They are identified by issue code EPD&C 3 in Appendix F.

4.2.1.B.4 EPD&C Issues Tied to Open IOA Hardware Issues

These issues are directly related to the open IOA hardware issues. These failure modes account for 8 open issues in the propellant storage and distribution subsystem. They are identified by issue code EPD&C 4 in Appendix F.

4.2.1.B.5 Additional EPD&C Failure Modes Recommended by IOA

These failure modes are not currently addressed by the NASA FMEA/CIL. IOA recommends these failure modes be incorporated into the FMEA/CIL.

These failures account for 32 open issues shown in the assessment tables for the aft RCS EPD&C (3 issues in the helium pressurization subsystem, 16 issues in the propellant storage and distribution subsystem, 5 issues in the thruster subsystem, and 8 issue in the thermal control subsystem). They are identified by issue code EPD&C 5 in Appendix F.

4.2.2 Specific Aft RCS Issues

The specific aft RCS hardware and EPD&C unresolved issues are presented in the following sections and paragraphs which were referenced in tables I and II. The organization of the sections and paragraphs follow the RCS hierarchy shown in Figures 4-7, and used in tables I and II.

Unresolved issues which are related to general issues discussed in section 4.2.1 contain a reference to the applicable general issue. Each issue is presented in a standard format which gives the failure mode, applicable FMEA number and IOA assessment ID, the NASA and IOA criticality and screen assignments, and the rationale behind the IOA issue. Refer to assessment sheets in Appendix C for further information on each issue.

4.2.2.1 Helium Pressurization Subsystem (24 issues)

4.2.2.1.A Hardware (14 issues)

4.2.2.1.A.1 Helium Tank Isolation Valves (4 issues)

1) FAILURE: FAILS OPEN

03-2A-201020-2 3/1R PPP
RCS-202 3/1R PFP, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 3/1R PFP. A failure of the redundant secondary regulator would not be detectable in flight (fail B screen). No way to tell that one level of redundancy has been lost.

2) FAILURE: INTERNAL LEAKAGE

NO FMEA
RCS-202A 3/1R PFP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers internal leakage to be a credible failure mode and recommends that it be addressed on the FMEA/CIL. Effects same as "fails open". See issue on 03-2A-201020-2, above.

3) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-10020X 2/1R PFF, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode and recommends that a 2/1R PFF FMEA and CIL be added. Effects same as "failed closed". Failure not detectable during dual leg operation (fail B screen). Contamination can affect both valves simultaneously (fail C screen).

4) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-10021X 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the He isol valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant.

4.2.2.1.A.2 Regulator Assemblies (3 issues)

1) FAILURE: FAILS CLOSED, RESTRICTED FLOW

03-2A-201030-2	2/1R PPF, CIL
RCS-211	2/1R PFF, CIL (Fails closed)
RCS-212	2/1R PFF, CIL (Restricted flow)

ISSUE: IOA recommends that the B screen be failed for these failure modes. A failed closed regulator would not be detectable during dual leg operation. IOA accepts NASA/RI failure of C screen, however has not identified a single event which can result in the loss of both parallel regs. Contamination from downstream source (prop vapors) requires multiple failures (quad check valve poppets). The NASA/RI C screen classification is inconsistent between the forward and aft RCS regulator analyses.

2) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-213 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the He regulator due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant.

3) FAILURE: SENSING PORT LEAKAGE

NO FMEA
RCS-214 3/2R PFP, CIL

ISSUE: This failure mode is not currently addressed on the NASA RCS FMEA/CIL, but is addressed on the NASA OMS FMEA/CIL (03-3-1004-3, sensing port leakage, 3/2R PFP). IOA recommends that this failure mode also be addressed for the RCS regulators, with the same rationale used in the OMS subsystem.

4.2.2.1.A.3 Quad Check Valve Assemblies (2 issues)

1) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2A-201095-1	3/3 ---
RCS-218	2/1R PFP, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 2/1R PFP. IOA contends that, with series check valve poppets failed open or leaking, the contamination of upstream components by prop or prop vapors during a mission could result in loss of prop tank repressurization capability and subsequent inability to utilize ARCS prop. Contamination by prop could cause parallel regulators to fail closed.

2) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-10024X 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the quad check valve assembly due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant, and leakage of prop and/or prop vapors. See 4.2.1.A.2.

4.2.2.1.A.4 Quick Disconnect Couplings (5 issues)

1,2) FAILURE: EXTERNAL LEAKAGE

03-2A-201070-1	2/1R FFP, CIL
RCS-200	2/1R FFP, CIL
03-2A-201091-1	3/1R FFP, CIL
RCS-208, 216, 220, 243	3/1R FFP, CIL

ISSUE: IOA recommends that "poppet fails open" be added as a failure mode on the FMEAs listed. This is a credible failure mode and is addressed on other QD coupling FMEAs.

3-5) FAILURE: FAILS TO COUPLE

03-2A-201070-2, 201091-2, 202150-2	3/3	---
RCS-201, 209, 217, 221, 226, 232, 238, 244	3/3	---

<u>ISSUE:</u> IOA recommends that "restricted flow" be added as a failure mode on the FMEAs listed. This is a credible failure and is addressed on other QD coupling FMEAs.

4.2.2.1.B EPD&C (10 issues)

4.2.2.1.B.1 Diodes (4 issues)

1) FAILURE: FAILS OPEN

05-6KA-2267-1	3/3	
ARCS-1326,1336	3/2R	PPP

<u>ISSUE:</u> This issue concerns falsely failing the valve closed. (see 4.2.1.B.1)

2) FAILURE: FAILED SHORT

05-6KA-2252-2	3/1R	PFP, CIL
ARCS-1323,1325,1333,1335	3/3	

<u>ISSUE:</u> NASA FMEA contains multiple failures (same diode short to ground). IOA-RCS claims this diode failed short alone has no effect. (see 4.2.1.B.2)

3) FAILURE: FAILS OPEN

NO FMEA		
ARCS-12329	2/1R	PPP, CIL

<u>ISSUE:</u> IOA-RCS claims this diode failed open causes inability to open the valve. Redundancy provided by other valve. Loss of this causes inability to expel propellants to meet landing weight constraints.

4) FAILURE: FAILS SHORT

NO FMEA	
ARCS-12330	3/3

<u>ISSUE:</u> IOA-RCS claims this diode failing short has no effect. No FMEA exists for this failure.

4.2.2.1.B.2 Hybrid Drivers (2 issues)

1) FAILURE: LOSS OF OUTPUT

05-6KA-2201-1 3/3
ARCS-1346,1358 3/2R PPP

2) FAILURE: LOSS OF OUTPUT

05-6KA-2201A-1 3/3
ARCS-1348,1360 3/2R PPP

ISSUE: Both of these issues concern falsely failing the valve closed. (see 4.2.1.B.1)

4.2.2.1.B.3 Resistors (2 issues)

1) FAILURE: FAILS OPEN

05-6KA-2077-1 3/3
ARCS-1372,1374,1378,1380 3/2R PPP

2) FAILURE: FAILS OPEN

05-6KA-2078-1 3/3
ARCS-1376,1377,1392,1393 3/2R PPP

ISSUE: Both of these issues concern falsely failing the valve closed. (see 4.2.1.B.1)

4.2.2.B.1.4 Microswitches (1 issue)

1) FAILURE: ERRONEOUS OUTPUT

NO FMEA
ARCS-12331 3/2R PPP

ISSUE: IOA-RCS claims this failed open resistor causes loss of acccurate indication of the valve status from the event indicator or the GPC/MDM microswitch discretes. This may lead to falsely failing the valve closed.

4.2.2.1.B.5 Event Indicators (1 issue)

1) FAILURE: FAILS OPEN

05-6KA-2151-1	3/3	
ARCS-1413	3/2R	PPP

ISSUE: This issue concerns falsely failing the valve closed. (see 4.2.1.B.1)

4.2.2.2 Propellant Storage and Distribution Subsystem (135 issues)

4.2.2.2.A Hardware (23 issues)

4.2.2.2.A.1 Propellant Tank Acquisition Assembly (1 issue)

1) FAILURE: STRUCTURAL FAILURE, HELIUM PASSAGE, SCREEN DRY-OUT

03-2F-211110-2 1/1 ---, CIL
RCS-227 1/1 ---, CIL

ISSUE: IOA recommends that the propellant tank acquisition device components be itemized in the item list or functional description sections to show specifically what is covered by this FMEA (e.g.: upper compartment channels/screens, lower compartment channels/screens, feedout tubes, plenum, bulkhead, etc.).

4.2.2.2.A.2 Pressure Relief Assemblies (3 issues)

1) FAILURE: BURST DISK LEAKAGE

NO FMEA
RCS-241 2/1R PFP, CIL

ISSUE: Internal leakage of the burst disk is a credible failure mode and is not currently addressed on the NASA FMEA/CIL. IOA recommends that this failure mode be added to 03-2A-201060-5 (pressure relief valve assy, burst disk ruptures prematurely, 2/1R PFP). The failure history of the burst disk includes internal leakage.

2) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-10026X 3/1R FNP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters and/or orifices, and recommends that it be addressed for the pressure relief valve. Failure mode can be added to 03-2A-201060-3 (pressure relief valve assy, burst disk fails to rupture, 3/1R FNP).

3) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-10027X 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2A-201060-1 addresses only a bellows failure. IOA considers external leakage of the relief valve assembly due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant, and leakage of prop or prop vapors. See 4.2.1.A.2.

4.2.2.2.A.3 Ground Manual Isolation Valve (1 issue)

1) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-247 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the ground manual isolation valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in loss of helium pressurant, and leakage of prop and/or prop vapors. See 4.2.1.A.2.

4.2.2.2.A.4 Propellant Tank Isolation Valves (5 issues)

1) FAILURE: FAILS CLOSED (1/2 VALVE)

03-2A-202110-1 3/1R PPP
RCS-251 3/1R PPP, 1/1 ABORT, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 3/1R PPP, 1/1 abort for the 1/2 valve. This failure results in the loss of one +X thruster for the RTLS and TAL abort ARCS propellant dump, and could result in inability to complete the dump. See 4.2.1.A.1.

2) FAILURE: RELIEF DEVICE FAILS CLOSED

03-2A-202110-2 3/3 ---
RCS-10029X 2/1R PNP, CIL (1/2 VALVE)
RCS-10030X 3/1R PNP (3/4/5 VALVES)

ISSUE: These valves are nominally open during all phases, and will be closed only during some crossfeed/interconnect operations or to isolate a downstream failure. During crossfeed/interconnect operations, the downstream propellant line is not subject to overpressurization because it is open to a tank. Therefore, this failure mode is applicable only during straight-feed operations when a failure has occurred which requires closing of the tank isol valves. IOA recommends that this failure mode be upgraded to a 2/1R PNP for the 1/2 valve and 3/1R PNP for the 3/4/5 valves (not a 1/1's, since a previous failure is required for the valves to be closed). See 4.2.1.A.3.

3) FAILURE: RESTRICTED FLOW (1/2 VALVE)

NO FMEA
RCS-249 3/1R PPP, 1/1 ABORT, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the propellant tank isolation 1/2 valves. Effects same as "failed closed" for the 1/2 valve. See issue on 03-2A-202110-1, above, and 4.2.1.A.1.

4) FAILURE: RESTRICTED FLOW (3/4/5 VALVES)

NO FMEA
RCS-10028X 3/1R PFP, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that a new 3/1R PFP FMEA be added for restricted flow of the propellant tank isolation 3/4/5 valves. Restricted flow through one 3/4/5 valve would not be detectable during dual leg operation (fail B screen).

5) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-248 1/1 ---, CIL

<u>ISSUE:</u> This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2A-202111-1 addressed only a bellows failure. IOA considers external leakage of a prop tank isolation valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results leakage of propellant. See 4.2.1.A.2.

4.2.2.2.A.5 Crossfeed Valves (3 issues)

1) FAILURE: RELIEF DEVICE FAILS CLOSED

03-2A-202111-3 3/3 ---
RCS-10033X 3/1R PNP

<u>ISSUE:</u> These valves are nominally closed during a flight and are open only during crossfeed/interconnect operations. IOA recommends that the FMEA for this failure mode be upgraded to a 3/1R PNP. Failure of the relief devices in all RCS and OMS crossfeed valves is required for overpressurization and leakage of the crossfeed lines to occur. See 4.2.1.A.3.

2) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-258 2/2 ---, 1/1 ABORT, CIL

<u>ISSUE:</u> This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the RCS crossfeed valves. This failure can be added to 03-2A-202111-2 (RCS crossfeed valve, fails closed, 2/2, 1/1 abort).

3) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-259A 1/1 ---, CIL

<u>ISSUE:</u> This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2A-202111-1 addressed only a bellows failure. IOA considers external leakage of a crossfeed valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results leakage of propellant. See 4.2.1.A.2.

4.2.2.2.A.6 Primary Manifold Isolation Valves (4 issues)

1) FAILURE: RELIEF DEVICE FAILS CLOSED

03-2A-202120-2 3/3 ---
RCS-10035X 2/1R PNP, CIL

ISSUE: These valves are nominally open during all phases, and will not be closed unless a downstream failure occurs which requires isolation. Therefore, this failure mode is not applicable until another failure occurs. IOA recommends that the FMEA for this failure mode be upgraded to a 2/1R PNP (not a 1/1, since a previous failure is required for the valve to be closed). See 4.2.1.A.3.

2) FAILURE: FAILS CLOSED, FAILS TO REMAIN OPEN

03-2A-202120-3 3/1R PPP
RCS-267, 271, 275, 279 3/1R PPP, 1/1 ABORT, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 3/1R PPP, 1/1 abort. This failure results in the loss of three primary thrusters and could result in the inability to complete RTLS and TAL abort RCS and OMS propellant dumps. See 4.2.1.A.1. IOA also recommends that the "E" effects be revised. Loss of three manifolds results in probable inability to maintain entry control.

3) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-287 3/1R PPP, 1/1 ABORT, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the primary manifold isolation valves. Effects same as "fails closed". See issue on 03-2A-202120-3, above, and 4.2.1.A.1.

4) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-286 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2A-202111-1 addressed only a bellows failure. IOA considers external leakage of a primary manifold isolation valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results leakage of propellant. See 4.2.1.A.2.

4.2.2.2.A.7 Vernier Manifold Isolation Valves (2 issues)

1) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-286A 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. FMEA 03-2A-202140-3 addressed a bellows failure. IOA considers external leakage of a vernier manifold isolation valve due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results leakage of propellant. See 4.2.1.A.2.

2) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-287 2/2 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the vernier manifold isolation valves. Effects same as "fails closed". This failure mode can be added to 03-2A-202140-1 (vernier manifold isolation valve, fails closed, 2/2).

4.2.2.2.A.8 Quick Disconnect Couplings (4 issues)

1,2) FAILURE: EXTERNAL LEAKAGE

03-2A-201080-1	2/1R FFP, CIL
RCS-254, 256, 268, 272, 276, 280, 284	2/1R FFP, CIL

03-2A-201090-1	3/1R FFP, CIL
RCS-229, 233, 235	3/1R FFP, CIL

ISSUE: IOA recommends that "poppet fails open" be added as a failure mode on the FMEAs listed. This is a credible failure mode and is addressed on other QD coupling FMEAs.

3,4) FAILURE: FAILS TO COUPLE

03-2A-201080-3, 201090-2	3/3 ---
RCS-230, 234, 236, 255, 257, 269, 273, 277, 281, 285	3/3 ---

ISSUE: IOA recommends that "restricted flow" be added as a failure mode on the FMEAs listed. This is a credible failure and is addressed on other QD coupling FMEAs.

4.2.2.2.B EPD&C (112 issues)

4.2.2.2.B.1 Remote Power Controllers (3 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2177-2	3/1R	PFP, CIL
ARCS-12019	3/3	

ISSUE: NASA FMEA contains multiple failures (open driver failed on, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this RPC inadvertently operating alone has no effect. (see 4.2.1.B.2)

2) FAILURE: INADVERTENT OPERATION

05-6KA-2178-2	3/1R	PFP, CIL
ARCS-12019	3/3	

ISSUE: NASA FMEA contains multiple failures (open driver failed on, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this RPC inadvertently operating alone has no effect.

3) FAILURE: LOSS OF OUTPUT

05-6KA-2178-1	3/2R	PPP
ARCS-12020	2/2,	CIL

ISSUE: Lose capability to open manifold isolation valve. Inability to open valve causes loss of verniers thus mission operations.

4.2.2.2.B.2 Diodes (35 issues)

1) FAILURE: FAILS OPEN

05-6KA-2268-1	3/3	
ARCS-12123	3/2R	PPP

2) FAILURE: FAILS OPEN

05-6KA-2269-1	3/3	
ARCS-1448,1452,1456,1460	3/2R	PPP

3) FAILURE: FAILS OPEN

05-6KA-2279-1 3/3
ARCS-12054,12056 3/2R PPP

ISSUE: The first three issues concern falsely failing the valve closed. (see 4.2.1.B.1)

4) FAILURE: FAILS OPEN

05-6KA-2253-1 2/1R PFP, CIL
ARCS-12086,12088 3/3

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone (causing continuous power to the motor) has no effect. (see 4.2.1.B.2)

5) FAILURE: FAILS OPEN

05-6KA-2253E-1 3/1R PFP, CIL
ARCS-12098 3/3

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone (causing continuous power to the motor) has no effect. (see 4.2.1.B.2)

6) FAILURE: FAILS OPEN

05-6KA-2253F-1 3/1R PFP, CIL
ARCS-12100 3/3

ISSUE: NASA FMEA contains multiple failures (shorted diode, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

7) FAILURE: FAILS SHORT

05-6KA-2253F-2 3/1R PFP, CIL
ARCS-12101 3/3

ISSUE: NASA FMEA contains multiple failures (close relay failed on, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed short alone causes no effect. (see 4.2.1.B.2)

8) FAILURE: FAILS OPEN

05-6KA-2254-1 2/1R PFP, CIL
ARCS-12107,12109 3/3

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone (causing continuous power to the motor) has no effect. (see 4.2.1.B.2)

9) FAILURE: FAILS OPEN

05-6KA-2254E-1 3/1R PFP, CIL
ARCS-12119 3/3

ISSUE: NASA FMEA contains multiple failures (diode short, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

10) FAILURE: FAILS OPEN

05-6KA-2254F-1 3/1R PFP, CIL
ARCS-12121 3/3

ISSUE: NASA FMEA contains multiple failures (diode open, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

11) FAILURE: FAILS OPEN

05-6KA-2261-1 2/1R PFP, CIL
ARCS-12130,12132,12151,12153 3/3

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone (causing continuous power to the motor) has no effect. (see 4.2.1.B.2)

12) FAILURE: FAILS OPEN

05-6KA-2261E-1 3/1R PFP, CIL
ARCS-12142,12163 3/3

ISSUE: NASA FMEA contains multiple failures (diode short, close relay fails on, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

13) FAILURE: FAILS OPEN

05-6KA-2261F-1 3/1R PFP, CIL
ARCS-12144,12165 3/3

ISSUE: NASA FMEA contains multiple failures (diode short, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

14) FAILURE: FAILS SHORT

05-6KA-2261F-2 3/1R PFP, CIL
ARCS-12145,12166 3/3

ISSUE: NASA FMEA contains multiple failures (diode opens, close relay fails on, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed short alone has no effect. (see 4.2.1.B.2)

15) FAILURE: FAILS OPEN

05-6KA-2255-1 2/1R PFP, CIL
ARCS-12192,12194,12208,12210 3/3
12224,12226,12240,12242

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone (causing continuous motor power) has no effect. (see 4.2.1.B.2)

16) FAILURE: FAILS OPEN

05-6KA-2255E-1 3/1R PFP, CIL
ARCS-12204,12220,12236,12252 3/3

ISSUE: NASA FMEA contains multiple failures (system leak, diode short, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

17) FAILURE: FAILS OPEN

05-6KA-2255F-1 3/1R PFP, CIL
ARCS-12206,12222,12238,12254 3/3

ISSUE: NASA FMEA contains multiple failures (diode short, continuous power to the motor and a bellows leak). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

18) FAILURE: FAILS OPEN

05-6KA-2257-1 3/1R PFP, CIL
ARCS-12036 3/3

ISSUE: NASA FMEA contains multiple failures (switch short, open driver failed on, causing continuous power to the solenoid). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

19) FAILURE: FAILS OPEN

05-6KA-2257A-1 3/1R PFP, CIL
ARCS-12038 3/3

ISSUE: NASA FMEA contains multiple failures (switch short, close driver failed on, causing continuous power to the solenoid). IOA-RCS claims this diode failed open alone has no effect. (see 4.2.1.B.2)

20) FAILURE: FAILS SHORT

05-6KA-2257F-2 3/2R PPP
ARCS-12063 3/3

ISSUE: NASA FMEA contains multiple failures (switch short, circuit breaker failed closed, causing continuous power to the solenoid). IOA-RCS claims this diode failed short alone has no effect. (see 4.2.1.B.2)

21) FAILURE: FAILS SHORT

05-6KA-2253E-2 2/1R PFP (1/1 ABORT), CIL
ARCS-12099 2/2 (1/1 ABORT), CIL

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close the valve (open relay has constant inhibit). This prevents crossfeed capability thus loss of mission operations (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.3)

22) FAILURE: FAILS SHORT

05-6KA-2254E-2	3/1R	PFP (1/1 ABORT), CIL
ARCS-12120	2/2	(1/1 ABORT), CIL

ISSUE: NASA FMEA contains multiple failures (diode opens, continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close the valve (open relay has constant inhibit). This prevents crossfeed capability thus loss of mission operations (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.3)

23) FAILURE: FAILS SHORT

05-6KA-2254F-2	3/1R	PFP, CIL
ARCS-12122	3/1R	PFP, CIL

ISSUE: NASA FMEA contains multiple failures (diode opens, continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes the valve to close on ascent (GPC mode). Redundancy provided by second leg and from crossfeed operation. Loss of all redundancy causes inability to expel propellants to meet landing weight constraints. (see 4.2.1.B.3)

24) FAILURE: FAILS SHORT

05-6KA-2261E-2	3/1R	PFP, CIL
ARCS-12143,12164	3/1R	PFP, CIL

ISSUE: NASA FMEA contains multiple failures (open diode, continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes the inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.2.1.B.3)

25) FAILURE: FAILS SHORT

05-6KA-2255E-2	3/1R	PFP, CIL
ARCS-12205,12221,12237,12253	3/1R	PFP, CIL

ISSUE: NASA FMEA contains multiple failures (diode opens, continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close the valve (open relay has constant inhibit). This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.2.1.B.3)

26) FAILURE: FAILS SHORT

05-6KA-2255F-2 3/1R PFP, CIL
ARCS-12207,12223,12239,12255 3/1R PFP, CIL

ISSUE: NASA FMEA contains multiple failures (system leak, diode opens, continuous power to the motor and a bellows leak). IOA-RCS claims this failure has no effect if command was from switch (normal mission configuration). However, if the command was from the GPC, this failure causes the inability to open the valve (close relay has constant inhibit). Switch redundancy provided. Loss of this, coupled with the loss of all hardware redundancy causes inability to expel propellants to meet landing weight constraints. (see 4.2.1.B.3)

27) FAILURE: FAILS SHORT

05-6KA-2257-2 3/3
ARCS-12037 3/2R PFP, CIL

ISSUE: IOA-RCS claims this failure causes inability to open the isolation valve manually. Redundancy to open the valve provided with the GPC/MDM commands. Loss of all redundancy prevents vernier operation thus loss of mission.

28) FAILURE: INADVERTENT OUTPUT

05-6KA-2255-2 3/3
ARCS-12193,12195,12209,12211 3/2R PPP
12225,12227,12241,12243

ISSUE: This issue concerns falsely failing the valve closed. (see 4.2.1.B.1)

29) FAILURE: FAILS OPEN

05-6KA-2257G-1 3/3
ARCS-12064 3/1R P NA P

ISSUE: Lose GPC close command to the ground driver. Redundancy provided with manual command. Loss of all redundancy prevents isolation of thruster leak.

30) FAILURE: FAILS OPEN

05-6KA-2258-1 3/2R PPP
ARCS-12052 2/2, CIL

ISSUE: Lose GPC and manual command to open the isolation valve. No redundancy provided. This prevents vernier operation thus loss of mission.

31) FAILURE: SHORTS TO GROUND

05-6KA-2258-3 3/2R PPP
ARCS-12344 2/2, CIL

<u>ISSUE:</u> Lose GPC and manual command to open the isolation valve. No redundancy provided. This prevents vernier operation thus loss of mission.

32-33) FAILURE: FAILS OPEN

NO FMEA
ARCS-12068,12070 3/1R P NA P

<u>ISSUE:</u> The manifold isolation valve has two diodes in parallel that completes the circuit to ground. One diode failing open has no effect. Second diode failing open (the redundancy) causes inability to close the valve to isolate a thruster leak.

34-35) FAILURE: FAILS SHORT

NO FMEA
ARCS-12069,12071 3/3

<u>ISSUE:</u> The manifold isolation valve has two diodes in parallel that completes the circuit to ground. Either or both diode failing short has no effect.

4.2.2.2.B.3 Hybrid Drivers (21 issues)

1) FAILURE: LOSS OF OUTPUT

05-6KA-2206-1 3/3
ARCS-1472,1474 3/2R PPP

2) FAILURE: INADVERTENT OUTPUT

05-6KA-2206-2 3/3
ARCS-1473,1475 3/2R PPP

3) FAILURE: LOSS OF OUTPUT

05-6KA-2207A-1 3/3
ARCS-1476,1477,1482,1483 3/2R PPP

4) FAILURE: LOSS OF OUTPUT

05-6KA-2217-1	3/3	
ARCS-1488,1490,1492,1494	3/2R	PPP

5) FAILURE: INADVERTENT OUTPUT

05-6KA-2217-2	3/3	
ARCS-1489,1491,1493,1495	3/2R	PPP

ISSUE: The first five issues concern falsely failing the valve closed. (see 4.2.1.B.1)

6) FAILURE: LOSS OF OUTPUT

05-6KA-2207-1	2/1R	PFP, CIL
ARCS-1478,1484	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

7) FAILURE: INADVERTENT OUTPUT

05-6KA-2207-2	3/1R	PPP
ARCS-1479,1485	3/3	

ISSUE: NASA FMEA contains multiple failures (driver failed on, manifold isolation valve failed open, thruster leak). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

8) FAILURE: LOSS OF OUTPUT

05-6KA-2219-1	2/1R	PFP, CIL
ARCS-1480,1486	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

9) FAILURE: INADVERTENT OUTPUT

05-6KA-2219-2 3/1R PFP, CIL
ARCS-1481,1487 3/3

ISSUE: NASA FMEA contains multiple failures (driver failed on, manifold isolation valve failed open, thruster leak). IOA-RCS claims this driver inadvertently operating alone has no effect.

10) FAILURE: LOSS OF OUTPUT

05-6KA-2208-1 2/1R PFP, CIL
ARCS-1496,1498,1500,1502 3/2R PPP
1504,1506,1508,1510

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

11) FAILURE: INADVERTENT OPERATION

05-6KA-2113A-2 3/1R PFP, CIL
ARCS-12033 3/3

ISSUE: NASA FMEA contains multiple failures (open driver failed on, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

12) FAILURE: LOSS OF OUTPUT

05-6KA-2210-1 3/1R PFP, CIL
ARCS-12024 3/2R PPP

ISSUE: NASA FMEA contains multiple failures (switch short, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

13) FAILURE: LOSS OF OUTPUT

05-6KA-2210A-1	3/1R	PFP, CIL
ARCS-12022	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (switch short, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

14) FAILURE: INADVERTENT OPERATION

05-6KA-2211-2	3/1R	PFP, CIL
ARCS-12031	3/3	

ISSUE: NASA FMEA contains multiple failures (open driver failed on, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

15) FAILURE: INADVERTENT OPERATION

05-6KA-2212-2	3/1R	PFP, CIL
ARCS-12029	3/3	

ISSUE: NASA FMEA contains multiple failures (open driver failed on, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

16) FAILURE: INADVERTENT OPERATION

05-6KA-2213-2	3/1R	PFP, CIL
ARCS-12027	3/3	

ISSUE: NASA FMEA contains multiple failures (close driver failed on, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

17) FAILURE: INADVERTENT OPERATION

05-6KA-2224-2	3/1R	PFP, CIL
ARCS-12035	3/3	

ISSUE: NASA FMEA contains multiple failures (type I driver failed on, type III driver failed on, causing continuous power to the solenoid). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

18) FAILURE: LOSS OF OUTPUT

05-6KA-2113A-1 3/2R PPP
ARCS-12032 2/2, CIL

ISSUE: Lose capability to open the isolation valve. This prevents vernier operation thus loss of mission.

19) FAILURE: INADVERTENT OPERATION

05-6KA-2210-2 3/2R PPP
ARCS-12025 2/2, CIL

ISSUE: Failure provides inhibit to the "open" driver so that it cannot be turned on. This causes inability to open the isolation valve which causes loss of verniers thus mission operations.

20) FAILURE: INADVERTENT OPERATION

05-6KA-2211-1 3/2R PPP
ARCS-12031 2/2, CIL

ISSUE: Lose capability to open the isolation valve. Inability to open the valve causes loss of verniers thus mission operations.

21) FAILURE: LOSS OF OUTPUT

05-6KA-2224-1 3/1R PPP
ARCS-12034 2/2, CIL

ISSUE: Lose capability to open the isolation valve. This prevents vernier operation thus loss of mission. NASA FMEA failure also credible. Lose capability to close valve to isolate a thruster leak. IOA-RCS recommends both failures be covered on this FMEA.

4.2.2.2.B.4 Relays (11 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2126-2 3/1R PFP, CIL
ARCS-1546,1548 3/3

ISSUE: NASA FMEA contains multiple failures (second series relay failed closed, continuous power to the motor and a bellows leak). IOA-RCS claims this relay inadvertently operating alone causes no effect. (see 4.2.1.B.2)

2) FAILURE: INADVERTENT OPERATION

05-6KA-2132-2	3/1R	PFP, CIL
ARCS-1562,1564,1570,1572	3/3	

ISSUE: NASA FMEA contains multiple failures (close relay fails on, continuous power to the motor and a bellows leak). IOA-RCS claims the latching relay inadvertently operating alone has no effect. (see 4.2.1.B.2)

3) FAILURE: LOSS OF OUTPUT

05-6KA-2133-1	3/1R	PPP
ARCS-1557,1559,1565,1567	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (open relay fails off, tank isolation valve failed closed, thruster failed off). IOA-RCS claims this failure causes inability to open the crossfeed valve. Electrical redundancy provided. Loss of this, coupled with the loss of all hardware redundancy may causes loss of mission. Note : FMEA incorrectly identifies relay 45V76A116K44. It should be 56V76A116K46. Refer to VS70-943099 and ARCS ID 1557. (see 4.2.1.B.2)

4) FAILURE: INADVERTENT OPERATION

05-6KA-2136-2	2/1R	PFP	(1/1 ABORT), CIL
ARCS-1542,1544	2/2		(1/1 ABORT), CIL

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close 1/2 valve. This prevents crossfeed capability thus loss of mission operations (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.3)

5) FAILURE: INADVERTENT OPERATION

05-6KA-2127-2	2/1R	PFP, CIL
ARCS-1552,1556	3/1R	PFP, CIL

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure will close the valve and cause inability to re-open it. Redundancy provided by second 3/4/5 leg and from crossfeed operation. Loss of all redundancy causes loss of jets required to expel propellants to meet landing weight constraints. (see 4.2.1.B.3)

6) FAILURE: INADVERTENT OPERATION

05-6KA-2137-2	2/1R PFP	(1/1 ABORT), CIL
ARCS-1550,1554	2/2	(1/1 ABORT), CIL

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close 3/4/5 valve. This prevents crossfeed capability thus loss of mission operations (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.3)

7) FAILURE: INADVERTENT OPERATION

05-6KA-2133-2	2/1R PFP, CIL
ARCS-1558,1560,1566,1568	3/1R PFP, CIL

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close crossfeed valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.2.1.B.3)

8) FAILURE: INADVERTENT OPERATION

05-6KA-2128-2	2/1R PPP, CIL
ARCS-1576,1580,1584,1586	3/1R PPP (1/1 ABORT), CIL

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure will close the valve and cause the inability to re-open it. This causes loss of jets on associated manifold. Redundancy provided by jets on other manifolds. Loss of all redundancy causes inability to expel propellants to meet landing weight constraints. Loss of manifold thrusters during RTLS/TAL abort could result in inability to complete a propellant dump. (see 4.2.1.B.3)

9) FAILURE: INADVERTENT OPERATION

05-6KA-2128A-2	2/1R PPP, CIL
ARCS-1574,1578,1582,1588	3/1R PNP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure causes inability to close manifold isolation valve. This, coupled with the loss of all hardware redundancy causes inability to isolate a thruster leak. (see 4.2.1.B.3)

10) FAILURE: LOSS OF OUTPUT

05-6KA-2126-1	3/1R PPP	(1/1 ABORT), CIL
ARCS-1545,1547	2/2	(1/1 ABORT), CIL

ISSUE: Lose capability to close the valve. This prevents crossfeed capability thus loss of mission (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort).

11) FAILURE: LOSS OF OUTPUT

05-6KA-2127-1	2/2, CIL
ARCS-1551,1555	2/1R PPP, CIL

ISSUE: Lose capability to close the valve. This prevents crossfeed capability and inability to isolate a leak.

4.2.2.2.B.5 Resistors (19 issues)

1) FAILURE: FAILS OPEN

05-6KA-2081-1	3/3 (1/1 ABORT), CIL
ARCS-1589,1591,1603,1605	3/2R PPP

2) FAILURE: FAILS OPEN

05-6KA-2082-1	3/3
ARCS-1597,1601	3/2R PPP

3) FAILURE: FAILS OPEN

05-6KA-2085-1	3/3
ARCS-1613,1615,1617,1629	3/2R PPP

4) FAILURE: FAILS OPEN

05-6KA-2086-1	3/3 (1/1 ABORT), CIL
ARCS-1607,1611,1619,1623, 1627,1631,1633,1635	3/2R PPP

5) FAILURE: FAILS OPEN

05-6KA-2102-1	3/3
ARCS-1641,1647,1651,1655, 1659,1665,1669,1673	3/2R PPP

6) FAILURE: FAILS OPEN

05-6KA-2088-1 3/3
ARCS-1679,1681,1685,1687,1693,1695,1699,1701, 3/2R PPP
1707,1709,1713,1715,1721,1723,1727,1729

7) FAILURE: FAILS OPEN

05-6KA-2091-1 3/3
ARCS-12012,12013,12014,12015 3/2R PPP

ISSUE: The first seven issues concern falsely failing the valve closed. (see 4.2.1.B.1)

8) FAILURE: FAILS OPEN

05-6KA-2083-1 2/1R PFP (1/1 ABORT), CIL
ARCS-1593,1595,1599 3/2R PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

9) FAILURE: FAILS OPEN

05-6KA-2084-1 2/1R PFP (1/1 ABORT)
ARCS-1609,1621,1625,1637 3/2R PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

10) FAILURE: FAILS OPEN

05-6KA-2103-1 2/1R
ARCS-1643,1645,1649, 3/2R PPP
1661,1663,1669

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

11) FAILURE: FAILS OPEN

05-6KA-2089-1 2/1R PPP
ARCS-1683,1697,1711,1725 3/2R PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

12) FAILURE: FAILS OPEN

05-6KA-2090-1 3/1R PFP
ARCS-12008 3/2R PPP

ISSUE: NASA FMEA contains multiple failures (switch short, ground driver failed on, causing continuous power to the solenoid). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

13-19) FAILURE: FAILS SHORT

NO FMEA
ARCS-1644,1646,1650 3/3
1662,1664,1668

ISSUE: A short across these resistors is a credible failure. IOA-RCS recommends they be incorporated into a FMEA.

4.2.2.2.B.6 Toggle Switches (4 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2039-2 3/1R PPP
ARCS-12126,12127,12147,12148 2/2 (1/1 ABORT), CIL

ISSUE: NASA FMEA contains multiple failures (close relay failed on, continuous power to the motor and a bellows leak). IOA-RCS claims the switch failed short across close contacts will close the valve and cause inability to re-open it. This prevents crossfeed capability thus loss of mission (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.4)

2) FAILURE: INADVERTENT OPERATION

05-6KA-2032-2	3/1R	PFP, CIL
ARCS-12204,12205,12206	3/1R	PPP

ISSUE: NASA FMEA contains multiple failures (diode failed open, open driver failed on causing continuous power to the solenoid). IOA-RCS claims this failure causes the inability to close the valve. This, coupled with the loss of all hardware redundancy prevents isolation of a thruster leak. (see 4.2.1.B.3)

3) FAILURE: INADVERTENT OPERATION

05-6KA-2028-2	3/1R	PPP	(1/1 ABORT), CIL
ARCS-12082,12083,12084	2/2		(1/1 ABORT), CIL

ISSUE: Switch failed short across open contacts causes inability to close the valve. This prevents crossfeed capability thus loss of mission operation (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.4)

4) FAILURE: INADVERTENT OPERATION

05-6KA-2029-2	3/1R	PPP	(1/1 ABORT), CIL
ARCS-12103,12104,12105	2/2		(1/1 ABORT), CIL

ISSUE: Switch failed short across open contacts causes inability to close the valve. This prevents crossfeed capability thus loss of mission operation (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.4)

4.2.2.2.B.7 Microswitches (9 issues)

1) FAILURE: ERRONEOUS OUTPUT

NO FMEA
ARCS-12332 2/2 (1/1 ABORT), CIL

ISSUE: The tank isolation valve 1/2 solenoid talkback switch provides power to the talkback circuitry and the relay inhibit. A microswitch failure across the close contacts will not allow the valve to be closed This prevents crossfeed capability thus loss of mission operations (2/2). Inability to crossfeed may cause incomplete OMS abort dump (1/1 abort). (see 4.2.1.B.5)

2) FAILURE: ERRONEOUS OUTPUT

NO FMEA
ARCS-12333 3/1R PPP

ISSUE: The tank isolation valve 3/4/5 solenoid talkback switch provides power to the talkback circuitry and the relay inhibit. A microswitch failure across the open contacts prevents valve from being opened. Hardware redundancy provided by second leg of 3/4/5, the 1/2 valve, and crossfeed operation. Loss of all redundancy causes loss of jets required to expel propellants to meet landing weight constraints. (see 4.2.1.B.5)

3) FAILURE: ERRONEOUS OUTPUT

NO FMEA
ARCS-12334 3/1R PFP

ISSUE: The crossfeed isolation valve 1/2 solenoid talkback switch provides power to the talkback circuitry and the relay inhibit. A microswitch failure across the close contacts prevents valve from being closed. This prevents isolation of a thruster leak. (see 4.2.1.B.5)

4-7) FAILURE: ERRONEOUS OUTPUT

NO FMEA
ARCS-12336,12337,12338,12339 3/2R PPP

ISSUE: IOA-RCS claims this failed open resistor causes loss of acccurate indication of the valve status from the event indicator or the GPC/MDM microswitch discretes. This may lead to falsely failing the valve closed. (see 4.2.1.B.5)

8-9) FAILURE: ERRONEOUS OUTPUT

NO FMEA
ARCS-12074,12075 3/2R PPP

ISSUE: IOA-RCS claims this failed open resistor causes loss of acccurate indication of the valve status from the event indicator or the GPC/MDM microswitch discretes. This may lead to falsely failing the valve closed. (see 4.2.1.B.5)

4.2.2.2.B.8 Circuit Breaker (2 issues)

1) FAILURE: SHORT, FAILED CLOSED

05-6KA-2280-2	3/1R	PFP, CIL
ARCS-12073	3/3	

ISSUE: NASA FMEA contains multiple failures (switch jam, open driver failed on, causing continuous power to the solenoid. IOA-RCS claims this circuit breaker failed closed alone has no effect. (see 4.2.1.B.2)

2) FAILURE: FAILED OPEN

05-6KA-2280-1	3/1R	PPP
ARCS-12072	2/2,	CIL

ISSUE: Lose capability to open the isolation valve. This prevents vernier operation thus loss of mission. NASA FMEA failure also credible. Lose capability to close valve to isolate a thruster leak. IOA-RCS recommends both failures be covered on this FMEA. (see 4.2.1.B.3)

4.2.2.2.B.9 Event Indicators (8 issues)

1) FAILURE: FAILS OPEN

05-6KA-2153-1	3/3	
ARCS-1857	3/2R	PPP

2) FAILURE: FAILS OPEN

05-6KA-2154-2	3/3	
ARCS-1858A	3/2R	PPP

3) FAILURE: FAILS OPEN

05-6KA-2159-1	3/3	
ARCS-1856	3/2R	PPP

4) FAILURE: FAILS OPEN

05-6KA-2155-2	3/3	
ARCS-1859A	3/2R	PPP

5) FAILURE: FAILS OPEN

05-6KA-2156-2	3/3	
ARCS-12017	3/2R	PPP

ISSUE: The first five issues concern falsely failing the valve closed. (see 4.2.1.B.1)

6) FAILURE: FAILS SHORT TO GROUND

05-6KA-2154-1	2/1R	PFP, CIL
ARCS-1858	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

7) FAILURE: FAILS SHORT TO GROUND

05-6KA-2155-1	2/1R	PFP, CIL
ARCS-1859	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (continuous power to the motor and a bellows leak - NOTE: FMEA scenario for failure not valid). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

8) FAILURE: FAILS SHORT TO GROUND

05-6KA-2156-1	3/1R	PFP, CIL
ARCS-12016	3/2R	PPP

ISSUE: NASA FMEA contains multiple failures (switch short, ground driver fails on, causing continuous power to the solenoid). IOA-RCS claims this failure may cause inability to accurately determine position of the valve. Loss of all redundancy may lead to falsely failing the valve closed. (see 4.2.1.B.2)

4.2.2.3 Thruster Subsystem (23 issues)

4.2.2.3.A Hardware (10 issues)

4.2.2.3.A.1 Primary Thruster Bipropellant Solenoid Valves (6 issues)

1) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2A-221310-1	3/1R	FPP, CIL
RCS-290	1/1	---, CIL (Fails open)
RCS-294, 296, 298	1/1	---, CIL (Internal leakage)

ISSUE: A thruster biprop valve failed open or leaking due to piece-part structural failure or seal failure results in leakage of propellant. See 4.2.1.A.2. Such a failure could also result in jet zots upon subsequent use of the thruster.

2) FAILURE: PREMATURE OPERATION (DURING GROUND C/O TRICKLE CURRENT TEST)

03-2A-221310-3	3/3	---
RCS-10138X	1/1	---, CIL

ISSUE: IOA considers a premature (unexpected) firing of an RCS thruster during ground operations and testing to be a 1/1 failure. Such a failure could result in loss of life due to exposure to prop vapors and thruster plume. This failure is the result of a reaction jet driver (RJD) failure. A "failed-on" thruster caused by an RJD failure is covered in the GNC subsystem.

3) FAILURE: FAILS CLOSED (ONE OR BOTH VALVES)

03-2A-221310-4	3/1R	FPP, CIL
RCS-293, 295, 297	3/1R	FPP, 1/1 ABORT, CIL

ISSUE: IOA recommends that this failure mode be upgraded to a 3/1R FPP, 1/1 abort. This failure results in the loss of one primary thruster and could result in the inability to complete RTLS and TAL abort RCS and OMS propellant dumps. See 4.2.1.A.1.

4) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-291 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the primary thruster biprop solenoid valves assembly due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in leakage of propellant. See 4.2.1.A.2.

5) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-292 3/1R FPP, 1/1 ABORT, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers restricted flow to be a credible failure mode for components with integral filters, and recommends that it be addressed for the primary thruster biprop valves. Effects same as "fails closed". See issue on 03-2A-221310-4, above, and 4.2.1.A.1.

6) FAILURE: DELAYED OPERATION, ONE VALVE OPENS SLOWLY OR LATE

NO FMEA
RCS-10043X - 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers the delayed opening of one biprop valve relative to the other to be a credible failure which should be addressed. Such a failure of the oxidizer valve could result in fuel migration into the oxidizer injector tube and detonation within the tube upon oxidizer flow (zots). Rupture of the valve assembly due to jet zots would result in leakage of propellant. See 4.2.1.A.2. IOA recommends that a 1/1 FMEA be generated for this failure mode.

4.2.2.3.A.2 Primary Thruster Injector Head Assembly (2 issues)

1) FAILURE: RESTRICTED FLOW

NO FMEA
RCS-10040X 1/1 ---, CIL

ISSUE: This item is not currently addressed on the NASA FMEA/CIL. IOA considers the injector assembly to be at the same level of detail as other primary thruster components on the FMEA/CIL, and recommends that a separate 1/1 FMEA be regenerated for this item and failure mode. This will ensure that this critical failure gets the proper amount of attention. Restricted flow leading to an improper mixture ratio or inadequate cooling would probably result in loss of the thruster, and could result in combustion chamber or nozzle extension burn-through.

2) FAILURE: STRUCTURAL FAILURE, BURN-THROUGH

NO FMEA
RCS-10041X 1/1 ---

ISSUE: This item is not currently addressed on the NASA FMEA/CIL. IOA considers the injector assembly to be at the same level of detail as other primary thruster components on the FMEA/CIL, and recommends that a separate 1/1 FMEA be regenerated for this item and failure mode. This will ensure that this critical failure gets the proper amount of attention. Such a failure of the injector head assembly could result in a fire/explosion potential leading to possible damage to the vehicle.

4.2.2.3.A.3 Vernier Thruster Assembly (2 issues)

1) FAILURE: FAILS OPEN, INTERNAL LEAKAGE

03-2A-231310-3	3/1R FPP, CIL
RCS-301	1/1 ---, CIL (Fails open)
RCS-304	1/1 ---, CIL (Internal leakage)

ISSUE: A thruster biprop valve failed open or leaking due to piece-part structural failure or seal failure results in leakage of propellant. See 4.2.1.A.2. The NASA criticalities assigned to these vernier thruster failures are inconsistent between the forward and aft RCS subsystems.

2) FAILURE: STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE

NO FMEA
RCS-303 1/1 ---, CIL

ISSUE: This failure mode is not currently addressed on the NASA FMEA/CIL. IOA considers external leakage of the vernier thruster biprop valve assembly due to a housing failure to be a credible failure (ref. NSTS 22206, p. 2-14, item 2.3.7.a), and recommends that it be addressed on the FMEA/CIL. Failure results in leakage of propellant. See 4.2.1.A.2.

4.2.2.3.B EPD&C (13 issues)

4.2.2.3.B.1 Remote Power Controllers (2 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2179-2	3/1R	PFP, CIL
ARCS-1872,1874,1880,1884, 1889,1891,1896,1900	3/3	

ISSUE: NASA FMEA contains multiple failures (RJD command, relay failed closed, manifold isolation valve failed, tank isolation valve failed, main bus failed, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this RPC inadvertently operating alone has no effect. (see 4.2.1.B.2)

2) FAILURE: INADVERTENT OUTPUT

05-6KA-2184-2	3/1R	PFP, CIL
ARCS-1904,1906	3/3	

ISSUE: NASA FMEA contains multiple failures (RPC failed on, RJD command, manifold isolation valve failed, tank isolation valve failed, main bus failed off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this RPC inadvertently operating alone has no effect.

4.2.2.3.B.2 Hybrid Drivers (3 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2214-2	3/1R	PFP, CIL
ARCS-1980,1982,1984,1986 1988,1990,1992,1994	3/3	

ISSUE: NASA FMEA contains multiple failures (RJD command, relay failed, manifold isolation valve failed, tank isolation valve failed, main bus failed, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

2) FAILURE: INADVERTENT OUTPUT

05-6KA-2185-2	3/1R	PFP, CIL
ARCS-2000,2002	3/3	

ISSUE: NASA FMEA contains multiple failures (driver failed on, RJD command, manifold isolation valve failed, tank isolation valve failed, main bus failed off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

3) FAILURE: INADVERTENT OUTPUT

05-6KA-2220-2	3/1R	PFP, CIL
ARCS-1996,1998	3/3	

ISSUE: NASA FMEA contains multiple failures (driver failed on, RJD command, manifold isolation valve failed, tank isolation valve failed, main bus failed off, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims this driver inadvertently operating alone has no effect. (see 4.2.1.B.2)

4.2.2.3.B.3 Relays (1 issue)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2130-2	3/1R	PPP
ARCS-2024,2026,2028	3/3	

ISSUE: NASA FMEA contains multiple failures (RJD command, relay failed closed, manifold isolation valve failed, tank isolation valve failed, main bus failed, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims the latching relay failing closed alone has no effect. (see 4.2.1.B.2)

4.2.2.3.B.4 Toggle Switches (2 issues)

1) FAILURE: INADVERTENT OPERATION

05-6KA-2036-2	3/1R	PPP
ARCS-12262,12272,12282,12292	3/3	
12263,12273,12283,12293		

ISSUE: NASA FMEA contains multiple failures (RJD command, manifold isolation valve failure, tank isolation valve failure, main bus failure, causing inadvertent or uncontrollable thruster firing). IOA-RCS claims the switch inadvertently operating alone has no effect. (see 4.2.1.B.2)

2) FAILURE: FAILS TO CONDUCT ONE OR MORE CONTACT SET

05-6KA-2035-1	3/1R	PFP, CIL
ARCS-12256,12260	3/1R	PFP (or 2/2), CIL
12276,12280		

ISSUE: IOA-RCS agrees with NASA FMEA criticalities and screens for manifolds 1-4 (3/1R PFP). However, IOA-RCS recommends the manifold 5 failure also be included in the effects as a 2/2 condition.

4.2.2.3.B.5 Pressure Sensors (3 issues)

1-3) FAILURE: INDICATES HIGHER OR LOWER PRESSURE THAN ACTUAL

NO FMEA		
ARCS-2286,2287,2288	3/2R	PPP

ISSUE: Redundancy management may fail jets. Vernier jet activity may be limited. IOA-RCS recommends these failures be incorporated into a FMEA. Note : Existing FMEA on pressure sensors contain only the primary jets.

4.2.2.3.B.6 Temperature Sensors (2 issues)

1-2) FAILURE: INDICATES HIGHER OR LOWER TEMPERATURE THAN ACTUAL

NO FMEA		
ARCS-2296,2297	3/2R	PPP

ISSUE: Redundancy management may fail jets. Vernier jet activity may be limited. IOA-RCS recommends these failures be incorporated into a FMEA. Note : Existing FMEA on temperature sensors contain only the primary jets.

4.2.2.4 Thermal Control Subsystem (8 issues)

4.2.2.4.A Hardware

IOA analyzed and assessed thermal control subsystem items as EPD&C items. See 4.2.2.4.B for assessment results.

4.2.2.4.B EPD&C (8 issues)

4.2.2.4.B.1 Thermal Switches (8 issues)

1-3) FAILURE: FAILS OPEN

NO FMEA
ARCS-2334,2336,2338 3/2R PPP

ISSUE: Propellant in jet may freeze. Redundancy provided with jets on other manifolds. If jet is required, orbiter may orient itself toward solar heating. This may effect mission operations.

4-6) FAILURE: FAILS HIGH

NO FMEA
ARCS-2335,2337,2339 3/3

ISSUE: Thermostat failing high provides continuous power to jet heaters. Heaters can be switched off. No effect.

7) FAILURE: FAILS OPEN

NO FMEA
ARCS-2340 2/2

ISSUE: Propellant in jet may freeze. No redundancy provided. This may effect mission operations.

8) FAILURE: FAILS HIGH

NO FMEA
ARCS-2341 3/3

ISSUE: Thermostat failing high provides continuous power to jet heaters. Heaters can be switched off. No effect.

4.3 Additional Comments and Concerns

During the assessment of the NASA RCS FMEA/CIL, IOA identified several areas of concern which are not evinced by the individual failure mode issues presented in this report. These concerns are discussed in the following hardware and EPD&C sections. Several general comments about the IOA assessment and resolution process are also given.

4.3.A Hardware Comments and Concerns

The IOA RCS hardware FMEA and CIL assessments were performed on the NASA/RI FMEA/CIL reevaluation information received by IOA as of 1/01/88. Any updates or changes in this information made by NASA/RI after this date are not reflected in this report. The IOA assessment of the RCS hardware CILs was performed against the post-CCB CIL package dated 12/05/87. This information was presented at RCS PRCB on 23 December 1987. The IOA assessment of the RCS hardware FMEAs (non-CILs) was performed against a criticality and screen summary package dated 9/03/87. For the FMEA (non-CIL) assessment, IOA had only criticality and screen information. The "effects" and other areas listed on a FMEA sheet could not be assessed. Updated FMEA sheets were not generated by NASA/RI.

RCS thermal control and instrumentation items are covered on the NASA RCS hardware FMEA/CIL, however IOA analyzed and assessed these items as EPD&C items. See the EPD&C portions of this report for the assessment results on these items.

Each of the hardware issues in this report have been discussed with the NASA RCS subsystem manager (SSM). The SSM has indicated agreement with a number of the IOA issues, however all issues remain classified by IOA as "open". IOA does not consider an issue to be resolved until it is either incorporated into the NASA FMEA/CIL, or withdrawn by IOA.

On the current NASA FMEA/CIL, one FMEA or CIL sheet may include several components and/or failure modes. The criticality and screens assigned on the FMEA or CIL reflect only the worst case component failure mode. IOA accepted this practice since the components and failure modes are addressed. However, IOA is concerned that this lumping of components and failure modes on individual FMEAs and CILs reduces insight into RCS subsystem failures. Many of the components and failure modes lumped together on one FMEA or CIL would have different criticality and screen assignments if they were separated onto individual FMEAs and CILs, and better insight would be obtained. For example, the vernier thruster assembly FMEAs (03-2F-131310 and 03-2A-231310) include the inlet valves, injector, thrust chamber, nozzle extension, heater, insulation, pressure transducer, and temperature transducer. These vernier thruster components are at the same level of detail as the same primary thruster components which are separated onto individual FMEAs and CILs. A better

understanding of the failures of each of the vernier thruster components could be obtained if they were separated onto individual FMEAs and CILs and assigned unique criticalities. IOA recommends a more consistent level of detail on the NASA RCS hardware FMEA/CIL, and less lumping of components and failure modes on FMEAs and CILs.

Related to this concern are the issues raised by IOA that leakage of valve housings should be addressed on the FMEA/CIL. IOA recommended that a new FMEA and CIL be generated for each valve housing, however accepted the lumping of all valve housings on the two existing helium and propellant line leakage FMEAs.

Some RCS subsystem failures do not exist as "failure modes" on current FMEAs and CILs. Instead, they are listed only as causes on FMEAs and CILs for other failure modes. IOA questions whether a critical RCS failure mode listed only as a cause on a FMEA or CIL receives adequate attention. All critical failures should be listed as failure modes on FMEAs and CILs to ensure that they receive the appropriate amount of attention.

4.3.B EPD&C Comments and Concerns

IOA takes issue with the NASA interpretations of NSTS 22206, Section 2.1.s, page 2-4, the definition of redundancy. The NASA-applied definition of the redundancy string allowed the selection of specific failures which were required to cause known problems, i.e., failures required to cause continuous power to the AC motor valves, or failures required to apply continuous power to the manifold 5 solenoid valve. IOA considers this definition of redundancy to be related more to a Hazard Analysis rather than a FMEA/CIL analysis and considers many NASA redundancy strings to include multiple failures.

IOA analyzed the specific function of the item and determined the impact of the failure. Per NSTS 22206 interpretation, the redundancy string was defined as any other item that is capable of performing the specific function of this item. Criticalities were then assigned based on this redundancy.

This discrepancy was discussed at a meeting with the NASA subsystem manager. In general, the NASA definition tended to be more conservative (assigned a more severe criticality on the FMEA). However, IOA was requested to follow NSTS 22206. The difference in interpretations accounts for the high number of issues cited.

Also at the meeting with the subsystem manager, IOA presented the issue concerning closing a valve to isolate a leak with the GPC. The subsystem manager stated that the GPC is not used to isolate a leak since the software has to be manually loaded. Due to time limitations, IOA was not able to extract all these issues concerning this out of this report.

An extensive amount of re-analysis was done for the assessment report. Since the manifold 5 isolation valve wiring changed after the IOA analysis was complete, IOA completely re-analyzed the new design. Additionally, all diodes and switches were re-analyzed in efforts to match the NASA FMEA breakdown for these items.

5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

1. Reaction Control System Workbook, RCS 2102, March 3, 1980
2. Reaction Control System Shuttle Flight Operations Manual, Volume 8D, March 31, 1980
3. OMS/RCS Systems Briefs Handbook, October 1, 1984
4. STS Operational Flight Rules Rationale, December 16, 1985 and PCN-1, February 14, 1986
5. NSTS 22206, Instructions for Preparation of FMEA and CIL, October 10, 1986.
6. Reliability Desk Instruction, No. 100-2G, Flight Hardware FMEA & CIL, 1-31-84.
7. VS70-942102 Rev. G, 6-7-84, FRCS Integrated System Schematics, 102, RI Level III.
8. VS70-942099 Rev. D, EOD01, 8-30-84, FRCS Integrated System Schematics, 099, 103, 104, RI Level III.
9. VS70-943099, Rev. B, EOB12, 7-22-85, OMS/RCS Integrated System Schematics, 099, 103, 104, RI Level III.
10. VS70-943102, Rev. C, 10-29-80, OMS/RCS Integrated System Schematics, 102, RI Level III.
11. MB0160-007, Rev M, 3-11-80, Steel Tubing, Mat'l spec., RI.
12. MC276-0017, Rev D, 6-23-84, Helium High Pressure Coupling, Proc. spec., RI.
13. MC276-0018, Rev B, 2-14-84, Hypergolic Service Coupling, Proc. spec., RI.
14. MC282-0082, Rev D, 3-17-82, Pressurant Storage Tank, Proc. spec., RI.
15. MC284-0421, Rev E, 5-3-82, Pressure Relief Valve, Proc. spec., RI.
16. MC284-0430, Rev E, 6-22-81, AC Motor Valve, Proc. spec., RI.
17. MC284-0480, Rev C, 5-3-82, Manual Operated Valve, Proc. spec., RI.
18. MC284-0481, Rev B, 6-23-84, Quad Check Valve, Proc. spec., RI
19. MC363-0031, Rev C, 3-15-78, Electrical Heater, Detail Proc.

spec., RI.

20. ME276-0032, Rev B, 7-20-79, Test Point Coupling, Spec. Control Dwg., RI.

21. AMS5562A, 7-15-80, Steel Tubing, Mat'l spec., SAE.

22. 73P550015, Rev B, 3-22-82, Gimbal Bellows, Proc. spec., MDAC.

23. 73P550003 Alignment Bellows Drawing, MDAC.

24. MC282-0061, Rev. G, RCS Propellant Tank, Proc. Spec., MDAC.

25. MC271-0095, RCS Propellant Line Flexible Assembly, Proc. Spec., MDAC.

26. MC467-0029, Rev. G, RCS Vernier Thruster Assembly, Proc. Spec., MDAC.

27. VS70-420309, Rev. D, 6-4-84, Aft RCS Subsystem Control Left OMS Pod Schematic Diagram.

28. JSC-11174, Space Shuttle Systems Handbook, Rev. C, DNC-5, 9-13-85.

APPENDIX A
ACRONYMS

AC	-	Alternating Current
ALC	-	Aft Load Controller
ALCA	-	Aft Load Control Assembly
AMCA	-	Aft Motor Control Assembly
AOA	-	Abort-Once-Around
APC	-	Aft Power Controller
ARCS	-	Aft Reaction Control System (Subsystem)
ASSY	-	Assembly
ATO	-	Abort-To-Orbit
ATT	-	Attitude
BCE	-	Bus Control ELement
BFS	-	Backup Flight System
BTU	-	Bus Terminal Unit
C&W	-	Caution and Warning
CIL	-	Critical Items List
CL	-	Close (Closed)
CMD	-	Command, Commander
CNTL	-	Control
CNTLR	-	Controller
CRIT	-	Criticality
CRT	-	Cathode-Ray Tube
D&C	-	Displays and Controls
DAP	-	Digital Autopilot
dc	-	Direct Current
DOD	-	Department of Defense
DPS	-	Data Processing System (Subsystem)
DTO	-	Detailed Test Objective
EI	-	Entry Interface
EPDC	-	Electrical Power Distribution and Control
ET	-	External Tank
F	-	Fahrenheit
F	-	Functional
FA	-	Flight Aft
FCOS	-	Flight Control Operating System
FDA	-	Fault Detection and Annunciation
FF	-	Flight Forward
FLCA	-	Forward Load Control Assembly
FLT	-	Flight
FM	-	Failure Mode
FMCA	-	Forward Motor Control Assembly
FMEA	-	Failure Modes and Effects Analysis
FRCS	-	Forward Reaction Control System (Subsystem)
FSW	-	Flight Software
ft	-	Feet
FU	-	Fuel
FUNC	-	Function
FWD	-	Forward
G	-	Gravity
GFE	-	Government Furnished Equipment
GNC	-	Guidance, Navigation, and Control
GPC	-	General Purpose Computer

GSE	-	Ground Support Equipment
He	-	Helium
HW	-	Hardware
I/C	-	Interconnect
I/O	-	Input/Output
ID	-	Inside Diameter
IMU	-	Inertial Measurement Unit
IOA	-	Independent Orbiter Assessment
ISOL	-	Isolation
ISP	-	Initial Specific Impulse
JSC	-	Johnson Space Center
L	-	Left
LCA	-	Load Controller Assembly
LRU	-	Line Replaceable Unit
MAN	-	Manual
MCA	-	Motor Control Assembly
MCC	-	Mission Control Center (JSC)
MDAC	-	McDonnell Douglas Astronautics Company
MDM	-	Multiplexer/Demultiplexer
MECO	-	Main Engine Cutoff
MM	-	Major Mode
MMH	-	Monomethyl Hydrazine
msec	-	Millisecond
N2O4	-	Nitrogen Tetroxide
NA	-	Not Applicable
NASA	-	National Aeronautics and Space Administration
NSTS	-	National Space Transportation System
NTO	-	Nitrogen Tetroxide
OA	-	Operational Aft
OF	-	Operational Forward
OI	-	Operational Instrumentation
OMRSD	-	Operational Maintenance Requirements and Specifications Document
OMS	-	Orbital Maneuvering System
OP	-	Open
OPS	-	Operations Sequence
OX	-	Oxidizer
OXID	-	Oxidizer
P	-	Pitch
PAD	-	Propellant Acquisition Device
PASS	-	Primary Avionics Software System
PBI	-	Push-Button Indicator
Pc	-	Chamber Pressure
PCA	-	Power Control Assembly
PCI	-	Potential Critical Item
PCM	-	Pulse Code Modulation
PCMMU	-	Pulse Code Modulation Master Unit
PLS	-	Primary Landing Site
PRCS	-	Primary Reaction Control System (jet)
PRESS	-	Pressure
PROC	-	Processor
psi	-	Pounds per Square Inch
psia	-	Pounds per Square Inch Absolute
psid	-	Pounds per Square Inch Differential
psig	-	Pounds per Square Inch Gage

PTI - Programmed Test Input
PWR - Power
R - Right
R - Roll
RCS - Reaction Control System
RHC - Rotation Hand Controller
RI - Rockwell International
RJD - Reaction Jet Driver
RM - Redundancy Management
RPC - Remote Power Controller
RTLS - Return-to-Launch Site
scfm - Standard Cubic Feet per Minute
SFOM - Shuttle Flight Operations Manual
SOP - Subsystem Operating Program
SPEC - Specification
SSM - Subsystem Manager
SSSH - Space Shuttle Systems Handbook
STS - Space Transportation System
SUM - Summary
SYS - System
TAL - Transatlantic Abort Landing
THC - Translation Hand Controller
TK - Tank
TPS - Thermal Protection System
VERN - Vernier
VLV - Valve
VRCS - Vernier Reaction Control System (jet)
Y - Yaw

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

APPENDIX B
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

RTLS - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

TAL - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

CREDIBLE (CAUSE) - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

CONTINGENCY CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

EARLY MISSION TERMINATION - termination of onorbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the highest criticality

HIGHEST CRITICALITY - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence (OPS)

MC - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations

APPENDIX B
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

   RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

   RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

   RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

   RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

   RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

B.3 RCS - Specific Groundrules and Assumptions

B.3.A Hardware

1. The function of an RCS thruster is to provide thrust in a certain axis and direction. Therefore, from a top down system analysis approach, thrusters which fire in the same axis and direction may be considered redundant to each other.

2. All aft RCS thrusters are required for the successful completion of OMS/RCS propellant dumps during RTLS and TAL aborts.

3. It is assumed that after the failure of an RCS thruster, the RCS redundancy management will automatically deselect the opposite-firing thruster.

4. Any leakage of RCS propellants is potentially life and vehicle threatening regardless of where the leak occurs (NSTS 22206, p. 2-11, item h). IOA classifies any single failure which results in propellant leakage as a 1/1. If redundant items must fail before leakage occurs, IOA assign a functional criticality 1R.

5. The IOA redundancy string applied to the "fails closed" failure mode for the helium tank isolation valves, propellant tank isolation valves, manifold isolation valves, and crossfeed valves does not include a failure which requires that the valve be closed.

6. Inability to deplete propellants or complete planned propellant dumps can lead to violations of orbiter entry mass properties constraints and/or violations of propellant tank landing weight constraints (ARCS only).

B.3.B EPD&C

1. IOA-RCS assumed the inability to re-open a valve on ascent is not a credible event. These valves (helium isolation valve A & B, tank isolation valves 1/2 & 3/4/5, and manifold isolation valves 1-5) are open prelaunch and are used to supply propellants to jets for control, ET separation, and RTLS/TAL aborts.

2. IOA-RCS assumed if a valve was closed for some reason (i.e. isolate a leak) after ascent, the inability to re-open this valve was a credible failure and the reason to close was not in the redundancy string.

3. The above valves and the aft crossfeed valves can be

configured manually or with the GPC. The primary and secondary application of these commands depends on the mission phase. For secondary application, IOA-RCS issued a "NA" for the B screen since this would be a stand-by function.

4. IOA-RCS issued a "NA" for B screens for all electrical components failed open that are used to isolate a leak. Isolation of a leak is a stand-by function. If a failed short item causes inability to isolate a leak (valve failed open), this item has the applicable B screen assigned to it.

5. IOA-RCS assumed that loss of logic power for reaction jet drivers on ascent was not a credible failure since multiple failures (driver power circuit failed off) must occur. However, after ascent, driver power is turned off during sleep periods. Inability to turn on logic power, thus driver power, is now credible. This causes loss of jets on associated manifolds.

6. MDM discretes and the event indicators provide the logic and visual status of the valve position. Resistors, diodes, and hybrid drivers are used in the circuitry that provide this data. IOA-RCS claims the failure of these items may lead to a false indication of the valve position. The worst effect of these indicators would be to falsely fail the valve closed which may effect on-orbit operations.

7. An issue has been made of all RLR type resistors with a short failure mode with a 3/3 criticality. This type resistor cannot fail short. Updated FMEAs have not been received to delete this failure mode.

8. Electrical components within the valve (microswitches, diodes, etc) have been analyzed for the assessment report. This analysis is shown in Appendix E.

9. All switches have been re-analyzed for the assessment report. They have been broken into five categorical groups. This analysis is shown in Appendix E.

10. Diodes have been re-analyzed for the assessment report. The diodes have been broken out into the seven groups (depending on the function of the diode in the circuit) as shown below :

    - x Limit switches or Talkback
    - A GPC close
    - B GPC open
    - C Manual open
    - D Manual close
    - E Manual open/close inhibit
    - F Manual close/open inhibit

APPENDIX C
DETAILED ASSESSMENT

This section contains the IOA assessment worksheets generated during the assessment of this subsystem. The information on these worksheets facilitates the comparison of the NASA FMEA/CIL (Pre and Post 51-L) to the IOA detailed analysis worksheets included in Appendix E. Each of these worksheets identifies the NASA FMEA being assessed, corresponding MDAC Analysis Worksheet ID (Appendix E), hardware item, criticality, redundancy screens, and recommendations. For each failure mode, the highest assessed hardware and functional criticality ~~is~~ compared and discrepancies noted as "N" in the compare row under the column where the discrepancy occurred.

LEGEND FOR IOA ASSESSMENT WORKSHEETS

Hardware Criticalities:
- 1 = Loss of life or vehicle
- 2 = Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle
- 3 = All others

Functional Criticalities:
- 1R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle
- 2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission

Redundancy Screens A, B and C:
- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

NASA Data :
- Baseline = NASA FMEA/CIL
- New = Baseline with Proposed Post 51-L Changes

CIL Item :
- X = Included in CIL

Compare Row :
- N = Non compare for that column (deviation)

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-100
NASA FMEA #: 03-2F-101010-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 100
ITEM: HELIUM STORAGE TANK

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

-	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF THE ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-101
NASA FMEA #: 03-2F-101070-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 101
ITEM: HELIUM FILL COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS. CONDITION OF CAP SEALS UNDETECTABLE AFTER CAP INSTALLATION. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-102
NASA FMEA #: 03-2F-101070-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 102
ITEM: HELIUM FILL COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW".

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-103
NASA FMEA #: 03-2F-101020-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 103
ITEM: HE ISOL A & B VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA NOW RECOMMENDS THAT THE B SCREEN BE FAILED AND THAT THIS ITEM AND FAILURE MODE BE PLACED ON THE CIL. A FAILURE OF THE REDUNDANT SECONDARY REG IS NOT DETECTABLE IN FLIGHT. IOA RECOMMENDS THE ADDITION OF A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-103A
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 103
ITEM: HE ISOL A & B VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (INTERNAL LEAKAGE). THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2F-101020-3 (FAILS OPEN), WHICH IS CLASSIFIED AS A 3/1R PPP. IOA NOW RECOMMENDS A 3/1R PFP FOR 03-2F-101020-3. SEE ASSESSMENT SHEET RCS-103.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-104
NASA FMEA #: 03-2F-101020-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 104
ITEM: HE ISOL A & B VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA ACCEPTS NASA/RI PASSAGE OF B SCREEN. IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R AND PLACED ON THE CIL. INABILITY TO REPRESS FRCS PROP TANK AND SUBSEQUENT INABILITY TO USE OR DEPLETE PROP COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-105
NASA FMEA #: 03-2F-101013-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 105
ITEM: HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS. THIS FMEA SHOULD ALSO INCLUDE HELIUM COMPONENT BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. THE SSM AGREED THAT VALVE BODIES SHOULD BE ADDED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-106
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 106
ITEM: HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 1/1 EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-107
NASA FMEA #: 03-2F-101013-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 107
ITEM: HE LINE, ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA ORIGINALLY CONSIDERED THE PARALLEL LINE SEGMENTS OF THE ISOL VLV LEGS TO BE REDUNDANT. HOWEVER, IOA AGREES WITH THE NASA/RI CRIT 1/1 ASSIGNMENT. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS. THIS FMEA SHOULD ALSO INCLUDE HELIUM COMPONENT BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. THE SSM AGREED THAT VALVE BODIES SHOULD BE ADDED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-108
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 108
ITEM: HE LINE, ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 2/1R EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-109
NASA FMEA #: 03-2F-101091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 109
ITEM: HIGH PRESSURE HELIUM TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE QUANTITY ON THIS FMEA/CIL SHOULD BE 12. THE SSM AGREED WITH THE IOA ISSUE. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-110
NASA FMEA #: 03-2F-101091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 110
ITEM: HIGH PRESSURE HELIUM TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-111
NASA FMEA #: 03-2F-101030-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 111
ITEM: HE PRESS REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF B SCREEN. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-112
NASA FMEA #: 03-2F-101030-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 112
ITEM: HE PRESS REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R PFP AND PLACED ON THE CIL. INABILITY TO REPRESS FRCS PROP TANK AND SUBSEQUENT INABILITY TO USE OR DEPLETE PROP COULD RESULT IN VIOLATIONS OF ENTRY MASS CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY. THIS FAILURE IS UNDETECTABLE DURING DUAL LEG OPERATION AND, THEREFORE, FAILS THE B SCREEN DURING THE ASCENT FLIGHT PHASE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-113
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 113
ITEM: HE PRESS REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2F-101030-2 (FAILS CLOSED), WHICH IS CURRENTLY CLASSIFIED AS A 3/1R PPP. IOA RECOMMENDS A 2/1R PFP FOR 03-2F-101030-2.
SEE ASSESSMENT SHEET RCS-112.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-114
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 114
ITEM: HE PRESS REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2F-101013-1) WITH CORRESPONDING RETENTION RATIONALE. IOA ORIGINALLY CONSIDERED THE PARALLEL HELIUM PATHS TO BE REDUNDANT FOR THIS FAILURE (2/1R), BUT NOW CLASSIFIES THIS FAILURE AS A 1/1.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-115
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 115
ITEM: HE PRESS REGULATOR PRIMARY SENSING PORT

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (EXTERNAL LEAKAGE THROUGH SENSING PORT). HOWEVER, THIS FAILURE MODE IS COVERED BY NASA/RI IN THE OMS SUBSYSTEM ON FMEA 03-3-1004-3 (3/2R PFP). IOA RECOMMENDS THAT THIS FAILURE MODE ALSO BE COVERED FOR THE RCS REGULATOR WITH THE SAME RATIONALE USED IN OMS. IOA WITHDRAWS 2/1R PPP CRIT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-116
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 116
ITEM: HE PRESS REGULATOR PRIMARY SENSING PORT

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE (BLOCKAGE OF SENSING PORT) IS ADEQUATELY ADDRESSED ON FMEAs 03-2F-101030-1 AND 101030-2, WHICH LIST CONTAMINATION OF PILOT SCREENS, RESTRICTOR ORIFICES, OR SENSE LINES AS CAUSES FOR THE REGULATOR FAILURES COVERED. AN ADDITIONAL FMEA IS UNNECESSARY. IOA RECOMMENDS A 2/1R PFP FOR 03-2F-101030-2. SEE ASSESSMENT SHEET RCS-112.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-117
NASA FMEA #: 03-2F-101091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 117
ITEM: HE PRESS REGULATOR OUTLET TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI 3/1R FFP ASSIGNMENT. IOA ORIGINALLY IDENTIFIED THIS AS A TWO-SEAL COUPLING RATHER THAN A MULTIPLE SEAL 0032 COUPLING. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE QUANTITY ON THIS FMEA SHOULD BE 12. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-118
NASA FMEA #: 03-2F-101091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 118
ITEM: HE PRESS REGULATOR OUTLET TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-119
NASA FMEA #: 03-2F-101095-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 119
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R AND PLACED ON THE CIL. WITH SERIES POPPETS FAILED OPEN, THE CONTAMINATION OF UPSTREAM COMPONENTS BY PROP OR PROP VAPORS COULD RESULT IN LOSS OF PROP TANK REPRESS CAPABILITY AND INABILITY TO USE OR DEPLETE FRCS PROP. THIS COULD LEAD TO VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND LOSS OF LIFE OF VEHICLE DURING ENTRY. FAILURE OF ONE POPPET UNDETECTABLE DURING FLIGHT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-120
NASA FMEA #: 03-2F-101095-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 120
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R. INABILITY TO REPRESS FRCS PROP TANK AND SUBSEQUENT INABILITY TO USE OR DEPLETE PROP COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-121
NASA FMEA #: 03-2F-101091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 121
ITEM: QUAD CHECK VALVE TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI 3/1R FFP ASSIGNMENT. IOA ORIGINALLY IDENTIFIED THIS AS A TWO-SEAL COUPLING RATHER THAN A MULTIPLE SEAL 0032 COUPLING. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE QUANTITY ON THIS FMEA SHOULD BE 12. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-122
NASA FMEA #: 03-2F-101091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 122
ITEM: QUAD CHECK VALVE TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-123
NASA FMEA #: 03-2F-111110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 123
ITEM: PROPELLANT TANK

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE "D" EFFECTS BE REVISED. FAILURE AFTER ET SEP COULD ALSO RESULT IN LOSS OF LIFE OR VEHICLE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE EXPOSURE OF EVA CREW AND GROUND CREW TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-124
NASA FMEA #: 03-2F-102108-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 124
ITEM: PROP LINES, ALL

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT "FAILURE OF LINE BELLOWS TO DEFLECT" BE ADDED AS A CAUSE ON THIS FMEA/CIL. IOA CONSIDERS THIS TO BE A CREDIBLE FAILURE WHICH SHOULD BE ADDRESSED ON THE FMEA/CIL. THIS FMEA SHOULD INCLUDE VALVE BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. IOA ALSO RECOMMENDS THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-125
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 125
ITEM: PROP LINES, ALL

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 1/1 EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-126
NASA FMEA #: 03-2F-102150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 126
ITEM: PROP FILL VENT REGULATOR CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-127
NASA FMEA #: 03-2F-102150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 127
ITEM: PROP FILL VENT REGULATOR CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-128
NASA FMEA #: 03-2F-111110-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 128
ITEM: PROP CHANNEL SCREENS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE P.A.D. COMPONENTS BE ITEMIZED IN THE ITEM LIST OR FUNCTIONAL DESCRIPTION SECTIONS TO SHOW SPECIFICALLY WHAT IS COVERED BY THIS FMEA/CIL. IOA ALSO RECOMMENDS THAT THE "HIGH G" DISCUSSION BE REMOVED FROM THE FUNCTIONAL DESCRIPTION. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-129
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 129
ITEM: PROP FEED-OUT TUBE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA NOW CONSIDERS RESTRICTED FLOW IN THIS SECTION OF TUBE TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF THIS FAILURE MODE IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-130
NASA FMEA #: 03-2F-101090-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 130
ITEM: PROP TK UPPER COMPARTMENT CHANNEL CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI 3/1R FFP ASSIGNMENT. IOA ORIGINALLY IDENTIFIED THIS AS A TWO-SEAL COUPLING RATHER THAN A MULTIPLE-SEAL 0032 COUPLING. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING POSSIBLE FIRE HAZARD, HAZARD TO GROUND CREW, AND POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-131
NASA FMEA #: 03-2F-101090-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 131
ITEM: PROP TK UPPER COMPARTMENT CHANNEL CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-132
NASA FMEA #: 03-2F-102150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 132
ITEM: PROP TK LOWER COMPARTMENT CHANNEL BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-133
NASA FMEA #: 03-2F-102150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 133
ITEM: PROP TK LOWER COMPARTMENT CHANNEL BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-134
NASA FMEA #: 03-2F-102150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 134
ITEM: PROP TK LOWER COMPARTMENT BULKHEAD BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-135
NASA FMEA #: 03-2F-102150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 135
ITEM: PROP TK LOWER COMPARTMENT BULKHEAD BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-136
NASA FMEA #: 03-2F-102150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 136
ITEM: PROP TK VENT AND REGULATOR CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-137
NASA FMEA #: 03-2F-102150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 137
ITEM: PROP TK VENT AND REGULATOR CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-138
NASA FMEA #: 03-2F-102106-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 138
ITEM: GIMBAL BELLOWS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT "FAILURE OF LINE BELLOWS TO DEFLECT" AND "ISOLATION VALVE RELIEF DEVICE FAILURE TO RELIEVE" BE ADDED AS CAUSES ON THIS FMEA. IOA ALSO RECOMMENDS THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-139
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 139
ITEM: GIMBAL BELLOWS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA NOW CONSIDERS THE CREDIBILITY OF RESTRICTED FLOW IN A BELLOWS TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF THIS FAILURE MODE IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-140
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 140
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (BURST DISK INTERNAL LEAKAGE). IOA CONSIDERS THIS FAILURE MODE TO BE CREDIBLE AND RECOMMENDS IT BE ADDED TO 03-2F-101060-5. THE FAILURE HISTORY OF THE BURST DISK INCLUDES THIS FAILURE. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-140A
NASA FMEA #: 03-2F-101060-5

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 140
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF B SCREEN. IOA RECOMMENDS THE ADDITION OF STATEMENTS TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS, AND HAZARD TO GROUND AND EVA CREWS FROM LEAKAGE OF PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-141
NASA FMEA #: 03-2F-101060-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 141
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[NA]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R FNP ASSIGNMENT. IOA CONSIDERED RELIEF VALVE TO BE AN EMERGENCY SYSTEM IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-141A
NASA FMEA #: 03-2F-101060-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 141
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT. IOA CONSIDERED RELIEF VALVE TO BE AN EMERGENCY SYSTEM IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-142
NASA FMEA #: 03-2F-101091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 142
ITEM: RELIEF VALVE TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE QUANTITY ON THIS FMEA/CIL SHOULD BE 12. THE SSM AGREED WITH THE IOA ISSUE. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-143
NASA FMEA #: 03-2F-101091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 143
ITEM: RELIEF VALVE TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-144
NASA FMEA #: 03-2F-101050-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 144
ITEM: GROUND MANUAL ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-145
NASA FMEA #: 03-2F-101050-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 145
ITEM: GROUND MANUAL ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA 1/1 BASED ON "FAILURE TO REMAIN OPEN". IOA NOW CONSIDERS THE CREDIBILITY OF THIS FAILURE MODE TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF "FAILURE TO REMAIN OPEN" IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-146
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 146
ITEM: GROUND MANUAL ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA/CIL (03-2F-101013-1) WITH CORRESPONDING RETENTION RATIONALE.
IOA ALSO RECOMMENDS THAT THIS FMEA INCLUDE PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-147
NASA FMEA #: 03-2F-102112-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 147
ITEM: PROP TK ISOL VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE PROP TANK ISOL VALVES. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS INCLUDE THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-148
NASA FMEA #: 03-2F-102120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 148
ITEM: PROP TK ISOL VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[F]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW TO A THRUSTER COULD RESULT IN BURN-THROUGH. IOA ALSO WITHDRAWS 1/1 ABORT ISSUE DUE TO LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON A POSSIBLE INCOMPLETE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE RESTRICTED FLOW FAILURE MODE BE UPGRADED TO A 2/1R PPF AND PLACED ON THE CIL. INABILITY TO USE OR DEPLETE FRCS PROP COULD RESULT IN INABILITY TO PERFORM ET SEP, OR VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY. ANY CONTAMINATION COULD AFFECT BOTH VALVES SIMULTANEOUSLY. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-149
NASA FMEA #: 03-2F-102120-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 149
ITEM: PROP TK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-149A
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 149
ITEM: PROP TK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (INTERNAL LEAKAGE). IOA NOW CLASSIFIES THIS FAILURE AS A 3/1R PNP. IOA RECOMMENDS THAT THIS FAILURE MODE BE ADDED TO 03-2F-102120-2 (3/1R PNP). THIS IS A CREDIBLE FAILURE MODE WHICH SHOULD BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-150
NASA FMEA #: 03-2F-102120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 150
ITEM: PROP TK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 ABORT ISSUE DUE TO LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE FAILED CLOSED AND FAILS TO REMAIN OPEN FAILURE MODE BE UPGRADED TO 2/1R PPP AND PLACED ON THE CIL. INABILITY TO USE OR DEPLETE FRCS PROP COULD RESULT IN INABILITY TO PERFORM ET SEP, OR VIOLATIONS OF ENTRY MASS PROPERTY CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-151
NASA FMEA #: 03-2F-102120-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 151
ITEM: PROP TK ISOL VLV 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-151A
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 151
ITEM: PROP TK ISOL VLV 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (INTERNAL LEAKAGE). IOA NOW CLASSIFIES THIS FAILURE AS A 3/1R PNP. IOA RECOMMENDS THAT THIS FAILURE MODE BE ADDED TO 03-2F-102120-2 (3/1R PNP). THIS IS A CREDIBLE FAILURE MODE WHICH SHOULD BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-152
NASA FMEA #: 03-2F-102120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 152
ITEM: PROP TK ISOL VLV 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 ABORT ISSUE DUE TO LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE FAILED CLOSED AND FAILS TO REMAIN OPEN FAILURE MODE BE UPGRADED TO 2/1R PPP AND PLACED ON THE CIL. INABILITY TO USE OR DEPLETE FRCS PROP COULD RESULT IN INABILITY TO PERFORM ET SEP, OR VIOLATIONS OF ENTRY MASS PROPERTY CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-153
NASA FMEA #: 03-2F-102150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 153
ITEM: MANIFOLD 1/2 FILL & DRAIN/PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-154
NASA FMEA #: 03-2F-102150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 154
ITEM: MANIFOLD 1/2 FILL & DRAIN/PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-155
NASA FMEA #: 03-2F-102150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 155
ITEM: MANIFOLD 3/4/5 FILL & DRAIN/PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-156
NASA FMEA #: 03-2F-102150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 156
ITEM: MANIFOLD 3/4/5 FILL & DRAIN/PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-157
NASA FMEA #: 03-2F-102110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 157
ITEM: MANIFOLD 1, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT. IOA RECOMMENDS THAT THE EFFECTS ON THIS FMEA INCLUDE PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-158
NASA FMEA #: 03-2F-102110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 158
ITEM: MANIFOLD 1, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 ABORT ISSUE BASED ON LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE FAILED CLOSED AND FAILS TO REMAIN OPEN FAILURE MODES BE UPGRADED TO 2/1R PPP AND PLACED ON THE CIL. CERTAIN COMBINATIONS OF TWO FAILURES (LOSS OF YAW JETS ON SAME SIDE) COULD RESULT IN INABILITY TO DUMP FRCS PROP AND POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS LEADING TO LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-159
NASA FMEA #: 03-2F-101080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 159
ITEM: MANIFOLD 1, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-160
NASA FMEA #: 03-2F-101080-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 160
ITEM: MANIFOLD 1, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-161
NASA FMEA #: 03-2F-102110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 161
ITEM: MANIFOLD 2, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-162
NASA FMEA #: 03-2F-102110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 162
ITEM: MANIFOLD 2, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 ABORT ISSUE BASED ON LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE FAILED CLOSED AND FAILS TO REMAIN OPEN FAILURE MODES BE UPGRADED TO 2/1R PPP AND PLACED ON THE CIL. CERTAIN COMBINATIONS OF TWO FAILURES (LOSS OF YAW JETS ON SAME SIDE) COULD RESULT IN INABILITY TO DUMP FRCS PROP AND POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS LEADING TO LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-163
NASA FMEA #: 03-2F-101080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 163
ITEM: MANIFOLD 2, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-164
NASA FMEA #: 03-2F-101080-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 164
ITEM: MANIFOLD 2, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-165
NASA FMEA #: 03-2F-102110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 165
ITEM: MANIFOLD 3, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-166
NASA FMEA #: 03-2F-102110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 166
ITEM: MANIFOLD 3, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 ABORT ISSUE BASED ON LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE FAILED CLOSED AND FAILS TO REMAIN OPEN FAILURE MODES BE UPGRADED TO 2/1R PPP AND PLACED ON THE CIL. CERTAIN COMBINATIONS OF TWO FAILURES (LOSS OF YAW JETS ON SAME SIDE) COULD RESULT IN INABILITY TO DUMP FRCS PROP AND POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS LEADING TO LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-167
NASA FMEA #: 03-2F-101080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 167
ITEM: MANIFOLD 3, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-168
NASA FMEA #: 03-2F-101080-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 168
ITEM: MANIFOLD 3, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-169
NASA FMEA #: 03-2F-102110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 169
ITEM: MANIFOLD 4, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-170
NASA FMEA #: 03-2F-102110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 170
ITEM: MANIFOLD 4, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /1R]	[P]	[P]	[P]	[ ]	*
IOA	[2 /1R]	[P]	[P]	[P]	[X]	
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]	

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 ABORT ISSUE BASED ON LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE FAILED CLOSED AND FAILS TO REMAIN OPEN FAILURE MODES BE UPGRADED TO 2/1R PPP AND PLACED ON THE CIL. CERTAIN COMBINATIONS OF TWO FAILURES (LOSS OF YAW JETS ON SAME SIDE) COULD RESULT IN INABILITY TO DUMP FRCS PROP AND POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS LEADING TO LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-171
NASA FMEA #: 03-2F-101080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 171
ITEM: MANIFOLD 4, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-172
NASA FMEA #: 03-2F-101080-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 172
ITEM: MANIFOLD 4, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-173
NASA FMEA #: 03-2F-102170-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 173
ITEM: MANIFOLD 5, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA NOW CLASSIFIES "FAILS OPEN", AND "INTERNAL LEAKAGE" AS A 3/1R PNP.
IOA RECOMMENDS THAT THIS ITEM AND THESE FAILURE MODES BE UPGRADED TO 3/1R PNP. INABILITY TO ISOLATE A PROP LEAK COULD RESULT IN LOSS OF PROP FROM TANK AND PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).
ANY LEAKAGE OF PROP IS A CRITICAL FAILURE PER NSTS-22206.
INABILITY TO CONTROL A LEAK SHOULD, THEREFORE, BE A 1R.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-174
NASA FMEA #: 03-2F-102170-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 174
ITEM: MANIFOLD 5, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE EFFECTS INCLUDE LOSS OF MISSION DUE TO HIGHER PROP CONSUMPTION USING PRIMARIES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-175
NASA FMEA #: 03-2F-101080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 175
ITEM: MANIFOLD 5, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA/CIL. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT PROP LEAKAGE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-176
NASA FMEA #: 03-2F-101080-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 176
ITEM: MANIFOLD 5, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-177A
NASA FMEA #: 03-2F-102170-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 177
ITEM: MANIFOLD ISOL VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA/CIL COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE VERNIER MANIFOLD ISOLATION VALVE. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-177
NASA FMEA #: 03-2F-102112-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 177
ITEM: MANIFOLD ISOL VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA/CIL COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE PRIMARY MANIFOLD ISOLATION VALVE. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-178
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 178
ITEM: MANIFOLD ISOL VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 / 2]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW TO A THRUSTER COULD CAUSE BURN-THROUGH. IOA ALSO WITHDRAWS 1/1 ABORT ISSUE DUE TO LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON A POSSIBLE INCOMPLETE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE RESTRICTED FLOW FAILURE MODE BE ADDRESSED ON THE FMEA/CIL. THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2F-102110-1 (3/1R PPP) FOR PRIMARY MANIFOLDS AND TO 03-2F-102170-1 (2/2) FOR VERNIER MANIFOLDS.
HOWEVER, IOA RECOMMENDS A 2/1R FOR 03-2F-102110-1. SEE ASSESSMENT SHEETS RCS-158, 162, 166, & 170.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-179
NASA FMEA #: 03-2F-121308-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 179
ITEM: JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE "D" EFFECTS BE REVISED. IOA CONSIDERS LEAKAGE OF PROP TO BE CRITICAL AFTER ET SEP ALSO, AS WELL AS A HAZARD TO EVA AND GROUND CREWS.
IOA ALSO RECOMMENDS THAT "ISOL VALVE RELIEF DEVICE FAILURE TO RELIEVE" AND "FAILURE OF LINE BELLOWS TO DEFLECT" BE ADDED AS CAUSES ON THIS FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-180
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 180
ITEM: JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA NOW CONSIDERS THE CREDIBILITY OF RESTRICTED FLOW IN A BELLOWS TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF THIS FAILURE MODE IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-181
NASA FMEA #: 03-2F-121310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 181
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD NOT INCLUDE "FAILS ON". IOA RECOMMENDS THAT THE FAILED OPEN MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS 22206, ANY SINGLE FAILURE RESULTING IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE PRESENTS A HAZARD TO THE CREW, VEHICLE, AND GROUND CREW. FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 2/1R FPP. SEE ASSESSMENT SHEET RCS-186.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-182
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 182
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE) FOR THE THRUSTER SOLENOID VALVE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-183
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 183
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW TO A THRUSTER COULD RESULT IN BURN-THROUGH. IOA ALSO WITHDRAWS 1/1 ABORT ISSUE DUE TO LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER RECOMMENDS A 1/1 ABORT CRIT (BASED ON A POSSIBLE INCOMPLETE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE.
IOA RECOMMENDS THAT THE RESTRICTED FLOW FAILURE MODE BE ADDRESSED ON THE FMEA/CIL. THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2F-121310-3 (3/1R FPP). HOWEVER, IOA RECOMMENDS A 2/1R FPP FOR 03-2F-121310-3. SEE ASSESSMENT SHEET RCS-186

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-184
NASA FMEA #: 03-2F-121310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 184
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, -X AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[F]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A SCREEN. IOA CONSIDERS THRUSTERS IN THE SAME AXIS TO BE REDUNDANT TO EACH OTHER. IOA CONSIDERS THE LOSS OF ALL -X THRUSTERS TO BE ONLY A 3/2R FPP. THE -X THRUSTERS ARE NOT REQUIRED FOR ET SEP OR FRCS PROP DUMPING. 03-2F-121310-3 INCLUDES THRUSTERS IN ALL AXES, AND THE CRITICALITY ASSIGNED IS FOR THE WORST-CASE AXIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-185
NASA FMEA #: 03-2F-121310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 185
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, -X AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS-22206, ANY SINGLE FAILURE RESULTING IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE PRESENTS A HAZARD TO THE CREW, VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 3/2R FPP. SEE ASSESSMENT SHEET RCS-184.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-186
NASA FMEA #: 03-2F-121310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 186
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, Y AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[N]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A SCREEN. IOA WITHDRAWS 1/1 ABORT CRIT DUE TO LACK OF CURRENT FRCS DUMP CAPABILITY DURING RTLS & TAL, HOWEVER IOA RECOMMENDS A 1/1 ABORT CRIT (BASED ON A POSSIBLE INADEQUATE DUMP) IF SUCH A CAPABILITY EXISTS IN THE FUTURE. IOA CONSIDERS THRUSTERS IN THE SAME AXIS TO BE REDUNDANT TO EACH OTHER. IOA RECOMMENDS THAT THE FAILED CLOSED FAILURE MODE FOR PRIMARY THRUSTERS IN THE Y AXIS BE UPGRADED TO A 2/1R FPP. LOSS OF BOTH +Y OR BOTH -Y JETS COULD RESULT IN INABILITY TO DUMP FRCS PROP, LEADING TO POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY. 03-2F-121310-3 INCLUDES THRUSTERS IN ALL AXES, AND THE CRITICALITY ASSIGNED IS FOR THE WORST-CASE AXIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-187
NASA FMEA #: 03-2F-121310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 187
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, Y AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS-22206, ANY SINGLE FAILURE RESULTING IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE PRESENTS A HAZARD TO THE CREW, VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 2/1R FPP. SEE ASSESSMENT SHEET RCS-186.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-188
NASA FMEA #: 03-2F-121310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 188
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, Z AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R FPP ASSIGNMENT FOR THRUSTERS IN THE Z AXIS. IOA CONSIDERS THRUSTERS IN THE SAME AXIS TO BE REDUNDANT TO EACH OTHER. 03-2F-121310-3 INCLUDES THRUSTERS IN ALL AXES, AND THE CRITICALITY ASSIGNED IS FOR THE WORST-CASE AXIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-189
NASA FMEA #: 03-2F-121310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 189
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, Z AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS-22206, ANY SINGLE FAILURE RESULTING IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE PRESENTS A HAZARD TO THE CREW, VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 3/1R FPP. SEE ASSESSMENT SHEET RCS-188.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-190
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 190
ITEM: JET ALIGNMENT BELLOWS, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE ARE NO ALIGNMENT BELLOWS ON THE VERNIER THRUSTER PROP LINES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-191
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 191
ITEM: JET ALIGNMENT BELLOWS, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE ARE NO ALIGNMENT BELLOWS ON THE VERNIER THRUSTER PROP LINES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-192
NASA FMEA #: 03-2F-131310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 192
ITEM: THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[2 /2]	[ ]	[ ]	[ ]	[X]	*
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]	
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD NOT INCLUDE "FAILS ON". IOA RECOMMENDS THAT THE FAILED OPEN MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS 22206, ANY SINGLE FAILURE RESULTING IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE PRESENTS A HAZARD TO THE CREW, VEHICLE, AND GROUND CREW.
FROM A LOSS OF VERNIER THRUSTER STANDPOINT, IOA AGREES WITH THE NASA/RI 2/2 ASSIGNMENT. IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-193
NASA FMEA #: 03-2F-131310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 193
ITEM: THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-194
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 194
ITEM: THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-195
NASA FMEA #: 03-2F-131310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 195
ITEM: THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS 22206, ANY SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE PRESENTS A HAZARD TO CREW, VEHICLE, AND GROUND CREW. FROM A LOSS OF VERNIER THRUSTER STANDPOINT, IOA AGREES WITH THE NASA/RI 2/2 ASSIGNMENT. IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY COMPONENTS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-196
NASA FMEA #: 03-2F-131310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 196
ITEM: THRUSTER BIPROP SOLENOID VLV, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW TO A THRUSTER COULD RESULT IN BURN-THROUGH. FROM A LOSS OF VERNIER THRUSTER STANDPOINT, IOA AGREES WITH THE NASA/RI 2/2 ASSIGNMENT.
IOA RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-197
NASA FMEA #: 03-2F-121312-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 197
ITEM: THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE FAILURE MODES ON THIS FMEA INCLUDE "STRUCTURAL FAILURE".

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-197A
NASA FMEA #: 03-2F-121313-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 197
ITEM: THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE FAILURE MODES ON THIS FMEA INCLUDE "STRUCTURAL FAILURE". IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-198
NASA FMEA #: 03-2F-131310-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 198
ITEM: THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE FAILURE MODES ON THIS FMEA INCLUDE "STRUCTURAL FAILURE" AND "BURN-THROUGH". IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-199
NASA FMEA #: 03-2A-201010-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 199
ITEM: HELIUM STORAGE TANK

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND/OR TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-200
NASA FMEA #: 03-2A-201070-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 200
ITEM: HELIUM FILL COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-201
NASA FMEA #: 03-2A-201070-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 201
ITEM: HELIUM FILL COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-202
NASA FMEA #: 03-2A-201020-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 202
ITEM: HE ISOL A & B VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA NOW RECOMMENDS THAT THE B SCREEN BE FAILED AND THAT THIS ITEM AND FAILURE MODE BE ADDED TO THE CIL. A FAILURE OF THE REDUNDANT SECONDARY REG IS NOT DETECTABLE DURING FLIGHT.

C-4

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-202A
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 202
ITEM: HE ISOL A & B VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (INTERNAL LEAKAGE). THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2A-201020-2, WHICH IS CLASSIFIED AS A 3/1R PPP. IOA NOW RECOMMENDS A 3/1R PFP FOR 03-2A-201020-2. SEE ASSESSMENT SHEET RCS-202.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-203
NASA FMEA #: 03-2A-201020-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 203
ITEM: HE ISOL A & B VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI PASSAGE OF B SCREEN. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND/OR PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-204
NASA FMEA #: 03-2A-201013-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 204
ITEM: HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND/OR PROP TANK LANDING WEIGHT CONSTRAINTS. THIS FMEA SHOULD ALSO INCLUDE HELIUM COMPONENT BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. THE SSM AGREED THAT VALVE BODIES SHOULD BE ADDED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-205
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 205
ITEM: HE LINE, ALL EXCEPT ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 1/1 EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-206
NASA FMEA #: 03-2A-201013-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 206
ITEM: HE LINE, ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA ORIGINALLY CONSIDERED THE PARALLEL LINE SEGMENTS OF THE ISOL VLV LEGS TO BE REDUNDANT. HOWEVER, IOA AGREES WITH THE NASA/RI CRIT 1/1 ASSIGNMENT. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS. THIS FMEA SHOULD ALSO INCLUDE HELIUM COMPONENT BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. THE SSM AGREED THAT VALVE BODIES SHOULD BE ADDED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-207
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 207
ITEM: HE LINE, ISOL VLV TO PRESS REGULATOR

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 2/1R EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-208
NASA FMEA #: 03-2A-201091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 208
ITEM: HIGH PRESSURE HELIUM TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON 03-2F-101070-1. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS. THE QUANTITY ON THIS FMEA IS INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-209
NASA FMEA #: 03-2A-201091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 209
ITEM: HIGH PRESSURE HELIUM TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-210
NASA FMEA #: 03-2A-201030-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 210
ITEM: HELIUM PRESSURE REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF B SCREEN. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-211
NASA FMEA #: 03-2A-201030-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 211
ITEM: HELIUM PRESSURE REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[F]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[F]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF C SCREEN. HOWEVER, IOA RECOMMENDS THAT THE B SCREEN BE FAILED. A FAILED CLOSED REG WOULD NOT BE DETECTABLE DURING DUAL LEG OPERATION (ASCENT). IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-212
NASA FMEA #: 03-2A-201030-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 212
ITEM: HELIUM PRESSURE REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[F]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[F]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF C SCREEN. HOWEVER, IOA RECOMMENDS THAT THE B SCREEN BE FAILED. A FAILED CLOSED REG WOULD NOT BE DETECTABLE DURING DUAL LEG OPERATION (ASCENT). IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-213
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 213
ITEM: HELIUM PRESSURE REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2A-201013-1) WITH CORRESPONDING RETENTION RATIONALE.
IOA ORIGINALLY CONSIDERED THE PARALLEL HELIUM FLOW PATHS TO BE REDUNDANT FOR THIS FAILURE (2/1R), BUT NOW CLASSIFIES THIS FAILURE AS A 1/1.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-214
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 214
ITEM: HELIUM PRESSURE REGULATOR PRIMARY SENSING PORT

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (EXTERNAL LEAKAGE THROUGH SENSING PORT). HOWEVER, THIS FAILURE MODE IS COVERED BY NASA/RI IN THE OMS SUBSYSTEM ON FMEA 03-3-1004-3 (3/2R PFP). IOA RECOMMENDS THAT THIS FAILURE MODE ALSO BE COVERED FOR THE RCS REGULATOR WITH THE SAME RATIONALE USED IN OMS. IOA WITHDRAWS 2/1R PPP CRIT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-215
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 215
ITEM: HELIUM PRESSURE REGULATOR PRIMARY SENSING PORT

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE (BLOCKAGE OF SENSING PORT) IS ADEQUATELY ADDRESSED ON FMEAs 03-2A-201030-1 AND 201030-2, WHICH LIST CONTAMINATION OF PILOT FILTERS, RESTRICTOR ORIFICES, AND SENSE PORTS AS CAUSES FOR THE REGULATOR FAILURES COVERED.
AN ADDITIONAL FMEA IS UNNECESSARY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-216
NASA FMEA #: 03-2A-201091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 216
ITEM: HELIUM PRESSURE REGULATOR OUTLET TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[N /]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI 3/1R FFP ASSIGNMENT. IOA ORIGINALLY IDENTIFIED THIS -0032 COUPLING AS A -0018 COUPLING. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON 03-2F-101070-1. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS. THE QUANTITY ON THIS FMEA IS INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-217
NASA FMEA #: 03-2A-201091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 217
ITEM: HELIUM PRESSURE REGULATOR OUTLET TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-218
NASA FMEA #: 03-2A-201095-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 218
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R PFP AND PLACED ON THE CIL. WITH SERIES POPPETS FAILED OPEN, THE CONTAMINATION OF UPSTREAM COMPONENTS BY PROP OR PROP VAPORS COULD RESULT IN LOSS OF PROP TANK REPRESS CAPABILITY AND INABILITY TO USE OR DEPLETE ARCS PROP. THIS COULD RESULT IN LOSS OF ET SEP CONTROL, LOSS OF ENTRY CONTROL, AND POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS. FAILURE OF ONE POPPET IS UNDETECTABLE DURING FLIGHT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-219
NASA FMEA #: 03-2A-201095-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 219
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[F]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF C SCREEN. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-220
NASA FMEA #: 03-2A-201091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 220
ITEM: QUAD CHECK VALVE TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON 03-2F-101070-1. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS. THE QUANTITY ON THIS FMEA IS INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-221
NASA FMEA #: 03-2A-201091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 221
ITEM: QUAD CHECK VALVE TEST PORT COUPLINGS A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-222
NASA FMEA #: 03-2A-211110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 222
ITEM: PROPELLANT TANK

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE EFFECTS DISCUSS THE EFFECTS OF PROP LEAKAGE (CORROSIVE, FIRE/EXPLOSIVE, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-223
NASA FMEA #: 03-2A-202108-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 223
ITEM: PROP LINES, ALL

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT "FAILURE OF LINE BELLOWS TO DEFLECT" BE ADDED AS A CAUSE ON THIS FMEA/CIL. IOA CONSIDERS THIS TO BE A CREDIBLE FAILURE WHICH SHOULD BE ADDRESSED ON THE FMEA/CIL. THIS FMEA SHOULD INCLUDE VALVE BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. IOA ALSO RECOMMENDS THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-224
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 224
ITEM: PROP LINES, ALL

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 1/1 EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-225
NASA FMEA #: 03-2A-202150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 225
ITEM: PROP FILL/VENT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-226
NASA FMEA #: 03-2A-202150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 226
ITEM: PROP FILL/VENT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-227
NASA FMEA #: 03-2A-211110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 227
ITEM: PROP CHANNEL SCREENS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE P.A.D. COMPONENTS INCLUDED ON THIS FMEA BE ITEMIZED IN THE ITEM LIST OR FUNCTIONAL DESCRIPTIONS SECTIONS TO SHOW SPECIFICALLY WHAT IS COVERED ON THIS FMEA. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-228
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 228
ITEM: PROP FEEDOUT TUBE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA NOW CONSIDERS RESTRICTED FLOW IN THIS SECTION OF TUBE TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF THIS FAILURE MODE IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-229
NASA FMEA #: 03-2A-201090-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 229
ITEM: PROP TK UPPER COMPARTMENT CHANNEL CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-230
NASA FMEA #: 03-2A-201090-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 230
ITEM: PROP TK UPPER COMPARTMENT CHANNEL CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-231
NASA FMEA #: 03-2A-202150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 231
ITEM: PROP TK LOWER COMPARTMENT CHANNEL BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-232
NASA FMEA #: 03-2A-202150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 232
ITEM: PROP TK LOWER COMPARTMENT CHANNEL BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-233
NASA FMEA #: 03-2A-201090-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 233
ITEM: PROP TK LOWER COMPARTMENT CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-234
NASA FMEA #: 03-2A-201090-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 234
ITEM: PROP TK LOWER COMPARTMENT CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-235
NASA FMEA #: 03-2A-201090-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 235
ITEM: PROP TK PLENUM SCREEN CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-236
NASA FMEA #: 03-2A-201090-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 236
ITEM: PROP TK PLENUM SCREEN CHECK-OUT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-237
NASA FMEA #: 03-2A-202150-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 237
ITEM: PROP TK ENTRY SUMP BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-238
NASA FMEA #: 03-2A-202150-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 238
ITEM: PROP TK ENTRY SUMP BLEED COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-239
NASA FMEA #: 03-2A-211120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 239
ITEM: GIMBAL BELLOWS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT "FAILURE OF BELLOWS TO DEFLECT" AND "ISOLATION VALVE RELIEF DEVICE FAILURE TO RELIEVE" BE ADDED AS CAUSES ON THIS FMEA. IOA ALSO RECOMMENDS THAT THE EFFECTS INCLUDE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-240
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 240
ITEM: GIMBAL BELLOWS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[/]	[ ]	[ ]	[ ]	[ ]	*
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]	
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA NOW CONSIDERS THE CREDIBILITY OF RESTRICTED FLOW IN A BELLOWS TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF THIS FAILURE MODE IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-241
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 241
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (BURST DISK INTERNAL LEAKAGE). IOA CONSIDERS THIS FAILURE MODE TO BE CREDIBLE AND RECOMMENDS IT BE ADDED TO 03-2A-201060-5. THE FAILURE HISTORY OF THE BURST DISK INCLUDES THIS FAILURE.
THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-241A
NASA FMEA #: 03-2A-201060-5

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 241
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF PROP TANK LANDING WEIGHT AND ORBITER ENTRY MASS PROPERTIES CONSTRAINTS, AND HAZARD TO GROUND AND EVA CREWS FROM LEAKAGE OF PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-242
NASA FMEA #: 03-2A-201060-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 242
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[NA]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R FNP ASSIGNMENT. IOA ORIGINALLY CONSIDERED THE PRESS RELIEF ASSY TO BE AN EMERGENCY SYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-242A
NASA FMEA #: 03-2A-201060-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 242
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT. IOA ORIGINALLY CONSIDERED THE PRESS RELIEF ASSY TO BE AN EMERGENCY SYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-243
NASA FMEA #: 03-2A-201091-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 243
ITEM: RELIEF VALVE TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[F]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON 03-2F-101070-1.
THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.
THE QUANTITY ON THIS FMEA IS INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-244
NASA FMEA #: 03-2A-201091-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 244
ITEM: RELIEF VALVE TEST PORT COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE FAILURE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-245
NASA FMEA #: 03-2A-201050-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 245
ITEM: GROUND MANUAL ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-246
NASA FMEA #: 03-2A-201050-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 246
ITEM: GROUND MANUAL ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA 1/1 BASED ON "FAILURE TO REMAIN OPEN". IOA NOW CONSIDERS THE CREDIBILITY OF THIS FAILURE MODE TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF "FAILURE TO REMAIN OPEN" IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-247
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 247
ITEM: GROUND MANUAL ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2A-201013-1) WITH CORRESPONDING RETENTION RATIONALE.
IOA ALSO RECOMMENDS THAT THE POSSIBLE PROP LEAKAGE EFFECTS OF THIS FAILURE BE INCLUDED IN THE EFFECTS (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-248
NASA FMEA #: 03-2A-202112-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 248
ITEM: PROP TANK ISOL VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE PROP TANK ISOL VALVES. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS INCLUDE THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-249
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 249
ITEM: PROP TANK ISOL VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA ITEM LIST SHOULD NOT INCLUDE THE 3/4/5 VALVES. NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA WITHDRAWS 1/1 ISSUE, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW OF PROP TO A THRUSTER COULD RESULT IN BURN-THROUGH.
THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDRESSED ON THE FMEA/CIL. IOA RECOMMENDS A 3/1R PPP, 1/1 ABORT FMEA AND CIL FOR RESTRICTED FLOW OF THE PROP TANK ISOL 1/2 VALVES. LOSS OF PROP FLOW THROUGH THE 1/2 VALVE WOULD RESULT IN THE LOSS OF ONE +X THRUSTER USED TO DUMP ARCS PROP DURING RTLS & TAL ABORTS. INABILITY TO COMPLETE A PLANNED ARCS DUMP COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-250
NASA FMEA #: 03-2A-202110-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 250
ITEM: PROP TANK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[3 /2R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 2/2, 1/1 ABORT ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-251
NASA FMEA #: 03-2A-202110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 251
ITEM: PROP TANK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS FAILURE MODE FOR THE PROP TANK ISOL 1/2 VALVE BE UPGRADED TO A 3/1R PPP, 1/1 ABORT AND PLACED ON THE CIL. LOSS OF FLOW THROUGH THE 1/2 VALVE WOULD RESULT IN THE LOSS OF ONE +X THRUSTER USED TO DUMP ARCS PROP DURING RTLS & TAL ABORTS. INABILITY TO COMPLETE A PLANNED ARCS DUMP COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-252
NASA FMEA #: 03-2A-202110-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 252
ITEM: PROP TANK ISOL VLV 3/4/5/ A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-253
NASA FMEA #: 03-2A-202110-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 253
ITEM: PROP TANK ISOL VLV 3/4/5/ A & B

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES FOR THE 3/4/5 VALVE, HOWEVER IOA RECOMMENDS A 3/1R PPP, 1/1 ABORT FOR THE 1/2 VALVE WHICH IS ALSO COVERED ON THIS FMEA. SEE ASSESSMENT SHEET RCS-251.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-254
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 254
ITEM: MANIFOLD 1/2 GROUND PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-255
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 255
ITEM: MANIFOLD 1/2 GROUND PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-256
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 256
ITEM: MANIFOLD 3/4/5 GROUND PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-257
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 257
ITEM: MANIFOLD 3/4/5 GROUND PURGE COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-258
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 258
ITEM: RCS CROSSFEED VLV 1/2 OR 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /2]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). THE SSM AGREED THAT RESTRICTED FLOW SHOULD BE ADDED AS A FAILURE MODE ON 03-2A-202111-2 (2/2, 1/1 ABORT). IOA AGREES WITH A 2/2, 1/1 ABORT FOR RESTRICTED FLOW.
IOA WITHDRAWS 1/1 CRIT ISSUE, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW OF PROP TO A THRUSTER COULD RESULT IN BURN-THROUGH.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-259
NASA FMEA #: 03-2A-202112-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 259
ITEM: RCS CROSSFEED VLV 1/2 OR 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE CROSSFEED VALVES. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS INCLUDE THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-260
NASA FMEA #: 03-2A-202111-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 260
ITEM: RCS CROSSFEED VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PPP CRIT ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-261
NASA FMEA #: 03-2A-202111-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 261
ITEM: RCS CROSSFEED VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[P]	[P]	[P]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-262
NASA FMEA #: 03-2A-202111-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 262
ITEM: RCS CROSSFEED VLV 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA ACCEPTS NASA/RI RATIONALE FOR 3/1R PPP CRIT ASSIGNMENT. HOWEVER, IOA MAINTAINS CONCERN REGARDING DETECTABILITY OF INTERNAL LEAKAGE DURING FLIGHT. IOA ACCEPTS SSM POSITION THAT A LEAKAGE LARGE ENOUGH TO CAUSE ANY PROBLEMS WOULD BE DETECTABLE. LEAKAGES TOO SMALL TO DETECT ARE OF NO CONSEQUENCE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-263
NASA FMEA #: 03-2A-202111-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 263
ITEM: RCS CROSSFEED VLV 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[P]	[P]	[P]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-264
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 264
ITEM: CROSSFEED LINES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER RESTRICTED FLOW IN A SEGMENT OF LINE DUE TO OBSTRUCTION OR DEFORMATION (CRIMPING). SUCH AN OCCURRENCE COULD RESULT IN 2/2, 1/1 ABORT EFFECTS, HOWEVER THE CREDIBILITY OF SUCH AN OCCURRENCE IS QUESTIONABLE. ANY CONTAMINATION WOULD FLOW TO DOWNSTREAM FILTER OR COMPONENT. IOA RECOMMENDS THAT SUCH A FAILURE BE ADDRESSED ON THE FMEA/CIL, BUT DOES NOT REGARD THIS RECOMMENDATION AS AN OPEN ISSUE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-265
NASA FMEA #: 03-2A-202108-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 265
ITEM: CROSSFEED LINES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT "FAILURE OF LINE BELLOWS TO DEFLECT" BE ADDED AS A CAUSE ON THIS FMEA/CIL. IOA CONSIDERS THIS TO BE A CREDIBLE FAILURE WHICH SHOULD BE ADDRESSED ON THE FMEA/CIL. THIS FMEA SHOULD INCLUDE VALVE BODIES IN THE ITEM LIST AND CORRESPONDING RETENTION RATIONALE. IOA ALSO RECOMMENDS THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-266
NASA FMEA #: 03-2A-202120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 266
ITEM: MANIFOLD 1, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-267
NASA FMEA #: 03-2A-202120-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 267
ITEM: MANIFOLD 1, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R PPP, 1/1 ABORT AND PLACED ON THE CIL. LOSS OF ALL THRUSTERS ON ONE MANIFOLD MAY RESULT IN THE INABILITY TO COMPLETE ADEQUATE OMS OR ARCS DUMPS DURING RTLS OR TAL, RESULTING IN POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS OR PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-268
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 268
ITEM: MANIFOLD 1, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS. THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-269
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 269
ITEM: MANIFOLD 1, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-270
NASA FMEA #: 03-2A-202120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 270
ITEM: MANIFOLD 2, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-271
NASA FMEA #: 03-2A-202120-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 271
ITEM: MANIFOLD 2, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R PPP, 1/1 ABORT AND PLACED ON THE CIL. LOSS OF ALL THRUSTERS ON ONE MANIFOLD MAY RESULT IN THE INABILITY TO COMPLETE ADEQUATE OMS OR ARCS DUMPS DURING RTLS OR TAL, RESULTING IN POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS OR PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-272
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 272
ITEM: MANIFOLD 2, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE. IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS. THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-273
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 273
ITEM: MANIFOLD 2, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-274
NASA FMEA #: 03-2A-202120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 274
ITEM: MANIFOLD 3, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-275
NASA FMEA #: 03-2A-202120-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 275
ITEM: MANIFOLD 3, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R PPP, 1/1 ABORT AND PLACED ON THE CIL. LOSS OF ALL THRUSTERS ON ONE MANIFOLD MAY RESULT IN THE INABILITY TO COMPLETE ADEQUATE OMS OR ARCS DUMPS DURING RTLS OR TAL, RESULTING IN POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS OR PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-276
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 276
ITEM: MANIFOLD 3, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-277
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 277
ITEM: MANIFOLD 3, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-278
NASA FMEA #: 03-2A-202120-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 278
ITEM: MANIFOLD 4, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-279
NASA FMEA #: 03-2A-202120-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 279
ITEM: MANIFOLD 4, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R PPP, 1/1 ABORT AND PLACED ON THE CIL. LOSS OF ALL THRUSTERS ON ONE MANIFOLD MAY RESULT IN THE INABILITY TO COMPLETE ADEQUATE OMS OR ARCS DUMPS DURING RTLS OR TAL, RESULTING IN POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS OR PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-280
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 280
ITEM: MANIFOLD 4, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-281
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 281
ITEM: MANIFOLD 4, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-282
NASA FMEA #: 03-2A-202140-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 282
ITEM: MANIFOLD 5, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR 3/1R PNP ASSIGNMENT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-283
NASA FMEA #: 03-2A-202140-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 283
ITEM: MANIFOLD 5, ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE "C" EFFECTS DISCUSS LOSS OF MISSION DUE TO HIGHER PROP CONSUMPTION WITH PRCS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-284
NASA FMEA #: 03-2A-201080-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 284
ITEM: MANIFOLD 5, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[F]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[F]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A AND B SCREENS. IOA RECOMMENDS THAT "POPPET FAILS OPEN" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS. THE SSM AGREED WITH THE IOA ISSUE.
IOA ALSO RECOMMENDS ADDING STATEMENTS TO THE EFFECTS REGARDING FIRE/EXPLOSION HAZARD AND HAZARD TO GROUND AND EVA CREWS.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-285
NASA FMEA #: 03-2A-201080-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 285
ITEM: MANIFOLD 5, GROUND PURGE/DRAIN COUPLING

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD INCLUDE "FAILS TO COUPLE" AND "RESTRICTED FLOW". IOA RECOMMENDS THAT "RESTRICTED FLOW" BE ADDED AS A FAILURE MODE ON THIS FMEA. THIS IS A CREDIBLE MODE AND IS ADDRESSED ON OTHER QD FMEAS.
THE SSM AGREED WITH THE IOA ISSUE.
THE QUANTITY ON THIS FMEA APPEARS TO BE INCORRECT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-286
NASA FMEA #: 03-2A-202112-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 286
ITEM: MANIFOLD ISOL VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA/CIL COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE PRIMARY MANIFOLD ISOLATION VALVES. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-286A
NASA FMEA #: 03-2A-202140-3

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 286
ITEM: MANIFOLD ISOL VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA/CIL COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE FOR THE VERNIER MANIFOLD ISOLATION VALVE. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS. NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-287
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 287
ITEM: MANIFOLD ISOL VLVS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2/2]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW OF PROP TO A THRUSTER COULD RESULT IN BURN-THROUGH. IOA RECOMMENDS THAT THE RESTRICTED FLOW FAILURE MODE BE ADDRESSED ON THE FMEA/CIL. THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2A-202120-3 (3/1R PPP) FOR PRIMARY MANIFOLD VALVES, AND TO 03-2A-202140-1 (2/2) FOR VERNIER MANIFOLD VALVES. HOWEVER, IOA RECOMMENDS A 3/1R PPP, 1/1 ABORT FOR 03-2A-202120-3.
SEE ASSESSMENT SHEETS RCS - 267, 271, 275, AND 279.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-288
NASA FMEA #: 03-2A-221308-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 288
ITEM: JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT "FAILURE OF BELLOWS TO DEFLECT" AND "ISOL VALVE RELIEF DEVICE FAILURE TO RELIEVE" BE ADDED AS CAUSES ON THIS FMEA WITH CORRESPONDING RETENTION RATIONALE.
IOA ALSO RECOMMENDS THAT THE EFFECTS INCLUDE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-289
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 289
ITEM: JET ALIGNMENT BELLOWS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[/]	[ ]	[ ]	[ ]	[ ]	*
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]	
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA NOW CONSIDERS THE CREDIBILITY OF RESTRICTED FLOW IN A BELLOWS TO BE QUESTIONABLE. IOA DOES NOT REGARD THE ABSENCE OF THIS FAILURE MODE IN THE FMEA/CIL TO BE AN OPEN ISSUE, BUT DOES RECOMMEND THAT THIS FAILURE MODE BE ADDRESSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-290
NASA FMEA #: 03-2A-221310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 290
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD NOT INCLUDE "FAILS ON". IOA RECOMMENDS THAT THE FAILED OPEN MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS 22206, ANY SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE IS A HAZARD TO EVA CREW, THE VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 3/1R FPP, 1/1 ABORT. SEE ASSESSMENT SHEETS RCS - 293, 295, AND 297.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-291
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 291
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-292
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 292
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW OF PROP COULD RESULT IN BURN-THROUGH. IOA RECOMMENDS THAT THE RESTRICTED FLOW FAILURE MODE BE ADDRESSED ON THE FMEA/CIL. THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDED TO 03-2A-221310-4 (3/1R FPP). HOWEVER, IOA RECOMMENDS A 3/1R FPP, 1/1 ABORT FOR 03-2A-221310-4. SEE ASSESSMENT SHEETS RCS - 293, 295, AND 297.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-293
NASA FMEA #: 03-2A-221310-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 293
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, +X AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A SCREEN. IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R FPP, 1/1 ABORT. THE LOSS OF ONE PRIMARY THRUSTER DURING AN RTLS OR TAL ABORT WOULD RESULT IN REDUCED OMS AND RCS PROP DUMPING CAPABILITY. INABILITY TO COMPLETE PLANNED OMS AND RCS DUMPS COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-294
NASA FMEA #: 03-2A-221310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 294
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, +X AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN THE LEAKAGE OF PROP. PER NSTS 22206, A SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE IS A HAZARD TO EVA CREW, THE VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 3/1R FPP, 1/1 ABORT. SEE ASSESSMENT SHEET RCS-293.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-295
NASA FMEA #: 03-2A-221310-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 295
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, Y AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A SCREEN. IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R FPP, 1/1 ABORT. THE LOSS OF ONE PRIMARY THRUSTER DURING AN RTLS OR TAL ABORT WOULD RESULT IN REDUCED OMS AND RCS PROP DUMPING CAPABILITY. INABILITY TO COMPLETE PLANNED OMS AND RCS DUMPS COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-296
NASA FMEA #: 03-2A-221310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 296
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, Y AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN THE LEAKAGE OF PROP. PER NSTS 22206, A SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE IS A HAZARD TO EVA CREW, THE VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 3/1R FPP, 1/1 ABORT. SEE ASSESSMENT SHEET RCS-295.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-297
NASA FMEA #: 03-2A-221310-4

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 297
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, Z AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA/RI RATIONALE FOR FAILURE OF A SCREEN. IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 3/1R FPP, 1/1 ABORT. THE LOSS OF ONE PRIMARY THRUSTER DURING AN RTLS OR TAL ABORT WOULD RESULT IN REDUCED OMS AND RCS PROP DUMPING CAPABILITY. INABILITY TO COMPLETE PLANNED OMS AND RCS DUMPS COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-298
NASA FMEA #: 03-2A-221310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 298
ITEM: THRUSTER BIPROP SOLENOID VLVS, PRIMARY, Z AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN THE LEAKAGE OF PROP. PER NSTS 22206, A SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE IS A HAZARD TO EVA CREW, THE VEHICLE, AND GROUND CREW.
FROM A LOSS OF THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 3/1R FPP, 1/1 ABORT. SEE ASSESSMENT SHEET RCS-297.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-299
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 299
ITEM: JET ALIGNMENT BELLOWS, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE ARE NO ALIGNMENT BELLOWS ON THE VERNIER THRUSTER PROP LINES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-300
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 300
ITEM: JET ALIGNMENT BELLOWS, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THERE ARE NO ALIGNMENT BELLOWS ON THE VERNIER THRUSTER PROP LINES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-301
NASA FMEA #: 03-2A-231310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 301
ITEM: THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA FAILURE MODES ON ANALYSIS SHEET SHOULD NOT INCLUDE "FAILS ON". IOA RECOMMENDS THAT THE FAILED OPEN FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS 22206, ANY SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1. PROP LEAKAGE IS A HAZARD TO EVA CREW, VEHICLE, AND GROUND CREW.
FROM A LOSS OF VERNIER THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 2/2, SINCE LOSS OF VERNIERS RESULTS IN PROBABLE LOSS OF MISSION. IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-302
NASA FMEA #: 03-2A-231310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 302
ITEM: THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-303
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 303
ITEM: THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-304
NASA FMEA #: 03-2A-231310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 304
ITEM: THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THE INTERNAL LEAKAGE FAILURE MODE BE UPGRADED TO A 1/1 BECAUSE IT RESULTS IN LEAKAGE OF PROP. PER NSTS 22206, ANY SINGLE FAILURE WHICH RESULTS IN PROP LEAKAGE SHOULD BE CLASSIFIED AS A 1/1.
PROP LEAKAGE IS A HAZARD TO EVA CREW, VEHICLE, AND GROUND CREW. FROM A LOSS OF VERNIER THRUSTER STANDPOINT, IOA CONSIDERS THIS FAILURE TO BE A 2/2, SINCE LOSS OF VERNIERS RESULTS IN PROBABLE LOSS OF MISSION. IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-305
NASA FMEA #: 03-2A-231310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 305
ITEM: THRUSTER BIPROP SOLENOID VLVS, VERNIERS, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA WITHDRAWS 1/1 CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW TO A THRUSTER COULD RESULT IN BURN-THROUGH. FROM A LOSS OF VERNIER THRUSTER STANDPOINT, IOA AGREES WITH THE NASA/RI 2/2 ASSIGNMENT.
IOA RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-306
NASA FMEA #: 03-2A-221312-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 306
ITEM: THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE FAILURE MODES ON THIS FMEA INCLUDE "STRUCTURAL FAILURE".

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-306A
NASA FMEA #: 03-2A-221313-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 306
ITEM: THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT FAILURE MODES ON THIS FMEA INCLUDE "STRUCTURAL FAILURE".

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-307
NASA FMEA #: 03-2A-231310-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 307
ITEM: THRUSTER COMBUSTION CHAMBER OR NOZZLE EXTENSION, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT FAILURE MODES ON THIS FMEA INCLUDE "STRUCTURAL FAILURE".
IOA ALSO RECOMMENDS THAT THE SUBASSEMBLY ITEMS INCLUDED ON THIS FMEA BE SEPARATED ONTO INDIVIDUAL FMEAS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10001X
NASA FMEA #: 03-2F-101060-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10001
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THE ADDITION OF A STATEMENT TO THE EFFECTS REGARDING POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS, AND POSSIBLE LEAKAGE OF PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10002X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10002
ITEM: HE ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[F]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[F]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA RECOMMENDS THAT THE RESTRICTED FLOW MODE BE ADDRESSED ON THE FMEA/CIL AS A 2/1R PFF. INABILITY TO REPRESS FRCS PROP TANK AND SUBSEQUENT INABILITY TO USE OR DEPLETE FRCS PROP COULD RESULT IN VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS. LOSS OF FLOW THROUGH ONE VALVE NOT DETECTABLE DURING DUAL LEG OPERATION. CONTAMINATION CAN EFFECT BOTH VALVES.
THE SSM AGREED THAT RESTRICTED FLOW SHOULD BE ADDED TO 03-2F-101020-4 (3/1R PPP). HOWEVER, IOA MAINTAINS 2/1R PFF POSITION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10003X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10003
ITEM: HE ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2F-101013-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10004X
NASA FMEA #: 03-2F-101030-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10004
ITEM: HE PRESS REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10005X
NASA FMEA #: 03-2F-101095-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10005
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI ORIGINALLY DID NOT COVER THIS FAILURE MODE (BLOCKAGE OF SINGLE INLET FILTER). HOWEVER, SSM ADDED A NEW FMEA/CIL (03-2F-101095-3, 2/1R PPP) FOR THIS FAILURE MODE AS A RESULT OF AN IOA ISSUE. IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 1/1. INABILITY TO REPRESS A FRCS PROP TANK AND SUBSEQUENT INABILITY TO USE OR DEPLETE FRCS PROP COULD RESULT IN VIOLATIONS OR ENTRY MASS PROPERTIES CONSTRAINTS AND LOSS OF LIFE OR VEHICLE DURING ENTRY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10006X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10006
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2F-101013-1) WITH CORRESPONDING RETENTION RATIONALE.
IOA ALSO RECOMMENDS THAT THE EFFECTS OF POSSIBLE PROP LEAKAGE BE INCLUDED ON THE FMEA (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10007X
NASA FMEA #: 03-2F-101060-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10007
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[NA]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING STATEMENTS TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS. DUE TO INABILITY TO DUMP FRCS PROP, AND THE EFFECTS OF POSSIBLE PROP LEAKAGE (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10008X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10008
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[NA]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[F]	[NA]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). THE SSM AGREED THAT RESTRICTED FLOW SHOULD BE ADDED TO THE FAILURE MODES ON 03-2F-101060-3 (3/1R FNP, BURST DISK FAILS TO RUPTURE).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10009X
NASA FMEA #: 03-2F-101060-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10009
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND ADDING STATEMENTS TO THE EFFECTS ABOUT POSSIBLE VIOLATION OF ENTRY MASS PROPERTIES CONSTRAINTS AND THE HAZARDS OF PROP LEAKAGE TO EVA CREW, VEHICLE, AND GROUND CREW.
NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10010X
NASA FMEA #: 03-2F-102120-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10010
ITEM: PROP TANK ISOL VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[NA]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R PNP AND PLACED ON THE CIL. THIS FAILURE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF DOWNSTREAM PROP LINES, AND IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) AND AS A FAILURE MODE ON 03-2A-202140-3. IOA NOW CLASSIFIES THIS FAILURE AS A 2/1R PNP SINCE A PREVIOUS FAILURE IS REQUIRED BEFORE THE VALVE WILL BE CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10011X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10011
ITEM: PROP TANK ISOL VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO ISSUE. NASA/RI DO NOT COVER THIS FAILURE MODE (FAILS MID-TRAVEL), HOWEVER THE WORST-CASE EFFECTS OF THIS FAILURE ARE COVERED BY THE FAILED CLOSED AND RESTRICTED FLOW FAILURE MODES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10012X
NASA FMEA #: 03-2F-102110-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10012
ITEM: MANIFOLD 1-4 ISOLATION VALVES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 1/1 AND PLACED ON THE CIL. THIS FAILURE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF DOWNSTREAM PROP LINES, AND IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2F-102108-1) AND AS A FAILURE MODE ON 03-2A-202140-3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10013X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10013
ITEM: MANIFOLD 1-4 ISOLATION VALVES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO ISSUE. NASA/RI DO NOT COVER THIS FAILURE MODE (FAILS MID-TRAVEL), HOWEVER THE WORST-CASE EFFECTS OF THIS FAILURE ARE COVERED BY THE FAILED CLOSED AND RESTRICTED FLOW FAILURE MODES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10014X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10014
ITEM: MANIFOLD 5 ISOLATION VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[NA]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RELIEF DEVICE FAILS TO RELIEVE). IOA RECOMMENDS THAT A 2/1R PNP CIL BE CREATED FOR THIS ITEM AND FAILURE MODE. THIS FAILURE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF DOWNSTREAM PROP LINES, AND IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA AND AS A FAILURE MODE ON 03-2A-202140-3.
IOA NOW CLASSIFIES THIS FAILURE AS A 2/1R PNP SINCE A PREVIOUS FAILURE IS REQUIRED BEFORE THE VALVE WOULD BE CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10015X
NASA FMEA #: 03-2F-121310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10015
ITEM: THRUSTER BIPROP SOLENOID VALVE, PRIMARY, +Z AXIS

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[F]	[P]	[P]	[X] *
IOA	[3 /2R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[F]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA CONSIDERS THRUSTERS IN THE SAME AXIS TO BE REDUNDANT TO EACH OTHER. IOA CONSIDERS THE LOSS OF ALL +Z THRUSTERS TO BE ONLY A 3/2R FPP. THE +Z THRUSTERS ARE NOT REQUIRED FOR ET SEP OR PROP DUMPING.
03-2F-121310-3 INCLUDES THRUSTERS IN ALL AXES, AND THE CRITICALITY ASSIGNED IS FOR THE WORST-CASE AXIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10016X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10016
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO HDW ISSUE. THIS FAILURE MODE (PREMATURE OPERATION, FAILS ON) COULD ONLY BE CAUSED BY AN EPDC (RJD) FAILURE. THE RJDS ARE ASSESSED BY IOA IN THE GNC SUBSYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10017X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10017
ITEM: THRUSTER BIPROP SOLENOID VALVE, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO HDW ISSUE. THIS FAILURE MODE (PREMATURE OPERATION, FAILS ON) COULD ONLY BE CAUSED BY AN EPDC (RJD) FAILURE. THE RJDS ARE ASSESSED BY IOA IN THE GNC SUBSYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10018X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10018
ITEM: THRUSTER INJECTOR HEAD ASSEMBLY, PRIMARY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS ITEM AND FAILURE MODE (RESTRICTED FLOW), HOWEVER, NOTE ON 03-2F-121312-1 SAYS THAT THE INJECTOR FMEA WAS DELETED AND ADDED AS A CAUSE ON 03-2F-121312-1.
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE ADDRESSED INDEPENDENTLY ON THE CIL WITH A 1/1 CRITICALITY. THE INJECTOR IS AT THE SAME LEVEL OF DETAIL WITH OTHER THRUSTER COMPONENTS COVERED ON INDIVIDUAL FMEAS, AND SHOULD ALSO RECEIVE 1/1 ATTENTION.
RESTRICTED FLOW OF THE INJECTOR COULD RESULT IN THRUSTER BURN-THROUGH.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10019X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10019
ITEM: THRUSTER INJECTOR HEAD ASSEMBLY, PRIMARY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS ITEM AND FAILURE MODE (STRUCTURAL FAILURE, BURN-THROUGH), HOWEVER, NOTE ON 03-2F-121312-1 SAYS THAT THE INJECTOR FMEA WAS DELETED AND ADDED AS A CAUSE ON 03-2F-121312-1.
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE ADDRESSED INDEPENDENTLY ON THE CIL WITH A 1/1 CRITICALITY. THE INJECTOR IS AT THE SAME LEVEL OF DETAIL WITH OTHER THRUSTER COMPONENTS COVERED ON INDIVIDUAL FMEAS, AND SHOULD ALSO RECEIVE 1/1 ATTENTION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10020X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10020
ITEM: HE ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[F]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[F]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). IOA RECOMMENDS THAT THE RESTRICTED FLOW MODE BE ADDRESSED ON THE FMEA/CIL AS A 2/1R PFF. INABILITY TO REPRESS ARCS PROP TANK AND INABILITY TO USE OR DEPLETE ARCS PROP COULD RESULT IN LOSS OF ENTRY CONTROL AND VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS. LOSS OF FLOW THROUGH ONE VALVE NOT DETECTABLE DURING DUAL LEG OPERATION, AND CONTAMINATION CAN AFFECT BOTH VALVES SIMULTANEOUSLY.
THE SSM AGREED THAT RESTRICTED FLOW MODE SHOULD BE ADDED TO 03-2A-201020-1 (2/1R PPP), HOWEVER IOA MAINTAINS 2/1R PFF POSITION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10021X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10021
ITEM: HE ISOL VLV

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2A-201013-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10022X
NASA FMEA #: 03-2A-201030-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10022
ITEM: HE PRESS REGULATOR ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTY CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10023X
NASA FMEA #: 03-2A-201095-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10023
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI ORIGINALLY DID NOT COVER THIS FAILURE MODE (BLOCKAGE OF SINGLE INLET FILTER), HOWEVER ADDED 03-2A-201095-3 PER IOA ISSUE. IOA RECOMMENDS ADDING A STATEMENT TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10024X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10024
ITEM: QUAD CHECK VALVE ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (STRUCTURAL FAILURE, RUPTURE, EXTERNAL LEAKAGE). THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE HELIUM LINE EXTERNAL LEAKAGE FMEA (03-2A-201013-1) WITH CORRESPONDING RETENTION RATIONALE.
IOA ALSO RECOMMENDS THAT THE EFFECTS OF POSSIBLE PROP LEAKAGE BE INCLUDED ON THE FMEA (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10025X
NASA FMEA #: 03-2A-201060-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10025
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[NA]	[P]	[X] *
IOA	[2 /1R]	[P]	[NA]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS ADDING STATEMENTS TO THE EFFECTS ABOUT POSSIBLE VIOLATIONS OF ORBITER ENTRY MASS PROPERTIES CONSTRAINTS AND PROP TANK LANDING WEIGHT CONSTRAINTS, AND THE EFFECTS OF POSSIBLE PROP LEAKAGE (CORROSION, FIRE, EXPLOSION, EXPOSURE OF EVA AND GROUND CREWS).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10026X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10026
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[NA]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[F]	[NA]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). THE SSM AGREED THAT RESTRICTED FLOW SHOULD BE ADDED TO THE FAILURE MODES ON 03-2A-201060-3 (3/1R FNP, BURST DISK FAILS TO RUPTURE).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10027X
NASA FMEA #: 03-2A-201060-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10027
ITEM: PRESSURE RELIEF ASSEMBLY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FMEA COVERS ONLY THE BELLOWS LEAKAGE FAILURE MODE. IOA HAS NO ISSUE WITH THIS FAILURE MODE, HOWEVER DOES RECOMMEND ADDING STATEMENTS TO THE EFFECTS ABOUT POSSIBLE VIOLATION OF ENTRY MASS PROPERTIES CONSTRAINTS AND THE HAZARDS OF PROP LEAKAGE TO EVA CREW, VEHICLE, AND GROUND CREW.
NASA/RI DO NOT COVER STRUCTURAL FAILURE, RUPTURE, OR EXTERNAL LEAKAGE OF THE VALVE HOUSING ON THIS FMEA OR ELSEWHERE. THE SSM AGREED THAT THIS VALVE BODY SHOULD BE ADDED TO THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) WITH CORRESPONDING RETENTION RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10028X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10028
ITEM: PROP TANK ISOL VLVS 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[F]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA NOW CLASSIFIES C SCREEN AS "PASS". NASA/RI DO NOT COVER THIS FAILURE MODE (RESTRICTED FLOW). THE SSM AGREED THAT THIS FAILURE MODE SHOULD BE ADDRESSED ON THE FMEA/CIL. IOA RECOMMENDS A 3/1R PFP FOR RESTRICTED FLOW OF THE PROP TANK ISOL 3/4/5 VALVES. RESTRICTED FLOW THROUGH ONE 3/4/5 VALVE WOULD NOT BE DETECTABLE DURING DUAL LEG OPERATION. IOA WITHDRAWS 2/1R CRIT, BUT MAINTAINS CONCERN THAT RESTRICTED FLOW OF PROP TO A THRUSTER COULD RESULT IN BURN-THROUGH.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10029X
NASA FMEA #: 03-2A-202110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10029
ITEM: PROP TANK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[NA]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS FAILURE MODE BE UPGRADED TO A 2/1R PNP FOR THE 1/2 VALVE AND PLACED ON THE CIL. THIS FAILURE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF THE DOWNSTREAM PROP LINES, AND IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) AND AS A FAILURE MODE ON 03-2A-202140-3.
IOA NOW CLASSIFIES THIS FAILURE AS A 2/1R PNP SINCE A PREVIOUS FAILURE IS REQUIRED BEFORE THE VALVE WILL BE CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10030X
NASA FMEA #: 03-2A-202110-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10030
ITEM: PROP TANK ISOL VLVS 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS FAILURE MODE BE UPGRADED TO A 3/1R PNP FOR THE 3/4/5 VALVE. THIS FAILURE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF THE DOWNSTREAM PROP LINES, AND IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) AND AS A FAILURE MODE ON 03-2A-202140-3. IOA NOW CLASSIFIES THIS FAILURE AS A 3/1R PNP SINCE A PREVIOUS FAILURE IS REQUIRED BEFORE THE VALVE WILL BE CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10031X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10031
ITEM: PROP TANK ISOL VLV 1/2

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO ISSUE. NASA/RI DO NOT COVER THIS FAILURE MODE (FAILS MID-TRAVEL), HOWEVER THE WORST-CASE EFFECTS OF THIS FAILURE ARE COVERED BY THE FAILED CLOSED AND RESTRICTED FLOW FAILURE MODES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10032X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10032
ITEM: PROP TANK ISOL VLVS 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO ISSUE. NASA/RI DO NOT COVER THIS FAILURE MODE (FAILS MID-TRAVEL), HOWEVER THE WORST-CASE EFFECTS OF THIS FAILURE ARE COVERED BY THE FAILED CLOSED AND RESTRICTED FLOW FAILURE MODES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10033X
NASA FMEA #: 03-2A-202111-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10033
ITEM: RCS CROSSFEED VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE (RELIEF DEVICE FAILS CLOSED) BE UPGRADED TO A 3/1R PNP. THE LOSS OF ALL REDUNDANCY (OMS & RCS CROSSFEED VALVE DEVICES) COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF CROSSFEED LINES.
THIS FAILURE IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) AND AS A FAILURE MODE ON 03-2A-202140-3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10034X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10034
ITEM: RCS CROSSFEED VLVS 1/2 & 3/4/5

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO ISSUE. NASA/RI DO NOT COVER THIS FAILURE MODE (FAILS MID-TRAVEL), HOWEVER THE WORST-CASE EFFECTS OF THIS FAILURE ARE COVERED BY THE FAILED CLOSED AND RESTRICTED FLOW FAILURE MODES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10035X
NASA FMEA #: 03-2A-202120-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10035
ITEM: MANIFOLD 1-4 ISOL VALVES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[NA]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE UPGRADED TO A 2/1R PNP AND PLACED ON THE CIL. THIS FAILURE COULD RESULT IN OVERPRESSURIZATION AND RUPTURE OF DOWNSTREAM PROP LINES, AND IS LISTED AS A CAUSE ON THE PROP LINE EXTERNAL LEAKAGE FMEA (03-2A-202108-1) AND AS A FAILURE MODE ON 03-2A-202140-3.
IOA NOW CLASSIFIES THIS FAILURE AS A 2/1R PNP SINCE A PREVIOUS FAILURE IS REQUIRED BEFORE THE VALVE WILL BE CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10036X
NASA FMEA #: 03-2A-202140-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10036
ITEM: VERNIER MANIFOLD ISOL VALVE

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[ ]	[ ]	[ ]	[X] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA RECOMMENDS THAT THE EFFECTS DISCUSS THE POSSIBLE EXPOSURE OF EVA AND GROUND CREWS TO PROP OR PROP VAPORS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10037X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10037
ITEM: MANIFOLD 1-4 ISOL VALVES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO ISSUE. NASA/RI DO NOT COVER THIS FAILURE MODE (FAILS MID-TRAVEL), HOWEVER THE WORST-CASE EFFECTS OF THIS FAILURE ARE COVERED BY THE FAILED CLOSED AND RESTRICTED FLOW FAILURE MODES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10038X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10038
ITEM: THRUSTER BIPROP SOLENOID VALVE, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO HDW ISSUE. THIS FAILURE MODE (PREMATURE OPERATION, FAILS ON) COULD ONLY BE CAUSED BY AN EPDC (RJD) FAILURE. THE RJDS ARE ASSESSED BY IOA IN THE GNC SUBSYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10039X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10039
ITEM: THRUSTER BIPROP SOLENOID VLV, VERNIER, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO HDW ISSUE. THIS FAILURE MODE (PREMATURE OPERATION, FAILS ON) COULD ONLY BE CAUSED BY AN EPDC (RJD) FAILURE. THE RJDS ARE ASSESSED BY IOA IN THE GNC SUBSYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10040X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10040
ITEM: THRUSTER INJECTOR HEAD ASSY, PRIMARY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS ITEM AND FAILURE (RESTRICTED FLOW). IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE ADDRESSED ON THE FMEA/CIL WITH A 1/1 CRITICALITY. THE INJECTOR IS AT THE SAME LEVEL OF DETAIL AS OTHER THRUSTER COMPONENTS WHICH ARE COVERED ON INDIVIDUAL FMEA, AND SHOULD ALSO RECEIVE 1/1 ATTENTION. RESTRICTED FLOW OF THE INJECTOR COULD RESULT IN THRUSTER BURN-THROUGH.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10041X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10041
ITEM: THRUSTER INJECTOR HEAD ASSY, PRIMARY

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS ITEM AND FAILURE (RESTRICTED FLOW). IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE ADDRESSED ON THE FMEA/CIL WITH A 1/1 CRITICALITY. THE INJECTOR IS AT THE SAME LEVEL OF DETAIL AS OTHER THRUSTER COMPONENTS WHICH ARE COVERED ON INDIVIDUAL FMEA, AND SHOULD ALSO RECEIVE 1/1 ATTENTION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10042X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 10042
ITEM: THRUSTER BIPROP SOLENOID VALVE, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (DELAYED OPERATION, ONE VALVE OPENS SLOWLY OR LATE). IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE ADDRESSED ON THE FMEA/CIL WITH A 1/1 CRIT. SUCH A FAILURE COULD RESULT IN ZOTS CAUSING THRUSTER RUPTURE AND LEAKAGE OF PROP.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10043X
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: ARCS
MDAC ID: 10043
ITEM: THRUSTER BIPROP SOLENOID VALVE, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DO NOT COVER THIS FAILURE MODE (DELAYED OPERATION, ONE VALVE OPENS SLOWLY OR LATE). IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE BE ADDRESSED ON THE FMEA/CIL WITH A 1/1 CRIT. SUCH A FAILURE COULD RESULT IN ZOTS CAUSING THRUSTER RUPTURE AND LEAKAGE OF PROP.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10116X
NASA FMEA #: 03-2F-121310-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 10116
ITEM: THRUSTER BIPROP SOLENOID VLV, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE (PREMATURE OPERATION DURING GROUND C/O TRICKLE CURRENT TEST) BE UPGRADED TO A 1/1 AND PLACED ON THE CIL. FIRING OF A THRUSTER ON THE GROUND COULD RESULT IN LOSS OF LIFE DUE TO EXPOSURE TO PROP, PROP VAPORS, OR THRUSTER PLUME.
THIS EPDC (RJD) FAILURE MAY BE COVERED IN THE GNC SUBSYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/01/88
ASSESSMENT ID: RCS-10138X
NASA FMEA #: 03-2A-221310-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: ARCS
MDAC ID: 10138
ITEM: THRUSTER BIPROP SOLENOID VALVE, PRIMARY, ALL AXES

LEAD ANALYST: C.D. PRUST

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[1 /1]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[1 /1]	[ ]	[ ]	[ ]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA RECOMMENDS THAT THIS ITEM AND FAILURE MODE (PREMATURE OPERATION DURING GROUND C/O TRICKLE CURRENT TEST) BE UPGRADED TO A 1/1 AND PLACED ON THE CIL. FIRING OF A THRUSTER ON THE GROUND COULD RESULT IN LOSS OF LIFE DUE TO EXPOSURE TO PROP, PROP VAPORS, OR THRUSTER PLUME.
THIS EPDC (RJD) FAILURE MAY BE COVERED IN THE GNC SUBSYSTEM.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-308
NASA FMEA #: 05-6KF-2176 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 308
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-309
NASA FMEA #: 05-6KF-2176 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 309
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-310
NASA FMEA #: 05-6KF-2176A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 310
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-311
NASA FMEA #: 05-6KF-2176A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 311
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-312
NASA FMEA #: 05-6KF-2176 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 312
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-313
NASA FMEA #: 05-6KF-2176 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 313
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-314
NASA FMEA #: 05-6KF-2176A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 314
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-315
NASA FMEA #: 05-6KF-2176A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 315
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-316
NASA FMEA #: 05-6KF-2251 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 316
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /1R]	[P]	[NA]	[P]	[ ]	*
IOA	[3 /1R]	[F]	[P]	[F]	[X]	
COMPARE	[/]	[N]	[N]	[N]	[N]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-317
NASA FMEA #: 05-6KF-2251 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 317
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[F]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-318
NASA FMEA #: 05-6KF-2251 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 318
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[F]	[X]
COMPARE	[/]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-319
NASA FMEA #: 05-6KF-2251 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 319
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[F]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-320
NASA FMEA #: 05-6KF-2252 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 320
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-321
NASA FMEA #: 05-6KF-2252 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 321
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[F]	[P]	[P]	[X]
COMPARE	[N /]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. DIODE FAILING SHORT ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-322
NASA FMEA #: 05-6KF-2252 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 322
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-323
NASA FMEA #: 05-6KF-2252 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 323
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[F]	[P]	[P]	[X]
COMPARE	[N /]	[N]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. DIODE FAILING SHORT ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-324
NASA FMEA #: 05-6KF-2267 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 324
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-325
NASA FMEA #: 05-6KF-2267 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 325
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-326
NASA FMEA #: 05-6KF-2267 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 326
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-327
NASA FMEA #: 05-6KF-2267 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 327
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-328
NASA FMEA #: 05-6KF-2202A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 328
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-329
NASA FMEA #: 05-6KF-2202A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 329
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-330
NASA FMEA #: 05-6KF-2202 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 330
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-331
NASA FMEA #: 05-6KF-2202 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 331
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-332
NASA FMEA #: 05-6KF-2202 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 332
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-333
NASA FMEA #: 05-6KF-2202 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 333
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-334
NASA FMEA #: 05-6KF-2201A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 334
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-335
NASA FMEA #: 05-6KF-2201A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 335
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-336
NASA FMEA #: 05-6KF-2201 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 336
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-337
NASA FMEA #: 05-6KF-2201 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 337
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[F]	[P]	[X]
COMPARE	[/]	[N]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-338
NASA FMEA #: 05-6KF-2202A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 338
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-339
NASA FMEA #: 05-6KF-2202A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 339
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

[/] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-340
NASA FMEA #: 05-6KF-2001 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 340
ITEM: FUSE, 1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[F]	[X]
COMPARE	[/]	[N]	[ ]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-341
NASA FMEA #: 05-6KF-2001 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 341
ITEM: FUSE, 1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-342
NASA FMEA #: 05-6KF-2076 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 342
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-343
NASA FMEA #: 05-6KF-2076 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 343
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-344
NASA FMEA #: 05-6KF-2076 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 344
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-345
NASA FMEA #: 05-6KF-2076 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 345
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-346
NASA FMEA #: 05-6KF-2076 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 346
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-347
NASA FMEA #: 05-6KF-2076 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 347
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-348
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 348
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-349
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 349
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-350
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 350
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-351
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 351
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-352
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 352
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-353
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 353
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-354
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 354
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-355
NASA FMEA #: 05-6KF-2077 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 355
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS A NOT CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-356
NASA FMEA #: 05-6KF-2078 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 356
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-357
NASA FMEA #: 05-6KF-2078 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 357
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

ISSUE RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-358
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 358
ITEM: HE OX & FU ISOL VLV A OR B SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[.]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-359
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 359
ITEM: HE OX & FU ISOL VLV A OR B SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-360
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 360
ITEM: HE OX & FU ISOL VLV A OR B SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-361
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 361
ITEM: HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 1, 2

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-362
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 362
ITEM: HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 1, 2

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-363
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 363
ITEM: HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS 3, 4

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-364
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 364
ITEM: HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS 3, 4

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-365
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 365
ITEM: HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS
5, 6

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-366
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 366
ITEM: HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 5, 6

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-367
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 367
ITEM: HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 7, 8

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-368
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 368
ITEM: HE OX & FU ISOL VLV A OR B SWITCH OPEN CONTACTS 7, 8

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-369
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 369
ITEM: HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS
9, 10

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-370
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 370
ITEM: HE OX & FU ISOL VLV A OR B SWITCH GPC CONTACTS
9, 10

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-371
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 371
ITEM: HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-372
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 372
ITEM: HE OX & FU ISOL VLV A OR B SWITCH CLOSE CONTACTS 11, 12

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
HELIUM OXIDIZER AND FUEL ISOLATION VALVE A & B SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11080X-11084X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-373
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 373
ITEM: HE TK PRESS-2 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-374
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 374
ITEM: HE TK PRESS-2 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-375
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 375
ITEM: HE FU TK PRESS-1 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-376
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 376
ITEM: HE FU TK PRESS-1 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-377
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 377
ITEM: HE OX TK PRESS-1 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-378
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 378
ITEM: HE OX TK PRESS-1 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-379
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 379
ITEM: HE OX TK PRESS-2 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-380
NASA FMEA #: 03-2F-103350 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 380
ITEM: HE OX TK PRESS-2 PRESS SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-381
NASA FMEA #: 03-2F-103360 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 381
ITEM: HE OX TK TEMP-1 TEMP SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-382
NASA FMEA #: 03-2F-103360 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 382
ITEM: HE OX TK TEMP-1 TEMP SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-383
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 383
ITEM: HE OX TK TEMP-1 TEMP SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
REDUNDANT TO FRCS 381.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-384
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 384
ITEM: HE OX TK TEMP-1 TEMP SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
REDUNDANT TO FRCS 382.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-385
NASA FMEA #: 03-2F-103360 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 385
ITEM: HE FU TK TEMP-1 TEMP SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-386
NASA FMEA #: 03-2F-103360 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 386
ITEM: HE FU TK TEMP-1 TEMP SENSOR

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-387
NASA FMEA #: 05-6KF-2151 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 387
ITEM: HE OX & FU ISOL VLV A OR B SWITCH TALKBACK

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-388
NASA FMEA #: 05-6KF-2253 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 388
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-389
NASA FMEA #: 05-6KF-2253 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 389
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-390
NASA FMEA #: 05-6KF-2253C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 390
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-391
NASA FMEA #: 05-6KF-2253C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 391
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-392
NASA FMEA #: 05-6KF-2253C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 392
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-393
NASA FMEA #: 05-6KF-2253C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 393
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-394
NASA FMEA #: 05-6KF-2253F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 394
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-395
NASA FMEA #: 05-6KF-2253F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 395
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[F]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-396
NASA FMEA #: 05-6KF-2253D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 396
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-397
NASA FMEA #: 05-6KF-2253D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 397
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-398
NASA FMEA #: 05-6KF-2253B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 398
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO OPEN THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT THE 1/20/88 MEETING WITH THE SUBSYSTEM MANAGER.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-399
NASA FMEA #: 05-6KF-2253B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 399
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-400
NASA FMEA #: 05-6KF-2253B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 400
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO OPEN THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT THE 1/20/88 MEETING WITH THE SUBSYSTEM MANAGER.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-401
NASA FMEA #: 05-6KF-2253B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 401
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-402
NASA FMEA #: 05-6KF-2253A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 402
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO CLOSE VALVE WITH GPC. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A THRUSTER LEAK BECAUSE TIME TO TAKE EFFECT CAN BE UP TO 24 HOURS. SOFTWARE HAS TO BE MANUALLY LOADED. IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-403
NASA FMEA #: 05-6KF-2253A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 403
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-404
NASA FMEA #: 05-6KF-2253A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 404
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO CLOSE VALVE WITH GPC. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A THRUSTER LEAK BECAUSE TIME TO TAKE EFFECT CAN BE UP TO 24 HOURS. SOFTWARE HAS TO BE MANUALLY LOADED. IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-405
NASA FMEA #: 05-6KF-2253A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 405
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-406
NASA FMEA #: 05-6KF-2253 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 406
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-407
NASA FMEA #: 05-6KF-2253 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 407
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-408
NASA FMEA #: 05-6KF-2253E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 408
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-409
NASA FMEA #: 05-6KF-2253E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 409
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-410
NASA FMEA #: 05-6KF-2253 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 410
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-411
NASA FMEA #: 05-6KF-2253 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 411
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-412
NASA FMEA #: 05-6KF-2253F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 412
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-413
NASA FMEA #: 05-6KF-2253F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 413
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[F]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-414
NASA FMEA #: 05-6KF-2253D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 414
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-415
NASA FMEA #: 05-6KF-2253D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 415
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-416
NASA FMEA #: 05-6KF-2253D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 416
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-417
NASA FMEA #: 05-6KF-2253D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 417
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-418
NASA FMEA #: 05-6KF-2253E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 418
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-419
NASA FMEA #: 05-6KF-2253E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 419
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-420
NASA FMEA #: 05-6KF-2253 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 420
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-421
NASA FMEA #: 05-6KF-2253 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 421
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-422
NASA FMEA #: 05-6KF-2253A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 422
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO CLOSE VALVE WITH GPC. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A THRUSTER LEAK BECAUSE TIME TO TAKE EFFECT CAN BE UP TO 24 HOURS. SOFTWARE HAS TO BE MANUALLY LOADED. IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-423
NASA FMEA #: 05-6KF-2253A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 423
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-424
NASA FMEA #: 05-6KF-2254 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 424
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-425
NASA FMEA #: 05-6KF-2254 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 425
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-426
NASA FMEA #: 05-6KF-2254C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 426
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-427
NASA FMEA #: 05-6KF-2254C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 427
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-428
NASA FMEA #: 05-6KF-2254C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 428
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/]	[N]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-429
NASA FMEA #: 05-6KF-2254C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 429
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-430
NASA FMEA #: 05-6KF-2254F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 430
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-431
NASA FMEA #: 05-6KF-2254F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 431
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[F]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-432
NASA FMEA #: 05-6KF-2254D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 432
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-433
NASA FMEA #: 05-6KF-2254D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 433
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-434
NASA FMEA #: 05-6KF-2254B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 434
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO OPEN THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:	1/29/88	NASA DATA:	
ASSESSMENT ID:	FRCS-435	BASELINE	[ ]
NASA FMEA #:	05-6KF-2254B-2	NEW	[X]

SUBSYSTEM: FRCS
MDAC ID: 435
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-436
NASA FMEA #: 05-6KF-2254B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 436
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[ ]
COMPARE	[/N]	[N]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO OPEN THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-437
NASA FMEA #: 05-6KF-2254B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 437
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-438
NASA FMEA #: 05-6KF-2254A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 438
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO CLOSE THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE THE INABILITY TO ISOLATE A LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A THRUSTER LEAK BECAUSE TIME TO EFFECT IS UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-439
NASA FMEA #: 05-6KF-2254A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 439
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-440
NASA FMEA #: 05-6KF-2254A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 440
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO CLOSE THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE THE INABILITY TO ISOLATE A LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A THRUSTER LEAK BECAUSE TIME TO EFFECT IS UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-441
NASA FMEA #: 05-6KF-2254A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 441
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-442
NASA FMEA #: 05-6KF-2254 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 442
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-443
NASA FMEA #: 05-6KF-2254 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 443
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-444
NASA FMEA #: 05-6KF-2254E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 444
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-445
NASA FMEA #: 05-6KF-2254E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 445
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-446
NASA FMEA #: 05-6KF-2254 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 446
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-447
NASA FMEA #: 05-6KF-2254 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 447
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-448
NASA FMEA #: 05-6KF-2254F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 448
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-449
NASA FMEA #: 05-6KF-2254F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 449
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[F]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-450
NASA FMEA #: 05-6KF-2254D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 450
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-451
NASA FMEA #: 05-6KF-2254D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 451
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-452
NASA FMEA #: 05-6KF-2254D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 452
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-453
NASA FMEA #: 05-6KF-2254D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 453
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-454
NASA FMEA #: 05-6KF-2254E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 454
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-455
NASA FMEA #: 05-6KF-2254E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 455
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-456
NASA FMEA #: 05-6KF-2254 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 456
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-457
NASA FMEA #: 05-6KF-2254A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 457
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-458
NASA FMEA #: 05-6KF-2254A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 458
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE GPC COMMAND TO CLOSE THE VALVE. MANUAL COMMANDING STILL AVAILABLE. LOSS OF ALL REDUNDANCY MAY CAUSE THE INABILITY TO ISOLATE A LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A THRUSTER LEAK BECAUSE TIME TO EFFECT IS UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-459
NASA FMEA #: 05-6KF-2254 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 459
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-460
NASA FMEA #: 05-6KF-2206 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 460
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-461
NASA FMEA #: 05-6KF-2206 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 461
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-462
NASA FMEA #: 05-6KF-2206 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 462
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-463
NASA FMEA #: 05-6KF-2206 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 463
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-464
NASA FMEA #: 05-6KF-2207 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 464
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-465
NASA FMEA #: 05-6KF-2207 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 465
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-466
NASA FMEA #: 05-6KF-2207 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 466
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-467
NASA FMEA #: 05-6KF-2207 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 467
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-468
NASA FMEA #: 05-6KF-2003 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 468
ITEM: FUSE, 1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-469
NASA FMEA #: 05-6KF-2003 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 469
ITEM: FUSE, 1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-470
NASA FMEA #: 05-6KF-2004 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 470
ITEM: FUSE, 1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-471
NASA FMEA #: 05-6KF-2004 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 471
ITEM: FUSE, 1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-472
NASA FMEA #: 05-6KF-2126 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 472
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
WITH THE LOSS OF THIS RELAY, VALVE CANNOT BE OPENED. INABILITY TO OPEN VALVE PREVENTS OPERATION OF JETS REQUIRED FOR TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO IOA HARDWARE CRITICALITY FOR THE TANK ISOLATION VALVE 1/2 FAILED CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-473
NASA FMEA #: 05-6KF-2126 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 473
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-474
NASA FMEA #: 05-6KF-2126A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 474
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-475
NASA FMEA #: 05-6KF-2126A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 475
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-476
NASA FMEA #: 05-6KF-2126A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 476
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-477
NASA FMEA #: 05-6KF-2126A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 477
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE CAUSES INABILITY TO OPEN THE VALVE. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-478
NASA FMEA #: 05-6KF-2126 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 478
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
WITH THE LOSS OF THIS RELAY, VALVE CANNOT BE OPENED. INABILITY TO OPEN VALVE PREVENTS OPERATION OF JETS REQUIRED FOR TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO IOA HARDWARE CRITICALITY FOR THE TANK ISOLATION VALVE 1/2 FAILED CLOSED.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-479
NASA FMEA #: 05-6KF-2126 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 479
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-480
NASA FMEA #: 05-6KF-2126A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 480
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-481
NASA FMEA #: 05-6KF-2126A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 481
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-482
NASA FMEA #: 05-6KF-2126A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 482
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-483
NASA FMEA #: 05-6KF-2126A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 483
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE CAUSES INABILITY TO OPEN THE VALVE. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-484
NASA FMEA #: 05-6KF-2127A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 484
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
WITH THE LOSS OF THIS RELAY, VALVE CANNOT BE OPENED. INABILITY TO OPEN VALVE PREVENTS OPERATION OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET LANDING CG LIMITS. ALSO THEIR IS NO REDUNDANCY FOR MANIFOLD 5 (VERNIERS - 2/2).

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED TANK ISOLATION VALVE 3/4/5. THE VERNIER ISSUE (2/2) REMAINS OPEN AS WELL.

ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-485
NASA FMEA #: 05-6KF-2127A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 485
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-486
NASA FMEA #: 05-6KF-2127 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 486
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-487
NASA FMEA #: 05-6KF-2127 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 487
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-488
NASA FMEA #: 05-6KF-2127 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 488
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-489
NASA FMEA #: 05-6KF-2127 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 489
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE CAUSES INABILITY TO OPEN THE VALVE. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-490
NASA FMEA #: 05-6KF-2127A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 490
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
WITH THE LOSS OF THIS RELAY, VALVE CANNOT BE OPENED. INABILITY TO OPEN VALVE PREVENTS OPERATION OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET LANDING CG LIMITS. ALSO THEIR IS NO REDUNDANCY FOR MANIFOLD 5 (VERNIERS - 2/2).

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED TANK ISOLATION VALVE 3/4/5. THE VERNIER ISSUE (2/2) REMAINS OPEN AS WELL.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-491
NASA FMEA #: 05-6KF-2127A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 491
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-492
NASA FMEA #: 05-6KF-2127 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 492
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-493
NASA FMEA #: 05-6KF-2127 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 493
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-494
NASA FMEA #: 05-6KF-2127 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 494
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-495
NASA FMEA #: 05-6KF-2127 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 495
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE CAUSES INABILITY TO OPEN THE VALVE. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-496
NASA FMEA #: 05-6KF-2083 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 496
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY TO MONITOR VALVE POSITION MAY LEAD TO FALSELY FAILING THE VALVE CLOSED.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-497
NASA FMEA #: 05-6KF-2083 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 497
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-498
NASA FMEA #: 05-6KF-2083 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 498
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY TO MONITOR VALVE POSITION MAY LEAD TO FALSELY FAILING THE VALVE CLOSED.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-499
NASA FMEA #: 05-6KF-2083 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 499
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-500
NASA FMEA #: 05-6KF-2083 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 500
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY TO MONITOR VALVE POSITION MAY LEAD TO FALSELY FAILING THE VALVE CLOSED.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-501
NASA FMEA #: 05-6KF-2083 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 501
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-502
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 502
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-503
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 503
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-504
NASA FMEA #: 05-6KF-2082 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 504
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-505
NASA FMEA #: 05-6KF-2082 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 505
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-506
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 506
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-507
NASA FMEA #: 05-6KF-2082 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 507
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-508
NASA FMEA #: 05-6KF-2082 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 508
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-509
NASA FMEA #: 05-6KF-2082 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 509
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-510
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 510
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-511
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 511
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-512
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 512
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-513
NASA FMEA #: 05-6KF-2081 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 513
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-514
NASA FMEA #: 05-6KF-2084 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 514
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY TO MONITOR VALVE POSITION MAY LEAD TO FALSELY FAILING THE VALVE CLOSED.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-515
NASA FMEA #: 05-6KF-2084 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 515
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-516
NASA FMEA #: 05-6KF-2084 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 516
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY TO MONITOR VALVE POSITION MAY LEAD TO FALSELY FAILING THE VALVE CLOSED.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-517
NASA FMEA #: 05-6KF-2084 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 517
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-518
NASA FMEA #: 05-6KF-2084 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 518
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF ALL REDUNDANCY TO MONITOR VALVE POSITION MAY LEAD TO FALSELY FAILING THE VALVE CLOSED.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-519
NASA FMEA #: 05-6KF-2084 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 519
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-520
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 520
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-521
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 521
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-522
NASA FMEA #: 05-6KF-2085 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 522
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-523
NASA FMEA #: 05-6KF-2085 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 523
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-524
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 524
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-525
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 525
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-526
NASA FMEA #: 05-6KF-2085 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 526
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-527
NASA FMEA #: 05-6KF-2085 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 527
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-528
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 528
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-529
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 529
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-530
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 530
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-531
NASA FMEA #: 05-6KF-2086 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 531
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-532
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 532
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-533
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 533
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-534
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 534
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-535
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 535
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-536
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 536
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 1, 2

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-537
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 537
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 3, 4

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-538
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 538
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 3, 4

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-539
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 539
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-540
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 540
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 5, 6

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-541
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 541
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 7, 8

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-542
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 542
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH OPEN CONTACTS 7, 8

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-543
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 543
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 9, 10

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-544
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 544
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH GPC CONTACTS 9, 10

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-545
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 545
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-546
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 546
ITEM: OX & FU TK ISOL VLV 1/2 SWITCH CLOSE CONTACTS 11, 12

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 1/2 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11085X-11089X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-547
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 547
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-548
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 548
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-549
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 549
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-550
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 550
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH OPEN CONTACTS
1, 2

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-551
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 551
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH OPEN CONTACTS 1, 2

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-552
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 552
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH GPC CONTACTS 3, 4

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-553
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 553
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH GPC CONTACTS 3, 4

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-554
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 554
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH CLOSE CONTACTS 5, 6

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-555
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 555
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH CLOSE CONTACTS
5, 6

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-556
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 556
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH OPEN CONTACTS 7, 8

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-557
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 557
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH OPEN CONTACTS
7, 8

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-558
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 558
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH GPC CONTACTS 9, 10

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-559
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 559
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH GPC CONTACTS 9, 10

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-560
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 560
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-561
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 561
ITEM: OX & FU TK ISOL VLV 3/4/5 SWITCH CLOSE CONTACTS 11, 12

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
OXIDIZER AND FUEL TANK ISOLATION VALVE 3/4/5 SWITCH RE-ANALYZED BY IOA. SEE ASSESSMENT IDs FRCS 11090X-11094X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-562
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 562
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE TO CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-563
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 563
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE TO CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-564
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 564
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE TO CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-565
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 565
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE TO CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-566
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 566
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE TO CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-567
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 567
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE TO CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-568
NASA FMEA #: 05-6KF-2255F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 568
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-569
NASA FMEA #: 05-6KF-2255F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 569
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-570
NASA FMEA #: 05-6KF-2255C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 570
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-571
NASA FMEA #: 05-6KF-2255C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 571
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-572
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 572
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-573
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 573
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-574
NASA FMEA #: 05-6KF-2255B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 574
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS DIODE FAILED OPEN CAUSES INABILITY TO OPEN THE VALVE WITH THE GPC. MANUAL REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-575
NASA FMEA #: 05-6KF-2255B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 575
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-576
NASA FMEA #: 05-6KF-2255E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 576
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-577
NASA FMEA #: 05-6KF-2255E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 577
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-578
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 578
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-579
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 579
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-580
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 580
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-581
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 581
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-582
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 582
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-583
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 583
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-584
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 584
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-585
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 585
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-586
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 586
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-587
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 587
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-588
NASA FMEA #: 05-6KF-2255D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 588
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-589
NASA FMEA #: 05-6KF-2255D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 589
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /1R]	[F]	[P]	[P]	[X]	
COMPARE	[/N]	[N]	[N]	[N]	[N]	

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-590
NASA FMEA #: 05-6KF-2255F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 590
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-591
NASA FMEA #: 05-6KF-2255F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 591
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-592
NASA FMEA #: 05-6KF-2255C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 592
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-593
NASA FMEA #: 05-6KF-2255C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 593
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-594
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 594
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-595
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 595
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-596
NASA FMEA #: 05-6KF-2255B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 596
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS DIODE FAILED OPEN CAUSES INABILITY TO OPEN THE VALVE WITH THE GPC. MANUAL REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-597
NASA FMEA #: 05-6KF-2255B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 597
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-598
NASA FMEA #: 05-6KF-2255E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 598
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-599
NASA FMEA #: 05-6KF-2255E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 599
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-600
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 600
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:	1/29/88	NASA DATA:	
ASSESSMENT ID:	FRCS-601	BASELINE	[ ]
NASA FMEA #:	05-6KF-2255 -2	NEW	[X]

SUBSYSTEM: FRCS
MDAC ID: 601
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-602
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 602
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-603
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 603
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-604
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 604
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-605
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 605
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-606
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 606
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-607
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 607
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-608
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 608
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-609
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 609
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-610
NASA FMEA #: 05-6KF-2255D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 610
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /1R]	[P]	[P]	[P]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/N]	[N]	[N]	[N]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-611
NASA FMEA #: 05-6KF-2255D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 611
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-612
NASA FMEA #: 05-6KF-2255F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 612
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-613
NASA FMEA #: 05-6KF-2255F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 613
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-614
NASA FMEA #: 05-6KF-2255C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 614
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-615
NASA FMEA #: 05-6KF-2255C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 615
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-616
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 616
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-617
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 617
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-618
NASA FMEA #: 05-6KF-2255B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 618
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS DIODE FAILED OPEN CAUSES INABILITY TO OPEN THE VALVE WITH THE GPC. MANUAL REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-619
NASA FMEA #: 05-6KF-2255B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 619
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-620
NASA FMEA #: 05-6KF-2255E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 620
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-621
NASA FMEA #: 05-6KF-2255E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 621
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-622
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 622
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-623
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 623
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-624
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 624
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-625
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 625
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-626
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 626
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-627
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 627
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-628
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 628
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-629
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 629
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-630
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 630
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-631
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 631
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-632
NASA FMEA #: 05-6KF-2255D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 632
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-633
NASA FMEA #: 05-6KF-2255D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 633
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-634
NASA FMEA #: 05-6KF-2255F-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 634
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /1R]	[P]	[F]	[P]	[X]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/N]	[N]	[N]	[N]	[N]	

RECOMMENDATIONS: (If different from NASA)

[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)	

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-635
NASA FMEA #: 05-6KF-2255F-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 635
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-636
NASA FMEA #: 05-6KF-2255C-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 636
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-637
NASA FMEA #: 05-6KF-2255C-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 637
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-638
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 638
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-639
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 639
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-640
NASA FMEA #: 05-6KF-2255B-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 640
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[NA]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS DIODE FAILED OPEN CAUSES INABILITY TO OPEN THE VALVE WITH THE GPC. MANUAL REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY CAUSES LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE NOT RESOLVED AT THE MEETING WITH THE SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-641
NASA FMEA #: 05-6KF-2255B-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 641
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-642
NASA FMEA #: 05-6KF-2255E-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 642
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-643
NASA FMEA #: 05-6KF-2255E-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 643
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. THIS FAILED SHORT DIODE CAUSES EXCESSIVE MOTOR OPERATION (CONTINUOUS POWER THAT OPENS THE VALVE SLIGHTLY THEN CLOSES IT, CONSTANTLY REPEATING ITSELF). MOTOR DAMAGE WOULD LIKELY CAUSE THE VALVE TO CLOSE, CAUSING LOSS OF JETS ON ASSOCIATED MANIFOLD. REDUNDANCY PROVIDED BY JETS ON ANOTHER MANIFOLD. LOSS OF REDUNDANCY CAUSES THE INABILITY TO EXPEL PROPELLANTS TO MEET CG CONSTRAINTS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-644
NASA FMEA #: 05-6KF-2255 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 644
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /3]	[ ]	[ ]	[ ]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONTAINS MULTIPLE FAILURES. THIS FAILURE ALONE HAS NO EFFECT.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-645
NASA FMEA #: 05-6KF-2255 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 645
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-646
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 646
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:	1/29/88	NASA DATA:	
ASSESSMENT ID:	FRCS-647	BASELINE	[ ]
NASA FMEA #:	05-6KF-2268 -2	NEW	[X]

SUBSYSTEM: FRCS
MDAC ID: 647
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-648
NASA FMEA #: 05-6KF-2268 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 648
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-649
NASA FMEA #: 05-6KF-2268 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 649
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-650
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 650
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-651
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 651
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-652
NASA FMEA #: 05-6KF-2255A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 652
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE 1 OF 2 GPC COMMANDS TO CLOSE THE VALVE. REDUNDANCY PROVIDED BY SECOND GPC COMMAND AND MANUAL CLOSE COMMAND. LOSS OF THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY, MAY PREVENT ISOLATION OF A THRUSTER LEAK.

SUBSYSTEM MANAGER STATED THAT THE GPC IS NOT USED TO ISOLATE A LEAK BECAUSE THE TIME TO EFFECT CAN BE UP TO 24 HOURS (SOFTWARE HAS TO BE MANUALLY LOADED). IOA WITHDRAWS THEIR ISSUE BASED ON THIS RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-653
NASA FMEA #: 05-6KF-2255A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 653
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-654
NASA FMEA #: 05-6KF-2255D-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 654
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-655
NASA FMEA #: 05-6KF-2255D-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 655
ITEM: DIODE

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[F]	[P]	[P]	[X]
COMPARE	[/N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-656
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 656
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-657
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 657
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-658
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 658
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-659
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 659
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-660
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 660
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-661
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 661
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[F]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[&a4680H]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-662
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 662
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-663
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 663
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[F]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-664
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 664
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-665
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 665
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[/]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-666
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 666
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-667
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
667 MDAC ID:
ITEM: DIODE

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-668
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 668
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-669
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 669
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-670
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 670
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[2 /1R]	[P]	[F]	[P]	[X]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[N /N]	[N]	[N]	[N]	[N]	

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-671
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 671
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-672
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 672
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-673
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 673
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-674
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 674
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-675
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 675
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-676
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 676
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-677
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 677
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-678
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 678
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-679
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 679
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-680
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 680
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-681
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 681
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-682
NASA FMEA #: 05-6KF-2208 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 682
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, IF DRIVER FAILS OPEN, LOSE CAPABILITY TO MONITOR VALVE STATUS WITH THE SWITCH TALKBACK. MDM DISCRETES PROVIDE REDUNDANCY. LOSS OF THIS REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-683
NASA FMEA #: 05-6KF-2208 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 683
ITEM: DRIVER, HYBRID

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-684
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 684
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-685
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 685
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-686
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 686
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-687
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 687
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-688
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 688
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-689
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 689
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-690
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 690
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[/]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-691
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 691
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-692
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 692
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-693
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 693
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /2]	[ ]	[ ]	[ ]	[X]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-694
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 694
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-695
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 695
ITEM: DRIVER, HYBRID

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-696
NASA FMEA #: 05-6KF-2005 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 696
ITEM: FUSE,1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-697
NASA FMEA #: 05-6KF-2005 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 697
ITEM: FUSE,1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-698
NASA FMEA #: 05-6KF-2005 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 698
ITEM: FUSE,1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-699
NASA FMEA #: 05-6KF-2005 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 699
ITEM: FUSE,1A

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-700
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 700
ITEM: FUSE,1A

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: FRCS-701
NASA FMEA #:

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: FRCS
MDAC ID: 701
ITEM: FUSE,1A

LEAD ANALYST:

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FORWARD MANIFOLD ISOLATION VALVE #5 RE-ANALYZED BY IOA DUE TO CHANGE IN CIRCUITRY. SEE ASSESSMENT IDs FRCS 11001X-11079X.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-702
NASA FMEA #: 05-6KF-2128A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 702
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /1R]	[P]	[P]	[P]	[ ]	*
IOA	[2 /1R]	[P]	[P]	[P]	[X]	
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]	

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS, COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-703
NASA FMEA #: 05-6KF-2128A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 703
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, RELAY FAILING HIGH CREATES INABILITY TO CLOSE THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-704
NASA FMEA #: 05-6KF-2128 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 704
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-705
NASA FMEA #: 05-6KF-2128 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 705
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. LOSE CAPABILITY TO OPEN THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DSCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-706
NASA FMEA #: 05-6KF-2128A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 706
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS, COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-707
NASA FMEA #: 05-6KF-2128A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 707
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, RELAY FAILING HIGH CREATES INABILITY TO CLOSE THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-708
NASA FMEA #: 05-6KF-2128 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 708
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-709
NASA FMEA #: 05-6KF-2128 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 709
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. LOSE CAPABILITY TO OPEN THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-710
NASA FMEA #: 05-6KF-2128A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 710
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS, COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-711
NASA FMEA #: 05-6KF-2128A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 711
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, RELAY FAILING HIGH CREATES INABILITY TO CLOSE THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-712
NASA FMEA #: 05-6KF-2128 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 712
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-713
NASA FMEA #: 05-6KF-2128 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 713
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. LOSE CAPABILITY TO OPEN THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-714
NASA FMEA #: 05-6KF-2128A-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 714
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
LOSE CAPABILITY TO OPEN ISOLATION VALVE. THIS, COUPLED WITH THE LOSS OF HARDWARE REDUNDANCY MAY CAUSE INABILITY TO EXPEL PROPELLANTS TO MEET CG LIMITS.

ISSUE IS TIED TO THE IOA HARDWARE CRITICALITY FOR THE FAILED CLOSED MANIFOLD 1-4 ISOLATION VALVE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-715
NASA FMEA #: 05-6KF-2128A-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 715
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[F]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, RELAY FAILING HIGH CREATES INABILITY TO CLOSE THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY PREVENTS ISOLATION OF A THRUSTER LEAK.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-716
NASA FMEA #: 05-6KF-2128 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 716
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA AGREES WITH NASA FMEA.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-717
NASA FMEA #: 05-6KF-2128 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 717
ITEM: RELAY

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[2 /1R]	[P]	[P]	[P]	[A] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. LOSE CAPABILITY TO OPEN THE VALVE. THIS, COUPLED WITH THE LOSS OF ALL HARDWARE REDUNDANCY MAY CAUSE LOSS OF JETS REQUIRED TO EXPEL PROPELLANTS TO MEET CG LIMITS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-718
NASA FMEA #: 05-6KF-2089 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 718
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF CAPABILITY TO MONITOR VALVE STATUS MAY LEAD TO FALSELY FAILING THE VALVE CLOSED POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-719
NASA FMEA #: 05-6KF-2089 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 719
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-720
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 720
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ]	*
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-721
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 721
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-722
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 722
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-723
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 723
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-724
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 724
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-725
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 725
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-726
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 726
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-727
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 727
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-728
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 728
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-729
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 729
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-730
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 730
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-731
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 731
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-732
NASA FMEA #: 05-6KF-2089 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 732
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA FMEA CONSIDERS MULTIPLE FAILURES. HOWEVER, LOSS OF CAPABILITY TO MONITOR VALVE STATUS MAY LEAD TO FALSELY FAILING THE VALVE CLOSED POSSIBLY EFFECTING MISSION OPERATIONS.

AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88, NSTS 22206 WAS DISCUSSED. IT WAS AGREED UPON THAT THE ISSUE RAISED ABOVE WAS DUE TO DIFFERENT INTERPRETATIONS OF NSTS 22206. THEREFORE, THE ISSUE REMAINS OPEN.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-733
NASA FMEA #: 05-6KF-2089 -2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 733
ITEM: RESISTOR, 1.2K 2W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-734
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 734
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

C-10

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-735
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 735
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-736
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 736
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-737
NASA FMEA #: 05-6KF-2087 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 737
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-738
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 738
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-739
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 739
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-740
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 740
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[3 /2R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MAY CAUSE LOSS OF ACCURATE INDICATION OF THE VALVE POSITION. REDUNDANCY PROVIDED. LOSS OF ALL REDUNDANCY MAY LEAD TO FALSELY FAILING THE VALVE CLOSED, POSSIBLY EFFECTING MISSION OPERATIONS.

ISSUE NOT RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 1/29/88
ASSESSMENT ID: FRCS-741
NASA FMEA #: 05-6KF-2088 -1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: FRCS
MDAC ID: 741
ITEM: RESISTOR, 5.1K 1/4W

LEAD ANALYST: D. HARTMAN

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[ ]	[ ]	[ ]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
A SHORT ACROSS A RLR TYPE RESISTOR IS NOT A CREDIBLE FAILURE. IOA RECOMMENDS REMOVAL OF THE "SHORT" FAILURE MODE FROM THIS FMEA.

ISSUE RESOLVED AT MEETING WITH SUBSYSTEM MANAGER ON 1/20/88 (SHORT FAILURE MODE TO BE REMOVED).