INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT
OF THE
LANDING/DECELERATION
SUBSYSTEM

18 MARCH 1988

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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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INDEPENDENT ORBITER ASSESSMENT
ASSESSMENT OF THE LANDING/DECELERATION (LDG/DEC)
SUBSYSTEM FMEA/CIL

18 MARCH 1988

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Independent Orbiter Assessment Assessment of the Landing/Deceleration FMEA/CIL

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 Landing / Deceleration (LDG/DEC) hardware, 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 NASA FMEA/CIL baseline with proposed Post 51-L updates included. A resolution of each discrepancy from the comparison is provided through additional analysis as required. This report documents the results of that comparison for the Orbiter LDG/DEC hardware.

The IOA product for the LDG/DEC analysis consisted of 259 failure mode "worksheets" that resulted in 124 potential critical items being identified. Comparison was made to the NASA baseline (as of 19 November 1986) which consisted of 267 FMEA's and 120 CIL items. The comparison determined if there were any results which had been found by the IOA but were not in the NASA baseline. This comparison produced agreement on all but 75 FMEA's which caused differences in 51 CIL items. Figure 1 presents a comparison of the proposed Post 51-L NASA baseline, with the IOA recommended baseline, and any issues.

The issues arose due to differences between the NASA and IOA FMEA/CIL preparation instructions. NASA had used an older ground rules document which has since been superseded by the NSTS 22206 used by the IOA. After comparison, there were no discrepancies found that were not already identified by NASA, and the remaining issues may be attributed to differences in ground rules.

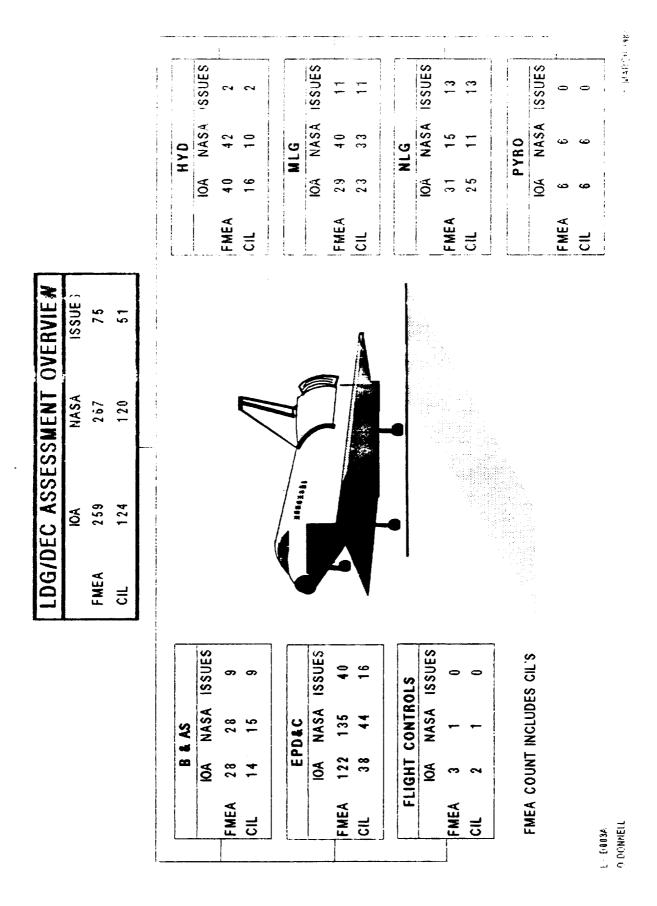


Figure 1 - LDG/DEC FMEA/CIL ASSESSMENT

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 re-evaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the proposed Post 51-L Orbiter FMEA/CIL 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, 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 breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the proposed Post 51-L NASA and Prime Contractor FMEA/CIL. 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 FMEA/CIL 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

Ground Rules and Assumptions 2.4

The ground rules and assumptions used in the IOA are defined in Appendix B. The subsystem specific ground rules were defined to limit the analysis to single-failed parts for each failure.

3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The Landing / Deceleration Subsystem consists of the hardware required to perform landing and rollout to a safe stop (Figure 2). In addition, the landing / deceleration system performs the function of transporting the Orbiter during the landing phase and towing during post mission operations. The Landing / Deceleration

Subsystem consists of the following components:

- 1. The Nose Landing Gear Shock Strut Assembly (NGSSA.) is the assembly that supports the nose of the Orbiter during landing and ground handling operations. The NGSSA consists of the Shock Strut, Axle, Steering / Damping Actuator, Torque Arms, Drag Brace, Lock Brace, and attaching hardware (Figures 3 & 4).
- 2. The Nose Landing Gear Doors and Uplock / Release Mechanisms (Figures 3 & 4) consists of the following components that function when the landing gear deploy switch is activated:
 - o Extend / Retract Hydraulic Strut Actuator
 - o Door Extend Retract Mechanism
 - o Door Over-Center Bungee
 - o Gear Uplock Hook
 - o Door Hooks
 - o Door Hook Actuation Linkage
 - o NLG Uplock Release Hydraulic Actuator
 - o Backup Pyro Uplock Release Actuator
 - o NLG Extension Booster Pyro Actuator
 - o Door Bungee Assist Assembly
- 3. The data for the Nose Landing Gear Wheels and Tires are not currently available for use in the evaluation of the wheels or the tires. B. F. Goodrich drawings were requested through NASA, Rockwell International Downey Operations, and through B. F. Goodrich in Troy, Ohio. Some analysis has been performed using the Rockwell Procurement Specifications which were available through NASA.
- 4. The two Main Landing Gear Shock Strut Assemblies (MGSSA) support the aft portion of the Orbiter during landing and ground handling activities. The MGSSA consists of the Shock Strut, Axle, Torque Arms, Drag Brace, Lock Brace, and attaching hardware (Figures 5 & 6).

- 5. The Main Landing Gear Doors and Uplock Mechanisms (Figures 5 & 6) consists of the following components that function when the landing gear deploy switch is activated:
 - o Extend / Retract Hydraulic Strut Actuator
 - o Door Extend Retract Mechanism
 - o Door Over-Center Bungee
 - o Gear Uplock Hook
 - o Door Hooks
 - o Door Hook Actuation Linkage
 - o MLG Uplock Release Hydraulic Actuator
 - o Backup Pyro Uplock Release Actuator
 - o Door Bungee Assist Mechanism
- 6. The data for the Main Landing Gear Wheels and Tires are not currently available for use in the evaluation of the wheels or the tires. B. F. Goodrich drawings were requested through NASA, Rockwell International Downey Operations, and through B. F. Goodrich in Troy, Ohio. Some analysis has been performed using the Rockwell Procurement Specifications which were available through NASA.
- The data for the Brake and Anti-Skid Controls are limited and the assessment was performed using the data available in the Space Shuttle Systems Handbook, the Shuttle Flight Operations Manual - Volume 10D, the Rockwell Procurement Specification, Brake / Skid Control Subsystem, Wheel Brakes - Main Landing Gear, Orbiter, and the NASA Training Document on Landing / Deceleration systems, LNDG/DECEL 2102. Data were requested on the Mark III Skid Control System, but we were informed that the data were proprietary and that the data would not be made available for the assessment. Current data were requested through NASA and Rockwell International - Downey Operations. The Brake and Anti-Skid Controls consist of the Rudder / Brake Pedal Assembly and the Brake / Skid Control System as identified in Figure 7.
- 8. The data for the Brake System are not currently available for use in the evaluation of the system.

 B. F. Goodrich drawings were requested through NASA, Rockwell International Downey Operations, and through B. F. Goodrich in Troy, Ohio. Some analysis has been performed using the Rockwell Procurement Specifications which were available through NASA. Some data were found on the Orbiter braking system through Lockheed, in Clear Lake through the notes from the AD HOC COMMITTEE ORBITER BRAKING SYSTEM ASSESSMENT documents. The brake system consists of four electrohydraulic disc braking systems. Each assembly has nine discs: four rotors and five stators. The rotors are

splined to the inside of the wheel and they rotate with the wheel. The stators are splined to the outside of the axle assembly and they do not rotate. When the brakes are applied, eight hydraulic actuators in the brake assembly press the discs together, thus provid ing the braking torque. The hydraulic brake actuators are distributed evenly around the discs. four of the actuators are manifolded into a brake chamber and are powered by a single hydraulic system. The remaining four are manifolded into a second braking chamber and are powered by a different hydraulic system.

- 9. The Rudder / Brake Pedal Assembly is the mechanical assembly that allows the crew to make manual inputs into the Landing / Deceleration Subsystems. The R/BPA converts the manual inputs into electrical data that is transmitted to the flight control systems, the brake controls and the nose wheel steering. Each rudder / brake pedal assembly contains two brake pedal transducer units called the Rudder Pedal Transducer Assemblies (RPTA). Each unit has four Linear Variable Differential Transducers (LVDT) which output 0-5 VDC brake signals to the brake / skid control boxes A and B. Each of the transducer units output four separate braking signals for the respective left / right brake control for the associated braking system.
- 10. The Electrical Power Distribution and Control (EPD&C) consists of two subsystems within the Landing / Deceleration Subsystem: Landing Gear Control and Brake and Antiskid. The Landing Gear Control system provides power to the Nose and Main Landing Gear Doors and Uplock Release Mechanisms on the orbiter (Figure 8). The Brake and Antiskid subsystem transfers brake and skid control power to the Brake/Skid Control Boxes A and B (Figure 7). Power is also provided to the hydraulic brake-line heater coils for orbiter hydraulic fluid heating. EPD&C powers the electronics for sensing and monitoring the discrete position of moving parts and assemblies within the Landing / Deceleration subsystem.
- 11. The responsibility for the Nose Wheel Steering system has been assigned to the NWS Group. The FMEA's for the NWS were originally included in the Landing / Deceleration Subsystem. The mechanical linkage portions of the NWS are still included in the Landing / Deceleration IOA reports as a portion of the Nose Landing Gear reports.

12. The Hydraulics Actuators on the Landing / Deceleration Subsystem consists of six actuators. Three actuators activate the mechanism to release the uplock mechanism to deploy the landing gear mechanisms, and three actuators perform the task of extending or retracting the landing gear. Landing gear retraction can only be performed while the vehicle is being supported by Ground Support Equipment (GSE), a landing gear retraction cannot be supported on orbit. These actuators are actually components of the subsystems listed in sections 2 and 5 of this paragraph. However, for this report they are broken out separately for the purpose of clarity.

3.2 Interfaces and Locations

The Landing / Deceleration hardware consists of six major subcomponents located in the Orbiter's cabin area and on the under carriage of the Orbiter. The interfaces for the subsystem are relatively simple in that there is a limited number of interfaces with the other subsystems on the Orbiter. The interfaces with the other subsystems are basically limited to interfaces with the Data Processing System (DPS) for backup flight control purposes (NWS) and for instrumentation on the Landing / Deceleration hardware, and the Hydraulics System (HYD) for hydraulics system pressure for the subsystem actuators and for the brakes. The remainder of the subsystem is capable of direct control, via wire, from the control device to the subsystem hardware.

3.3 Hierarchy

Figure 2 illustrates the hierarchy of the Landing / Deceleration Subsystem hardware and the corresponding subcomponents. Figures 3 through 8 comprise the detailed system representations.

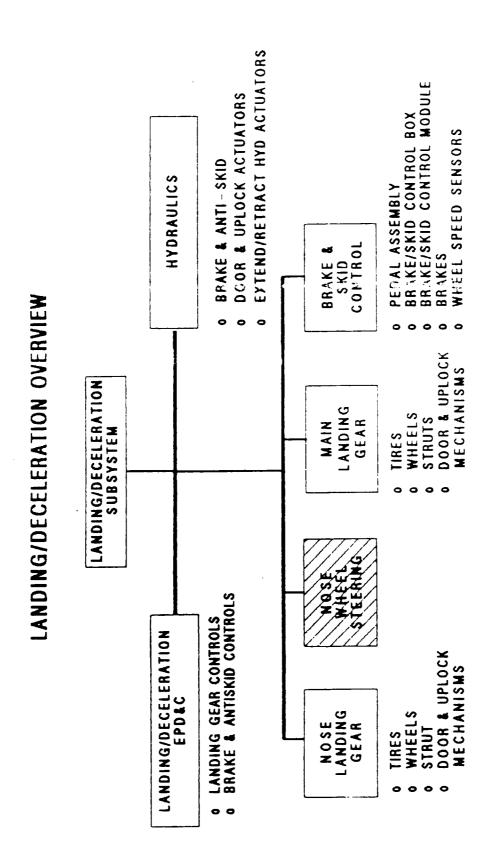




Figure 2 - LDG/DEC SUBSYSTEM OVERVIEW

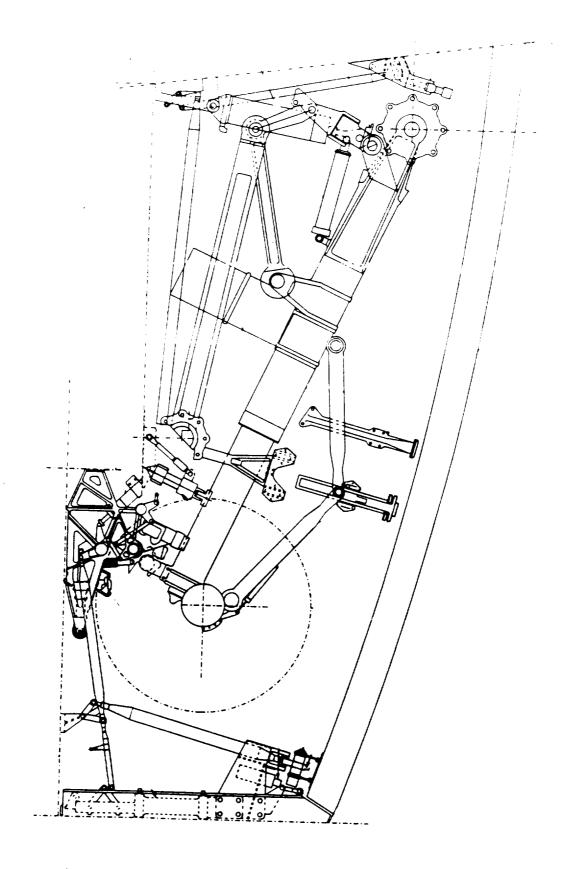


Figure 3 - NOSE LANDING GEAR - STOWED POSITION

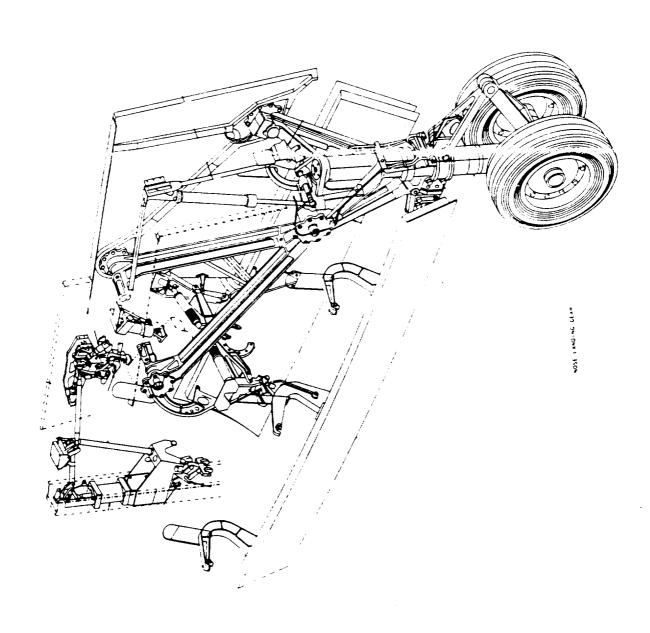


Figure 4 - NOSE LANDING GEAR - EXTENDED POSITION

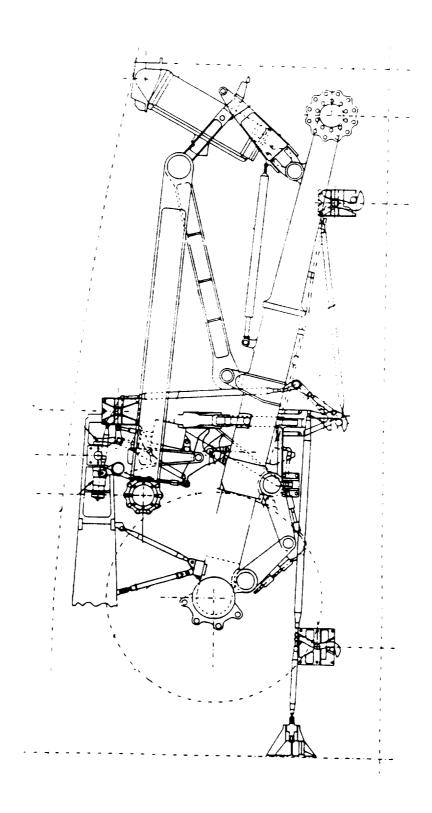


Figure 5 - MAIN LANDING GEAR - STOWED POSITION

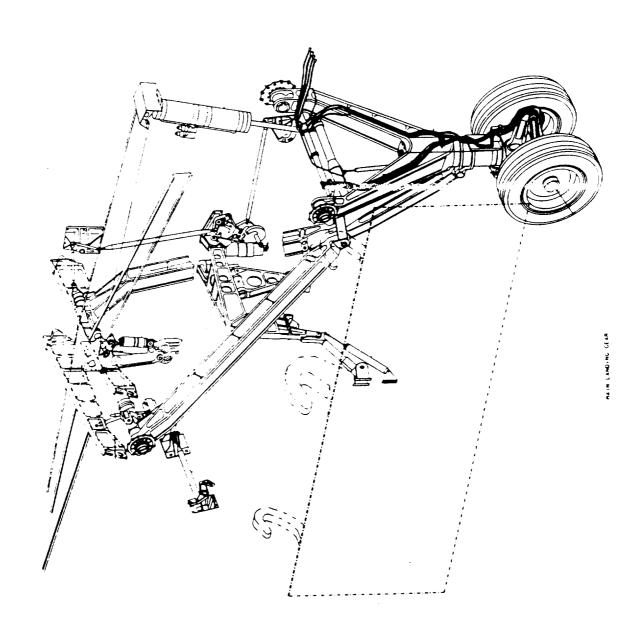


Figure 6 - MAIN LANDING GEAR - EXTENDED POSITION

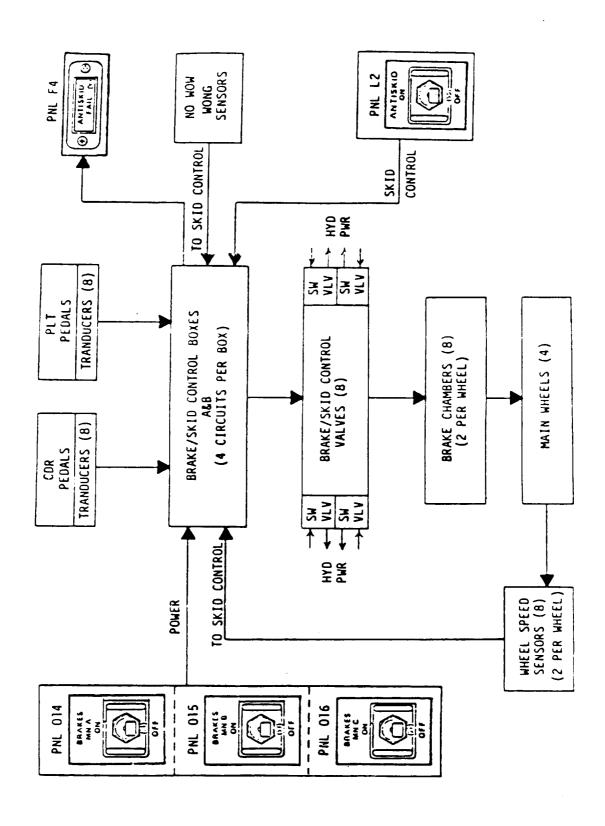


Figure 7 - BRAKE / SKID CONTROL SYSTEM OVERVIEW

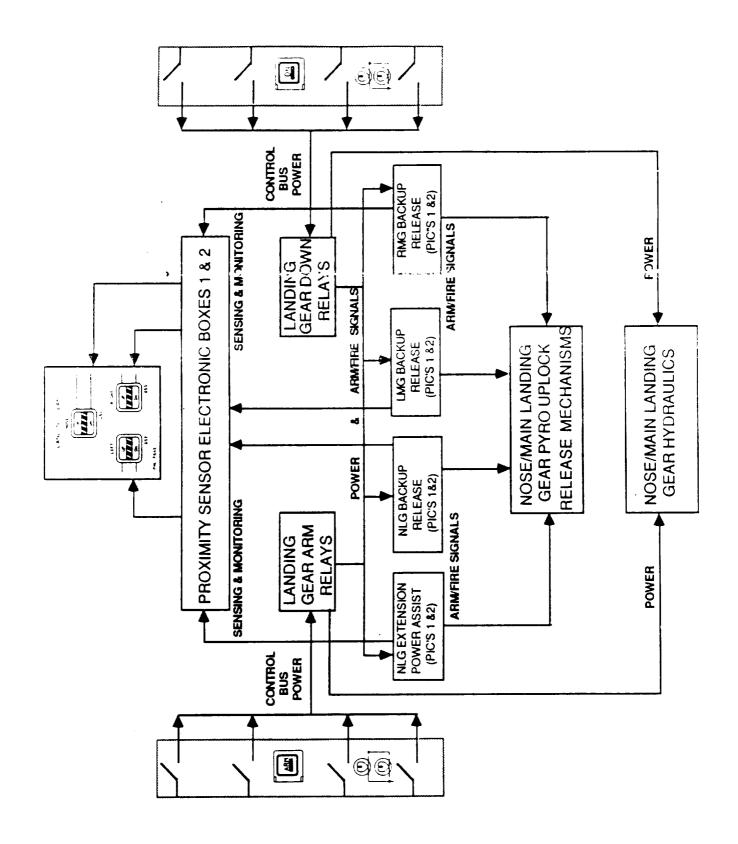


Figure 8 - LANDING GEAR CONTROL SYSTEM OVERVIEW

4.0 ASSESSMENT RESULTS

The IOA analysis of the Landing / Deceleration hardware initially generated 256 failure mode worksheets and identified 124 Potential Critical Items (PCIs) before starting the assessment The IOA supported the first NASA sponsored Landing / Deceleration hardware working group meeting on 20-24 January During the meeting a great deal of work was done to support the development of the OMRSD data and to support the tracking of the OMRSD data with the FMEA/CIL data. minutes and reports were requested during the meeting, but no minutes or reports were received by the IOA for an analysis. During May 1987, the IOA personnel went directly to the Subsystem Manager, and subsequently to his supervisor in order to have data released. Rough data was obtained and the data that the IOA personnel received was stamped as preliminary data and verbal instructions were given that the data not be used for a comparison of FMEA/CIL documentation. Additional attempts to obtain hardware data were unsuccessful, success was achieved in obtaining preliminary EPD&C in October 1987. The hardware portion of the NASA analysis was not completed until January 1988, there was insufficient time available to perform an analysis and prepare a comparison of the results.

In the analysis report, the Landing / Deceleration Subsystem was divided into six separate functional areas according to hardware and function. Difficulty was encountered in the hardware analysis due to the large amounts of proprietary data or unobtainable data on the brakes and skid control hardware, the tires and wheels, and many of the mechanisms of the landing gear and the hydraulics systems. The initial NASA document, STS 82-0013, consisted of five separate functional areas which included one hundred eighteen (118) FMEA/CIL's. After the initial definition of the subsystem the thirty two (32) NWS FMEA's were removed and a separate group was initiated to prepare the analysis for that subsystem. A decision was made to include the EPD&C data for the subsystem and one hundred twenty two (122) Electrical FMEA's were added to the subsystem. In November 1986 forty four (44) Hydraulics FMEA's were added to the subsystem. After the initial IOA Analasys was completed in January 1987, a decision was made to remove the pyrotechnic devices from the subsystem, which removed six FMEA's from the NLG and MLG subsystems. The seven areas of the Landing / Deceleration analysis that have been encompassed in this report and there status are as follows:

BRAKES AND ANTI-SKID (B&AS)

Forty two (42) FMEA's on the Brakes and Anti-Skid were included in the original data package. The study of the Anti-Skid system was accomplished utilizing data that was available through NASA. Difficulty was encountered in the preparation of the data on the actual brake hardware and the wheels and tires, for there was no data available through NASA to study or review, a large amount of the data involved

is proprietary. Data on the brakes and tires is controlled by B.F. Goodrich, and the data on the antiskid subsystem is maintained by Crane Industries. An analysis on the Brakes, Wheels and Tires was not fully accomplished due to the lack of data available.

ELECTRICAL POWER DISTRIBUTION AND CONTROL (EPD&C)

EPD&C provides power to the Landing Gear Control Subsystem, Brake and Anti-Skid subsystem, and to the sensing and monitoring functions within the Landing / Deceleration Subsystem. The IOA Analysis generated 114 assessment worksheets associated with credible failure modes and defined criticality. Of the identified failure modes eleven (11) are criticality 2/1R, forty-six (46) are criticality 3/1R, and fifty seven (57) are criticality 3/3. Thirty one (31) failure modes are identified as PCI's. These PCI's are listed in Appendix D. The assessment between the IOA EPD&C worksheets and NASA Post 51-L FMEA/CIL (PRCB Review Presentation 1/25/88) Produced forty (40) issues. recommends downgrading the criticality of nine (9) FMEA's, three (3) of which will be removed from the CIL. IOA recommends that fifteen (15) of the NASA baseline FMEA's be deleted because they represent non-credible failure modes for those particular components. These deletions would remove seven (7) items from the CIL. IOA recommends changes in the redundancy screens for six (6) NASA FMEA's. Resulting in two new additional CIL's. IOA also recommends the addition of fifteen (15) FMEA's to the NASA baseline for failure modes not present in the NASA baseline. One (1) of the additions will require a new CIL. IOA generated one (1) new analysis sheet to correspond to a NASA baseline FMEA not covered in the original IOA analysis. The IOA analysis agreed with the NASA failure mode and criticality evaluation.

FLIGHT CONTROLS

Originally, only one (1) FMEA was written on the flight controls and that was written against the Pedal Assembly.

HYDRAULICS (HYD)

Originally, no Hydraulics FMEAs were included in the Landing / Deceleration subsystem. Forty-four (44) FMEA's from the Hydraulics system were added to the subsystem in order to conform with the NASA configuration. The information about the addition of the Hydraulics data was transmitted to the IOA Subsystem manager in late November 1986 just prior to the initial submission of the data to the IOA Data Management Group. The Landing / Deceleration subsystem assumed responsibility for the actuators and the hydraulic

lines from the point where the hydraulic lines entered the landing gear compartment.

MAIN LANDING GEAR (MLG)

Twenty five (25) FMEA's were written against the MLG. Two (2) Pyrotechnic FMEA's were removed from this system after the IOA analysis was completed, these analysis have remained in this report.

NOSE LANDING GEAR (NLG)

Nineteen (19) FMEA's were written against the NLG. Four (4) Pyrotechnic FMEA's were removed from this system after the IOA analysis was completed, these analysis have remained in this report.

NOSE WHEEL STEERING (NWS)

Thirty two (32) FMEA's on the NWS were originally included in the Landing / Deceleration subsystem, these FMEA's were transfered to the NWS analysis group in order to align with the NASA configuration.

The following Pyrotechnic (PYRO) data was covered by the initial Independent Orbiter Assessment, and the data has been included in the initial assessment report. The data is not covered in the NASA Landing / Deceleration report.

FMEA NUMBER	IOA ASSESSMENT NUMBER
02-1-015-1	11102
02-1-015-2	11101
02-1-097-1	21101
02-1-097-2	21102
02-1-104-1	11202
02-1-104-2	11201

The data required to perform an analysis was not available for the following FMEA's, so no analysis was performed rather than preparing data with no documentation to support a position.

```
FMEA NUMBER
              CLAMP FLEX LINE BRAKES
02-1-011-1
              DISPLACEMENT LIMITER
02-1-031-1
              THERMAL RELIEF PLUG MLG
02-1-056-1
              WHEEL BRAKE ASSEMBLY
02-1-066-1
02-1-067-1
              WHEEL TIE BOLTS, MLG
              WHEEL ASSEMBLY, MLG
02-1-068-1
              WHEEL ASSEMBLY, MLG
02-1-068-2
              WHEEL ASSEMBLY, MLG
02-1-068-3
              WHEEL ASSEMBLY OVERINFLATION PLUG MLG
02-1-069-1
               WHEEL TIE BOLTS - NLG
02-1-070-1
              WHEEL - NLG
02-1-071-1
              WHEEL - NLG
02-1-071-2
               NLG THERMAL RELIEF PLUG
02-1-105-1
02-1-110-2
              NLG TIRES
```

The following Nose Wheel Steering (NWS) data were removed from the Landing / Deceleration Subsystem responsibility in order to align with the activities at NASA. A separate IOA team evaluated the NWS data.

02-1-086-1 02-1-091-1 02-1-086-2 02-1-091-2 02-1-087-1 02-1-092-1 02-1-087-2 02-1-092-2 02-1-088-1 02-1-093-1 02-1-089-1 02-1-094-1 02-1-089-3 02-1-095-1 02-1-090-1 02-1-096-1	02-1-100-2 CIL ONLY 02-1-101-1 CIL ONLY 02-1-101-2 CIL ONLY 02-1-106-2 CIL ONLY 02-1-SPA-1 02-1-SPA-2 02-1-SPT-1 02-1-SPT-2
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------

The IOA analysis of the LDG/DEC hardware generated 259 failure mode worksheets and identified 124 Potential Critical Items (PCI's). These analysis results were compared to the proposed NASA Post 51-L baseline of 267 FMEA's including 120 CIL items, which were generated using the NSTS 22206 FMEA/CIL instructions. Upon completion of the assessment, there were 75 issues with 51 pertaining to CIL items.

A summary of the quantity of NASA FMEAs assessed, versus the recommended IOA baseline, and any issues identified is presented in Table I.

Table I SUMMARY OF IOA FMEA ASSESSMENT						
Component	NASA	IOA	Issues			
B&AS EPD&C Flight Controls HYD MLG NLG PYRO	28 135 1 42 40 15 6	28 122 3 40 29 31 6	9 40 - 2 11 13			
TOTAL	267	259	75			

FMEA count inlcudes CIL's

A summary of the quantity of NASA CIL items assessed, versus the recommended IOA baseline, and any issues identified is presented in Table II.

Table II SUMMARY OF IOA CIL ASSESSMENT							
Component	NASA	IOA	Issues				
B&AS EPD&C Flight Controls HYD MLG NLG PYRO	15 44 1 10 33 11 6	14 38 2 16 23 25 6	9 16 - 2 11 13				
TOTAL	120	124	51				

Appendix C presents the detailed assessment worksheets for each failure mode identified and assessed. Appendix D highlights the NASA Critical Items 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-VA86001-25, Analysis of the Landing/Deceleration Subsystem (19 January 1987). Appendix F provides a cross reference between the NASA FMEA and corresponding IOA worksheet(s). IOA recommendations are also summarized.

Table III presents a summary of the IOA recommended failure criticalities for the Post 51-L FMEA baseline. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

Table III SUMMARY OF IOA RECOMMENDED FAILURE CRITICALITIES							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
B&AS EPD&C Flight Cntrls HYD MLG NLG PYRO	5 - 2 6 22 23 6	7 11 - 10 - -	- - - - -	9 52 - 1 2 -	-	7 59 1 24 6 6	28 122 3 40 29 31 6
TOTAL	64	28	-	64	- 	103	259

FMEA count includes CIL's

Of the failure modes analyzed, 124 were determined to be critical items. A summary of the IOA recommended critical items is presented in Table IV.

Table IV SUMMARY OF IOA RECOMMENDED FAILURE CRITICALITIES							
Criticality:	1/1	·2/1R	2/2	3/1R	3/2R	3/3	TOTAL
B&AS EPD&C Flight Cntrls HYD MLG NLG PYRO	5 - 2 6 22 23 6	7 11 - 10 - -	- - - - -	2 27 - 1 2	- - - - -	-	14 38 2 16 23 25 6
TOTAL	64	28	+ - +	32	-	- -	124

The scheme for assigning IOA assessment (Appendix C) and analysis (Appendix E) worksheet numbers is shown in Table V.

Table V IOA WORKSHEET NUMBERS					
Component	IOA ID Number				
B&AS EPD&C Flight Controls HYD MLG NLG PYRO	LDGDEC - 30000 LDGDEC - 31000 LDGDEC - 30000 LDGDEC - 10000, 11000, 20000, 21000 LDGDEC - 20000, 21000 LDGDEC - 10000, 11000 LDGDEC - 11000, 21000				

5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

- 1. AD HOC COMMITTEE ORBITER BRAKING SYSTEM ASSESSMENT Volume I, Data Book, January 1984.
- 2. AD HOC COMMITTEE ORBITER BRAKING SYSTEM ASSESSMENT Volume II, Assessment, March 1984.
- 3. AD HOC COMMITTEE ORBITER BRAKING SYSTEM ASSESSMENT Volume III, Interim Review, July 1985.
- 4. THIRD AD HOC COMMITTEE MEETING ORBITER BRAKE DEVELOPMENT July 1986.
- 5. JSC-12770 Shuttle Flight Operations Manual Volume 10D. Preliminary, 15-12-78.
- JSC-18341 Mechanical Systems Console Handbook Volume II Systems Briefs, Basic, Revision A, PCN-3, 07-02-86.
- 7. NSTS-22206 Instructions For Preparation Of Failure Modes And Effects Analysis (FMEA) And Critical Items List (CIL), 10 October 1986.
- 8. MC197-0007 Rockwell Procurement Specification, Tires Orbiter, 22 February 1984.
- 9. MC325-0006 Rockwell Procurement Specification, Thruster Assembly, Pyrotechnic, Emergency Nose Gear Uplock Release, 29 February 1984.
- 10. MC325-0019 Rockwell Procurement Specification, Thruster Assembly, Main Landing Gear Gear Uplock Release, 6 June 1986.
- 11. MC621-0011 Rockwell Procurement Specification, Shock Strut Assembly Main Landing Gear Orbiter, 8 July 1985.
- 12. MC621-0012 Rockwell Procurement Specification, Shock Strut Assembly Nose Landing Gear Orbiter, 7 May 1981.
- 13. MC621-0043 Rockwell Procurement Specification, Space Shuttle Flight Control Subsystem, 4 October 1985.
- 14. MC621-0050 Rockwell Procurement Specification, Wheel Assembly, Nose Landing Gear Orbiter, 30 March 1984.
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- 20. V070-510201 Mechanical Installation Main Landing Gear. Revision D-10, 8 July 1986.
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- 22. VO70-510300 Fitting Installation Main Landing Gear. Revision C-05, 1 March 1984.
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- 25. VO70-510346 Hook, Center Door Assembly of, Main Landing Gear. Revision B, 1 August 1978.
- 26. VO70-510400 Hook Door, Assembly of, Main Landing Gear. Revision ?, 5 November 1980.
- 27. VO70-510476 Fitting, Inboard Trunnion, Assembly of, Main Landing gear. Revision ?, 26 April 1986.
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- 29. V070-510502 Chassis Assembly Nose Landing Gear. Revision E-09, 29 July 1986.
- 30. V070-510550 Uplock Assembly Nose Landing Gear. Revision B-10, 7 November 1985.
- 31. VO70-510601 Doors and Mechanical Installation Nose Landing Gear. Revision E-24, 19 February 1985.
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- 33. VO70-510751 Bungee Assembly Thruster, Nose Landing Gear. Revision B-05, 12 February 1982.

- 34. VO70-552001 Cartridge Installation Nose Landing Gear Thrusters.
- 35. VO70-573001 Mechanical Installation Yaw & Brake Control Pedals. Revision C-11, 25 October 1985.
- 36. VS70-510109 Schematic Diagram Landing Gear Control Subsystem. Revision E-01, 6 June 1983.
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- 40. 1170100 MENASCO Shock Strut Assembly Main Landing Gear Orbiter. Revision 2-H, Date Unreadable.
- 41. 1170101 MENASCO Cylinder Assembly, Shock Strut Main Landing Gear - Orbiter. Revision D, Date Unreadable.
- 42. 1170114 MENASCO Pin Meetering, Shock Strut Main Landing Gear Orbiter. Revision C, Date Unreadable.
- 43. 1170182 MENASCO Axle Assembly, Shock Strut Main Landing Gear - Orbiter. Revision A. 7 November 1984. (Reference Only)
- 44. 1170300 MENASCO Drag Brace Assembly Main Landing Gear Orbiter. Revision D, Date Unreadable.
- 45. 1170301 MENASCO Drag Brace Assembly Lower Main Landing Gear Orbiter. Revision A, Date Unreadable.
- 46. 1170350 MENASCO Lock Brace Assembly Main Landing Gear Orbiter. Revision E, 20 July 1976.
- 47. 1170493 MENASCO Layout Shock Strut Main Landing Gear Orbiter. Revision F, Date Unreadable.
- 48. Landing / Deceleration LDG/DECEL 2102 Training Document. 22-02-83
- 49. MC287-0034 Rockwell Procurement Specification, Actuator Strut, Landing Gear, Hydraulic. Revision H-6, 1 August 1983.

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APPENDIX A ACRONYMS

- Abort-Once-Around AOA - Abort-To-Orbit ATO B&AS Brakes and Antiskid - Backup Flight Control BFC - Backup Flight System BFS - Built-In Test Equipment BITE - Caution and Warning C&W - Critical Items List CIL - Central Processing Unit CPU - Cathode-Ray Tube Cathode-Ray TubeDigital to AnalogData Processing S CRT D/A DPS - Data Processing System (Subsystem) - Electrical Power Distribution and Control EPD&C - Extravehicular Activity EVA - Failure Modes and Effects Analysis FMEA - Government Furnished Equipment GFE - General Purpose Computer GPC - Ground Support Equipment GSE - Hybrid Driver Controller HDC - Hydraulics HYD LCA - Load Controller Asser

LDG/DEC - Landing/Deceleration

LVDT - Linear Variable - Independent Orbiter Assessment - Load Controller Assembly - Linear Variable Differential Transformer - McDonnell Douglas Astronautics Company MDAC - Main Gear Shock Strut Assembly MGSSA - Main Landing Gear MLG - Not Applicable NA National Aeronautics and Space Administration
 Nose Landing Gear Shock Strut Assembly NASA NGSSA - Nose Landing Gear NLG - Number NO - National Space Transportation System NSTS - Nose-Wheel Steering NWS - Operational Maintenance Requirements and OMRSD Specifications Document - Operations Sequence OPS - Power Control Assembly PCA - Potential Critical Item PCI - Pyro Initiator Controller PIC Pyrotechnic PYRO - Rudder/Pedal Brake Assembly R/BPA - Regulate, Regulator REG - Rockwell International RI - Rudder Pedal Transducer Assembly RPTA - Return-to-Landing Site RTLS

ACRONYMS

SFTWE - Software - Space Transportation System STS - Space Transportation System Engineering and Operations Support STSEOS - Transatlantic Abort Landing TAL - Touch Down TD - Thruster Hand Controller THC VAC - Volts, ac - Volts, dc - Weight on Nose Gear VDC WONG WOW - Weight on Wheels

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

- B.1 Definitions
 B.2 Project Level Ground Rules and Assumptions
 B.3 Subsystem-Specific 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

<u>TAL</u> - begins at declaration of the abort and ends at transition to OPS 9, post-flight

<u>AOA</u> - 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

<u>CREDIBLE (CAUSE)</u> - 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

<u>CONTINGENCY CREW PROCEDURES</u> - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

<u>EARLY MISSION TERMINATION</u> - termination of onorbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the
highest criticality

<u>HIGHEST CRITICALITY</u> - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence
(OPS)

 $\underline{\text{MC}}$ - 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.)

<u>MULTIPLE ORDER FAILURE</u> - 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)

<u>LIFTOFF MISSION PHASE</u> - 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

<u>LANDING/SAFING PHASE</u> - 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 <u>NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986</u>, 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/CIL's, 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 FMEA's 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.

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.3 LDG/DEC-Specific Ground Rules and Assumptions

The IOA analysis was performed to the component or assembly level of the Landing and Deceleration (LDG/DEC) Subsystem. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

1. Pyrotechnic devices were not considered as emergency devices that were to be used in contingency operations. The Pyrotechnic devices were evaluated according to the usage or the demand for usage, if the devices were demanded and they failed to perform. (Pyrotechnic devices were removed from the NASA Analysis after the completion of the IOA Assessment).

RATIONALE: The NLG extension Booster Pyro Actuator functions every time that the NLG is operated to insure that the system is able to overcome any wind forces that are acting on the landing gear doors.

RATIONALE: The Backup Pyro Uplock Release Actuator is a backup or redundant actuator that operates two seconds after the deploy command is issued, if it does not receive a signal that the Uplock Release Hook has functioned properly.

2. The Landing / Deceleration Subsystem considers that all NORMAL and INTACT ABORT LANDINGS will be initiated during the Deorbit Phase and terminated post landing at the time of vehicle egress.

RATIONALE: Under the IOA specific rules all landings will fall under two phase definitions, the deorbit Phase and the Landing/Safing Phase. The intent of this rule is to simplify the development of the analysis by not requiring an analysis for both operational phases.

3. Component age life will not be considered in the analysis.

RATIONALE: Component age analysis is beyond the scope of this task.

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)

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-20201	OGDEC-20201 BASELI										
SUBSYSTEM: MDAC ID: ITEM:	20201	HOCK STRUT STRUCTURE										
LEAD ANALYST:	W. WEISSINGER											
ASSESSMENT:												
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LEAD ANALYST:	W. WEISSINGER									
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⁻ NASA FMEA ASSUMES LOSS OF NITROGEN ELASTIC MEDIUM ONLY.

⁻ HYD FLUID IS CONSIDERED AS CAPABLE OF ABSORBING A LANDING SHOCK PER MC621-0011.

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⁻ NASA FMEA CONSIDERS ONLY THE ASSEMBLY AND DOES NOT CONSIDER THE INDIVIDUAL CRITICAL PARTS.

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ALSO SEE 20219.

- NASA FMEA CONSIDERS ONLY THE ASSEMBLY AND DOES NOT CONSIDER THE INDIVIDUAL CRITICAL PARTS.

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ASSESSMENT:					
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SEE 20206, 20220, 20221 & 20223.

⁻ NASA FMEA 02-1-003-1 DEALS WITH THE DRAG BRACE ASSEMBLY AS A SINGLE PART. THE ASSEMBLY CONSISTS OF SEVERAL COMPONENTS MOST OF WHICH ARE CRITICAL.

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⁻ NASA FMEA 02-1-003-1 DEALS WITH THE DRAG BRACE ASSEMBLY AS A SINGLE PART. THE ASSEMBLY CONSISTS OF SEVERAL COMPONENTS MOST OF WHICH ARE CRITICAL.

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⁻ NASA FMEA 02-1-003-1 DEALS WITH THE DRAG BRACE ASSEMBLY AS A SINGLE PART. THE ASSEMBLY CONSISTS OF SEVERAL COMPONENTS MOST OF WHICH ARE CRITICAL.

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		FI	CAL LIGH V/FU	T		RE A	DUN	IDAN	CY B	SCR	EENS	c			[L [EM	1	
NASA IOA	[1	/1 /1]]	NA NA]]	NA NA]]	NA]		[X X]	*
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* CIL RE	TEI	VTI	ON	RAT:	IONAL	E:	(If	ap	pli	cab		-	UATE UATE	_	x]	

ASSESSMEN	ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-20211 NASA FMEA #: 02-1-007-1										: [X []
SUBSYSTEM MDAC ID: ITEM:	4:		20211	DOWN AND LOCK SENSORS								
LEAD ANA	LYST	:	W. WE	ISS	SINGER							
ASSESSME	T:											
(ΙΤΥ		REDUNI	OAN	CY SCR	EENS	5		CIL	
FLIGHT HDW/FUNC A B C												
NASA IOA	[3 [3	/3 /3]	[NA] NA]	[NA] NA]	[NA] NA].		[] *
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* CIL RE	TENT	ION	RATION	ΑL	E: (If	ap	plicab		ADEQU NADEQU		[]
REMARKS:	O SE	E 20	212.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-2 02-1-008	20209	: [X] []							
SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 20209 ITEM: DOWN LOCK BUNGEE										
LEAD ANALYST:	W. WEISS	SINGER								
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL TIEM										
HDW/FU		A B	С	ITEM						
NASA [3 /1R IOA [1 /1] [P] [NA] [NA] [NA] . [P] NA]	[] * [X]						
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RECOMMENDATIONS:	(If di	.fferent from NASA)								
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* CIL RETENTION :	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE [] REMARKS:									
	UNTIL THE SAFETY PIN IS INSTALLED IN THE LOCK BRACE THERE IS									

A MAJOR PROBLEM. FROM THE TIME THE HYD SYS 1 IS SHUTDOWN UNTIL THE SAFETY IS INSTALLED THERE IS AN IMINENT THREAT OF COLLAPSE.

ASSESSMEN ASSESSMEN NASA FMEA	NT ID:	LDGDEC-	20210		BASELINI NEV		
SUBSYSTEM MDAC ID: ITEM:		LANDING 20210 DOWN LO		ERATION S	YSTEMS		
LEAD ANA	LYST:	W. WEIS	SINGER				
ASSESSME	NT:						
(CRITICAL		REDUNI	DANCY SCR	EENS	CIL ITEM	
	FLIGH' HDW/FU		A	В	С	11211	
NASA IOA	[3 /1R [1 /1] [P] NA]	[NA] [NA]	[P] [NA]	[x]	*
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RECOMMEN	DATIONS:	(If d	liffere	nt from N	ASA)		
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* CIL RE	TENTION	RATIONA	E: (If	applicab	le) ADEQUATE INADEQUATE	[]	
REMARKS:	TON EFF	ኮ ፖጥሮ / Ɗልባ	ΡΤΟΝΆΤ.Έ		- ~		

ASSESSMI ASSESSMI NASA FMI	ENT	I		LDG		20212				NASA DA BASELI N		K]	
SUBSYSTIMDAC ID				202	12			rion s K sens		ems			
LEAD AN	ALY	ST	:	W.	WEIS	SINGER	₹						
ASSESSMI	ENT	:											
		F	LIG				IDANG	CY SCR	EENS		CII		
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SUBSYSTE MDAC ID:			202	13			rion s K sens		MS				
LEAD ANA	LYS	T:	W.	WEISS	SINGE	R							
ASSESSME	NT:												
		TICAL FLIGH	r		REDUI	NDAN	CY SCF	REENS			CI:		
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ASSESSMI ASSESSMI NASA FMI	ENT	ID:	LDG	15/86 DEC-20 1-010-					NASA DATA: BASELINE [X] NEW []					
SUBSYSTI MDAC ID: ITEM:			202	DING/I 17 QUE TO				YSTE	ems					
LEAD ANA	LY	ST:	W.	WEISS	INGE	₹								
ASSESSME	ENT	:												
		FLIC				IDANC	Y SCR	EENS	3	CIL ITEN	ſ			
			FUNC		_		В		С					
NASA ĮO A	[[1 /1 1 /1	L] L]	[N	IA] IA]]	NA] NA]	[[NA] NA]	[X] *]			
COMPARE	[/]	[]	[]	[]	Ĺ]			
RECOMMEN	DA:	rions	S: (If dif	fere	ent f	rom N	ASA)						
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* CIL RE	TE	NOIT	RATI	ONALE:	(If	app	licab	•	ADEQUATE ADEQUATE]			
										L	1			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-20501	NASA DAT BASELIN NE									
SUBSYSTEM: MDAC ID: ITEM:	20501	OR EXTEND / RETRACT MECH									
LEAD ANALYST: J. COMPTON											
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM											
	NC A	в с									
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA] [NA] [NA]	[X] * [X]								
COMPARE [/] []	[] []	[]								
RECOMMENDATIONS:	(If differe	nt from NASA)									
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* CIL RETENTION	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [X] INADEQUATE []										
REMARKS: THIS ASSEMBLY WAS CALLED OUT BY NAME ON THE DRAWING. THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS AND TUBES WHICH MAKE UP OUR ASSEMBLIES.											
WHICH MAKE UP OU	K WOOFWDTITO.										

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-	2/15/86 NASA DATA: DGDEC-20701 BASELINE [2-1-012-1 NEW [
SUBSYSTEM: MDAC ID: ITEM:	20701		RATION SYS						
LEAD ANALYST:	J. COMP	TON							
ASSESSMENT:									
CRITICAL FLIGH		REDUNDA	NCY SCREE	ens	CIL ITEM				
HDW/FU	_	A	В	С	IIEM				
NASA [1 /1 IOA [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] * [X]				
COMPARE [/] [1	[]	[]	[]				
RECOMMENDATIONS:	(If d	ifferent	from NAS	iA)					
[/] []	[]		[] DD/DELETE)				
* CIL RETENTION 1	RATIONALI	E: (If a	pplicable	ADEQUATE	[X]				
REMARKS: THIS ASSEMB	LY WAS C	ALLED OU	T BY NAME	ON THE DRAW	. ,				
THE NASA FM	EA'S CALI	L OUT TH	E VARIOUS	RODS. FITT	NGS. HOOK				

AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 NASA DATA: LDGDEC-20901 BASELINE [X] 02-1-012-1 NEW []								
SUBSYSTEM: MDAC ID: ITEM:	20901		ATION SYS TUON LINK						
LEAD ANALYST:	J. COMP	гои							
ASSESSMENT:									
CRITICAL: FLIGH		REDUNDA	NCY SCREE	ns	CIL ITEM				
HDW/FU		A	В	С					
NASA [1 /1 IOA [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] * [X]				
COMPARE [/] []	[]	[]	[]				
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* CIL RETENTION	RATIONAL	E: (If a	pplicable	e) ADEQUATE INADEQUATE	[X]				
REMARKS: THIS ASSEMB	LY WAS C	ALLED OU	T BY NAME	ON THE DRA	WING.				

THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSME ASSESSME NASA FME	NT	ID:	12/1 LDGD 02-1	EC-2	05017	NASA DAT BASELII NI]			
SUBSYSTE MDAC ID:			2050	1			TION S				
LEAD ANA	LYS	T:	J. C	OMPT	ИС						
ASSESSME	NT:										
		TICAL FLIGH		1	REDUN	IDANC	Y SCR	EENS	3	CIL	
		DW/FU								ITE	М
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RECOMMEN	DAT:	ions:	(I:	f di	ffere	ent f	rom N	ASA)			
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REMARKS:							•	-41		. (J

THIS ASSEMBLY WAS CALLED OUT BY NAME ON THE DRAWING. THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS AND TUBES WHICH MAKE UP OUR ASSEMBLIES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-2	0701A		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	20701	DECELERAT		ems	
LEAD ANALYST:	J. COMPT	ON			
ASSESSMENT:					
FLIGHT		REDUNDANC A	Y SCREENS	c c	CIL ITEM
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] *
COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If d	ifferent f	rom NASA)	
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* CIL RETENTION	RATIONAL	E: (If app		ADEQUATE NADEQUATE	
REMARKS: THIS ASSEMB	LY WAS C	ALLED OUT	BY NAME	ON THE DRAV	VING.
THE NASA FM	EA'S CAL MAKEUP O	L OUT THE UR ASSEMBI	VARIOUS	RODS, FITT	INGS, HOOKS

ASSESSM ASSESSM NASA FM	C-20901A BASELINE											x]								
SUBSYST MDAC ID ITEM:	OOK ACTUATUON LINKAGE																				
LEAD AN	COMP'	CON	I																		
ASSESSM	ENT:																				
	LTY C		RE	EDU	NDAI	1C	Y S	SCRE	ENS	S			CIL ITEM								
	HDW/FUNC								В			С									
NASA IOA	[[1	/1 /1]	[[NA NA	[] []	1	:	NA NA]]	[N2 N2	A] A]		[X X]	*		
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RECOMME	TADN	'IO	NS:	(]	If di	ff	er	ent	f	ror	n NAS	SA))								
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* CIL RI	ETEN	TI	ON F	CITAS	ONALI	E:	(I	f ap	q	lic	cable	•			ATE ATE	[x]			
REMARKS:		.ss	EMBI	LY W	AS CA	LL	ED	נטס	•	вұ	NAME			_	DRA	٠	īG.	J			
THI	E NA	SA	FME	EA'S	CALI	. 0	UT	THE	:	VAF	RIOUS	F	ROE	s,	FITT	INC	s,	Н	OOKS		

AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSME ASSESSME NASA FME	NT DATE: NT ID: A #:	LDGDE 02-1-	/86 C-205 014-1	501B		BASEL	BASELINE [X] NEW []							
SUBSYSTEM MDAC ID:		20501	•	ECELERA!										
LEAD ANA														
ASSESSMENT:														
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COMPARE	[/	1	[] []	[]	[]							
RECOMMEN	DATIONS	: (If	dif	ferent	from N	ASA)								
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* CIL RE	TENTION	RATION	ALE:	(If ap	plicab	ADEQUA	TE [X]							
REMARKS: THI NASA FME WHICH MA	S ASSEM A'S CAL	L OUT T	HE V	ARIOUS	BY NA RODS,	ME ON THE	DRAWING. THE HOOKS AND TUBES							

ASSESSMENT DA ASSESSMENT II NASA FMEA #:	D: LD	/15/86 GDEC-2070 -1-014-1)1B	CA: VE [X] CW []		
SUBSYSTEM: MDAC ID: ITEM:	201	NDING/DEO 701 G UPLOCK				
LEAD ANALYST	. J.	COMPTON				
ASSESSMENT:						
	CALITY LIGHT	REI	OUNDANC	Y SCREEN	ıs	CIL ITEM
HDV	/FUNC	A	1	В	С	
NASA [1 IOA [1	/1] /1]	[NA] [NA]	[]] [AN	NA]	[X] * [X]
COMPARE [/]	[]	[] (]	[]
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* CIL RETENTI	ON RAT	ONALE: (If app	·	ADEQUATE NADEQUATE	
	SEMBLY W	AS CALLE	D OUT I	BY NAME	ON THE DR	AWING.

THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/80 LDGDEC-2 02-1-01	20901B	[x]							
SUBSYSTEM: MDAC ID: ITEM:	20901	DECELERA OK ACTUAT								
LEAD ANALYST:										
ASSESSMENT:										
CRITICAL FLIGH		REDUNDAN	CY SCREEN	ıs	CIL ITEM					
HDW/FU		A	В	С						
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] NA]	[X] * [X]					
COMPARE [/] [] [) []	[]					
RECOMMENDATIONS:	(If d	ifferent	from NASA	۷)						
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* CIL RETENTION	RATIONAL	E: (If ap	plicable)	ADEQUATE	[X]					
			3	INADEQUATE						
REMARKS: THIS ASSEMB	LY WAS C	ALLED OUT	BY NAME	ON THE DRAW	WING.					
THE NASA FM				RODS, FITT	INGS, HOOKS					

ASSESSM ASSESSM NASA FM	ENT	I	D:	LDO	GDEC-	211			NASA DATA: BASELINE [X] NEW []								
SUBSYST:		211	LANDING/DECELERATION SYSTEMS 21101 MLG PYRO UPLOCK RELEASE														
LEAD AN	J.	COMP	1OT	1													
ASSESSM	ENT	:															
	ITY T			EDUN	IDAN		Y SCR	EEN	CIL ITEM								
	1	HDI	/FU	NC		A				В		С					
NASA IOA	[1	/1 /1]	[[NA NA	\]] [:	NA] NA]]	NA] NA]		[X X]	*
COMPARE	[/]	[]	[•]	[]		[]	
RECOMME	NDA!	ric	ONS:	(If d	iff	ere	nt	f	rom N	'ASA')			•		
	[/.]	·[]	(•]	[]	(AI	[/¤	/DF] ELF	ETE)
* CIL RI	ETEI	NT)	ON :	RATI	ONAL	E:	(If	ap	q	licab		ADEQUA		[x]	

ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-2 NASA FMEA #: 02-1-015														SA D ASEL		[x				
SUBSYSTE MDAC ID:	M:			21	LANDING/DECELERATION SYST 21102 MLG PYRO UPLOCK RELEASE																
LEAD ANA	LYS	ST	:	J. COMPTON																	
ASSESSMENT:																					
							RE	DUNI	DANC	CY	SCR	EENS	3			CIL ITEM					
FLIGHT HDW/FUNC						A B						С									
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COMPARE	(N	/N]		[]	[]	[]	÷	[]			
RECOMMEN	DA:	ΓΙ	ons:		(If	đ:	iff	ere	nt 1	fro	om N	ASA))								
	[2	/1R]		[N]	[N]	(N]	(A)] DD,	/DI] ELE	TE)		
* CIL RE	TE	NT:	ION	RAT	'ION	AL l	Ε:	(If	app	91 i	cab			EQUA		[x]			
REMARKS:	REMARKS: THIS SYSTEM IS NEVER CALLED UPON TO FUNCTION UNLESS THERE IS																				
ANT TRITMT																					

ACCORDING TO THE REDUNDANCY RULES IN 22206, THIS SYSTEM IS A 2/1R CRITICALITY, BUT A FAILED HYDRAULICS SYSTEM ACTIVATES THIS SYSTEM. THIS SYSTEMS FAILURE WILL NOT ACTIVATE THE HYDRAULICS. THERE IS A LINEAR OPERATION HERE THAT WILL NOT ALLOW REVERSAL OF THE ROLES.

INITIATES THE PYRO BACKUP.

ASSESSMI ASSESSMI NASA FMI	CNT	ID:	LDG	15/86 DEC-20 1-017				NASA DATA: BASELINE [X] NEW []							
SUBSYSTE MDAC ID:			202	DING/I 18 CK STI											
LEAD ANA	LYS	ST:	W.	WEISS	INGE	₹									
ASSESSME	ENT	:													
		ITICAL FLIGH HDW/FU	T		REDUN	NDANC	EY SCR		CIL ITEM						
NASA		·		_	_	r	_		C NTA 1		_	v	,	.1.	
		1 /1 1 /1	j	1] 1]	IA]	[NA]		NA]		[X X]	•	
COMPARE	[/]	[]	(]	[]		[]		
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DEMADUC.															

NASA DATA:

ASSESSMEI ASSESSMEI NASA FMEA	NT I		12/15 LDGDE 02-1-	C-20]	NASA DATA BASELINI NEV	[X]
SUBSYSTEM MDAC ID:	M:		LANDI 20223 SUPPO			ERATI(ON SY	(STE	MS	
LEAD ANA	LYST	:	W. WE	ISSI	NGER					
ASSESSME	NT:									
•		ICAL		F	REDUN	DANCY	SCRI	EENS		CIL ITEM
		LIGH' W/FU		P	\	В		(С	11211
NASA IOA	[1	/1 /1]	[]	IA] IA]	[N.	A] A]	[]	NA] NA]	[X] * [X]
COMPARE	[/	1	[]	ĺ]	[]	[]
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om Ni	ASA)		
	[/]	[)	[]	[] (2	[] ADD/DELETE)
* CIL RE	TENT	ION :	RATION	ALE:	(If	appl	icab:		ADEQUATE ADEQUATE	
REMARKS:										

THE SUPPORT BEAM IS THE COMPONENT THAT HOLDS THE TRUNIONS OF THE DRAG BRACE ASSEMBLY (AT THE ORBITER ATTACHING POINTS) IN ALIGNMENT. THE SUPPORT BEAM IS A COMPONENT OF THE DRAG BRACE ASSEMBLY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-2050	.c	BASELINI	NASA DATA: BASELINE [X] NEW []										
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECI 20501 DOOR EXTEND	ELERATION SYS												
LEAD ANALYST:	J. COMPTON													
ASSESSMENT:														
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM														
HDW/FU	NC A	В	С	1141										
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[X] * [X]										
COMPARE [/] []	[]	[]	[]										
RECOMMENDATIONS:	(If differ	ent from NAS	SA)											
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* CIL RETENTION	RATIONALE: ()	f applicable	ADEQUATE											
REMARKS:	IV WAG GATTE	AUM DU 11314		. 1										
THIS ASSEMBLY WAS CALLED OUT BY NAME ON THE DRAWING. THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS AND TUBES WHICH MAKE UP OUR ASSEMBLIES.														

ASSESSMENT DA ASSESSMENT ID NASA FMEA #:	: LDGDE	C-20701C	: [X]		
SUBSYSTEM: MDAC ID: ITEM:	20701	NG/DECELE PLOCK HOO			
LEAD ANALYST:	J. CO	MPTON			
ASSESSMENT:					
	CALITY LIGHT	REDUND	ANCY SCRE	EENS	CIL ITEM
HDW	/FUNC	A	В	С	
NASA [1 IOA [1	/1] /1]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[X] * [X]
COMPARE [/ 1	[]	[]	[]	[]
RECOMMENDATIO	ons: (If	differen	t from NA	ASA)	
[/ 1	[]	[]	[] (A	[] ADD/DELETE)
* CIL RETENTI	ON RATION	ALE: (If	applicabl		r v 1
				ADEQUATE INADEQUATE	
REMARKS: THIS ASS	SEMBLY WAS	CALLED C	OUT BY NAM	ME ON THE DRA	WING.
THE NASA				JS RODS, FITT	INGS, HOOKS

NASA DATA:

ASSESSMENT DATE: 12/15/86

ASSESSMENT ID: NASA FMEA #:	LDGDEC-20901C 02-1-019-1	BASELINE [X] NEW []												
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERATION ST 20901 DOOR HOOK ACTUATUON LIN													
LEAD ANALYST:	J. COMPTON	J. COMPTON												
ASSESSMENT:														
CRITICAL: FLIGHT	EENS CIL													
HDW/FUI		I TEM C												
NASA [1 /1 IOA [1 /1] [NA] [NA]] [NA] [NA]	[NA]												
COMPARE [/] [] []	[] []												
RECOMMENDATIONS:	(If different from NA	ASA)												
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	LY WAS CALLED OUT BY NAM	E ON THE DRAWING.												

THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS

AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-20501D	BASELINE	NASA DATA: BASELINE [X] NEW []											
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELE 20501 DOOR EXTEND /													
LEAD ANALYST:	J. COMPTON													
ASSESSMENT:														
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM														
	NC A	В С												
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA] [NA]	[X] * [X]											
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RECOMMENDATIONS:	(If differen	nt from NASA)												
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* CIL RETENTION 1	RATIONALE: (If	applicable) ADEQUATE INADEQUATE												
	OUT THE VARIOU	OUT BY NAME ON THE DRAW IS RODS, FITTINGS, HOO												

ASSESSME ASSESSME NASA FME	NT II	D:		C-20	701D	NASA DATA: BASELINE [X] NEW []								
SUBSYSTE MDAC ID: ITEM:	M:		LANDII 20701 MLG U	·			ON SYS		MS					
LEAD ANA	LYST	:	J. CO											
ASSESSME	NT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM														
			NC	A		E	3		С	IIE.	M			
NASA IOA	[1 [1	/1 /1]	[N	A] A]	[N	IA] IA]	[NA] NA]	x]] *]			
COMPARE	[/	.]	[]	(]	[]	[]			
RECOMMEN	DATIC	ons:	(If	dif	feren	t fr	om NAS	SA)						
	[/]	[]	[]	[[DD/D] ELETE)			
* CIL RE	TENT	ION 1	RATION	ALE:	(If	appl	icable		ADEQUATE ADEQUATE					
REMARKS:	S ASS	SEMB:	LY WAS	CAL	LED O	UT E	Y NAMI		N THE DRA	-	-			

THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS

AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSMENT DATE: 12/15/8 ASSESSMENT ID: LDGDEC- NASA FMEA #: 02-1-02								DEC-20901D						NASA DATA: BASELINE [X] NEW []				
SUBSYSTEM: LANDING/DECELERATION SYST MDAC ID: 20901 ITEM: DOOR HOOK ACTUATUON LINKA																		
LEAD ANALYST: J. COMPTON																		
ASSESSMENT:																		
CRITICALITY REDUNDANCY SCF FLIGHT										SCREE	:NS	5		CI	L EM	[
	I	HDV	W/FU	NC			A			В			С					
NASA IOA	[1 1	/1 /1]		[NA NA]]	NA NA	\]	[NA]		[X X]	*
COMPARE	[/]		[]	[]	[]		[]	
RECOMMEN	'DA'	ri	ons:		(If	đi	ff	erent	: 1	fro	om NAS	SA)	١					
	[/	3		[]	[3	(j	(Al		'DE		TE)
* CIL RE	TE	NT:	ION	RAT	IONA	\L I	Ξ:	(If a	apı	p1:	icable		ADEQU.			x]	
REMARKS:												Iì	NADEQU.	ATE	[]	
THI	THIS ASSEMBLY WAS CALLED OUT BY NAME ON THE DRAWING.																	
THE	N.	AS. WH	A FM ICH	EA' MAK	S CA	ALI OU	L O JR	UT TI ASSEI	HE MB	VZ LII	ARIOUS ES.	S 1	RODS,	FITT:	ING	s,	Н	OOKS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-20501E 02-1-021-1	NASA DATA BASELINE NEW	[X]											
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERATION 20501 DOOR EXTEND / RETRAC													
LEAD ANALYST:														
ASSESSMENT:														
CRITICALITY REDUNDANCY SCREENS CIL ITEM														
HDW/FUI	NC A B	С												
NASA [1 /1 IOA [1 /1] [NA] [NA]] [NA] [NA]	[NA] [NA]	[X] * [X]											
COMPARE [/] [] []	[]	[]											
RECOMMENDATIONS:	(If different from	NASA)												
(/] [] []	. [] (AI	[] DD/DELETE)											
	RATIONALE: (If applic	able) ADEQUATE INADEQUATE												
REMARKS: THIS ASSEMBLY WAS CALLED OUT BY NAME ON THE DRAWING. THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS AND TUBES WHICH MAKE UP OUR ASSEMBLIES.														

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-2 02-1-021		NASA DATA: BASELINE NEW										
SUBSYSTEM: MDAC ID: ITEM:	20701	DECELERATION A	rion systi Assembly	EMS									
LEAD ANALYST:	J. COMP	гои											
ASSESSMENT:													
CRITICAL	CIL ITEM												
FLIGH HDW/FU		A	В	С	* 								
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] * [X]								
COMPARE [/] [] [] []	[]								
RECOMMENDATIONS:	(If d	ifferent	from NASA)									
[/] [] [] [] (AI	[] DD/DELETE)								
* CIL RETENTION	RATIONAL	E: (If ap		ADEQUATE NADEQUATE									
REMARKS: THIS ASSEMBLY WAS CALLED OUT BY NAME ON THE DRAWING.													
THE NASA FM	EA'S CAL	L OUT THE	VARIOUS	RODS, FITT	INGS, HOOKS								

AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSM ASSESSM NASA FM	ENT	I	D:	LDO		20901	LE			NASA DATA: BASELINE [X] NEW []							
SUBSYST MDAC ID ITEM:				209	LANDING/DECELERATION SYSTEMS 20901 DOOR HOOK ACTUATUON LINKAGE												
LEAD AN	ALY	ST	:	J.	COMP	TON											
ASSESSM	ENT	:												٠			
	CR		ICAL LIGH	ITY T		REDU	INDAN	CY SCI	REENS	;		CI	L	ſ			
	1	HD	/FU	NC		A		В		С				-			
NASA IOA	[1	/1 /1]	[[NA] NA]] [NA] NA]	[NA] NA]		[X X]	*		
COMPARE	[/]	[]	(]	[]		[]			
RECOMME	NDA!	ric	ons:	(If d	iffer	ent	from 1	NASA)								
	[/]	ĵ.]	. [3	(]	(AD	[D/	DE] :LE	TE)		
* CIL RI		ני די א	ON	RATI	ONAL	E: (I	f ap	plicak	·	ADEQU ADEQU		[[x]			
	-	ASS	EMB	LY W	AS C	ALLED	OUT	BY NA	ME O	N THE	DRAW	IN	G.				

THE NASA FMEA'S CALL OUT THE VARIOUS RODS, FITTINGS, HOOKS

AND TUBES WHICH MAKEUP OUR ASSEMBLIES.

ASSESSME ASSESSME NASA FME	NT ID:		EC-30114		BASELIN	NASA DATA: BASELINE [X] NEW []								
SUBSYSTE MDAC ID: ITEM:	M:	3011			YSTEMS HYD MODULE A	SSY								
LEAD ANA	LYST:	J. C	J. COMPTON											
ASSESSME	NT:													
		ALITY GHT FUNC	REDUNI A	DANCY SCR	EENS C	CIL ITEM								
NASA IOA	[3 /	1R] 1R]	[P] [P]	[P] [P]	[P] [P]	[] *								
COMPARE	[/]	£]	[]	[]	[]								
RECOMMEN	DATION	s: (I	f differe	nt from N	ASA)									
	[/]	[]	[]	[] ([] ADD/DELETE								
		N RATIO	NALE: (If	applicab	le) ADEQUATE INADEQUATE									
REMARKS:														

	D:	12/15/86 LDGDEC-30113 02-1-022-2									NASA DATA: BASELINE [X] NEW []									
MDAC ID: 30 ITEM: DI					LANDING/DECELERATION SYSTEMS 30113 DISPLACEMENT LIMITER, HYD MODUL									ASS	SY					
LEAD ANA	:	J.	J. COMPTON																	
ASSESSME	NT	:																		
•	ITY REDUNDANCY												CIL ITEM							
	I	HDI	W/FUI	NC			A			E	3			С						
NASA IOA	[[2	/1R /1R]		[P P]		[E	•]	[P P]		[X]	*
COMPARE	[N	/]		[]		[]	[]		[N]	
RECOMMEN	מאכ	rio	ons:	(If	đ	iff	ere	nt	fr		n NAS	SA))						
	[3	/1R]		[P]		[]	• :]	[P)	(AI				ETE)
* CIL RE	re1	VT:	ION I	RATI	ONA	LE	E :	(If	a	ppl	.io	cable	-	AI IAI	DEQUA	TE TE	[]	

REMARKS:

LOSS OF ONE DISPLACEMENT LIMITER WILL CAUSE LOSS OF ONE BRAKE LINE. NEXT FAILURE WILL LOSE ANOTHER BRAKE LINE, BUT CREW SHOULD STILL ROLLOUT SAFELY IF RUNWAY LONG ENOUGH.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-3		NASA DATA: BASELINE NEW									
SUBSYSTEM: MDAC ID: ITEM:	30119		ATION SYS HYD MODU									
LEAD ANALYST:	J. COMPT	CON										
ASSESSMENT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM												
HDW/FU	С	1121	•									
NASA [3 /1R IOA [3 /3] [[P] [NA]	[[] *]								
COMPARE [/N] [N]	[N]	[N]	C]						
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)								
[3 /3] [NA]	[NA]	[NA]	[DD/DI] ELETE)						
* CIL RETENTION	RATIONAL	E: (If a	applicable	ADEQUATE	[]						
REMARKS: WITH VALVE SYSTEM OKAY. CO BRAKES BASED ON	NTROL VA	JID IS A LVE WILI	AVAILABLE L STILL RE	ASSUMING HY	DRAU!	LIC						

ASSESSME ASSESSME NASA FME	NT	ID:	LDG		117 ·2				NASA D BASEL		[x]
SUBSYSTE MDAC ID:	M:		301	17					MS ASSY				
LEAD ANA	LYS	T:	J. (COMPTO									
ASSESSME	NT:												
CRITICALITY REDUNDANCY SCREENS FLIGHT HDW/FUNC A B C												IL PEN	4
		·							С				
NASA IOA	[1 /1 1 /1]	[N	A]	[]	NA] NA]	[[NA] NA]		[[X X] *]
COMPARE	[/]	[]	[]	[]		[]
RECOMMEN	DAT:	ions:	()	f dif	fere	nt f	rom N	ASA)					
	[/]	[]	[]	[]	(Al		'DE] ELETE)
* CIL RE	TEN'	TION 1	RATIO	NALE:	(If	app:	licab	-	ADEQUA'	TE	[х]
DDW DWG								IN.	ADEQUA'	ΤE	Ī]

REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-3 02-1-023	5 30118 3-3	1	NASA DATA: BASELINE NEW	[X]	
SUBSYSTEM:	LANDING, 30118	/DECELERAT				
LEAD ANALYST:	J. COMP	ron				
ASSESSMENT:						
CRITICAL FLIGH		REDUNDANC	CY SCREENS		CIL ITEM	
	NC	A	В	С		
NASA [1 /1 IOA [3 /1R] [NA] [P] [NA] [P] [NA] P]	[X] *	:
COMPARE [N /N] [N] [N] [N]	[]	
RECOMMENDATIONS:	(If d	ifferent 1	from NASA)			
[3 /1F	2] [P] [P] [[A] DD/DELET	E)
* CIL RETENTION	RATIONAL	E: (If app	plicable) IN	ADEQUATE ADEQUATE		
REMARKS: IF VALVE JA BE AVAILABLE THE WHEEL-WELL). IN	ROUGH THI	S SYSTEM	BRAKES APP (HALF BRAK	LIED, BRAN	KING WII TH WHEEI	LS IN

WITH CONTINUOUS PRESSURE.

	ENT DATE: ENT ID: EA #:		NASA DAT BASELIN NE										
SUBSYST MDAC ID ITEM:	-	30101		RATION S									
LEAD AN	ALYST:	J. COMP	TON										
ASSESSM	ENT:												
	CRITICAL:		REDUNDA	ANCY SCRI	EENS	CIL ITEM							
	HDW/FU	-											
NASA IOA	[3 /1R [3 /3] [P] NA]	[P] [NA]	[P] [NA]	[] *							
COMPARE	[/N] [и ј	[N]	[N]	[]							
RECOMME	NDATIONS:	(If d	ifferent	from NA	ASA)								
	[3 /3] [NA]	[NA]		[A] ADD/DELETE)							
* CIL RI	ETENTION F	RATIONALI	E: (If a	pplicab]	•								
DEW DVG	_				ADEQUATE INADEQUATE	[] []							
REMARKS: SWI ANTISKII	TCH IS RE	DUNDANT,	BUT VE	CHICLE CA	N LAND SAFE	LY WITHOUT							

NO NASA CIL AVAILABLE ON THIS.

ASSESSME ASSESSME NASA FME	ENT	II		LDG	1/15/86 GDEC-30106 -1-025-1 NDING/DECELERATION SY											SA BASE	ΙE		x]	
SUBSYSTEMDAC ID:				301	06			CELI UIT	ER/	\Τ	IO	N	SYS	TE	MS	3					
LEAD ANA	ALYS	ST	:	J.	COM	PT(NC	Ī													
ASSESSMI	ENT	:																			
FLIGHT								DUNI	DAI		Y B	sc	REE	NS	c			CI	L	ſ	
	1	יעא	w/ FUI	NC.		4	A				D				_						
NASA IOA	[[3 3	/1R /1R]		[P P]		[[P P]		[P P]		[X X]	*
COMPARE	[/]		[]		(]		[]		[]	
RECOMME	NDA'	TI	ons:	(If	di	ff	ere	nt	f	ro	om	NAS	A)							
	[/]		[]		[]		[]	(AI	[DD,	/DI	S L J	ETE)
* CIL R	ETE:	NΤ	ION 1	RATI	ONA	LE	:	(If	a j	рp	1 i	ica	ble			DEQU DEQU		[x]	

REMARKS:

ASSESSM	ENT ID	TE: 12/1 : LDGD: 02-1	EC-30105			TA: NE [X] EW []
SUBSYSTI MDAC ID ITEM:		3010		ERATION S	YSTEMS	
LEAD AND	ALYST:	J. C	OMPTON			
ASSESSMI	ENT:					
	FL	CALITY IGHT FUNC	REDUN A	DANCY SCR	EENS C	CIL ITEM
	ĺ			_	•	
NASA IOA	[1 /	/1R] /1]	[P] [NA]	[F] [NA]	[P] [NA]	[X] * [X]
COMPARE	[N /	/N]	[N]	[N]	[N]	[]
RECOMMEN	IDATION	NS: (I	differe	nt from N	ASA)	
	[1 /	/1]	[NA]	[NA]		[A] (ADD/DELETE)
* CIL RI	ETENTIC	ON RATION	VALE: (If	applicab	le) ADEQUATI INADEQUATI	

REMARKS:

WITH BRAKE PRESSURE BEING APPLIED AT TOUCHDOWN, TIRE ON THAT WHEEL WILL PROBABLY BLOW RIGHT AFTER TOUCHDOWN CAUSING POSSIBLE LOSS OF VEHICLE.

ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-30108 NASA FMEA #: 02-1-026-1 SUBSYSTEM: LANDING/DECELERATION												NASA DATA BASELINE NEV	Ε]	
SUBSYSTEMDAC ID:	M:		LANDIN 30108 SKID C				RA'	ΓI	10	1 SYS	TE	CMS				
LEAD ANA	LYST	:	J. COM	P	ON	Ī										
ASSESSMENT:																
CRITICALITY REDUNDANCY SCREENS CIL ITEM																
	FLIGHT HDW/FUNC A B C															
NASA IOA	[3	/1R /3	[P] [F] [P] [NA] [NA]											[[]	*
COMPARE	[/N]	[N]	[N	1]	[N]		[]	
RECOMMEN	DATI	ons:	(If	đ:	iff	eren	t	fı	:01	n NAS	A)	ı				
	[3	/3	3	[NA	\]	[N	JA į]	[NA]	ΑĎ	[D/DI		TE)
* CIL RE	TENT	ION 1	RATION	L	Ξ:	(If	ap	p]	Li	cable		ADEQUATE NADEQUATE]]	
REMARKS: NO CAPABILI			LABLE. TEM IS								SS	5 OF 12.5	ક	BRAI	KIN	IG

ASSESSME NASA FME	NT I	D:	LDGDE	3-3	30107					BASELINE NEW	[X]	
SUBSYSTE MDAC ID: ITEM:			LANDII 30107 SKID (DECELE	RA	TIC	N SYS	T	ems				
LEAD ANA	LYST	:	J. com	IP:	гои									
ASSESSME	NT:													
	F	LIGHT	ITY I IC		REDUND	AN	CY B	SCREE	ENS	; С		IL PEN	1	
		· ·												
NASA IOA	[2	/1R /3]	[P] NA]	[F NA	.]	[P] NA]	[Х]	*
COMPARE	[N	/N]	[и]	[N]	[n j	[N]	
RECOMMEN	DATI	ons:	(If	d:	ifferen	t	fro	m NAS	A)					
	[3	/3]	[NA]	[NA	.]	[NA]		A / DE		TE)
* CIL RE	TENT	ION E	RATIONA	LI	E: (If	ap	pli	cable	-	ADEQUATE IADEQUATE	[x]	
TOC	G 070	3.37007	COUTD 1	· ·	.mr.am.t.a	T	T	01T					. —	

LOSS OF ANTISKID PROTECTION TO ONE BRAKE. SHOULD NOT PRESENT A PROBLEM SINCE CREW NOTIFIED OF ANTISKID PROBLEM AND SHOULD AVOID HEAVY BRAKING. CIL NOT NEEDED.

NASA DATA: ASSESSMENT DATE: 12/15/86 BASELINE [X] ASSESSMENT ID: LDGDEC-30109 NEW [02-1-027-1 NASA FMEA #: LANDING/DECELERATION SYSTEMS SUBSYSTEM: 30109 MDAC ID: ANTI-SKID FAIL CIRCUIT ITEM: LEAD ANALYST: J. COMPTON ASSESSMENT: CIL REDUNDANCY SCREENS CRITICALITY ITEM FLIGHT С В HDW/FUNC Α [P] [F] [P] [NA] [NA] [NA] [X] * NASA [2 /1R] IOA [3 /3] COMPARE [N /N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [A] [3/3] [NA] [NA] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [INADEQUATE [X]

REMARKS:

CIL NOT REQUIRED. FAIL CIRCUIT MONITORS SYSTEM AND IN WORST CASE DESELECT A GOOD CIRCUIT RESULTING IN REDUCED BRAKING CAPABILITY. CREW NOTIFIED OF A PROBLEM AND SHOULD AVOID HEAVY BRAKING.

ASSESSMENT DA ASSESSMENT II NASA FMEA #:	: LDGDEC	-30109A	NASA DATA BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	30109	G/DECELERATION SYS' KID FAIL CIRCUIT	TEMS	
LEAD ANALYST:	J. COM	PTON		
ASSESSMENT:				
	CALITY IGHT	REDUNDANCY SCREEN	1S	CIL ITEM
HDW	/FUNC	A B	С	TIDN
NASA [2 IOA [3	/1R] /3]	[P] [F] [NA] [P] NA]	[X] *
COMPARE [N	/N] ([и] [и] [N]	[N]
RECOMMENDATIO	NS: (If d	different from NASA	7)	
[3	/3] [[NA] [AN]	NA]	[A] DD/DELETE)
* CIL RETENTI	ON RATIONAL	E: (If applicable)		
REMARKS:		I	ADEQUATE NADEQUATE	[X]
CASE DESELECT	A GOOD CIR	FAIL CIRCUIT MONIT CCUIT RESULTING IN ED OF A PROBLEM AN	REDUCED BRA	KING

ASSESSME ASSESSME NASA FME	ENT II):		C-3	301								DATA LINE NEW			
SUBSYSTE MDAC ID:			LANDII 30122 BRAKE									3				
LEAD ANA	LYST	:	J. CO	MPT	(O	1										
ASSESSME	ENT:															
		ICAL: LIGH	ITY T		RI	EDUN	IDAN	CY	SCI	REENS	3			CII ITE		
	HDV	/FU	NC													
NASA IOA	[3 [3	/1R /1R]	[P P]	((P P]	[P P]		[]	*
COMPARE	[/]	(]	[]	[]		[]	
RECOMMEN	NDATI(ons:	(If	d :	if	fere	ent	fr	om 1	NASA)					
	[/	1.	[]	(]	E]	(A	[DD/I		ETE)
* CIL RI	ETENT:	ION :	RATION	AL l	E:	(If	f ar	pl	ical				JATE JATE]	
REMARKS NO		AVAI	LABLE.											-	,	

ASSESSME ASSESSME NASA FME	NT II):	LDGDE	C-:				NASA BASE	DATA LINE NEW	[X]		
SUBSYSTEM MDAC ID:	M:		30121				rion s							
LEAD ANA	LYST	:	J. CC	MP'	ron									
ASSESSME	NT:													
•	FI	CAL LIGH V/FUI			REDUI	IDAN(CY SCE	REENS	c c		C:	IL PEM	1	
NASA IOA	[1	/1 /1]	[NA] NA]	[NA] NA]	[NA] NA]		[X X]	*
COMPARE	[/]	[]	[]	[]		1]	
RECOMMEN	DATIC	ons:	(If	d:	iffere	ent i	from N	IASA)						
	ָן.	/]	[]	[]	[]	(AI	[DD/	'DF] LE	ETE
* CIL RE	rent i	ON 1	RATION	ALI	E: (I1	apı	plicab	·	ADEQU.		[x]	

REMARKS:

ASSESSME ASSESSME NASA FME	TN	II):	LDO	GDEC	:-3	01	.20						ASA DA BASELI N]	
SUBSYSTE MDAC ID:				30	120			CELE						3					
LEAD ANA	LYS	ST:	:	J.	COM	(P	101	1											
ASSESSME	ENT:	:																	
	RI	EDUNI)ANC	Y	SCR	EEN:	S			CI IT		[
	FLIGHT HDW/FUNC A B C																		
NASA IOA	[[3 3	/1R /1R]]	P P]	[]	P P]	[[P P]		[]	*
COMPARE	[/]		[]	[]	[]		[]	
RECOMMEN	IDA!	ΓΙ	ons:		(If	d:	if	fere	nt f	r	om N	ASA)						
	[1.]		[]	[]	[1	(A)	[D D /	DE] :LE	ETE)
* CIL RI	e TE)	NT:	ION 1	RAT	ION	AL)	E:	(If	app	1:	icab	le) I	Al NA	DEQUAT DEQUAT	CE CE	[]	
REMARKS NO		L	AVAI:	LAB	LE.														

	ENT DATE: ENT ID: EA #:	, ,	-30115		NASA DAT BASELIN NE		X]
SUBSYST MDAC ID ITEM:		30115		ERATION S	YSTEMS ODULE ASSY		
LEAD AN	ALYST:	J. COM	PTON				
ASSESSM	ENT:						
	CRITICAI FLIGH HDW/FU	T	REDUN A	DANCY SCR	EENS C	CII	
NASA IOA	[3 /3 [3 /3]	[NA] [NA]	[NA] [NA]		[] *]
COMPARE	[/] !]	[]	[]	[]
RECOMME	NDATIONS:	(If o	liffere	nt from N	ASA)		
	[/] (]	[]		[ADD/D] ELETE
* CIL R	ETENTION	RATIONAI	E: (If	applicab	le) ADEQUATE INADEQUATE	-]
CAMMIAA	•						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-30	116	1	NASA DATA: BASELINE [X] NEW []				
	LANDING/D 30116 BY - PASS	DECELERATI S VALVE, H						
LEAD ANALYST:	J. COMPTO	N						
ASSESSMENT:								
FLIGH'					CIL ITEM			
HDW/FU	NC A	A B	}	С				
NASA [3 /3 IOA [2 /1R] [N	NA] [N	[A] [NA] P]	[x] *			
COMPARE [N /N] []	1] [N] [и]	[N]			
RECOMMENDATIONS:	(If dif	fferent fr	om NASA)					
[2 /1R] []	P] [F	'] [P] (AI	[DD/DELETE)			
* CIL RETENTION	RATIONALE:	: (If appl		ADEQUATE ADEQUATE	[]			
REMARKS:								
THIS VALVE SHUTDOWN AND LIN TO VALVE UNTIL J STANDBY SYSTEMS	E CLOSED (UST PRIOR	OFF DURING TO LANDIN	FLIGHT.	FLUID NO SOTH PRIMAL	OT AVAILABLE RY AND			
THAT THE BRAKES ON TH	IS CONTRO	L MODULE V	ON'T FUN	ICTION. A	LSO SEE			

30131.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-30131 02-1-029-2	NASA DATA: BASELINE [X] NEW []						
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERAT 30131 BY - PASS VALVE,	TION SYSTEMS HYD MODULE ASSY (ST	YS 2&3)					
LEAD ANALYST:	J. COMPTON							
ASSESSMENT:								
CRITICAL: FLIGH HDW/FU		Y SCREENS B C	CIL ITEM					
NASA [3 /3 IOA [2 /1R] [NA] [] [P] [NA] [NA] P] [P]	[
COMPARE [N /N] [N] [и] [и]	[N]					
RECOMMENDATIONS:	(If different f	rom NASA)						
[2 /1R] [P] [[A] DD/DELETE)					
* CIL RETENTION I	RATIONALE: (If app	·	[]					
SEE 30116.	SINCE CIRC PUMPS LLURE COULD BE DET	ARE ON FOR THESE SY ECTED INFLIGHT.	YSTEMS					

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/15/86 LDGDEC-301 02-1-030-1	112	NASA DATA: BASELINE [X] NEW []							
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DE 30112 INLET FILT	LANDING/DECELERATION SYSTEMS 30112 INLET FILTER, HYD MODULE ASSY								
LEAD ANALYST:	J. COMPTON	4								
ASSESSMENT:										
		EDUNDANCY SCRE	ENS	CIL ITEM						
FLIG HDW/F	UNC A	В	С							
NASA [3 /1 IOA [2 /1	R] [P R] [P] [P]] [P]	[P] [P]	[] * [X]						
COMPARE [N /) [] []	[]	[N]						
RECOMMENDATIONS	: (If dif	ferent from NA	SA)							
[2 /:	R] [P] [P]		[A] DD/DELETE)						
* CIL RETENTION	RATIONALE:	(If applicabl	e) ADEQUATE INADEQUATE	[]						
REMARKS: NO CIL AV GETS CLOGGED, I WELL WILL BE L	IALF BRAKING	OULD BE 2/1R B CAPABILITY TO 130.	ECAUSE IF ST BRAKES IN T	ANDBY FILTER						

ASSESSME NASA FME	NT ID:	LDGDEC-	-30130	NASA DATA: BASELINE [X] NEW []							
SUBSYSTE MDAC ID: ITEM:	M:	30130		ERATION SY HYD MODUI	STEMS E ASSY (SYS	; 1)					
LEAD ANA	LYST:	J. COMP	MOT								
ASSESSME	NT:										
•	CRITICAL FLIGH HDW/FU	T	REDUNI	DANCY SCRE	ENS C	CIL ITEM					
NASA IOA	•		P]	[] [F]	•	[] * [X]					
COMPARE	[N /] [и ј	[N]	[N]	[N]					
RECOMMEN	DATIONS:	(If d	ifferen	nt from NA	SA)						
	[2 /1R] [P]	[F]		[A] ADD/DELETE					
* CIL RET	TENTION 1	RATIONAL	E: (If	applicabl	e) ADEQUATE INADEQUATE						

SEE 30112 - SYS 1 DOES NOT PASS REDUNDANCY SCREEN B.

ASSESSME ASSESSME NASA FME	NT]	ID:	/86 C-3 032	01							SA DA BASELI N	NE]		
SUBSYSTE MDAC ID: ITEM:			30103	ING/DECELERATION SYSTEMS 3 E PEDAL TRANSDUCER												
LEAD ANA	LYS	r:	J. CO	MPT	'ON	•						-				
ASSESSME	:TN															
	1	rical: FLIGHT	r		RE A	DUNI	OAN	CY B	SCRE	ENS	s c			CIL	M	
NASA IOA	[:	3 /1R 3 /1R]	[[P P]	[P P]	[P P]]] *	
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	IDAT:	ions:	(If	đ	lff	erei	nt :	fr	om NA	SA)					
	[/]	[]	(]	[]	(Al	[D D / D :] ELETI	Ξ)
* CIL RE		TION 1	RATION	ALI	€:	(If	ap	pl:	icabl			DEQUA!		[]	
*/******/*///	•															

NASA CIL NOT AVAILABLE.

ASSESSMI ASSESSMI NASA FMI	L	12/15/86 LDGDEC-30102 02-1-032-2								NASA BASE	DATA: LINE NEW	[x]				
SUBSYSTEMDAC ID	31	ANDII 0102 RAKE								MS								
LEAD AN	ALY	ST	:	J	. coi	MP	TOI	1										
ASSESSMI	ENT	:																
	CR		ICAL LIGH		ľ		RI	EDUN	IDAI	1CY	SCI	REENS				L CEM	ſ	
	1	HDI	W/FU	NC			A			В	ı		С				-	
NASA IOA	[2 2	/1R /1R]]	P P]	!	P]	[P] P]		[x x]	k
COMPARE	[/]		(]		•]	[]		[]	
RECOMMEN	NDA'	ric	ONS:		(If	d:	iff	ere	nt	fr	om N	IASA)						
	[/]		[]	(•]	[]	(AD	[D/	'DE] LET	ſE)
* CIL RE	ETEI	NT	ION 1	RA'I	CIONA	ALI	€:	(If	ar	pl	icab	i	ADEQU		[X		

REMARKS:

ASSESSME ASSESSME NASA FME		12/15/86 LDGDEC-30110 02-1-033-1						NASA DATA: BASELINE [X] NEW []												
SUBSYSTE MDAC ID: ITEM:					LANDING/DECELERATION 30110 HYDRAULIC PRESSURE N															
LEAD ANA	LYS	ST	:	J.	COM	[P	101	1												
ASSESSME	NT:	:																		
		F	ICALI LIGHT	נ			RI A	EDUNI	DAN	CY B		CREE	NS	c			CI	L	ſ	
			•			_		,	,				r	ו מ			r		1	*
NASA IOA	[3	/1R /1R]		[P]	[P]		[P]			[]	
COMPARE	[/]		[]	(]		[]			[]	
RECOMMEN	DA!	rI¢	ons:		(If	d:	if	fere	nt	fr	om	NAS	A)							
	[/	3		[]	[]		[]	l	(AI	[\DC/	/DF] ELF	ETE)
* CIL RE	TE	NT:	ION 1	RAT	ONA	λLi	E:	(If	aŗ	pl	ica				TAUQE TAUQE		ĺ]	

REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-30111	NASA DATA: BASELINE [X] NEW []							
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELER 30111 HYD PRESS REG (S	•							
LEAD ANALYST:	J. COMPTON								
ASSESSMENT:									
CRITICAL FLIGH		NCY SCREENS	CIL ITEM						
HDW/FU		В С	HAII						
NASA [3 /1R IOA [2 /1R] [P]] [P]	[P] [P] [P] [P]	[] * [X]						
COMPARE [N /] []	. 1 []	[N]						
RECOMMENDATIONS:	(If different	from NASA)							
[2 /1R] [P]	[P] [P]	[A] (ADD/DELETE)						
* CIL RETENTION 1	RATIONALE: (If ap	oplicable) ADEQUA	re []						
REMARKS:		INADEQUAT	re [j						
SEE 30129.	TLE BRAKING WOULI	CAUSE IF STANDBY BE AVAILABLE - (SYSTEM HAD SOME ONLY FROM LAST						

ASSESSMEN ASSESSMEN NASA FMEA		-3	01							N		EL	ATA: INE NEW	[x]						
SUBSYSTEM MDAC ID: ITEM:	i:			LAN 301 HYD	29								SYST	ren	IS							
LEAD ANAL	YS	г:		J.	COM	PΤ	'ON	1														
ASSESSMEN	T:																					
C		TIC FLI					RE	EDUN	NDA	NC	CY	SC	REE	NS					IL TEM	1		
				iC			A				В			(2			_		_		
NASA IOA	[:	3 / 2 /	1R 1R]]	P P]		[P F]		[] []	?]			[X X]	*	
COMPARE	[]	N /]		[]		[N]	1	[]			[]		
RECOMMEND)AT	ION	s:	(If	di	.ff	fere	ent	: 1	fro	om :	NAS	A)								
	[2 /	1R]		[P]		[F]	,	[]	?]		(A)		A / DE		ETE)	
* CIL RET	EN'	TIO	N I	RATI	ONA	LE	:	(II	f a	ıpı	91 i	ica		7			TE TE		x]		
REMARKS: SEE SCREEN B.		111	. -	DIF	FER	EN	T	BEG	CAU	JSI	3	ľHI	s d	Œ	SN '	r P	ASS	R	EDU	JNE)AŅC	2

ASSESSMENT I ASSESSMENT I NASA FMEA #	ID: LD	GDEC-21301		NASA DATA: BASELINE [X] NEW []							
SUBSYSTEM: MDAC ID: ITEM:	21	NDING/DECE 301 G DOOR BOO									
LEAD ANALYS	т: J.	COMPTON									
ASSESSMENT:											
1	TICALITY FLIGHT DW/FUNC		NDANCY SCE	REENS		IL PEM					
	•		Γ N Δ 1	ר אא ז	r	V 1	•				
IOA [1/1]	[NA]	[NA]	[NA] [NA]	[X]					
COMPARE [/]	[]	[]	[]	[]					
RECOMMENDAT	ions:	(If differ	ent from 1	NASA)							
. [/]	[]	[]	[]	[(ADD/] /DEL					
* CIL RETENT	TION RAT	IONALE: (I	f applicat	ole)							
				ADEQUA INADEQUA		x]					

REMARKS:

ASSESSMEN ASSESSMEN NASA FME	NT ID:		30125		NASA DATA BASELINE NEW	[X]
SUBSYSTEM MDAC ID: ITEM:	M:	30125		RATION SYS		
LEAD ANA	LYST:	W. WEIS	SINGER			
ASSESSMEN	NT:					
(CRITICAL FLIGH HDW/FU	r	REDUNDA A	ANCY SCRE	ENS C	CIL ITEM
NASA IOA	,		NA]	[NA] [NA]	[NA] [NA]	[X] *
COMPARE	[/] []	[]	[]	[]
RECOMMEN	DATIONS:	(If d	lifferen	t from NA	SA)	
	[/] []	[]	[] (A	[] DD/DELETE)
* CIL RET	TENTION	RATIONAI	E: (If	applicabl	e) ADEQUATE INADEQUATE	

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	LD	/15/80 GDEC-: -1-04	30126	5				DATA ELINE NEW	[X]	
SUBSYSTIMDAC ID				301	126				SYST		-				
LEAD AN	ALY	ST	:	W.	WEIS	SING	ER								
ASSESSMI	ENT	:													
		F	LIGH			REDU	JNDAN	CY S	CREEN	S			IL CEM	1	
]	HDI	/FU	NC		A		В		С					
NASA IOA	[1	/1 /1]	[NA] NA]	[NA]	[[NA] NA]		[X X]	*
COMPARE	[/]	[]	(]	[]		[]	
RECOMMEN	NDA!	ric	ons:	((If d	iffer	ent :	from	NASA)					
	[/]	[]	[]	[]	(AI	[OD/	/DF] ELF	ETE.
* CIL RI	ETEI	NT:	ION	RATI	ONALI	E: (I	f ap	plica	able)						
									TI	ADEQU		•	X]	

REMARKS:

NASA DATA: ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-30123 NASA FMEA #: 02-1-050-1 BASELINE [X] NEW [] LANDING/DECELERATION SYSTEMS SUBSYSTEM: MDAC ID: 30123 EXCITER RING - WHEEL SENSOR ITEM: LEAD ANALYST: J. COMPTON ASSESSMENT: CRITICALITY REDUNDANCY SCREENS \mathtt{CIL} ITEM FLIGHT в с HDW/FUNC NASA [2 /1R] [P] [P] [P] IOA [3 /3] [NA] [NA] [X] * COMPARE [N /N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [3/3] [NA] [NA] [A] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [INADEQUATE [X]

REMARKS:

EXCITER RING USED TO FEED WHEEL SPEED INFORMATION BACK TO CIRCUIT CONTROL BOX. IF INPUT NOT RECEIVED THEN ANTISKID FUNCTION FOR THAT CIRCUIT INOPERATIVE. CREW SHOULD GET FAILURE LIGHT AND AVOID HEAVY BRAKING.

ASSESSMENT DATE: 12/15/86 NASA DATA: ASSESSMENT ID: LDGDEC-30123A BASELINE [X] NASA FMEA #: 02-1-051-1 NEW [] SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 30123 ITEM: EXCITER RING - WHEEL SENSOR LEAD ANALYST: J. COMPTON ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C NASA [2 /1R] [P] [P] [P] IOA [3 /3] [NA] [NA] [X] * COMPARE [N/N] [N] [N] [N]RECOMMENDATIONS: (If different from NASA) [3/3] [NA] [NA] [NA] [A] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [

REMARKS:

EXCITER RING USED TO FEED WHEEL SPEED INFORMATION BACK TO CIRCUIT CONTROL BOX. IF INPUT NOT RECEIVED THEN ANTISKID FUNCTION FOR THAT CIRCUIT INOPERATIVE. CREW SHOULD GET FAILURE LIGHT AND AVOID HEAVY BRAKING.

INADEQUATE [X]

ASSESSMENT DATE: 12/15/80 ASSESSMENT ID: LDGDEC- NASA FMEA #: 02-1-05							01	23B							LINE NEW	[
SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 30123 ITEM: EXCITER RING - WHEEL SENSOR LEAD ANALYST: J. COMPTON																				
LEAD ANA	LY	ST	:	J.	COM	ΡΊ	ON	İ												
ASSESSME	NT	:																		
CKITIONETI NEBONETICE CONTENTS											C:	IL PEN								
			A			В				С										
NASA IOA	[2	/1R /3]]	P NA]	[P N] A]		[P] NA]		[X]	*	
COMPARE	[N	/N]		[N]	[N]		[и]		[N]		
RECOMMEN	IDA'	ΓΙ	ons:		(If	đi	iff	eren	t:	fr	om	NAS	SA))						
	[3	/3)		[NA	1]	[N	A]		[NA]		.DD,			ETI	Ξ)
* CIL RE	ETE:	NT:	ION 1	RAT	IONA	LI	Ξ:	(If	ap	pl	ica	able		ADEQI VADEQI			x]		
REMARKS:										_	_									
			-											INFO					K '1	LO
CIRCUIT FUNCTION	CO	NT'	KOL :	ROX										O THE					тт.т	IP F
FUNCTION LIGHT AN									'AM	1 L	VE.	. (UM SIN	עננטכ	ناح		ı A.	الله ۱	JICE
TIGHT W	עוי.	W A A	מדח י	neA	VI D) IC	JVI	.110.												

ASSESSMEN ASSESSMEN NASA FMEA	T ID:	12/15/8 LDGDEC- 02-1-05	30123C		NASA DATA BASELINE NEW	[X]
SUBSYSTEM MDAC ID:		30123		RATION SY		
LEAD ANAI	YST:	J. COMP	TON			
ASSESSMEN	T:					
C	RITICAL: FLIGH HDW/FU	r	REDUNDA A	ANCY SCRE	ENS	CIL ITEM
NASA	[2 /1R			_	_	
IOA		; ;	NA]	[P] [NA]	[NA]	[X] * []
COMPARE	[N /N] [N]	[N]	[N]	[N]
RECOMMEND	ATIONS:	(If d	ifferen	t from NA	SA)	
	[3 /3) [NA]	[NA]	•	[A] DD/DELETE)
* CIL RET	ENTION 1	RATIONAL	E: (If a	applicable	e) ADEQUATE INADEQUATE	[] [X]
REMARKS:					_	-

EXCITER RING USED TO FEED WHEEL SPEED INFORMATION BACK TO CIRCUIT CONTROL BOX. IF INPUT NOT RECEIVED THEN ANTISKID FUNCTION FOR THAT CIRCUIT INOPERATIVE. CREW SHOULD GET FAILURE LIGHT AND AVOID HEAVY BRAKING.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-	2/15/86 NASA DAT DGDEC-30124 BASELIN 2-1-066-2 NE									
SUBSYSTEM: MDAC ID: ITEM:	30124	ATORS, ROTORS, CLIPS									
LEAD ANALYST:	J. COMP	TON									
ASSESSMENT:											
		REDUNDA	ANCY SCREE	ens	CIL ITEM						
FLIGH HDW/FU		A	В	С							
NASA [3 /1H IOA [1 /1	?] [P] P] .	[P] [P]	[P] [P]	[x] *						
COMPARE [N /N] [1	[]	[].	[N]						
RECOMMENDATIONS	(If d	ifferen	t from NA	SA)							
. [1/1] [P]	[P]	[P]	[A] ADD/DELETE						
* CIL RETENTION	RATIONAL	Æ: (If	applicabl	e) ADEQUATE INADEQUATE							
REMARKS: IF LOCKUP OPENING POSSIBLE LOSS O	OCCURS AT	HIGH S	PEED, TIR LE.	E WILL BLOW	CAUSING						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/8 LDGDEC- 02-1-07	6 10215 5-1		NASA DATA BASELINE NEW								
SUBSYSTEM: MDAC ID: ITEM:	10215	HOCK STRUT										
LEAD ANALYST:	W. WEIS	SINGER										
ASSESSMENT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C												
HDW/FU	NC	A	В	С								
NASA [1 /1 IOA [1 /1] . [NA] [NA] [NA] [NA] [NA] NA]	[X] * [X]							
COMPARE [/] [] [] []	[]							
RECOMMENDATIONS:	(If di	ifferent 1	from NASA)								
[/] [] [] [[] DD/DELETE)							
* CIL RETENTION I	RATIONALE	E: (If app	olicable)		_							
REMARKS: THE NGSSA CA	AN LOSE T	THE NITROG		ADEQUATE NADEQUATE	į							
ATMOSPHERE AND ST HYDRAULIC FLUID O NGSSA IS DEGRADED	TILL PERF OCCURS TH	FORM A SAF HE SHOCK A	TE LANDING ATTENUATIO	BUT ONCE ON CAPABILIT	A LOSS OF							

ASSESSMENT DATE: 12/15/86
ASSESSMENT ID: LDGDEC-10216 NASA DATA: BASELINE [X] NEW [] NASA FMEA #: 02-1-075-1 LANDING/DECELERATION SYSTEMS SUBSYSTEM: 10216 MDAC ID: SHOCK STRUT ITEM: LEAD ANALYST: W. WEISSINGER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL ITEM FLIGHT В HDW/FUNC NASA [1 /1] [NA] [NA] [NA] [X] *

IOA [3 /1R] [NA] [NA] [X] COMPARE [N /N] [] [] [] RECOMMENDATIONS: (If different from NASA) [3 /1R] [NA] [NA] [A] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [INADEQUATE [X]

REMARKS: ALSO SEE IOA 10215.

THIS ASSESSMENT RELATES DIRECTLY TO THE LOSS OF THE NITROGEN ELASTIC MEDIUM.

ASSESSMENT DATE: 12/15/86 NASA DATA: ASSESSMENT ID: LDGDEC-10211 BASELINE [X] NASA FMEA #: 02-1-076-1 NEW [] SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 10211 ITEM: TORQUE ARM ASSEMBLY LEAD ANALYST: W. WEISSINGER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C NASA [3 /1R] [P] [P] [P] IOA [1 /1] [NA] [NA] į x j COMPARE [N/N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [1/1] [NA] [NA] [A] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [INADEQUATE [X] **REMARKS:**

A NOSE WHEEL SLAPDOWN WHERE THE NOSE WHEEL ROTATES BEYOND A SAFE ANGLE OF ATTACK WILL CAUSE AN IMMEDIATE COLLAPSE OF THE NLG.

ASSESSMEN ASSESSMEN NASA FMEA	NT ID:	LDGDEC-		NASA DATA BASELINE NEW	[X]			
SUBSYSTEM MDAC ID:		LANDING, 10202 DRAG BR		RATION SYS	STEMS			
LEAD ANA								
ASSESSMEN	NT:							
Ó	CRITICAL: FLIGHT HDW/FUI	r	REDUNDA A	ANCY SCRE	ENS C	CIL ITEM		
NASA IOA	[1 /1 [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] *		
COMPARE	[/] []	[]	[]	[]		
RECOMMENI	OATIONS:	(If d	ifferent	from NA	SA)			
	[1 /1] [NA]	[NA]		[A] DD/DELETE)		
REMARKS:		RATIONAL		applicabl	e) ADEQUATE INADEQUATE	[x] [x]		

ALSO SEE 10203, 10202, 10221

CONCUR WITH THE BASIC ANALYSIS BUT THE ANALYSIS IS NOT COMPREHENSIVE ENOUGH TO COVER SINGLE POINT FAILURES WITHIN THE COMPONENT.

NASA FMEA TREATS THE DRAG BRACE AS A SINGLE COMPONENT WHEN THERE ARE SEVERAL PARTS THAT ARE CRITICAL INDIVIDUALLY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-10203		NASA DAT BASELII NI	FA: VE [X] EW []
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECEL 10203 DRAG BRACE TR			
LEAD ANALYST:	W. WEISSINGER			
ASSESSMENT:				
CRITICAL FLIGH	ITY REDUN	DANCY SCRE	EENS	CIL ITEM
HDW/FU	_	В	С	IIEM
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[X] * [X]
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If differe	nt from NA	ASA)	
[1 /1] [NA]	[NA]		[A] (ADD/DELETE)
* CIL RETENTION	RATIONALE: (If	applicabl	.e) ADEQUATI INADEQUATI	
REMARKS: THE DRAG BR	ACE TRUNIONS W	ERE NOT CO		S AN INDIVIDUAL
COMPONENT.				
SEE LDGDEC-	T0203			

ASSESSME ASSESSME NASA FME	NT ID:	LDG	15/86 DEC-10221 1-077-1		NASA DATA BASELINI NEV						
SUBSYSTE MDAC ID:		102	DING/DECEL 21 G BRACE								
LEAD ANA	LYST:	W.	WEISSINGER								
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM											
		FUNC	A	В	С	- 1 W.					
NASA IOA	[1 /	(1] (1]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[X] * [X]					
COMPARE	[/	']	[]	[]	[]	[]					
RECOMMEN	(DATION	1s: ((If differe	ent from N	ASA)						
	[/	′]	[]	[]	[] ([] ADD/DELETE)					
* CIL RI	* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [X] INADEQUATE []										
REMARKS:		10202,	, 10203								
FM1	EA 02-	1-077-1	L COVERS TH	IE NLG DRA	G BRACE ASSE	MBLY BUT IT					

DOES NOT COVER THE CRITICAL PARTS INDIVIDUALLY.

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	LD	GDEC-	-10	222						A DAT SELIN NE		x]	
SUBSYSTIMDAC ID:	EM:			10	ANDING/DECELERATION SYSTEMS 0222 RAG BRACE TRUNION WEISSINGER												
LEAD AND	ALY	ST	:	W.	WEIS	SI	NGEI	R									
ASSESSMI	ENT	:															
		F	LIGH	T				NDA		Y SCR	REENS				IL PEN	М	
			/FU			A	-			В		С					
NASA IOA	[1	/1 /1]	[N N	A] A]	i	[[NA] NA]	[[NA]]]	X X]	*
COMPARE	[/]	[]		(]	(]		[]	
RECOMMEN	NDA'	ric	ons:		(If d	lif	fere	ent	f	rom N	(ASA))					
	[1	/1]	[N	A]	-	[NA]	[AN]		[ADD,	A / DE		ETE)
* CIL RE	:			-	IONAL , 102			f ag	qç	licab			QUATE QUATE	[]	
				2	,	J J											

FMEA 02-1-077-1 COVERS THE NLG DRAG BRACE ASSEMBLY BUT IT DOES NOT COVER THE CRITICAL PARTS INDIVIDUALLY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-10223	NASA DATA: BASELINE [X] NEW []
	LANDING/DECELERATION SYSTE 10223 DRAG BRACE TRUNION	ems .
LEAD ANALYST:	W. WEISSINGER	
ASSESSMENT:		
CRITICALI FLIGHT		CIL ITEM
HDW/FUN	IC A B	С
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] [X] * NA] [X]
COMPARE [/] [] [] [] []
RECOMMENDATIONS:	(If different from NASA)	
[1 /1] [NA] [NA] [AN] [A] (ADD/DELETE)
REMARKS:	RATIONALE: (If applicable)	ADEQUATE [X] IADEQUATE []

ALSO SEE 10202, 10203

FMEA 02-1-077-1 COVERS THE NLG DRAG BRACE ASSEMBLY BUT IT DOES NOT COVER THE CRITICAL PARTS INDIVIDUALLY.

ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-10224 NASA FMEA #: 02-1-077-1														NASA DATA BASELINI NEV	E [x]	
SUBSYSTE MDAC ID: ITEM:	M:				ANDING/DECELERATION SYSTEMS 0224 SUPPORT BEAM													
LEAD ANA	LYS	ST:	:	W.	WEI	SS	SING	GER										
ASSESSME	ASSESSMENT:																	
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C																		
HDW/FUNC										В				С				
NASA IOA]	1	/1 /1]	[NA] [NA] [NA] [NA] [NA]								[X X]	*		
COMPARE	[/]		[]	[]		(]	[]	
RECOMMEN	DA!	ric	ons:		(If	d:	Lff	eren	it :	fr	om	NAS	A))				
	(1	/1]	٠	[NA]	[N.	A]		[AN]				ETE)
* CIL RE	TEI	NT:	ION	RAI	ION	L	2:	(If	ap	pl	ica	able	2)	ADEQUATE	r	v	1	
REMARKS:		SEI	E 10	202	, 10)2()3						Iì	NADEQUATE				
FME DOES NOT														RACE ASSEN	MBL	Y I	IUE	' IT

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-10204 02-1-078-1		ATA: INE [X] NEW []
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERA 10204 LOCK BRACE ASSEM		
LEAD ANALYST:	W. WEISSINGER		
ASSESSMENT:			
CRITICAL FLIGHT	r	NCY SCREENS	CIL ITEM
HDW/FU	NC A	ВС	
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA] [NA] [NA]	[X] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If different	from NASA)	
[/] []	[] []	[] (ADD/DELETE)
* CIL RETENTION 1	RATIONALE: (If a	pplicable) ADEQUA INADEQUA	

REMARKS:

ASSESSMENT DATE: 12/15/86 NASA DATA: ASSESSMENT ID: LDGDEC-10205 BASELINE [X] NASA FMEA #: 02-1-079-1 NEW [] SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 10205 DOWNLOCK BUNGEE ITEM: LEAD ANALYST: W. WEISSINGER ASSESSMENT: REDUNDANCY SCREENS CRITICALITY CIL FLIGHT ITEM HDW/FUNC Α в с NASA [3 /1R] [P] [NA] [P] [] IOA [1 /1] [NA] [NA] [NA] [X] COMPARE [N/N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [1/1] [NA] [NA] [NA] [A] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ADEQUATE [] INADEQUATE []

REMARKS:

ALSO SEE 10206

THE DOWNLOCK BUNGEE IS A MECHANICAL DEVICE THAT IF BENT OR JAMMED IN THE EXTENDED POSITION COULD CAUSE A FORCE THAT WOULD UNLOCK THE LOCK BRACE.

HYDRAULICS - THE EXTEND/RETRACT HYD ACTUATOR IS THE ONLY REDUNDANT ITEM. WHEN THE VEHICLE IS SHUT DOWN POST LANDING THERE IS NO REDUNDANCY. THE NASA FMEA/CIL DOES NOT CONSIDER APU SHUTDOWN OCCURRING BEFORE CREW EGRESS.

NASA DATA: ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-10206 BASELINE [X] NEW [NASA FMEA #: 02-1-079-1 LANDING/DECELERATION SYSTEMS SUBSYSTEM: MDAC ID: 10206 DOWNLOCK BUNGEE ITEM: LEAD ANALYST: W. WEISSINGER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL ITEM FLIGHTС HDW/FUNC В NASA [3 /1R] [P] [NA] [P] IOA [1 /1] [NA] [NA] COMPARE [N/N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [1/1] [NA] [NA][A] (ADD/DELETE) * CIL RETENTION RATIONALE: (If applicable) ADEQUATE INADEQUATE [

REMARKS:

SEE 10205.

THERE WILL BE NO COMPLICATIONS THROUGHOUT THE LANDING UNTIL AFTER THE VEHICLE IS SHUTDOWN. ONCE THE HYDRAULICS SYSTEM IS DEACTIVATED THERE IS NO SYSTEM TO HOLD THE LOCK BRACE IN POSITION, AND A GUST OF WIND, AN IMPACT FROM APPROACHING VEHICLES OR MOVEMENT INSIDE THE VEHICLE COULD CAUSE NLG COLLAPSE. A COLLAPSE OF THE NLG WOULD CAUSE STRUCTURAL DAMAGE AND A POSSIBLE LOSS OF LIFE.

THIS SITUATION CAN BE BYPASSED BY INSTALLING THE LANDING GEAR SAFETY PINS IN THE LOCK BRACE PRIOR TO HYDRAULICS SYSTEM 1 SHUTDOWN.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-10214 02-1-080-1	NASA D BASEL	ATA: INE [X] NEW []
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERA 10214 WEIGHT ON WHEELS		
LEAD ANALYST:	W. WEISSINGER		
ASSESSMENT:			
FLIGH'	-		CIL ITEM
HDW/FU	NC A	В С	
NASA [3 /1R IOA [3 /3] [P]] [P]	NA] [P] [P]	[] *
COMPARE [/N] []	[и] [ј	[]
RECOMMENDATIONS:	(If different	from NASA)	
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* CIL RETENTION	RATIONALE: (If a	oplicable) ADEQUA INADEQUA	TE []
	SWITCHES CAN ALSO		ILL ACTIVATE NWS

ASSESSMEN ASSESSMEN NASA FME	NT ID:	LDGDEC	-102		NASA DAT BASELIN NE]	
SUBSYSTEM MDAC ID:		10218		•	eration s' Els senso			
LEAD ANA	LYST:	W. WE	ISSI	IGER				
ASSESSME	NT:							
,	CRITICAL		RI	EDUN	DANCY SCR	EENS	CIL	
	FLIGH HDW/FU		A	В	С	116	II.	
NASA IOA	[3 /1R [3 /3	:]]	[P]	[NA] [P]	[P] [P]	[[] *]
COMPARE	[/N]	[]	[N]	[]	[3
RECOMMEN	DATIONS:	(If	dif	fere	nt from N	ASA)		
	[3 /3]	[P]	[P]	[P]	[ADD/D] ELETE
* CIL RE	TENTION	RATION	ALE:	(If	applicab	le) ADEQUATI INADEQUATI]
REMARKS:	10214,		v.D.3. G	a e b	ny mua am	/CDB CED CWI	rmeu	

- SWITCHES CAN BE BYPASSED BY THE ET/SRB SEP SWITCH.
 DIFFERENTIAL BRAKING CAN BE USED AS BACKUP STEERING.
- NASA FMEA ASSUMES THE FAILURE OF BOTH SENSOR SWITCHES.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-10219 02-1-080-1		NASA DATA BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELE 10219 WEIGHT ON WHEE			
LEAD ANALYST:	W. WEISSINGER			
ASSESSMENT:				
CRITICALI FLIGHT HDW/FUN	ר	B B	is C	CIL ITEM
NASA [3 /1R IOA [3 /3] [P]] [P]	[NA] [[P] [P]	[] *
COMPARE [/N] []	[14]	. 1	[]
RECOMMENDATIONS:	(If differen	t from NASA	۷)	
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* CIL RETENTION F	RATIONALE: (If		ADEQUATE NADEQUATE	[]

- SENSOR CAN BE BYPASSED WITH THE ET/SRB SEP SWITCH.
- DIFFERENTIAL BRAKING CAN BE USED AS THE ALTERNATE STEERING METHOD.

SEE 10214.

ASSESSMEN ASSESSMEN NASA FME	NT ID:	LD	/15/8 GDEC- -1-08	-102					NASA 1 BASE		[X]	
SUBSYSTEM MDAC ID:	M:	10	NDING 207 G - 1										
LEAD ANA	LYST:	W.	WEIS	SSIN	GER								
ASSESSME	NT:												
(CRITIC	ALITY GHT	<u> </u>	RE	DUND	ANC	CY SC	REENS	;		CIL		
		FUNC		A			В		С				
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COMPARE	[/	′]		[]	. []	[]		[]	
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REMARKS:							٠						

ASSESSME ASSESSME NASA FME	NT I	D:	12/15 LDGDE 02-1-	C-10					NASA DAT BASELIN NI		K]
SUBSYSTE MDAC ID: ITEM:	M:		LANDI 10208 NLG -	}					MS		
LEAD ANA	LYSI	?:	W. WE	issi	INGER	!					
ASSESSME	NT:										
	F	CICAL: LIGH: W/FUI	r	F Z			Y SCR		c	CII	
NASA IOA		/3]	[]	IA] IA]	[]	NA] NA]	[]	NA] NA]	[] *
COMPARE	[/]	1]	[]	[]	[]
RECOMMEN	DATI	ons:	(If	dif	fere	nt fi	com N	ASA)			
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* CIL RE	TENT	'ION I	RATION	ALE:	(If	app]	licab	` 1	ADEQUATE ADEQUATE	•]

MECHANICAL FAILURE CAUSING A LOSS OF SIGNAL.

ASSESSME ASSESSME NASA FME	NT I	ATE: D:	LDGDE	12/15/86 NASA I LDGDEC-10217 BASEI 02-1-082-1								[X]	
SUBSYSTE MDAC ID: ITEM:			10217	DING/DECELERATION SYSTEMS 17 OCK ROLLER RETAINING ASSEMBLY											
LEAD ANA	LYST	:	W. WE	SSIN	IGER										
ASSESSME	ENT:														
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM															
	_	W/FUI		A			В			С			TILL	,	
NASA IOA	[1 [1	/1 /1]	[NZ	A] A]	[NA NA]	[NA] NA]		[[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
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* CIL RI		ION :	RATION	ALE:	(If	app	oli	cable		ADEQUAT NADEQUAT		[x]	
REMARKS:	SA FM			3-1 (COVER	s :	PHE	SAMI	Ξ 2	ASSY BUT	TH	E	FA	ΊI	URE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-10701 02-1-082-1		NASA DATA BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELE 10701 NLG UPLOCK HOO		PEMS	
LEAD ANALYST:	J. COMPTON			
ASSESSMENT:				
CRITICALI FLIGHT		DANCY SCREEN	rs	CIL ITEM
HDW/FU	NC A	В	С	
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [[NA] [NA] NA]	[X] * [X]
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REMARKS:

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SUBSYSTE MDAC ID:		1021	•		YSTEMS G ASSEMBLY	
LEAD ANA	ALYST:	w. w	EISSINGER			
ASSESSME	ENT:					
	CRITICA FLIG		REDUN	DANCY SCR	EENS	CIL ITEM
	HDW/F	UNC	A	В	С	
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RECOMMEN	NDATIONS	: (I	f differe	nt from N	ASA)	
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REMARKS	•				INADEQUA	re []
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MODES AT	KE NOT A	LIKE.				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-1	.0209	NASA DATA BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	10209	DECELERATION SYST	EMS	
LEAD ANALYST:	W. WEISS	SINGER		
ASSESSMENT:				
CRITICAL FLIGH		REDUNDANCY SCREEN	S	CIL ITEM
HDW/FU	NC .	A B	С	
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COMPARE [/] []	и] [и] [и ј	[]
RECOMMENDATIONS:	(If di	fferent from NASA)	
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* CIL RETENTION	RATIONALE	: (If applicable)	ADEQUATE	
REMARKS:			NADEQUATE	•
OBSERVED IS DURING	RTION OF	THE FLIGHT THAT T NDING ROLLOUT AND	HIS FUNCTION	ON CAN BE
INFORMATION IS V				VE A FAILURE
SIGNAL THE NLG M	JST HAVE I	WEIGHT ON THE NLG	WHICH MEAN	NS THAT
THE VEHICLE IS I	N THE ROL	LOUT PHASE OF THE	LANDING.	IF A FAILUR
OCCURS THE PILOT	WOULD HAV	VE TAKEN OVER MAN	UALLY BEFOR	RE HE WOULD

RECOGNIZE THE FAILURE SIGNAL ON PANEL F3. THE VEHICLE WILL STOP

BEFORE A COMPLETE ANALYSIS OF THE SITUATION IS PERFORMED.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-111 02-1-097-1	02	NASA DATA BASELINE NEW								
SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 11102 ITEM: NLG B/U PYRO UPLOCK RELEASE MECH											
LEAD ANALYST:	J. COMPTON										
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM											
HDW/FU	NC A	В	С								
NASA [2 /1R IOA [1 /1] [NA] [NA] [NA]] [NA]	[NA] [NA]	[X] * [X]							
COMPARE [N /N] [] []	[]	[]							
RECOMMENDATIONS:	(If diff	erent from	NASA)								
[1 /1] [NA] [NA]		[A] ADD/DELETE)							
* CIL RETENTION	RATIONALE:	(If applica	able) ADEQUATE INADEQUATE								
REMARKS: SYSTEM IS NO	OT USED UNL	ESS HYDRAUI	LIC UPLOCK RELE	CASE SYSTEM							

SYSTEM IS NOT USED UNLESS HYDRAULIC UPLOCK RELEASE SYSTEM FAILS. IF THIS SYSTEM FAILS WHEN CALLED ON TO FUNCTION, THERE IS NO OTHER BACKUP.

ACCORDING TO THE REDUNDANCY RULES IN 22206, THIS SYSTEM IS A 2/1R CRITICALITY BUT, A FAILED HYDRAULICS SYSTEM ACTIVATES THIS SYSTEM. THIS SYSTEMS FAILURE WILL NOT ACTIVATE THE HYDRAULICS. THERE IS A LINEAR OPERATION HERE THAT WILL NOT ALLOW REVERSAL OF THE ROLES.

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:		DEC-	11101	NASA DATA: BASELINE [X] NEW []								
SUBSYST				111	NDING/DECELERATION SYSTEMS 101 G B/U PYRO UPLOCK RELEASE MECH										
LEAD AN	ALY	ST	:	J. (COMP	ron									
ASSESSM	ENT	:													
		F	LIGH				NDAN	CY SCI	REENS				IL Pem	1	
		HDI	/FU	NC		A		В		С					
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REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		NASA DATA: BASELINE NEW	[X]									
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERATION SYS 10501 NLG DOOR EXTEND / RETRAC											
LEAD ANALYST:	J. COMPTON											
ASSESSMENT:												
CRITICALI FLIGHT HDW/FUN	T NC A B	С	CIL									
NASA [1 /1 IOA [1 /1] [NA] [NA]] [NA] [NA]	[NA] [NA]	[X] * [X]									
COMPARE [/] [] []	[]	[]									
RECOMMENDATIONS: (If different from NASA)												
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NASA FME	A #:	02-1	1-098-1			ī	IEW (j						
SUBSYSTE MDAC ID: ITEM:	M:	LANI 1090 NLG	•	I S										
LEAD ANA	LYST:	J. (J. COMPTON											
ASSESSME	NT:													
	CRITI	CALITY	RE	REDUNDANCY SCREENS CIL										
		IGHT	_		_		_	rı	ITEM					
	HDW,	/FUNC	A		В	(3							
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REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-10 02-1-099	х]]										
MDAC ID:	LANDING/DECELERATION SYSTEMS 10501 NLG DOOR EXTEND / RETRACT MECHANISM												
LEAD ANALYST:	J. COMPT	ON											
ASSESSMENT:													
		Y REDUNDANCY SCREENS											
FLIGHT HDW/FUI	NC .	A	В	С	ITEM								
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RECOMMENDATIONS: (If different from NASA)													
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REMARKS: DOORS COULD COMPONENTS OR OT	IMPACT A HER ITEMS	ND DAMAGI LOCATED	E ELECTRION THE SI	CAL AND HYI HOCK STRUT	DRAUI ASSE	LIC EMBLY							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #: SUBSYSTEM: MDAC ID: ITEM:	LDGDEC-10901A 02-1-099-1	BA ERATION SYSTEMS	A DATA: SELINE [X] NEW []								
LEAD ANALYST:	•										
ASSESSMENT:											
CRITICAL FLIGH HDW/FU	T	DANCY SCREENS B C	CIL ITEM								
NASA [1 /1 IOA [1 /1] [NA]] [NA]	[NA] [NA] [NA]	[X] * [X]								
COMPARE [/] []	[] []	[]								
RECOMMENDATIONS:	(If differe	nt from NASA)									
[1 /1] . [NA]	[NA] [NA]	[A] (ADD/DELETE)								
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REMARKS:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:					/15/86 GDEC-1 -1-10		NASA DATA: BASELINE [X] NEW []										
SUBSYSTEM: MDAC ID: ITEM:				11	LANDING/DECELERATION SYSTEMS 11301 NLG DOOR BUNGEE ASSIST ASSY												
LEAD ANALYST:				J.	COMP	TO	1										
ASSESSME	NT:																
	ITY REDUNDANCY SCREE T						EENS					CIL ITEM					
	H	IDW	/FU	NC		A				В		С					
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RECOMMEN	DA'	ric	ons:		(If d	if	fere	ent	ſ	rom N	IASA))					
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ASSESSMI ASSESSMI NASA FMI	ENT]	D:	LDG	15/8 DEC- 1-10	11202		NASA DATA: BASELINE [X] NEW []							
SUBSYSTI MDAC ID ITEM:			112	LANDING/DECELERATION SYSTEMS 11202 NLG EXTENSION BOOSTER PYRO ACT										
LEAD AND	ALYSI	r:	J. (J. COMPTON										
ASSESSMI	ENT:													
		'ICAL 'LIGH								CIL				
	NC A				В		С			ITEM				
NASA IOA		/1		[NA] NA]	[NA] NA]	[NA] NA]		[X X]	*
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RECOMMEN	IDATI	ONS:	(1	If di	iffere	ent i	from	NASA))					
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-11201 02-1-104-2		ATA: INE [X] NEW []
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELE 11201 NLG EXTENSION	RATION SYSTEMS BOOSTER PYRO ACT	
LEAD ANALYST:	J. COMPTON		
ASSESSMENT:			
CRITICAL		ANCY SCREENS	CIL ITEM
FLIGH' HDW/FU		ВС	-
NASA [1 /1 IOA [1 /1] [NA]]. [NA]	[NA] [NA] [NA]	[X] * [X]
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SUBSYSTI MDAC ID: ITEM:	EM:			10	ANDING 0201 OSE LA										
LEAD ANA	LY	ST	:	W.	WEIS	SINGE	ER								
ASSESSME	ENT	:													
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		HDI	W/FU	INC	А В С										
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REMARKS: ALS	0 5	SEF	10	203	, 1022	22, 10	0223					ι Λ	J		

THE NASA FMEA DOES NOT COVER ANYTHING BUT THE NLG SHOCK STRUT TRUNIONS. THERE ARE SEVERAL OTHER TRUNNIONS IN THE NLG AND THEY ARE LOCATED IN THE NLG DRAGBRACE, THE NLG LOCKBRACE AND THE SUPPORT BEAM

ASSESSMEI ASSESSMEI NASA FME	I TN	D:	LDGD	12/15/86 NASA DATA LDGDEC-10101 BASELINE 02-1-110-1 NEW]	
SUBSYSTEM MDAC ID:	M:		1010	1	/DECEL			YSTEI	MS					
LEAD ANA	LYST	:	W. W	EIS	SINGER	2								
ASSESSME	NT:													
1	F	ICAL			REDUN A	IDANCY			c		CI:			
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SUBSYSTI MDAC ID: ITEM:										SYS	STI	EMS	5									
LEAD ANA	ALY:	ST	:	J.	COI	MP'	roi	N														
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		F	ICAL: LIGH' W/FUI	r	•		RI A	EDU	NDA	N(CY B	s	CREE	ENS	s c				CI	CEN	1	
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NASA IOA	[2	/1R /1R]		[P]		[F]		[P]			[x]	*
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* CIL RE	ETEI	NT	ION 1	RAT	ION	AL	Ε:	(I	fa	ıpı	91 i	LCa	able				UATI ITAU		[x]	

REMARKS:

REDUNDANCY SCREEN B FAILS BECAUSE HYD. SYS. 1 FLUID IS NOT CIRCULATED TO THIS ACTUATOR ONORBIT, THUS FAILURE NOT DETECTED.

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:		21003	NASA DATA: BASELINE NEW		
SUBSYSTEM: MDAC ID: ITEM:	21003	OCK ACTU	RATION SYST	PEMS	
LEAD ANALYST:	J. COMP	MOTON			
ASSESSMENT:					
CRITICA FLIG		REDUNDA	NCY SCREEN	IS	CIL ITEM
HDW/F		A	В	С	4
NASA [2 /1 IOA [2 /1	R] [R] [P] P]	[P] [[F] [P] P]	[X] * [X]
COMPARE [/] [. 1	[и]]	[]
RECOMMENDATIONS	: (If d	lifferent	from NASA	A)	
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* CIL RETENTION	RATIONAL	LE: (If a		ADEQUATE INADEQUATE	
REMARKS: POSSIBLE L	oss of H	ZDRAULICS	S SYSTEM 1	IF SYSTE	M FAILS, THE

THE ORBITER IS ONE FAILURE AWAY FROM LOSS OF LIFE OR VEHICLE. PYRO BACKUP. HYDRAULIC FLUID IS NOT CIRCULATED TO THIS ACTUATOR ONORBIT, THUS FAILURE CANNOT BE DETECTED -FAILS REDUNDANCY SCREEN B.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-21006	NASA DATA: BASELINE [X] NEW []						
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERATION S 21006 MLG UPLOCK ACTUATOR	SYSTEMS						
LEAD ANALYST:	J. COMPTON							
ASSESSMENT:								
CRITICALI FLIGHT HDW/FUN	r.	REENS C	CIL ITEM					
NASA [3 /3 IOA [3 /3] [NA] [NA]] [NA] [NA]	[NA] [NA]	[] *					
COMPARE [/] [] []	[]	[]					
RECOMMENDATIONS:	(If different from N	NASA)						
[/] [] []	[]	[] ADD/DELETE;					
* CIL RETENTION R	NATIONALE: (If applicat	ole) ADEQUATE INADEQUATE						

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 12/15/86 LDGDEC-2 02-6-G09	20404		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	LANDING/ 20404 MLG EXTI			EMS STRUT ACT	
LEAD ANALYST:	J. COMP	ron			
ASSESSMENT:					
CRITICA FLIG	LITY	REDUNDANC	CY SCREEN	s	CIL ITEM
	UNC	A	В	С	
NASA [1 /1 IOA [1 /1] [NA] [NA] [NA] [NA] [NA] NA]	[X] * [X]
COMPARE [/] [] [] []	[]
RECOMMENDATIONS	: (If d	ifferent :	from NASA	')	
[/] [] [.] [] (2	[ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If app		ADEQUATE NADEQUATE	
REMARKS: SAME FOR 1	OSE LANDI	NG GEAR -	SEE LDGI	EC - 1040	4.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-20402 02-6-G09-A02	NASA DATA: BASELINE [X] NEW []		
SUBSYSTEM: MDAC ID: ITEM:	20402	LERATION SYSTEM RETRACT HYD SI		
LEAD ANALYST:	J. COMPTON			
ASSESSMENT:				
FLIGH'		NDANCY SCREENS B C	CIL ITEM	
NASA [3 /3 IOA [2 /1R] [NA]] [P]	[NA] [N [F] [F	[A] [] *	
COMPARE [N /N] [N]	[N] [N	[и]	
RECOMMENDATIONS:	(If differ	ent from NASA)		
[2 /1R] [P]	[F] [P	[A] (ADD/DELETE)
* CIL RETENTION I	ATIONALE: (I	A	DEQUATE [] DEQUATE []	
REMARKS:	C OF HADDYIII		~	 .
THE ORBITER IS ON THE GEAR HAS A PY	E FAILURE AWA RO BACKUP TO	AY FROM LOSS OF	IF SYSTEM FAILS, ' LIFE OR VEHICLE. R. IF IT FAILS, '	

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SUBSYSTE MDAC ID:	M:			204	03		ELERAT			MS TRUT	ACT				
LEAD ANA	LYS	ST:	:	J.	COMP	ron									
ASSESSME	NT:	:													
		Fl	LIGH	_			UNDAN		REENS			CI	L LEM	1	
	1	HDV	/FU	NC		A		В		С					
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ASSESSMENT DATE: 12/15/86 ASSESSMENT ID: LDGDEC-20416 NASA FMEA #: 02-6-G09-A04													A DAT SELIN NE		x]		
SUBSYSTE MDAC ID:	M:			LANDI 20416 MLG E										r act	<u>'</u>			
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	CR1		ICAL LIGH	ITY		R	EDUN	DAN	CY	sc	REEN	S				IL	-	
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* CIL RE	TEN	T)	ON I	RATION	ALI	Ξ:	(If	app) 1i	lca				UATE UATE]	
REMARKS:	TATE	\	TOV C	COPEN	_			22							-		•	
CIRCULATI DETECTED	ED	TC	THI	SCREEN IS ACTU	JA'	rr IOI	S ONG	BE(ORB)	T,	T.	HVD,	SY	S	FAIL	URE	IS IS	N N	OT

	12/15/86 LDGDEC-20412 02-6-G09-B01		ATA: INE [X] NEW []						
SUBSYSTEM: MDAC ID: ITEM:	20412	LG EXTEND / RETRACT HYD STRUT ACT							
LEAD ANALYST:	J. COMPTON								
ASSESSMENT:	•								
CRITICALI FLIGHT HDW/FUN	r NC A	ANCY SCREENS B C	CIL ITEM						
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA] [NA]	[] *						
COMPARE [/] []	[] []	[]						
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* CIL RETENTION DREMARKS:	RATIONALE: (If	applicable) ADEQUA INADEQUA	-						

ASSESSMENT DA ASSESSMENT II NASA FMEA #:		-20413		NASA DAT BASELIN NI	NE [X]
SUBSYSTEM: MDAC ID: ITEM:	20413	•	ERATION SY	STEMS D STRUT ACT	נ
LEAD ANALYST:	J. COM	PTON			
ASSESSMENT:	•				
FI	CALITY LIGHT I/FUNC	REDUNI A	DANCY SCRE	ENS C	CIL ITEM
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* CIL RETENTI	ON RATIONA	LE: (If	applicabl	e) ADEQUATE INADEQUATE	• •

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SUBSYSTI MDAC ID: ITEM:				20	411	-	'DECEL					ACT			
LEAD AND	ALYS	ST:	;	J.	COM	PΊ	мог								
ASSESSMI	ENT	:													
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SUBSYSTEMDAC ID				204	109					ems Strut act	r		
LEAD AN	ALY	ST	:	J.	COMP	TON							
ASSESSMI	ENT	:											
		F	LIGH				NADI)	CY SCF	REENS		CI IT		
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NASA IOA	[3 3	/3 /3]) [NA] NA]	[NA] NA]	[NA] NA]	[]	*
COMPARE	[/]	[]	[]	[1	[]	
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	E: 12/15/86 LDGDEC-20408 02-6-G09-E01		NASA DATA BASELINI NEV]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECE 20408 MLG EXTEND /				
LEAD ANALYST:	J. COMPTON				
ASSESSMENT:					
CRITIC FLI	ALITY REDU	NDANCY SCRE	ENS	CIL	
	FUNC A	В	С		
NASA [3 / IOA [3 /	3] [NA] 3] [NA]	[NA] [NA]	[NA] [NA]	[[] *]
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* CIL RETENTIO	N RATIONALE: (I	f applicabl	e) ADEQUATE INADEQUATE]

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SUBSYSTE MDAC ID:	M:			204	408		DECEL				ems Strut	ACT			
LEAD ANA	LYS	ST	:	J.	CON	(P)	ON								
ASSESSME	NT	:			•										
	CR		ICAL LIGH				REDUN	DAN	CY SC	CREENS	5		CII		
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ASSESSME ASSESSME NASA FME	NT :	ID:	12/15 LDGDE 02-6-	C-2					NASA D BASEL]
SUBSYSTE MDAC ID:			LANDI 20414 MLG E						ems strut a	CT		
LEAD ANA	LYS	r:	J. CO	MPT	NC							
ASSESSME	NT:											
		rical: Fligh		F	REDUN	DANC	Y SCR	EENS	5		CIL	vr
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REMARKS:			, •					ΤV	ADEQUA'	LE	L	J

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SUBSYSTEM: LANDING/DECED MDAC ID: 20406 MLG EXTEND / LEAD ANALYST: J. COMPTON												ACT			
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ASSESSMI	ENT	:													
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ASSESSME ASSESSME NASA FME	NT	ID:	LDGI	DEC-20	415				NASA DA BASELI N	NE			
	AD ANALYST: LANDING/DECELERATION SYSTEMS 20415 MLG EXTEND / RETRACT HYD STR												
LEAD ANA	LYS	ST:	J. (COMPTO	N								
ASSESSME	NT:	:											
CRITICALITY REDUNDANCY SCREENS FLIGHT												M	
	H	IDW/FU	NC	A	L		В		С				
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ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-20415A 02-6-G09-H02	NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERAT 20415 MLG EXTEND / RETR		
LEAD ANALYST:	J. COMPTON		
ASSESSMENT:			
CRITICAL: FLIGHT	r		CIL ITEM
HDW/FUI	NC A	В С	
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COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If different f	rom NASA)	
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* CIL RETENTION	RATIONALE: (If app	licable) ADEQUATE INADEQUATE	•

ASSESSMI	ENT ID: EA #:	LDGDEC-	-20407			DATA: LINE [] NEW [(]]
SUBSYSTI MDAC ID: ITEM:		20407	·	ERATION S	YSTEMS YD STRUT A	CT	
LEAD ANA	ALYST:	J. COM	PTON				
ASSESSME	ENT:						
	CRITICAL FLIGH	T		DANCY SCR		CII	
	HDW/FU		A	В	С		
NASA IOA	[3 /3]	[NA] [NA]	[NA] [NA]	[NA] [NA]	[] *]
COMPARE	[/] []	[]	[]	[]
RECOMMEN	DATIONS:	(If d	liffere	nt from N	ASA)		
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* CIL RE	TENTION 1	RATIONAI	E: (If	applicab	le) ADEQUA	-]

ASSESSME	SSESSMENT DATE: 12/15/86 SSESSMENT ID: LDGDEC-20407A IASA FMEA #: 02-6-G09-J02 SUBSYSTEM: LANDING/DECELERAT											_	SASE		E	-]		
SUBSYSTE MDAC ID:				20	407							SYST HYD			ACT				
LEAD ANA	LYS	ST:	:	J.	COM	PJ	ON												
ASSESSME	ENT:	:																	
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SUBSYST MDAC ID		2040)5	LERATION RETRACT	SYSTEMS HYD STRUT <i>1</i>	ACT	
LEAD AN	ALYST:	J. (COMPTON				
ASSESSM	ENT:						
	FLI	ALITY GHT FUNC		NDANCY SCI	REENS C	CI	L EM
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LEAD ANA	LYS	ST:	}	J.	CON	(P	(O	1													
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REMARKS:	;																				

CIL NOT AVAILABLE.

ASSESSM ASSESSM NASA FM		12/15/8 LDGDEC- 02-6-H	10404			DATA: LINE [X] NEW []
SUBSYST		10404		ERATION RETRACT	SYSTEMS HYD STRUT	ACTUATOR
LEAD AND	ALYST:	J. COMP	TON			
ASSESSMI	ENT:					
	CRITICAL: FLIGHT HDW/FU	r	REDUN	DANCY SC		CIL ITEM
	·		A	В	С	
NASA IOA	[1 /1 [1 /1] [NA] NA]	[NA] [NA]	[NA] [NA]	[X] * [X]
COMPARE	[/) [1	[]	[]	[]
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REMARKS:					ADEQU.	ATE [j
SAM	LE FUR MAI	.N LANDI	NG GEAI	R - SEE I	LDGDEC 204	04.

ASSESSMENT DATE: 12/15/86 NASA DATA: ASSESSMENT ID: LDGDEC-10402 BASELINE [X] NASA FMEA #: 02-6-H01-A02 NEW [] SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 10402 ITEM: NLG EXTEND / RETRACT HYD STRUT ACT LEAD ANALYST: J. COMPTON ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC Α В С
 IASA [3 /3]
 [NA] [NA] [NA]

 IOA [2 /1R]
 [P]
 [F]
 [P]
 NASA [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 [X] **REMARKS:** POSSIBLE LOSS OF HYDRAULICS SYSTEM 1. IF THE SYSTEM FAILS, THEN THE ORBITER IS ONE FAILURE AWAY FROM LOSS OF LIFE OR VEHICLE. THE GEAR HAS A PYRO BACKUP TO UNLOCK THE GEAR. IF IT FAILS, THE GEAR WILL NOT DEPLOY.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-1 02-6-H01	.0403			TA: NE [X] EW []
SUBSYSTEM: MDAC ID: ITEM:	LANDING/ 10403 NLG EXTE			STEMS D STRUT AC	TUATOR
LEAD ANALYST:	J. COMPT	ON			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	ANCY SCRE		CIL ITEM
HDW/FU	INC	A	В	С	
NASA [3 /3 IOA [3 /3] [NA] NA]	[NA] [NA]	[NA] [NA]	[] *
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SUBSYSTEM MDAC ID:			LANDIN 10416 NLG EX	·									ACTU	AΤC)R		
LEAD ANA	LYST	:	J. COM	IPI	101	ī											
ASSESSME	NT:																
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COMPARE	[/]	[]	[N]	[.]		[]	
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* CIL RE	TENT	ION 1	RATION	ALI	Ξ:	(If a	apj	p1 i	[cab]		AI IAI	DEQU DEQU	JATE JATE	[x]	
REMARKS: RED CIRCULAT DETECTED	ED T		SCREEN IS ACTU													NO	от

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-10412 02-6-H01-B01		NASA DATA BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELO 10412 NLG EXTEND / 1			ATOR	
LEAD ANALYST:	J. COMPTON				
ASSESSMENT:					
CRITICAL: FLIGHT HDW/FUI	r	DANCY SCREENS B	s c	CIL	ſ
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COMPARE [/] []	[]	1	[]
RECOMMENDATIONS:	(If differe	nt from NASA)			
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* CIL RETENTION I	RATIONALE: (If		ADEQUATE IADEQUATE	[]

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LEAD AN	ALYS	ST:	J.	. COMP	TON									
ASSESSM	ENT:	:												
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SUBSYSTE MDAC ID:			104	11	DECEI		•		MS TRUT A	CTUAT	OR		
LEAD ANA	LYS	ST:	J.	COMP	ron								
ASSESSME	ENT:	:											
		FLIG			REDUN	IDANG		REENS	s c		IL TEN	M	
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COMPARE	[/]	[]	[]	[]	[]	
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ASSESSMEN ASSESSMEN NASA FMEA	T ID:	12/15/8 LDGDEC- 02-6-H0	10409			INE [X IEW []
SUBSYSTEM MDAC ID: ITEM:	:	10409		RATION SY ETRACT HY	STEMS D STRUT AC	TUATOR	
LEAD ANAL	YST:	J. COMP	TON				
ASSESSMEN	T:						
C	RITICAL FLIGH		REDUND	ANCY SCRE		CIL ITEM	[
	HDW/FU	NC	A	В	С		
NASA IOA	[3 /3 [3 /3] [NA] NA]	[NA] [NA]	[NA] [NA]	[] *]
COMPARE	[: /] []	[]	[]	[]
RECOMMENI	ATIONS:	(If d	ifferer	nt from NA	SA)		
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* CIL RET	TENTION	RATIONAI	Æ: (If	applicabl	.e) ADEQUA INADEQUA	_]

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SUBSYSTEMDAC ID:	EM:		104	10			TION :			ACTU	JATO:	R	
LEAD ANA	LYS	ST:	J.	COMPT	'ON								
ASSESSME	ENT	:											
		TICAL FLIGH IDW/FU	${f T}$		REDUI A	NDAN(CY SCI B	REENS	s c		CI:		
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* CIL RE	TEN	TION 1	RATIO	ONALE	: (If	app	licab						
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ASSESSMEN ASSESSMEN NASA FME	NT I	D:	LDGDE	2-10	0408					DATA: ELINE NEW	[]	(]	
SUBSYSTEM MDAC ID:			LANDIN 10408 NLG EX	•						ACTUA	\TOF	2	
LEAD ANA	LYST	:	J. COM	(PT	ON								
ASSESSME	NT:												
•	F	ICALI LIGHT W/FUI	_		REDUN A	DANC	Y SCR	REENS	c		CII	_	
NASA IO A	[3 [3	/3 /3]	[]	NA] NA]	[NA] NA]	[NA] NA]		[]	*
COMPARE	[/]	[]	Į]	[]		[]	
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REMARKS:													

ASSESSMI NASA FMI	ENT	ID:	LDGD			A			NASA DAT BASELIN NI		K]
SUBSYSTI MDAC ID: ITEM:			1040	8			rion s		ems Trut act	UATOI	₹
LEAD ANA	ALYS	T:	J. C	OMPTO	N						
ASSESSMI	ENT:										
		TICAL FLIGH	r	F		IDANG	CY SCI	REENS	c	CII ITI	
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COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	IDAT	'IONS:	(I	f dif	fere	ent i	from N	NASA)			
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* CIL RE	ETEN	TION 1	RATIO	NALE:	(If	app	olicak	•	ADEQUATE	_]

ASSESSME ASSESSME	NT ID:	LDGD	EC-104]		
NASA FME	:A #:	02-6	-H01-	F01				1	NEW]	
SUBSYSTE MDAC ID:		LAND: 10414 NLG	1					EMS STRUT AC	CTUA	то	R		
LEAD ANA	LYST:	J. C	OMPTO	N									
ASSESSME	ENT:												
	CRITICA		R	EDUN	DANC	SCR	EENS	3		CI	L EM		
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NASA IOA	[1 /1 [1 /1]	[N.	A] A]	í] í]	NA] NA]]	NA] NA]		[[X X]	*
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REMARKS:													

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-10406		NASA DATA: BASELINE [X] NEW []					
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELE 10406 NLG EXTEND / R			ATOR				
LEAD ANALYST:	J. COMPTON							
ASSESSMENT:			·					
CRITICAL: FLIGHT HDW/FUI	r	B	ens C	CIL ITEM	[
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[NA] [NA]	[NA] [NA]	[] *			
COMPARE [/] []	[]	[]	[]			
RECOMMENDATIONS:	(If differen	t from NAS	SA)					
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* CIL RETENTION I	RATIONALE: (If	applicable	e) ADEQUATE INADEQUATE	[]			

ASSESSMEN ASSESSMEN NASA FME	TV.	ID:	LDGI	15/86 DEC-1 6-H01	0415			NASA DATA: BASELINE [X] NEW []					
SUBSYSTEM MDAC ID:	M:		104	าร				SYSTE		ACTUA	TOR		
LEAD ANA	LYS'	T:	J.	COMPT	ON								
ASSESSME	NT:												
1		TICAL FLIGH			REDU	NDANG	CY SC	CREENS	3		CIL		
		DW/FU			A		В		С				
NASA IOA	[3 /3 3 /3]]	NA]	[NA] NA]	((NA] NA]		[] *	e .
COMPARE	[/]	[]	ι]	[]		[]	
RECOMMEN	DAT	ions:	(If d	iffer	ent	from	NASA)				
	[/	3	[)	[1	[)	(A	[DD/I] DELE	re)
* CIL RE	TEN	TION	RATI	ONAL	E: (1	f ap	plic		ADEQ NADEQ		[]	

ASSESSM ASSESSM NASA FM	ENT	' II):	LD	GDEC-	6 10415 1-H02			NASA DATA: BASELINE [X] NEW []					
SUBSYST MDAC ID ITEM:				10	415	/DECE				EMS STRUT A	CTUAT	OR		
LEAD AN	ALY	ST:	:	J.	COMP	TON								
ASSESSM	ENT	:												
		FI	CAL LIGH //FU			REDU A	'NDAN	CY SC	REEN	S C		IL TEM	[
NASA IOA	[[3 3	/3 /3]]	NA] NA]	[NA] NA]	[NA] NA]	[]	*
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	IDA:	ric	NS:	((If d	iffer	ent i	from	NASA))				
	[/]	[]	[]	Ţ]	(ADD)	/DE] LE	TE)
* CIL RE	ETEN	YTI	ON :	RATI	ONALI	E: (I	f app	olica	-	ADEQUAT IADEQUAT]	

	12/15/86 LDGDEC-10407 02-6-H01-J01		NASA DATA: BASELINE [X] NEW []					
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECEL 10407 NLG EXTEND /			ATOR				
LEAD ANALYST:	J. COMPTON							
ASSESSMENT:								
CRITICAL: FLIGH	r	DANCY SCREEN		CIL ITEM				
HDW/FU	NC A	В	С					
NASA [3 /3 IOA [3 /3] [NA]] [NA]	[AN] [AN]	NA] NA]	[] *				
COMPARE [/] []	[]]	[]				
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* CIL RETENTION	RATIONALE: (If		ADEQUATE	[]				

ASSESSME ASSESSME NASA FME	NT	ID:	LDG	DEC-	10407	A		NASA DATA: BASELINE [X] NEW []					
SUBSYSTE MDAC ID:			104	07	/DECEI					ACTU	ATOR	<u>.</u>	
LEAD ANA	LYS	ST:	J.	COMP	ron								
ASSESSME	NT:												
		TICAL FLIGH IDW/FU	_							CIL ITEM			
NASA IOA	[3 /3 3 /3]]	NA] NA]	[NA]	[NA] NA]		[]	*
COMPARE	(/]	[]	[]	[]		[]	
RECOMMEN	DAI	cions:	(If d	iffere	ent :	from 1	NASA)					
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* CIL RE	TEN	TION	RATI	ONALI	E: (If	apı	plical	•	ADEQU IADEQU	JATE JATE	[]	

ASSESSME):	12/15/86 LDGDEC-10405 02-6-H01-K01							NASA DATA: BASELINE [X] NEW []							
SUBSYSTEMDAC ID:				LANDING/DECELERATION 10405 NLG EXTEND / RETRACT									ACTU	ATOF	t	
LEAD ANA	ALYS	ST:	:	J.	COM	ЭΤ(ИС									
ASSESSMI	ENT	:														
		FI	CAL LIGH	T			REDUN	DAN			REENS			CII		
	1	HDV	V/FU	NC		4	A			В		С				
NASA IOA	[[3 3	/3 /3]		[]	NA] NA]	[[1	NA] NA]	[[NA] NA]		[]	*
COMPARE	[/]		[1	[]	C]		[]	
RECOMME	NDA'	TIC	ons:		(If	li	ffere	nt	f	rom 1	NASA)				
	[/ .]		[3	[]	[]	(A	[DD/I) DELI	ETE)
* CIL R	ETE:	NT:	ION	RAT	IONA:	LE	: (If	ap	p.	lica		ADEQ NADEQ	UATE UATE	[]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-1 02-6-H03	L1005		NASA DAT BASELIN NE	E [X]							
SUBSYSTEM: MDAC ID: ITEM:	LANDING/ 11005 NLG UPLO			STEMS								
LEAD ANALYST:	J. COMPI	гои										
ASSESSMENT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM												
HDW/FU	NC	A	В	С								
NASA [2 /1R IOA [2 /1R	[]	P] P]	[P] [F]	[P] [P]	[X] * [X]							
COMPARE [/] []	[N]	[]	[]							
RECOMMENDATIONS:	(If di	fferent	from NA	ASA)								
[2 /1R] [P]	[F]		[A] ADD/DELETE)							
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []												
REMARKS:												
	REDUNDANCY SCREEN B FAILS BECAUSE HYD SYS. 1 FLUID IS NOT CIRCULATED TO THIS ACTUATOR ONORBIT, THUS FAILURE NOT DETECTED.											

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-110 02-6-H03-2	003 2	NASA DATA: BASELINE NEW								
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DE 11003 NLG UPLOCE	ECELERATION SY K ACTUATOR	STEMS								
LEAD ANALYST:	J. COMPTON	N									
ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM											
HDW/FU	NC A	В	С								
NASA [2 /1R IOA [2 /1R] [NA] [P	A] [NA]] [F]	[NA] [P]	[X] *							
COMPARE [/] [N] [N]	[N]	[N]							
RECOMMENDATIONS:	(If diff	ferent from NA	SA)								
[2 /1R] [P] [F]	[P]	[A] DD/DELETE)							
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE []											
INADEQUATE [] REMARKS: POSSIBLE LOSS OF HYDRAULICS SYSTEM 1. IF SYSTEM FAILS, THEN THE ORBITER IS ONE FAILURE AWAY FROM LOSS OF LIFE OR VEHICLE. PYRO BACKUP. HYDRAULIC FLUID IS NOT CIRCULATED TO THIS ACTUATOR ONORBIT, THUS FAILURE CANNOT BE DETECTED - FAILS REDUNDANCY											

SCREEN B.

ASSESSMI ASSESSMI NASA FMI	LI	12/15/86 LDGDEC-11006 02-6-H03-3						NASA DAT BASELIN NE	Ε [x]				
SUBSYSTIMDAC ID:				11	1006	_	DECELI			YSTE	EMS				
LEAD AND	ALY	ST	:	J.	CO	MP'	ron								
ASSESSMI	ENT	:													
	CR		ICAI LIGH		?		REDUNI	DAN	CY SCR	EENS	3		IL FEM	r.	
	1	-	W/FC				A		В		С	_	LLIF	•	
NASA IOA	[3 3	/3 /3]		[NA] NA]	[NA] NA]]	NA] NA]	[]	*
COMPARE	[/]		[]	[3	[J	[]	
RECOMMEN	NDA'	ΓI	ONS:	:	(If	d:	iffere	nt i	from N	ASA)					
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* CIL RI	ETEI	NT:	ION	RAT	NOI	ALI	E: (If	apı	plicab	•	ADEQUATE	•]	

ASSESSMEN ASSESSMEN NASA FMEA	T	ID		1/23/87 NASA DATA LDGDEC-31147 BASELINE 05-06BA-2401-1 NEW						E	[X]								
SUBSYSTEM MDAC ID: ITEM:	1:			31	D&C 147 BRID	· E	RI	VER	cc)NT	ROL	LER	(ΤŸ	PE	1)					
LEAD ANAI	LYS	T:		G.	BEA	IF	D														
ASSESSME	T:																				
(CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM																				
	H		J.GH.				A			В				С						•	
NASA IOA			/1R /1R]		[P P]		[P]] [P P]			[]	*
COMPARE	[/]		[]		[]		[]			[]	
RECOMMEN	DAI	ric	ons:		(If	d:	ifi	fere	nt	fr	om	NAS	A)								
	[/]		[3		[]	•	[]	((A l	[DD/	'D!	ELJ	ETE)
* CIL RE	TEI	T	ON :	RAT	'ION?	XL I	E :	(If	a j	ppl	ica	able				UATI UATI		[]	
REMARKS: IOA DOES	REMARKS: IOA DOES CONCUR WITH NASA'S EVALUATION OF FMEA 2401-1.																				

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	LDGDEC-	31147A									
MDAC ID:	EPD&C 31147 HYBRID	DRIVER	CONTROLL	ER (TYPE 1)							
LEAD ANALYST:	G. BEAI	RD									
ASSESSMENT:											
CRITICA FLIG	LITY	REDUNI	DANCY SCR	EENS	CIL						
HDW/F		A	В	С	ITEM						
NASA [3 /11 IOA [3 /11	l] [P] P]	[P] [P]	[P] [P]	[] *						
COMPARE [/] []	[]	[]	[]						
RECOMMENDATIONS	(If d	ifferen	nt from N	ASA)							
[/] [] .	[]		[] ADD/DELETE)						
* CIL RETENTION	RATIONAL	E: (If	applicab								
REMARKS:	ADEQUATE [] INADEQUATE []										
REMARKS: IOA DOES CONCUR WITH NASA'S EVALUATION OF FMEA 2401-2, AND IOA RECOMMENDS THAT FMEA 2401-2 SHOULD COMBINED WITH 2401-1. NASA REEVALUATION COMBINED FMEA 2401-2 IN WITH 2401-1.											

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3 05-2106-			[X]	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31224 TOGGLE S	WITCH,	3PST		
LEAD ANALYST:	G. BEAIR	RD.			
ASSESSMENT:					
CRITICAL		REDUNDA	NCY SCRE	ens	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [3 /1R IOA [3 /1R] [P] P]	[P] [P]	[P] [P]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If d	ifferent	from NA	SA)	
. [/] [P]	[P]	[P] (A	[] DD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	applicabl	e) ADEQUATE INADEQUATE	
REMARKS: IOA DOES CONCUR SWITCH.	WITH NAS	A'S EVA	LUATION O	F THE "MAIN	C" TOGGLE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-311 05-2409-2	155		SA DATA: ASELINE NEW	: [X] []	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31155 HYBRID DRI	IVER CONTE	ROLLER (TY	PE 3)		
LEAD ANALYST:	G. BEAIRD					
ASSESSMENT:						
CRITICAL FLIGH		DUNDANCY	SCREENS		CIL ITEM	
HDW/FU	NC A	В	С			
NASA [3 /3 IOA [3 /1R] [] [P] [] [F] [p]]	[
COMPARE [/N] [N] [N] [N]]	[N]	
RECOMMENDATIONS:	(If diff	erent fro	m NASA)			
[/] [] [] []		[] D/DELETE)	
* CIL RETENTION :	RATIONALE:	(If appli	ADE	EQUATE EQUATE	[]	
IOA DOES CONCUR	WITH NASA'S	EVALUATI	ON OF THE	TYPE 3	HDC's.	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31			ASA DATA: BASELINE NEW	[X]				
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31163 HYBRID DR	IVER CONT	ROLLER (T	YPE II)					
LEAD ANALYST:	G. BEAIRD)							
ASSESSMENT:									
CRITICAL: FLIGHT	ITY R	EDUNDANCY	SCREENS		CIL ITEM				
HDW/FU		В	C						
NASA [3 /1R IOA [3 /1R] [P	P [P] [P]	[x] *				
COMPARE [/] [] (N] [].	[N]				
RECOMMENDATIONS:	(If dif	ferent fr	om NASA)						
. [/] [] [) [] (AI	[DD/DELET	E)			
* CIL RETENTION	RATIONALE:	(If appl			r 3				
			INA	DEQUATE DEQUATE	[]				
REMARKS: IOA DOES CONCUR WITH NASA'S EVALUATION. NASA GENERATED SEPARATE FMEA'S TO COVER THE HDC'S FAILURE MODES INSTEAD OF LUMPING THEM TOGETHER WITH UNLIKE COMPONENTS IN FMEA 200200-1. REFER TO LDGDEC-31164.									

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-31164 05-6BA-200200	NASA DAT BASELIN D-1 NE	'A: E[X] W[]
MDAC ID:	EPD&C 31164 HYBRID DRIVER	R CONTROLLER (TYPE II)	
LEAD ANALYST:	G. BEAIRD		
ASSESSMENT:			
CRITICAL: FLIGHT		NDANCY SCREENS	CIL
HDW/FU		В С	ITEM
NASA [3 /1R IOA [3 /1R] [P]] . [P]	[P] [P] [F] [P]	[
COMPARE [/] []	[N]	[N]
RECOMMENDATIONS:	(If differe	ent from NASA)	
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* CIL RETENTION I	RATIONALE: (If		
DEWA DVG		ADEQUATE INADEQUATE	
OF LUMPING THEM T	FOGETHER WITH ALUATED IN FME 2408-2, 2409-1	TO COVER THE FAILURE UNLIKE COMPONENTS IN EAS 05-6BA-2209-1, 2201, 2409-2, 2410-1, 241	FMEA 200200-1. 9-2, 2356-1,

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-31165 05-6BA-200200-1	NASA DATA: BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31165 HYBRID DRIVER CO	ONTROLLER (TYPE III)	
LEAD ANALYST:	G. BEAIRD		
ASSESSMENT:			
CRITICAL		NCY SCREENS	CIL ITEM
FLIGH HDW/FU		В С	
NASA [3 /1R IOA [3 /1R	[P] [P]	[P] [P] [F] [P]	[x] *
COMPARE [/			[и]
RECOMMENDATIONS:	(If different	from NASA)	
[/] []	() ()	[] .DD/DELETE)
* CIL RETENTION	RATIONALE: (If a	pplicable) ADEQUATE INADEQUATE	
REMARKS: NASA INCORPORATE 31164.	ED FMEA INTO OTHE	ER FMEA. SEE ASSESSM	IENT LDGDEC-

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31166 NASA FMEA #: 05-6BA-200200-1								NASA DATA: BASELINE [X] NEW []					
SUBSYSTEM MDAC ID:			EPD&C 31166 HYBRI		RIVER	co1	N T I	ROLL	ER (1	YPE I	III)		
LEAD ANA	LYSI	r:	G. BE	AIRI)								
ASSESSME	NT:												
CRITICALITY FLIGHT				F	REDUNDANCY SCRE				EENS			CIL ITEM	
	HE	W/FU	NC	A			В		C	!	41	EH	
NASA IO A	[3	/1R /1R]	[F))]]	P F]	[P]	[x] *	
COMPARE	[/]	. []	[N]	[]	[N]	
RECOMMEND	ATI	ONS:	(If	dif	fere	nt f	rc	m NA	ASA)				
	[/].	[]	[F]	[]	[ADD/I	A] DELETE)	
* CIL RET	ENT	ION F	RATION	ALE:	(If	app	li	.cab1	A	DEQUA'	TE (j	
REMARKS: NASA INCO 31164.	RPO	RATEI	FMEA	INT	O OTI	HER	FM	EAS.			•	•	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-31181 05-6BA-200200-	NASA DA BASELI 1									
MDAC ID:	EPD&C 31181 MAIN GEAR BRAK	E UPLOCK RELEASE C	IRCUITS 1 & 2								
LEAD ANALYST:	G. BEAIRD										
ASSESSMENT:											
CRITICAL FLIGH	ITY REDUND	ANCY SCREENS	CIL ITEM								
	NC A	В С									
NASA [3 /1R IOA [3 /1R] [P]] [P]	[P] [P] [P] [P]	[] *								
COMPARE [/] []	[] []	[]								
RECOMMENDATIONS:	(If differen	t from NASA)									
[/] []	[] []	[] (ADD/DELETE)								
* CIL RETENTION	RATIONALE: (If	ADEQUA'									
INADEQUATE [] REMARKS: IOA RECOMMENDS: (1) DELETING THIS FMEA AND COVERING EACH TYPE OF COMPONENT WITH ITS OWN FMEA (E.G. MDAC ID'S 31120, 31128, 31129, 31156, 31157, 31163 THROUGH 31166 COVER ALL THE COMPONENTS LISTED IN THIS FMEA) INTO OTHER FMEAS, REFER TO MDAC ASSESSMENTS NOTED ABOVE.											

	SMENT DATE: 1/23/87 SMENT ID: LDGDEC-31119 FMEA #: 05-6BA-2113-1							NASA DATA: BASELINE [X] NEW []						
SUBSYSTIMDAC ID				EPD 311: EVE		DICAT	ors ((6)						
LEAD AN	ALY	ST	:	G. 1	BEAIRI)								
ASSESSM	ENT	:												
CRITICAL												CI		
FLIGHT HDW/FUN			. A		E	В		С		ITEM				
NASA IOA]	3 3	/3 /3]	[]	[]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[)	
RECOMME	NDA	TI	ons:	(:	If di	ffere	ent fr	om N	IASA)					
	[/]	[]	[]	[]	(AI		DEI	LETE
* CIL R	ETE	NT:	ION	RATIO	ONALE:	(If	appl	.icak	•	ADEQU	ATE]	1	
REMARKS	:									ADEQU		-	j	
IOA CONCINDICATO	CUR		WITH	NAS	A'S EV	/ALUA	MTION	OF T	HE L	ANDIN	G GEA	ıR	EVE	:NT

ASSESSMENT DATE:			SA DATA:
ASSESSMENT ID: NASA FMEA #:	LDGDEC-31113 05-6BA-2115-1		ASELINE [X] NEW []
MDAC ID:	EPD&C 31113 PUSHBUTTON SW	ITCH (2), LANDI	NG GEAR DOWN
LEAD ANALYST:	G. BEAIRD		
ASSESSMENT:			
CRITICAL: FLIGH		DANCY SCREENS	CIL ITEM
HDW/FU		в с	11211
NASA [2 /1R IOA [3 /1R] [P]] [P]	[P] [P [F]] [X] * [X]
COMPARE [N /] []	[и][] []
RECOMMENDATIONS:	(If differe	ent from NASA)	
[/] []	[] [.	[] (ADD/DELETE
* CIL RETENTION	RATIONALE: (If	AΓ	DEQUATE [X] DEQUATE []
REMARKS: PROVIDES REDUNDAL LATCHING RELAYS REVIEW/ANALYSIS	FOR LANDING GE	CONTROL FROM C	CONTROL BUS TO

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-311	14A		ASA DATA BASELINE NEW	[X]					
	EPD&C 31114 PUSHBUTTON	SWITCH	(2), LAND	ING GEAR	DOWN					
LEAD ANALYST:	G. BEAIRD	. BEAIRD								
ASSESSMENT:										
CRITICAL FLIGH	ITY RE	EDUNDANCY	SCREENS		CIL ITEM					
	NC A	В	С		TIEM					
NASA [/ IOA [3 /3] [] [] []	[]	*				
COMPARE [N /N] [] [] []	[]					
RECOMMENDATIONS:	(If diff	erent fr	om NASA)							
[/] [] [.1 [] (A	[] DD/DEL					
* CIL RETENTION	RATIONALE:	(If appl	Δ.	DEQUATE	[]					
REMARKS: PROVIDES REDUNDA LATCHING RELAYS WITH NASA'S EVAL A CREDIBLE FAILU	FOR LANDING UATION THAT	GEAR DO	ROL FROM (WN CIRCUI' 15-2 (SHO)	T. IOA	BUS TO	ONCUR				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31114	NASA DATA: BASELINE NEW	[X]				
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31114 PUSHBUTTON S	WITCH (2), Li	ANDING GEAR	DOWN			
LEAD ANALYST:	G. BEAIRD						
ASSESSMENT:							
CRITICAL FLIGH		ITY REDUNDANCY SCREENS					
HDW/FU		В	С				
NASA [1 /1 IOA [3 /3] []	[]	[] []	[X] *			
COMPARE [N /N] []	[]	[]	[N]			
RECOMMENDATIONS:	(If differ	ent from NAS	A)				
[3 /3] []	[]	[] IA)	[D] DD/DELETE)			
* CIL RETENTION	RATIONALE: (I) ADEQUATE INADEQUATE	[]			
REMARKS: PROVIDES REDUNDA LATCHING RELAYS CONCUR WITH NASA 2115-3 CRITICALI	FOR LANDING G	EAR DOWN CIR	CUIT. IOA I	DOES NOT			

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	LDG	DEC-31	.115 .16-:	1		1	DATA: LINE [X] NEW []				
SUBSYSTIMDAC ID:				311		EAR	TOGGI	LE SW	IITCH ,	. S13				
LEAD AND	ALY	ST	:	G.	BEAIRE)								
ASSESSMI	ENT	:												
CRITICALITY RED FLIGHT						EDUI	DUNDANCY SCREENS				CII	CIL		
]				A	A		В		C				
NASA IOA	[3 3	/3 /3]	[]	[]	[[]		[[] ;	*
COMPARE	(/]	[]	(]	[]		[]	
RECOMMEN	NDA!	ric	ONS:	; (If dif	fere	ent fr	om N	ASA)					
	[/]	[]	[)	[]	(A)	[DD/[) DELET	ΓE)
* CIL RI	ETEI	YT:	ION	RATI	ONALE:	(II	f appl	.icab	P	-	ATE	-]	
REMARKS: IOA CONC SUBSYSTI	CUR								URE H	LAS N	ATE O EF	•] ON	

ASSESSME ASSESSME NASA FME	NT I	D:	LDGI	EC-31	115A 16-2				ASA DA'I BASELIN NI]	
SUBSYSTE MDAC ID: ITEM:			EPD8 3111 LAND		EAR '	TOGGLI	E SW	ITCH,	S 13			
LEAD ANA	LYST	r:	G. E	BEAIRD								
ASSESSME	NT:											
		rical FLIGH		R	EDUN	DANCY	SCR	REENS		CIL		
			NC	A		В		C				
NASA IOA	[:	3 /3 3 /3]	ĵ []	[[]	[]]]	*
COMPARE	[/]	[]	[]	[]	ſ]	
RECOMMEN	IDAT:	ions:	(:	If dif	fere	nt fr	om 1	NASA)				
	[,	/	1	[]	[]	£]	[(ADD/E		TE)
* CIL RE	ETEN'	TION	RATI(ONALE:	(If	appl	icak	A	DEQUAT	E [E []	
REMARKS: IOA RECO BECAUSE EVALUATI	MME IT	IS NO	T A	CREDIE	BLE F	AILUR	E OI	F FMEA	2116- S COMP	2 BE I ONENT.	ELE N	TED, IASA

	1/23/87 LDGDEC-31115B 05-6BA-2116-3	NASA DATA: BASELINE [X] NEW []						
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31115 LANDING GEAR TOGGLE SWITCH	H, S13						
LEAD ANALYST:	YST: G. BEAIRD							
ASSESSMENT:								
CRITICAL: FLIGH	ITY REDUNDANCY SCREENS							
HDW/FUI		ITEM C						
NASA [2 /1R IOA [3 /3] [P] [F] [P] [X] *						
COMPARE [N /N] [N] [N] [и] [и]						
RECOMMENDATIONS:	(If different from NASA)							
[3 /3] [] [] [] [D] (ADD/DELETE)						
* CIL RETENTION I	RATIONALE: (If applicable)							
2501	IN	ADEQUATE [] ADEQUATE []						
IOA DOES NOT CONC ON SUBSYSTEM. CE	REMARKS: IOA DOES NOT CONCUR WITH NASA'S EVALUATION, FAILURE HAS NO EFFECT							

CONFORM TO NSTS 22206.

3 TOGETHER, SINCE THEY ARE BOTH CRITICALITY 3/3, TO

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3 05-6BA-2	31117 2117-1		NASA DATA: BASELINE NEW	[X]			
SUBSYSTEM: MDAC ID:	EPD&C 31117			ARM, 4PDT	, ILLUMINATED			
LEAD ANALYST:	G. BEAI	RD						
ASSESSMENT:								
CRITICAL FLIGH		REDUNDANC	Y SCREENS	5	CIL ITEM			
HDW/FU		A	В	С				
NASA [2 /1R IOA [3 /1R] [P] [P] [P] [F] [P] P]	[X] *			
COMPARE [N /] [] [N] [1 .	[]			
RECOMMENDATIONS:	(If d	ifferent 1	rom NASA)				
[3 /1R] [P] [F] [P] (Al	[] DD/DELETE)			
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []								
REMARKS:								
PROVIDES REDUNDA	NT MANUA	L "ON" CON	NTROL FROI	MI CONTROL I	BUS TO DES NOT			
CONCUR FULLY WIT	LATCHING RELAYS FOR LANDING GEAR ARM CIRCUIT. IOA DOES NOT CONCUR FULLY WITH NASA'S EVALUATION AND IOA RECOMMENDS: (1)							
CHANGING THE RED	UNDANCY	SCREENS,	T FAILS	REDUNDANCY	SCRÈEN B,			
LOWERING THE CRI	TICALITY	TO 3/1R.						

ASSESSMEN ASSESSMEN NASA FMEA	T ID:	1/23/87 LDGDEC- 05-6BA-	31118A		NASA DATA BASELINE NEW	[X]
SUBSYSTEM MDAC ID: ITEM: ILLUMINAT		EPD&C 31118 PUSHBUT	TON SWI	TCH, LDG	GR ARM, 4 PD	г,
LEAD ANAL	YST:	G. BEAI	RD			
ASSESSMEN	T:					•
C	RITICALI FLIGHT HDW/FUN		REDUND.	ANCY SCRE	ENS	CIL ITEM
NASA IOA	[3 /1R [3 /3] [NA]	[NA] []	[AN] []	[] *
COMPARE	[/N] [N]	[N] .	[и]	[]
RECOMMEND	ATIONS:	(If d	ifferen	t from NA	SA)	
	[/] []	[]	[] (AI	[DD/DELETE)
* CIL RET	ENTION F	RATIONAL	E: (If	applicabl		
DEMARKO					ADEQUATE INADEQUATE	
LATCHING	RELAYS F O GROUNE	FOR LAND) IS NO	ING GEAT	R ARM CIR DIBLE FAI	ROM CONTROL I CUIT. NASA I LURE AND IOA	FMEA 2117-2

NASA DELETED THIS FMEA FROM THE BASELINE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-311	18 7-3	NASA BASI	DATA: ELINE [X] NEW []
MDAC ID:	EPD&C 31118 PUSHBUTTON	SWITCH,	LDG GR ARM,	4 PDT,
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				
	TY RE	DUNDANCY	SCREENS	CIL ITEM
FLIGHT HDW/FU1		В	C	TIDA
NASA [2 /1R IOA [3 /3] [P] [P] [P]] []	[X] * []
COMPARE [N /N] [N] [N] [N]	[N]
RECOMMENDATIONS:	(If diff	erent fro	om NASA)	
[3 /3] [] [] []	[D] (ADD/DELETE)
* CIL RETENTION F	RATIONALE:	(If appli	ADEOL	UATE [] UATE []
REMARKS: PROVIDES REDUNDAN LATCHING RELAYS I CONCUR WITH NASA 2117-3 CRITICALIT	FOR LANDING 'S EVALUATI	GEAR ARM ON AND IC	ROL FROM CONT M CIRCUIT.	TROL BUS TO IOA DOES NOT DOWNGRADING FMEA

ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:	E: 1/23/87 LDGDEC-31101 05-6BA-2118-4		TA: NE [X] EW []						
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31101 PROXIMITY SENS	SOR BOX (2)							
LEAD ANALYST: G. BEAIRD									
ASSESSMENT:									
CRITIC FLI		ANCY SCREENS	CIL ITEM						
HDW/	FUNC A	ВС							
NASA [2 / IOA [2 /	LR] [P] LR] [P]	[P] [P] [P] [P]	[X] * [X]						
COMPARE [/] []	[] []	[]						
RECOMMENDATION	G: (If differen	t from NASA)							
[/] []	[] []	[] (ADD/DELETE)						
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [X] INADEQUATE []									
REMARKS: IOA CONCURS WITH NASA'S EVALUATION OF THE PROXIMITY SENSOR BOXES FOR THE FAILURE MODE: INADVERTENT OUTPUT.									

ASSESSME ASSESSME NASA FME	ID:	LDGI	/87 EC-31 BA-22			ı	IASA DAT BASELIN NE]			
SUBSYSTEMDAC ID:	M:		EPDS 3110 ISOI		DIO	DE (1	.2),	1 AMI	,			
LEAD ANA	LYS	r:	G. E	BEAIRD)							
ASSESSME	NT:											
		TICAI FLIGH		R	EDUN	DANC	SCR	EENS		CIL		
		DW/FU		A		F	3	(2			
NASA IOA	[3 /3 3 /3]]]	[[]	[]	[] *]	ŧ
COMPARE	[]	[]	Ţ]	[3	(]	
RECOMMEN	DAT	IONS	: (3	f dif	fere	nt fi	com N	ASA)	•			
	[/	1	[]	[]	[]	[(ADD/I] ELET	ΓE)
* CIL RE	TEN	TION	RATIO	ONALE:	(If	appi	licab		ADEQUATI ADEQUATI]	
REMARKS: IOA DOES LOSS OF	co	NCUR	WITH NDICA	NASA'	'S EV	ALUA'	TION CAL I	OF T	HE ISOLA IGHT.	ATION	DIOI	DES.

ASSESSME ASSESSME NASA FME	NT I	D:	LDGD	EC-3					NASA 1 BASE	DATA LINE NEW	[]	х ј ј	
SUBSYSTE MDAC ID:			EPD& 3110 ISOL	0	N DIC	DDE (12),	1 AM	₽				
LEAD ANA	LYSI	!:	G. B	EAIRI)								
ASSESSME	NT:			•									
		ICAL	TTY	I	REDUN	IDANC?	SCR	EENS			CII		
			NC	7	A	I	3	(С		ITI	1M	
NASA IOA	[3 [3	/3 /3]	[]	[]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(I	f dif	fere	nt fi	om N	ASA)					
	[/]	[]	Ţ]	[]	(AI	[DD/[ETE)
* CIL RE	TENT	ION	RATIO	NALE:	(If	appl	icab	•	DECLL	m n	_	•	
REMARKS:					,				ADEQUA ADEQUA		[]	
IOA DOES LOSS OF	CON EVEN	CUR T IN	WITH DICAT	'ASA' N NOI	S EV	ALUAT	CION CAL T	OF TH	E ISC	LATI	ON	DIC	DES

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31105 NASA FMEA #: 05-6BA-2205-1 NASA FMEA								[X]			
SUBSYSTEM MDAC ID:	M:		EPD&6 3110 TRAN	5	SUP	PRESS	OR I	DIODE	(4),	3 AM	IPS	
LEAD ANA	LYST	:	G. B	EAIRD								
ASSESSME	NT:											
		ICAL LIGH		R	EDUN	DANCY	SCI	REENS			CIL	
		W/FU		A		В	}		С			
NASA IOA		/3 /3]	[]	[[]]	[]		[] *]
COMPARE	[/	3	[)	[]	[]		[]
RECOMMEN	DATI	ons:	(I	f dif	fere	nt fr	om l	NASA)				
	[/]	[]	[]	[1	(Al	[DD/D] ELETE)
* CIL RE		NOI!	RATIO	NALE:	(If	appl	ical		ADEQUA ADEQUA		[]
REMARKS:	URS	WITH	NASA	's EV	'ALU <i>F</i>	MOITA	of :	FMEA	2205-1	. FO	R TH	Œ

TRANSIENT SUPPRESSOR DIODES.

ASSESSM	ENT DATE: ENT ID: EA #:	LDGDEC-	31105A			ATA: INE [X] NEW []
SUBSYSTI MDAC ID ITEM:		EPD&C 31105 TRANSIE	NT SUPI	PRESSOR	DIODE (4),	3 AMPS
LEAD AND	ALYST:	G. BEAI	RD			
ASSESSMI	ent:					
	CRITICAL:		REDUNE	ANCY SC	REENS	CIL ITEM
	HDW/FUN	_	A	В	С	IIEM
NASA IOA	[3 /1R [3 /3] [F]	[F] []	[P] []	[X] *
COMPARE	[/N] [N]	[N]	[N]	[N]
RECOMMEN	DATIONS:	(If d	ifferen	t from 1	NASA)	
	[3 /3] []	[]	[].	[D] (ADD/DELETE)
* CIL RE	TENTION F	RATIONALI	E: (If	applical	•	
REMARKS:					ADEQUAT INADEQUAT	
IOA DOES DOWNGRAD LOSS OF	NOT CONC	RITICALI S IS LOS	TY AND S OF A	REMOVI	TION AND ION NG THIS ITEN LIC SYSTEM W	A RECOMMENDS I FROM CIL. WHICH THEN

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3 05-6BA-2		NASA D BASEI	NEW []	
MDAC ID:	EPD&C 31107 BLOCKING	DIODE	(2) 12	AMP, 400V	
LEAD ANALYST:	G. BEAIR	D			
ASSESSMENT:					
CRITICAL		REDUND	ANCY SC	REENS	CIL ITEM
FLIGH HDW/FU		A	В	С	
NASA [3 /1R IOA [3 /1R] [P] P]	[F] [F]	[P] [P]	[X] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If di	ifferen	t from	NASA)	
[/] []	[]	[]	[] (ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If	applica	ADEQU	ATE [X]
REMARKS: IOA CONCURS WITH ELECTRICAL POWER	NASA'S I MIGHT L	EVALUAT EAD TO	CION AND	RATIONALE CREW/VEHI	LOSS OF

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	ID: LDGDEC-31108 BASELINE [X] #: 05-6BA-2206-2 NEW []							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31108 BLOCKING	DIODE (2) 12 A	MP, 400V				
LEAD ANALYST:	G. BEAIRD)						
ASSESSMENT:								
CRITICALI FLIGHT	TY R	EDUNDANG	CY SCRE	ens	CIL			
	ic a		В	С	ITEM			
NASA [3 /3 IOA [3 /3] [] []	[]	[] *			
COMPARE [/] []	[]	[]			
RECOMMENDATIONS:	(If dif	ferent f	rom NAS	SA)				
[/] [] []		[DD/DELETE)			
* CIL RETENTION R	ATIONALE:	(If app	licable	e) ADEQUATE INADEQUATE				
IOA CONCURS WITH DELOCKING DIODE FAILSOLATION MIGHT OF	LLS SHORTI	ALUATION ED, POSS	OF THE	BLOCKING DI	IODES. IF A			

ASSESSMEN ASSESSMEN NASA FME	NT ID:	LDGDEC-	31109		NASA BASE	DATA: LINE [X] NEW []
SUBSYSTEM MDAC ID:		31109	G DIODE	(2) 12	АМР	
LEAD ANA	LYST:	G. BEAI	RD			
ASSESSME	NT:					
•	CRITICAL FLIGH			DANCY SC	REENS C	CIL ITEM
	•					
NASA IOA	[3 /1R [3 /1R] [P] P]	[F] [F]	[P] [P]	[X] * [X]
COMPARE	[/] [1	[]	[]	[]
RECOMMEN	DATIONS:	(If d	lifferer	nt from	NASA)	
	[/] . [1	[]	[]	[] (ADD/DELETE)
* CIL RE	TENTION	RATIONAI	Œ: (If	applica	ADEQU	ATE [X] ATE []
REMARKS: IOA CONC ELECTRIC	URS WITH AL POWER	NASA'S FROM AN	EVALUAT	TION AND	RATIONALE SE LOSS OF	, LOSS OF CREW/VEHICLE.

ASSESSMI ASSESSMI NASA FMI	ENT ENT EA	Di II #:	ATE: D:	1/2 LDG 05-	3/87 DEC-31 6BA-22	2				DATA LINE NEW	[X	:]		
SUBSYSTI MDAC ID: ITEM:	EM:			EPD 311	&C				AMP,	400V				
LEAD AN	ALY	ST	:	G.	BEAIRD)								
ASSESSMI	ENT	:												
	CR		ICAL LIGH		R	EDU	NDANCY	SCR	EENS			CIL		
	I				A	•	В		С			TIE	M	
NASA IOA	[3 3	/3 /3]	[[]	[]	([]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMME	'ADA	ric	ons:	(If dif	fere	ent fro	om N	ASA)					
	[<i>!</i>]	[]	[]	[]	(AI	[D/DC		ETE)
* CIL RI	ETE	T	ION	RATI	ONALE:	(11	f appli	icab						
22722									A IŅA	DEQUA DEQUA	ATE ATE	[]	
REMARKS: IOA CONC CAPABILI	CURS									Loss	S OF	UNI	Т	

ASSESSME ASSESSME NASA FME	NT	II		LDG	DEC	7 -311 -220]	NASA BASE	DATA: LINE NEW	[X]		
SUBSYSTE MDAC ID: ITEM:				EPI 311 BLC	L22	ng i	OIOD	E (2)	1 A	MP					
LEAD ANA	LYS	ST:	:	G.	BEA	IRD									
ASSESSME	NT:	:													
	CR1	_	ICAL LIGH			R	EDUN	DANCY	SCR	REENS			CIL		
	I		/FU			A		B	,		С				
NASA IOA] [3 3	/3 /3]		[]	[]	[]		[]	*
COMPARE	[/]		[]	[]	[]		[]	
RECOMMEN	IDA!	ri	ons:		(If	dif	fere	ent fr	om N	IASA)					•
	[/] ·		[j	(]	[)	(A	[DD/I		ETE)
* CIL RE	e TE l	NT:	ION	RAT	ION <i>I</i>	ALE:	(If	appl	icab		ADEQU ADEQU		[]	
REMARKS:	: CUR	s ¹	WITH	I NA	SA'S	S EV	ALUA	TION	OF T	CHE E	LOCKI	NG D	IODI	ES.	

ASSESSME ASSESSME NASA FME	ent i	D:	1/23, LDGDI 05-61	EC-31			1	NASA DA BASELI N	NE [x]	
SUBSYSTE MDAC ID:			EPD&0 31122 BLOCI	2	DIOD	DE (2)	1 A	MP			
LEAD ANA	LYST	':	G. BI	EAIRE)						
ASSESSME	ENT:										
		ICAL		R	EDUN	IDANCY	SCR	EENS		CI	
		W/FU		A		В		C	2	IT	EM
NASA IOA	[3	/3 /3]	[]	[]	[[]	[] *
COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	DATI	ons:	(If	dif	fere	nt fro	om N	ASA)			
	[/]	[]	[]	[]	[(ADD/)] DELETE
* CIL RE								INA	DEQUAT	E []
IOA CONC	URS	WITH	NASA'	S EV	ALUA	TION C	F T	HE BL	OCKING	DIODI	ES.

ASSESSMEN ASSESSMEN NASA FMEA	II TI		1/23/8 LDGDEC 05-6B	3									DATA: LINE NEW	[X]	
SUBSYSTEM MDAC ID: ITEM:	1:		EPD&C 31121 BLOCKI	NG	D	IODE	(6	5)	3 AMI	•						
LEAD ANAI	LYST	:	G. BEA	AIR	D											
ASSESSMEN	NT:															
C		ICAL:	TTY T		RE	DUNDA	NC	CY	SCRE	ENS	3			CIL	1	
	HDI	W/FUI	1C	•	A			В			С					
NASA IOA	[3 [3	/1R /1R]	[P P]	[P P]	[P P]]].]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMENI	DATI	ons:	(If	di	ff	erent	: 1	fro	om NAS	SA)						
	C	/]	[]	[]	[]	(A)	[DD/DI] E L E	TE)
* CIL RET	rent:	ION 1	RATION	ALE	:	(If a	ıpı	,1 :	icable				ATE ATE	[]	
REMARKS:	JRS 1	WITH	NASA'S	S E	VA	LUATI	[0]	١.								

ASSESSME ASSESSME NASA FME	ENT	II	D:	LDG	DEC-31			ŀ	IASA BASE	LINE	-]		
SUBSYSTE MDAC ID:				EPD 311 BLO		DIOE	DE (6)	3 A	MP					
LEAD ANA	LY	ST	:	G.	BEAIRD									
ASSESSME	ENT	:												
	CR		ICAL LIGH	ITY T	R	EDUN	IDANCY	SCR	EENS			CII	_	
]		W/FU		A		В		C	:				
NASA IOA	[3 3	/3 /3]	[]	[[]	[]		[]	*
COMPARE	ſ		/]	[]	[]	[]		[]	
RECOMMEN	IDA'	ΓI	ons:	(If dif	fere	ent fr	om N	ASA)					
	[/]	[]	[]	[]	(A	[DD/I) DELE	ΓE)
* CIL RE	- :					·			INA	DEQU DEQU]	
IOA CONC	CUR	s i	HTIN	THE	NASA	FMEA	EVAL	UATI	ON.					

ASSESSME	SESSMENT DATE: 1/23/87 SESSMENT ID: LDGDEC-31111 SA FMEA #: 05-6BA-2243-1 BSYSTEM: EPD&C														SA DA ASEL:		[X	;]]		
SUBSYSTEMDAC ID:	M:			31	111	т	BF	EAKE	RS	; (:	2),	LG	S	EN	SORS					
LEAD ANA	LYS	T:		G.	BEA	IF	ΝD													
ASSESSME	NT:																			
	CRI		[CAL]				RE	EDUND	AN	ICY	s	CREE	NS	3			CII			
	F		LIGHT V/FUI	_			A			В				С						
NASA IOA	[3	/1R /1R]		[P P]	{	P]		[P P]		[[]	*	
COMPARE	[/]		[]	İ	[]		[]		[.]		
RECOMMEN	IDA'	ric	SNC:		(If	đ	if	ferer	nt	fr	om	NAS	A))						
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* CIL RE	ete!	NT:	ION :	RAI	TION	ΑL	Е:	(If	aj	ppl	ic	able			DEQU <i>A</i> DEQU <i>A</i>]		
REMARKS:	:																			

IOA DOES CONCUR WITH NASA'S EVALUATION.

ASSESSMI ASSESSMI NASA FMI	ENT I	D:	LDGDE	C-31	:		:	NASA DAT. BASELIN NE		x]	
SUBSYSTE MDAC ID:			EPD&C 31112 CIRCU		REAK	ERS ((2),	LG S	ENSORS		
LEAD ANA	LYSI	:	G. BE	AIRD)						
ASSESSME	ENT:										
		CICAL LIGH	ITY	R	EDUN	DANCY	SCR	EENS		CII	
	2	ITI	EM								
NASA IOA	[3 [3	/3]	[]	[] *				
COMPARE	[/]	[]	[]	[] .	[]
RECOMMEN	DATI	ONS:	(If	dif	fere	nt fr	om N	ASA)			
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REMARKS:									DEQUATE DEQUATE]
IOA CONC SUBSYSTE	URS M, C	WITH IRCU	NASA': IT BRE	S EV. AKER	ALUA' S ARI	rion, E NOR	FAI:	LURE Y IN	HAS NO E	FFEC	T ON SITION.

ASSESSME ASSESSME NASA FME	NT :	ID:	1/23/ LDGDE 05-6B	C-31					ASA DAT BASELIN NE]
SUBSYSTE MDAC ID: ITEM:			EPD&C 31123 CIRCU	,	BREAK	ER (3	AMP	')			
LEAD ANA	LYS	r:	G. BE	AIRD)						
ASSESSME	NT:										
		TICAL		F	REDUN	DANCY	SCR	REENS		CIL ITE	
		FLIGH DW/FU	_	P	1	В		C			••
NASA IOA	[3 /3 3 /3]	((]	[[]	[[]	[] *]
COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	IDAT	ions:	(11	f di	ffere	nt fr	om N	NASA)			
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* CIL RI	ETEN	TION	RATION	NALE:	: (If	appl	icak	A	DEQUATI]
REMARKS: IOA DOES CIRCUIT	s co			NASA	'S EV	'ALUAT	NOI	OF TH	IE LDG A	ARM/DN	RESET

ASSESSME	ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31123A NASA FMEA #: 05-6BA-2244-2											SA D		[x]	
SUBSYSTE MDAC ID: ITEM:	M:		EPD&C 31123 CIRCU	ΙΤ	BR	REAKEI	₹	(3	AMP))							
LEAD ANA	LYST	:	G. BE	AIF	RD												
ASSESSME	NT:																
		ICAL:			RE	DUND	ANC	CY	SCRI	EENS	3				IL PEN	1	
	HD	W/FUI	1C		A			В			С						
NASA IOA	[2 [3	/1R /3]	[P]	[P]	[P]		[[X]	*
COMPARE	[N	/N]	[N]	[N]	[N]		[N]	
RECOMMEN	DATI	ons:	(If	di	.ff	erent	- 1	fro	om NA	ASA)							
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* CIL RE	TENT	ION F	RATION	ALE	:	(If a	ıpp	oli	cabl			EQUA' EQUA'		[x]	
REMARKS: IOA DOES	CON	CIID 1	JTMLI NY				***		·ov o			~					.~
TOW DOES	CUN	CUK Y	TIN NA	15A		EVAL	JUP	٧.I. I	UN () P' '	HF.	140G	AKM	ı / T)N	RH	. S. H. T

CIRCUIT BREAKER.

ASSESSMEN ASSESSMEN NASA FMEA	.26 00-1					•			DAT ELIN NE	E		X]								
SUBSYSTEM MDAC ID: ITEM:	1:			31	D&C 126 NERA	L	PU	IRPO:	SE	FU	SE,	(8)),	1	Al	ſΡ					
LEAD ANAI	LYS	T:		G.	BEA	II	QS														
ASSESSMEN	T:																				
CRITICALITY REDUNDANCY SCREENS FLIGHT														CI IT		ſ					
FLIGHT HDW/FUNC A B C															•						
NASA IOA	[3	/1R /1R]	NC A B C]	X X]	*			
COMPARE	[/]		[]	[]		[]			[]	
RECOMMEN	DAT	IO	NS:		(If	d:	ifi	fere	nt	fr	om	NAS	A)								
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* CIL RET												:				JATE JATE			x]	
IOA DOES	CO	NC	UR I	TIW	H NA	\S	A ' S	S EV	AL	JAT	TOI	٧.									

ASSESSME	SSESSMENT DATE: 1/23/87 SSESSMENT ID: LDGDEC-31126A ASA FMEA #: 05-6BA-2300-2 UBSYSTEM: EPD&C															ASA BASE	LIN	A: E [X W []	
SUBSYSTE MDAC ID:				311	.26	L	ΡŪ	JRPO	OSE	I	TUS	SE,	(8	.)	, :	l AM	ΙP			
LEAD ANA	LYS	T:		G.	BEA	II	RD													
ASSESSME	NT:																			
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	H	DW	/FUI	NC.			A				В				С					
NASA IO A	[3 3	/3 /1R]]	P]		[[F]		[P]		[]	*
COMPARE	[/N]		(N]		[N]		[N]		[]	
RECOMMEN	DAT	'IO	NS:	(Ίf	di	Ĺff	fere	ent	í	fro	om	NAS	A))					
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* CIL RE	TEN	TI	ON I	RATI	ONA	LE	E :	(Ii	f a	bk	1 1	ica		-		DEQU DEQU]	
REMARKS: IOA DOES BECAUSE	co												AN	D	DI	ELET	ING	FMEA	23	00-2

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SUBSYSTEM MDAC ID:	1:		EPD&C 31127 GENERA	AL P	URPO	SE FU	SE (1 AM	P)					
LEAD ANAI	LYST	:	G. BEZ	AIRD)									
ASSESSMEN	T:													
(F	ICALI LIGHT	r	R		DANCY B			С		CI	[L [EM	1	
	עת	W/ FUI	10		•	u	•	·						
NASA IOA		/1R /1R]	[F)]	[F]	[P] P]		[X X]	*
COMPARE	ĺ	/	3	[]	[]	[]		[]	
RECOMMENI	DATI	ons:	(If	dif	fere	nt fr	om N	ASA)						
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* CIL RET	CENT	ION I	RATION	ALE:	(If	appl	icab		ADEQUA ADEQUA		[x]	

IOA DOES CONCUR WITH NASA'S EVALUATION.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:			BASELINE NEW	[X]	
	EPD&C 31127 GENERAL PURPOS	SE FUSE (1 AM	P)		
LEAD ANALYST:	G. BEAIRD				
ASSESSMENT:					
CRITICAL: FLIGH		ANCY SCREENS		CIL ITEM	
HDW/FU		В	С	IIEM	
NASA [3 /3 IOA [3 /1R] []]	[] [[F] [] P]	[]	*
COMPARE [/N] [N]	[N]	N]	[]	
RECOMMENDATIONS:	(If differen	t from NASA)			
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REMARKS: IOA DOES CONCUR N DELETED BECAUSE					

COMPONENT.

ASSESSMENT ASSESSMENT NASA FMEA	ID:	LDGDEC-	-311	.25						SA DATA ASELINE NEW	[_	
SUBSYSTEM: MDAC ID: ITEM:		EPD&C 31125 GENERA	L PU	IRPOSE	F	US	E (5	ΑM	IP)					
LEAD ANALY	ST:	G. BEA	IRD											
ASSESSMENT	!:													
CR	RITICAL:	TTY T	RI	EDUNDA	NC	Y	SCREE	NS			CI	L	ſ	
	HDW/FU	NC	A			В			С					
NASA [IOA [2 /1R 3 /1R]	[P]	[P F]	[P P]	[X X]	*
COMPARE [N /]	[]	[N	1	[]	[]	
RECOMMENDA	ATIONS:	(If	dif:	ferent	t f	rc	m NAS	SA))					
(3 /1R	1	[P]	[F]	[P] (A		/DI		ETE)
* CIL RETE	ENTION	RATIONA	LE:	(If a	app	11	cable		IA IAN	DEQUATE DEQUATE	[x]	
REMARKS: IOA DOES I RECOMMENDS REDUNDANCS	S. CHAN	GING TH	E R	EDUND	ANC	Y:	SCREI	EN:	SS	SINCE IT	· F	AL.	کیا	LR.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31137		NASA DATA BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31137 GENERAL PURPOSE	FUSE (2),	5 AMP	
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				•
CRITICAL FLIGH		NCY SCREENS		CIL
HDW/FU		В	С	ITEM
NASA [2 /1R IOA [2 /1R] [P]] [P]	[P] [[F]	P] P]	[X] * [X]
COMPARE [/] []	[и] []	[]
RECOMMENDATIONS:	(If different	from NASA)		
[/] []	[F] [[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If a	i	ADEQUATE	[]
REMARKS: IOA DOES NOT CONG AND IOA RECOMMENT NSTS 22206.	CUR FULLY WITH NA OS CHANGING THE 1	ASA'S EVALU	ADEQUATE ATION OF I SCREEN B T	TMEA 2303-1

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3 05-6BA-2			NASA DATA BASELINE NEW	[X]
	EPD&C 31137 GENERAL	PURPOSE	FUSE (2)	, 5 AMP	
LEAD ANALYST:	G. BEAI	RD			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDA	NCY SCREE	ens	CIL ITEM
HDW/FU		A	В	С	
NASA [3 /3 IOA [2 /1R] [P]	[] [F]	[] [P]	[x] *
COMPARE [N /N] [N]	[N]	[N]	[N]
RECOMMENDATIONS:	(If d	ifferent	from NAS	SA)	
[/] [1	[]	[]	[] ADD/DELETE)
* CIL RETENTION	RATIONAL	E: (If a	applicable	ADEQUATE	-
REMARKS:				INADEQUATE	
IOA DOES CONCUR FMEA AND CIL REF FAILURE MODE FOR	ERENCE B	A'S EVAI E DELETE	LUATION OF ED BECAUSE	F FMEA 2303- E IT IS NOT	-2 THAT THE A CREDIBLE

ASSESSME ASSESSME NASA FME	NT	ID:	L	/23/87 DGDEC-: 5-6BA-:	31130			1	NASA BASE		[]	[]	
SUBSYSTE MDAC ID:			3	PD&C 1130 SOLATIO	ON RE	SISTO	RS (1	L8); !	5.1K,	1/4	W		
LEAD ANA	LYS	ST:	G	. BEAII	RD								
ASSESSME	NT:	:											
	CRI		ALITY GHT	Y	REDUI	NDANCY	SCF	REENS			CII	_	
	H	IDW/	FUNC		A	F	3	(2				
NASA IOA	[3 / 3 /	3] 3]	[]	[]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DAT	CION	s:	(If d	iffer	ent fr	com N	IASA)					
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* CIL RE	TEN	TIO	N RAT	rionali	E: (I:	f appl	licab	1	ADEQUA ADEQUA		[]	
REMARKS: IOA DOES RESISTOR		NCU	R WIT	TH NAS	A'S E	VALUAT	NOI	OF TH	HE IS	OLAT:	-	_	

NASA DATA:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-311	30A 31-2				ASA DATA BASELINE NEW		
MDAC ID:	EPD&C 31130 ISOLATION	RESIS	TORS	(18)	; 5.	.1K, 1/4	W	
LEAD ANALYST:	G. BEAIRD							
ASSESSMENT:								
CRITICAL: FLIGHT	ITY RI	EDUNDA	NCY	SCREE	:NS		CIL	
HDW/FUI	С							
NASA [3 /3 IOA [3 /3] []	[[]	[]	[[] *]
COMPARE [/] []	[]	[]	[3
RECOMMENDATIONS:	(If dif	ferent	fro	om NAS	SA)			
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REMARKS: IOA DOES CONCUR RESISTORS, RECOM MODE IS NOT CRED	MENDS THAT	FMEA	235	1-2 BI	E DE	LETED BE	ISOL ECAUS	ATION E FAIL

ASSESSME ASSESSME NASA FME	NT	ID:	LDGDE	C-31	132 52-1]	NASA DA BASELI N		[
SUBSYSTEM MDAC ID:	M:		EPD&C 31132 RESIS		(3),	1.2K	, 2W						
LEAD ANA	LYS'	T:	G. BE	AIRD									
ASSESSME	NT:												
(TICAL FLIGH		R	EDUNI	DANCY	SCRE	ENS			CI	L EM	
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COMPARE	[/]	[]	[]	[]		[]	
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REMARKS:	TRS	שדיים	NASAL	s evi	ייבונ. דיבונ	י אחדי	ושיתי שר				-	_	1

RESISTOR.

ASSESSME ASSESSME NASA FME	NΤ	ID	:	LDG					ı		DATA LINE NEW	[}	(]	
SUBSYSTE MDAC ID:				EPD 311 RES		(3),	, 1.2	2K, 2V	N					
LEAD ANA	LYS	ST:		G.	BEAIRD									
ASSESSME	NT:	:												
	CR]				R	EDUI	NAADN	CY SCI	REENS			CII		
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NASA IOA]	3	/3 /3]	()]]	[[]		[]	*
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REMARKS: IOA CONC RESISTOR	UR	s W IN	ITH THE	NAS	SA'S EV OG GR D	ALU OWN'	ATIO	N OF	THE C	JRREN ORING	T LI CIR	MIT:	ING IS.	

ASSESSME ASSESSME NASA FME	NT I):	LDGDE	C-31	134 54 - 1				NASA DA BASELI		-]			
SUBSYSTE MDAC ID:			EPD&C 31134 RESIS	TOR	(2),	1.8K	., 1	./4W							
LEAD ANA	LYST:		G. BE	AIRD											
ASSESSME	ASSESSMENT:														
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C															
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NASA IOA	[3 [3	/3 /3]	[]	[]	[[]		[] *]			
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* CIL RE	TENTI	ON F	RATION	ALE:	(If	appl	ica	ble)	ADEQUAT	'E	Г	1			
REMARKS:								I	NADEQUAT	E	[[j			
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SUBSYSTEM MDAC ID:	M:			31	D&C 128 SIST	'OF	٤ ((12),	. 1	LO.2	2 OI	HMS,	27	1						
LEAD ANA	LYS	T:		G.	BEA	II	RD													
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REMARKS:	CO	NC	UR 1	WIT	H NZ	AS	A'S	s EV	AL	UAT	ION	•								

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SUBSYSTE MDAC ID:				EPD 311: RES	29	(12)	, 10.	2 OH	IMS, 2	:W				
LEAD ANA	LY	ST	:	G. 1	BEAIRD)								
ASSESSME	NT	:												
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RESISTORS.

ASSESSME ASSESSME NASA FME	NT II):	LDGDE]	NASA DA BASELI 1	INE	[X					
SUBSYSTE MDAC ID:			EPD&C 31138 RESIST	ror <u>j</u>	(2),	2.2K	, 1/2	W					
LEAD ANA	LYST	•	G. BEA	AIRD									
ASSESSME	NT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C													
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NASA IOA	[3 [3	/3 /3]	[]]]	[.]		[]	*
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REMARKS: IOA CONC LIMITING	URS 1	WITH ISTO	NASA': RS USE	S EV	ALUAT RPC	TION OUTF	OF TH	E I	SOLATI ONITOR	ON/C ING	CURRI	ENT CUI	TS.

ASSESSME ASSESSME NASA FME	NT I	D:	LDG	3/87 DEC-31 6BA-23				1	IASA BASE		[x]	
SUBSYSTE MDAC ID: ITEM:			EPD 311 RES		(6),	1001	K, 1,	/8W						
LEAD ANA	LYST	:	G. 1	BEAIRD										
ASSESSME	NT:													
			ITY	R	EDUN	DANC	z sci	REENS			CI			
		LIGH W/FU		A		I	3	C	2		II	EM		
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COMPARE	[/]	[]	C]	[]		[]	
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IOA CONC	URS 1	WITH	NASA	A'S EV	ALUA	rion	OF 1	THE CU	RREN'	r LIN	ΊΤ	'IN	G	

RESISTOR.

ASSESSMEN ASSESSMEN NASA FMEA	1T	ID	:		3/87 DEC-311 6BA-236					BASEL				
SUBSYSTEM MDAC ID:	1:			EPD 311 RES		8),	17.4	к, ј	L/4W					
LEAD ANA	LYS	T:		G.	BEAIRD									
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REMARKS: IOA CONC LIMITING	UR	S ES	WIT IST	H NA:	SA'S EV	ALU.	ATION	OF	THE	GSE TE	ST C	URR.	ENT	

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COMPARE	[/]	[]	[]	(]	[]	
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* CIL RE	TEN	TION	RATIO	NALE:	(If	appl	icab	le)				
REMARKS:								INA	DEQUAT:	E į̇́	J	
IOA CONC	URS RE	WITH SISTO	I NASA RS.	'S EV	ALUA	TION (OF T	HE GS	E TEST	CURRE	NT	

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SUBSYSTE MDAC ID: ITEM:		EPD& 3113 RESI	9	1.2	K, 2W							
LEAD ANA	LYST:	G. E	BEAIRD)								
ASSESSME	INT:											
	CRITICA		F	REDUN	IDANCY	SCR	EENS			CIL		
		FUNC	A		В		(2		111	ir.	
NASA IOA	[3 /3	B]	[[]	[]	[]		[]	*
COMPARE	[/	3	[]	[]	(]		[]	•
RECOMMEN	IDATIONS	S: (1	f dif	fere	nt fr	om N	ASA)					
	[/]	[]	[]	[]	(A)	[DD/E) DELE	E TE)
* CIL RE	TENTIO1	N RATIO	NALE:	(If	appl	icab	7	ADEQU. ADEQU.		[]	
REMARKS: IOA CONC RESISTOR	CURS WIT	TH NASA HE LANI	A'S EV	/ALUA	TION ACTU	OF I	HE CU	URREN ITION	T LI	MITI ICAT	ING I'OR .	

ASSESSMEI NASA FME	NT I	D:	LDGDE	C-31				ľ	BASEL	INE]
SUBSYSTEM MDAC ID:	M:		EPD&C 31139 RESIS	ror,	1.2K	, 2W						
LEAD ANA	LYST	:	G. BEZ	AIRD								
ASSESSME	NT:											
(ICAL	ITY	RI	EDUND	ANCY	SCRE	ENS			CIL	
		W/FU		A		В		C	2		ITE	M
NASA . IOA	[3 [3	/3 /3]	[]	[]	[]		[] *]
COMPARE	[/]	[]	[]	[]		[]
RECOMMEN	DATI	ons:	(If	dif	feren	t fr	om NA	SA)				
	[/]	[]	[]	[]	(AI	[D/D] ELETE)
* CIL RET	TENT	ION :	RATION	ALE:	(If	appl	icabl	P	ADEQUA ADEQUA		[]
IOA CONCI	URS	WITH	NASA'S	S EV	ALUAT	ION	OF TH	E CU	RRENT	LIN	(ITI	NG

RESISTOR FOR THE LANDING STRUT ACTUATOR POSITION INDICATOR.

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31131 NASA FMEA #: 05-6BA-2363-1 SUBSYSTEM: EPD&C													;]	
SUBSYSTEM MDAC ID:				311		, 7.5	К, 2	W						
LEAD ANA	LYS	5 T :		G.	BEAIRI)								
ASSESSME	NT:	:												
,	CRI				I	REDUN	IDANC	Y SCR	EENS			CIL		
CRITICALITY REDUNDANCY SCREENS FLIGHT HDW/FUNC A B C												111	11.1	
NASA IOA	[3	/3 /3]	[]]]	[[].		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DAT	ric	ons:	(If di	ffere	ent f	rom N	IASA)					
	[/]	[]	[]	[]	(A	[DD/I		ETE)
* CIL RE	TEI	NT]	ON	RATI	ONALE	: (If	app	olicab		ADEQU ADEQU]	
REMARKS: IOA CONC RESISTOR		5 V	WITH	NAS	SA'S E	VALU <i>I</i>	ATION	of T	гне с	URREN	T LI	MITI	ING	

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31140 NASA FMEA #: 05-6BA-2400-1 SUBSYSTEM: EPD&C												х <u>ј</u>	
SUBSYSTE MDAC ID:				3114	10	RIVER	CONT	ROLL	ÆR (7	TYPE 1)			
LEAD ANA	Y LYS	ST:	:	G. 1	BEAIRI								
ASSESSME	ENT:	:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
	F			NC I	A	1	I	3	C	2	1.1	EM	
NASA IOA	[3 3	/1R /1R]	[E	P]	[I))	[I	?]	[]	*
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	IDAT	ri(ONS:	(1	f dif	fere	nt fi	om N	ASA)				
•	[/]	[]	[]	ĺ]	[(ADD/] DELE	CTE)
* CIL RE	ETEN	T	ON I	RATIO	NALE:	(If	appl	icab	•			_	
							•			DEQUAT DEQUAT]	
REMARKS: IOA CONO MODE: LO CIRCUITS	URS SS	OI	our	(TUT	THAT	CON	NECTS	MAI	N DC	BUS PO	WER T	O TH	E WOW

STEERING.

ASSESSMENT ID:	DATE: 1/23/87 NASA DATA: ID: LDGDEC-31141 BASELINE #: 05-6BA-2400-2 NEW												
MDAC ID:	EPD&C 31141 HYBRID DRI	VER CON	TROLLE	R (TY	PE 1)								
LEAD ANALYST:	G. BEAIRD												
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL ITEM													
HDW/FU			В	С		TIEN	4						
NASA [3 /3 IOA [3 /3] [] []	[]	[] *						
COMPARE [/	1 (] []	[1	[]						
RECOMMENDATIONS:	(If diff	erent f	rom NA	SA)									
[/] [] []	[[DD/DE] ELETE)						
* CIL RETENTION	RATIONALE:	(If app	licabl	AD	EQUATE]						
REMARKS: IOA CONCURS WITH MODE: INADVERTENT WOW CIRCUITS. FI	r output) 1	THAT CON	NECTS 1	MAIN	DC BUS I	POWER	R TO THE						

ASSESSME	SUBSYSTEM: EPD&C													Έ	[]	X]	
SUBSYSTE MDAC ID: ITEM:	M:		EPD&C 31149 HYBRII) [DR1	VER	CC) NTI	ROLLEI	₹	(T)	/PE	1)					
LEAD ANA	LYS'	T:	G. BEA	II	RD													
ASSESSME	NT:																	
CRITICALITY REDUNDANCY SCREENS CIL ITEM																		
												11.	C IV	L				
NASA IOA	[2 /1R 2 /1R]	[P P]	(P P]	[P P]			[X X]	*
COMPARE	[/]	[]	[]	(]			[]	
RECOMMEN	DAT	ions:	(If	d:	ifi	feren	it	fr	om NAS	SA)							
	C	/]	ĺ]	[]	[]	((AI	[)D/] LE	ETE)
* CIL RE						·		-		I	NAI	DEQ	UATE UATE	Ē	Ĩ		j	
IOA CONC									OF TH	E '	TYI	PE	1 HI	C	FO	R	TH	ΙE

ASSESSMEN ASSESSMEN NASA FME	T T	D:		EC-3						NASA BASI	DATA ELINE NEW	[x]	
SUBSYSTEM MDAC ID: ITEM:	1:		EPD&6 3114: HYBR	3	ORI	VER	CON	FROL	LER (TYPE	1)			
LEAD ANA	LYST	:	G. B	EAIF	RD									
ASSESSME	T:													
(ICAL:			RE	DUNI	DANC	y sc	REENS			CI		
	HD	W/FUI	NC		A		1	В		С				
NASA IOA	[3	/1R /1R]	[[P P]	[]	P]	[P] P]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMENI	OATI	ons:	(I :	f di	Lff	erer	nt f	rom	NASA)					
	[/]	[]	(]]	(A)	[DD/	DE LE	TE)
* CIL RE	TENT	ION 1	RATIO	NALE	Ξ:	(If	app:	lica		ADEQU ADEQU	JATE JATE	[]	
REMARKS: IOA DOES	CON	CUR I	WITH 1	NASA	\'S	EVA	LUA!	rion	OF F	MEA 2	402-	1.		

ASSESSME ASSESSME NASA FME	NT ID:	1/23/ LDGDE 05-6B	C-31				-	ASA DATA BASELINI NEV	E [:	x]
SUBSYSTE MDAC ID:	M:	EPD&C 31143 HYBRI		IVER	CONT	ROLLEI	R (T	YPE 1)		
LEAD ANA	LYST:	G. BE	AIRD							
ASSESSME	NT:									
	CRITICAL FLIGH		R	EDUND	ANCY	SCRE	ens		CI:	
	HDW/FU	NC	A		В		С			
NASA IOA	[3 /1F [3 /1F	:] :]	[P]	[P [P]	[P]	[] *]
COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	DATIONS:	(If	dif	feren	t fr	om NA	SA)			
	[/]	[]	[]	[] DELETE
* CIL RE	TENTION	RATION	ALE:	(If	appl:	icable	A	DEQUATE DEQUATE]
REMARKS:	CONCUR	WITH N	ASA'	S EVA	LUAT	ION O	F FM	EA 2402	-2.	NASA

INCORPORATED FMEA 2402-2 INTO 2401-1.

ASSESSMEN'	SSESSMENT DATE: 1/23/87 SSESSMENT ID: LDGDEC-31144 ASA FMEA #: 05-6BA-2402-3									DATA LINE NEW	[x]				
SUBSYSTEM MDAC ID: ITEM:	:		EPD&C 31144 HYBRID	D	RI	VER	co	NTF	OLLER	٤ (TY:	PE	1)				
LEAD ANAL	YST:		G. BEA	IR	D												
ASSESSMEN	T:																
C		CAL			RE	DUNE	AN	CY	SCREE	ENS	3				IL TEN	1	
		IGHT /FUI			A			В			С			_			
NASA IOA	[2	/1R /1R]	[P P]	[P P]	[P P]		[X X]	*
COMPARE	[/]	[]	(]	[]		(]	
RECOMMEND	ATIC	ons:	(If	di	fí	ferer	nt	fr	om NAS	SA))						
•	[/]	[]	(]	[]	(A		/D		ETE)
* CIL RET	ENT	CON :	RATION	ALI	Ξ:	(If	ar	pl	icable				JATE JATE		x]	
REMARKS: IOA CONCU FAILURE M	ODE	: IN	ADVERT	s i ent	EV)	ALUA!	ric U r .	N	OF THI	E :	ry p Cor	E :	1 HDC RATED	F	OR ME.	TI A/O	HE CIL

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-3 NASA FMEA #: 05-6BA-2				EC-3	31148 BASELTNE (Y 1						
SUBSYSTE MDAC ID:			EPD& 3114 HYBR	8	RIVER	CON	TROLI	LER ('	TYPE 1)		
LEAD ANA	LYSI	?:	G. B	EAIR	D						
ASSESSME	NT:										
			ITY	1	REDUN	DANC	Y SCF	REENS		CII	
FLIGHT HDW/FUNC			1	A B			(c	ITI	±M	
NASA IOA	[3	/3]	[]	[[]	[]	[] *
COMPARE	[/]	[]	[]	[]	[]
RECOMMEN	DATI	ons:	(I	f di	fere	nt f	com N	(ASA)			
	[/]	[]	[]	[] DELETE)
* CIL RE	TENT	ION	RATIO	NALE:	(If	app	licab	-	DEOUS EE	_	
REMARKS:								INZ	ADEQUATE ADEQUATE	[]
IOA DOES AND IOA	RECO FME	MMEN	DS NA	SA FM	IEA 2	403-1	LAND	2403	-2 SHOUL	LD BE	ID 2403-2 COMBINED CED 2403-2

ASSESSMENT DATE: 1/23/8 ASSESSMENT ID: LDGDEC NASA FMEA #: 05-6BA			EC-31	.148A				ASA DA BASEL:					
SUBSYSTEM MDAC ID:			3114	8	RIVER	CONT	ROLL	ER (I	YPE 1)			
LEAD ANA	LYST	:	G. E	BEAIRE									
ASSESSME	NT:												
•			YTI	F	REDUN	DANC	SCR	EENS			CIL		
FLIGHT HDW/FUNC			2	A	I	3	C	2					
NASA IOA	[3 [3	/3 /3]	[]	[[]				[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	: (]	If di	ffere	nt f	rom N	ASA)					
	[]	. []	[]	[]	(A)	[DD/I) ELI	ETE)
* CIL RE	TENT	'ION	RATIO	ONALE	: (If	app	licab		ADEQUA ADEQUA]	-
REMARKS: IOA DOES AND IOA INTO ONE INTO 240	CON RECC FME	MMEI A T	MIDG M	ACA F	MEA 2	24N3-	1 ANI	240	3-2 St	TOOL	ום ט	, C	NIDTNET

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC- NASA FMEA #: 05-6BA- SUBSYSTEM: EPD&C			/87 EC-3 BA-2	1142 404 - 1				NASA BASE	LINE				
SUBSYSTI MDAC ID: ITEM:			EPD&0 31142 HYBR	2	RIVER	CONT	ROLLI	ER (1	TYPE	1)			
LEAD ANA	ALYS	T:	G. BI	EAIR	D								
ASSESSME	ENT:												
		TICAL FLIGH	ITY	1	REDUNI	DANCY	SCRI	EENS			CII		
			NC	i	A	В		c	:		ITE	EM	
NASA IOA	[]	3 /3 3 /3]	[]]]	[]		[]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DAT:	cons:	(If	di	fferer	nt fro	om NA	ASA)					
,	[]	[]	[]	[]	(Al	[DD/D] ELET	ΓE)
* CIL RE	TENT	TION I	RATION	ALE:	(If	appl	icabl						
REMARKS:								A INA	DEQU <i>A</i> DEQU <i>A</i>	TE TE	[]	
IOA DOES 2 FOR TH OUTPUT) IOA RECO TO CONFO	CON E TY TO F	POWER ONE ONE ONE ONE ONE ONE ONE O	HDC (THE D OMBINI	FAII OWN NG F	URE M COILS MEA 2	ODES: OF 7:404-1	: LOS THE T L AND	SOF WON 240	OUTF LG EV	UT, ENT OGET	INA IND	DVEF	RTENT CORS.
TYMO 340	~ .		222		MASA	TIACC	NYPUK	WILD	2404	-1 P	MU	2404	1-2

INTO 2403-1.

ASSESSME	SSESSMENT DATE: 1/23/87 SSESSMENT ID: LDGDEC-31142A ASA FMEA #: 05-6BA-2404-2			142A			N	IASA D BASEI		[X]	
SUBSYSTEMDAC ID:	M:		EPD&C 31142 HYBRI	2	IVER	CONT	ROLL	ER (I	YPE 1	.)		
LEAD ANA	LYST	:	G. BE	EAIRD								
ASSESSME	NT:											
	CRITI			R	EDUNI	DANCY	SCR	EENS			CIL	
		LIGH! N/FUI		A		E	3	c	2		115	M
NASA IOA	[3 [3	/3 /3]	[]	[[]	[]		[] *]
COMPARE	[/]	[]	[]	[]		[]
RECOMMEN	DATIO	ons:	(Ii	f dif	fere	nt fi	om N	ASA)		`		
	[/]	[]	[]	[j	(A	[DD/D] ELETE)
* CIL RE	TENT	ION 1	RATIO	VALE:	(If	app]	licab	P	ADEQUA		ָ []
REMARKS: IOA DOES 2 FOR TH	E TY	PE 1	HDC	(FAIL	URE I	MODES	: LO	SS OF	OUTE	UT,	INA	DVERTENT

OUTPUT) TO POWER THE DOWN COILS OF THE TWO NLG EVENT INDICATORS. IOA RECOMMENDS COMBINING FMEA 2404-1 AND 2404-2 TOGETHER TO CONFORM TO NSTS 22206. NASA INCORPORATED 2404-1 AND 2404-2 INTO 2403-1.

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC- NASA FMEA #: 05-6BA-								SA DATA: BASELINE NEW	[X]
SUBSYSTEM MDAC ID: ITEM:	I :	EPD&C 31142 HYBRID	DRI	VER C	ONTF	OLLEF	R (TY	PE 1)		
LEAD ANAL	YST:	G. BEA	IRD							
ASSESSMEN	T:					٠				
C	RITICAL:		RE	DUNDA	NCY	SCREE	ens		CIL	
	HDW/FU		A		В		С		TTER	1
NASA IOA	[3 /3 [3 /3]	[]	[]	[]	[] *
COMPARE	[/]	[]	[]	[]	[]
RECOMMEND	ATIONS:	(If	diff	erent	fro	om NAS	SA)			
	[/]	[]	[]	[] (AI	[DD/DI] ELETE)
* CIL RET	ENTION I	RATIONA	LE:	(If a	ppli	.cable	AI	EQUATE EQUATE	[]
IOA RECOM CREDIBLE INTO 2403	FAILURE									NOT A ATED 2403

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31146 NASA FMEA #: 05-6BA-2405-1					NEW []	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31146 HYBRI	D DRIVER	CONTROLL	ER (TYPE 1	.)	
LEAD ANALYST:	G. BE	AIRD				
ASSESSMENT:						
	ANCY SCR	EENS	CIL ITEM			
FL HDW	A	В	C	11211		
NASA [3 IOA [3	/3] /3]	[]		[]	[] []	*
COMPARE [/]	[]	[]	[]	[]	
RECOMMENDATIO	NS: (If	differer	nt from N	ASA)		
[/]	[]	[]	[]	[] (ADD/DEL	
* CIL RETENTI	ON RATION	ALE: (If	applicab	ADEQU <i>A</i>	ATE []	
REMARKS: IOA DOES CONC RECOMMENDS CO TO NSTS 22206	MBINING F	ASA'S EVA MEA'S 240	ALUATION 05-1 AND	OF THE TYP 2405-2 TO	PE 1 HDC'S SETHER TO	, IOA CONFORM

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31			NASA DATA BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31146 HYBRID DRI	IVER CONT	ROLLER	(TYPE 1)		
LEAD ANALYST:	G. BEAIRD					
ASSESSMENT:						
CRITICAL FLIGH	ITY RI	EDUNDANCY	SCREEN	IS	CIL	ſ
HDW/FU		В		С		•
NASA [3 /3 IOA [3 /3] [] [] []	[] *]
COMPARE [/] [] [] []	[]
RECOMMENDATIONS:	(If diff	ferent fr	om NASA	7)		
[/] [] [] [[] (AI	[DD/DE] CLETE)
* CIL RETENTION DREMARKS:	RATIONALE:	(If appl	·	ADEQUATE NADEQUATE	[]
IOA CONCURS WITH RECOMMENDS COMBITO NSTS 22206.	NING FMEA'S	3 2405-1 .	AND 240	5-2 TOGETHI		IOA CONFORM

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	.146B 105-3		NASA DATA: BASELINE NEW	[X]		
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31146 HYBRID DF	RIVER CONT	ROLLER	(TYPE 1)		
LEAD ANALYST:	G. BEAIRD)				
ASSESSMENT:						
CRITICA FLIG		REDUNDANCY	SCREEN	CIL ITEM		
	UNC A	В		С	TTEM	
NASA [3 /3 IOA [3 /3] [] [] []	[] *	
COMPARE [/] [] [] []	[]	
RECOMMENDATIONS	: (If dif	ferent fr	om NASA	7)		
[/] [] [] [[] (AI	[] DD/DELETE)	
* CIL RETENTION REMARKS:	RATIONALE:	(If appl	•	ADEQUATE		
IOA DOES NOT CO AND RECOMMENDS NOT A CREDIBLE	DELETING FM	EA 2405-3	BECAUS	E ITS FAILU	TRE MODE IS	

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 1/23/87 LDGDEC-311 05-6BA-240		1	NASA DATA: BASELINE NEW	: [X []
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31145 HYBRID DR	IVER CONTI	ROLLER ('	TYPE 1)		
LEAD ANALYST:	G. BEAIRD					
ASSESSMENT:						
CRITICA FLIG HDW/F	HT	EDUNDANCY B		С	CIL	
NASA [3 /1 IOA [3 /3	R] [P] [P] [P]	[] *]
COMPARE [/N] [N] [N] [и]	[]
RECOMMENDATIONS	: (If dif:	ferent fro	om NASA)			
[3 /3] [] [] [] (A)	[DD/DE] LETE)
* CIL RETENTION	RATIONALE:	(If appl:		ADEQUATE ADEQUATE	[]

REMARKS:

IOA DOES NOT CONCUR FULLY WITH NASA'S EVALUATION OF THE TYPE 1 HDC, IOA RECOMMENDS: DOWNGRADING CRITICALITY TO 3/3 AND COMBINING FMEA'S 2406-1 AN 2406-2 TOGETHER TO CONFORM TO NSTS 22206.

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31145A NASA FMEA #: 05-6BA-2406-2		A 2	NASA I BASEI	DATA: LINE [X] NEW []
	EPD&C 31145 HYBRID DRIVE	R CONTROLI	ER (TYPE 1	L)
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				
CRITICAL: FLIGHT	ITY REDUI	NDANCY SCR	EENS	CIL ITEM
HDW/FUI	-	В	С	1150
NASA [3 /3 IOA [3 /3] []	[] []	[]	[] *
COMPARE [/] []	[]	[]	[]
RECOMMENDATIONS:	(If differe	ent from N	ASA)	
[/] []	[]	[]	[] (ADD/DELETE)
* CIL RETENTION 1	RATIONALE: (I	f applicab	ADEQUA	ATE [] ATE []
REMARKS: IOA DOES CONCUR V RECOMMENDS: COMBI TO NSTS 22206.			OF THE TY	

ASSESSMENT ID: NASA FMEA #:	LDGDEC-31145 05-6BA-2406-	B 3	BASEI	DATA: LINE [X] NEW []	
	EPD&C 31145 HYBRID DRIVE	R CONTROLI	ER (TYPE 1	L)	
LEAD ANALYST:	G. BEAIRD				
ASSESSMENT:					
CRITICAI FLIG	LITY REDU	NDANCY SCR	REENS	CIL ITEM	
HDW/FU		В	С	11111	
NASA [3 /3 IOA [3 /3] []	[]	[]	[] *	
COMPARE [/] []	[]	[]	[]	
RECOMMENDATIONS:	: (If differ	ent from N	(ASA)		
[/] []	[]	[]	[] (ADD/DELETE)	
* CIL RETENTION REMARKS:	RATIONALE: (I	f applicab	ole) ADEQUA INADEQUA		
IOA DOES NOT CON RECOMMENDS DELET	TING FMEA 2406 E. NASA INCOR	-3 BECAUSE PORATE 240	: ITS FAILU 6-3 INTO 2	E TYPE 1 HDC AND URE MODE IS NOT 2406-1, WHICH IS	A

	1/23/87 LDGDEC-31 05-6BA-24		ì	VASA DATA: BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31158 HYBRID DF	RIVER CONT	ROLLER (TYPE 1)	
LEAD ANALYST:	G. BEAIRI	D			
ASSESSMENT:					
CRITICAL FLIGH		REDUNDANCY	SCREENS		CIL ITEM
HDW/FU		A B		C	
NASA [2 /1R IOA [3 /3	.] []	P] [P] []	P]	[X] * []
COMPARE [N /N] [1	и] [и] []	N]	[и]
RECOMMENDATIONS:	(If di	fferent fr	om NASA)		
[/] [] [] [] (AI	[] OD/DELETE)
* CIL RETENTION	RATIONALE	: (If appl	7	ADEQUATE ADEQUATE	[X]
REMARKS: IOA DOES CONCUR	WITH NASA	'S EVALUAT	ION OF T	HE TYPE 1	HDC'S.

ASSESSMENT ID:		158A		SA DATA: ASELINE	
NASA FMEA #:	05-6BA-24	07-2		NEW	נ ז
MDAC ID:	EPD&C 31158 HYBRID DR	IVER CONT	ROLLER (TY	PE 1)	
LEAD ANALYST:	G. BEAIRD				
ASSESSMENT:					
CRITICAL FLIGH		EDUNDANCY	SCREENS		CIL ITEM
HDW/FU		В	С		IIEM
NASA [2 /1R IOA [3 /3] [P] [P] [P]	[X] *
COMPARE [N /N] [N] [N] [N]	[N]
RECOMMENDATIONS:	(If dif	ferent fr	om NASA)		
[/] [] [] [[] DD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE:	(If appl	AD	EQUATE EQUATE	
IOA DOES CONCUR	WITH NASA'	S EVALUAT	ION OF THE	TYPE 1	HDC'S.

ASSESSMENT ASSESSMENT NASA FMEA	ID:	LDGDEC	-311					SA DATA: ASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:		EPD&C 31158 HYBRID	DRI	VER C	CONTR	ROLLER	t (TY	PE 1)		
LEAD ANALY	ST:	G. BEA	IRD							
ASSESSMENT	':									
CR	ITICAL		RE	DUND	ANCY	SCREE	ns		CIL ITEM	ſ
	HDW/FU		A		В		С			-
NASA [IOA [3 /3 3 /3]	[]	[]	[]	[] *
COMPARE [/]	[]	[]	[]	[]
RECOMMENDA	TIONS:	(If	diff	erent	t fr	om NAS	SA)			
C	. /]	[]	. [1	[] (A	נם/סם נם/סם] ELETE)
* CIL RETE	ENTION	RATIONA	LE:	(If a	app1:	icable	AΓ	EQUATE	[]
REMARKS: IOA DOES N FOR FMEA 2 NOT A CREI	407-3	AND REC	OMMI	ENDS '	THAT	IT BI	E DEI	LETED BE	CAUS	E IT IS

ASSESSME NASA FME	NT ID:	LDG	DEC-31						DATA LINE NEW	[x]	
SUBSYSTE MDAC ID: ITEM:	M:	EPD 3119 HYBI	56	IVE	R CONT	ROLL	ER (T	YPE	1)				
LEAD ANA	LYST:	G. 1	BEAIRD										
ASSESSME	NT:												
•	CRITICA FLIG	HT	R	EDUI	NDANCY	SCR	EENS			CI II	IL PEN	4	
	HDW/F	UNC	A		В		С						
NASA IOA	[3 /1 [3 /1	R] R]	[P]	[F [F]	[P [P]		[X X]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATIONS	: (1	f dif	fere	ent fr	om N	ASA)						
	[/]	. []	[]	[1	(Al	[\dc	'DF] ELE	TE)
* CIL RET	TENTION	RATIO	NALE:	(II	appl:	icab		DEQU.	ATE	[x]	
REMARKS:							INA	DEQU	ATE ATE	Ī		j	
IOA DOES	CONCUR	WITH	NASA'S	s ev	ידעוו.זעי	CON	ואי א	יעים ל	DF 1	иг	יטי	c	

ASSESSME ASSESSME NASA FME	I TN		LDGE	EC-3	1157 408 - 2					DATA: LINE NEW]	
SUBSYSTE MDAC ID:			EPD& 3115 HYBR	57	RIVER	CONT	ROLI	LER (I	YPE	1)			
LEAD ANA	LYST	:	G. E	BEAIR	D								
ASSESSME	ENT:												
		ICAL			REDUN	DANCY	SCI	REENS			CIL	м	
		LIGH W/FU			A	В		c	!		1111	•	
NASA IO A		/3 /1R]	[] P]	[[F]	[[F)		[x] *	
COMPARE	[/N]	[N]	[N]	[]]		[N]	
RECOMMEN	ITADI	ONS:	()	[f di	ffere	ent fr	om 1	NASA)					
	. [/]	[3	[]	(]	(A)	[DD/D) ELETE	Ε)
* CIL RI		'ION	RATIO	ONALE	: (If	appl	ical	P		JATE JATE]	
REMARKS: IOA CONC FAILURE	CURS				VALUA OUTI		OF :	THE TY	PE (ONE H	oc's	FOR	THE

ASSESSMEI ASSESSMEI NASA FMEZ	NT I	D:	LDGDE	31:					N	IASA DA BASEL		[:	X]]
SUBSYSTEM MDAC ID:			EPD&C 31154 HYBRII	D DR	IVER	COI	VTI	ROLL	ER (1	YPE 3)			
LEAD ANA	LYST	:	G. BEA	AIRD										
ASSESSME	NT:													
(F	LIGHT			EDUNI	OANC		SCR	EENS			CI:		
	HD	W/FUI	4C	A			В		C	2				
NASA IOA	[3 [3	/1R /1R]	[P [P]	[[P F]] []))		[x]] *]
COMPARE	[/]	[]	[N]	[]			N]	
RECOMMENI	DATI	ons:	(If	dif	ferer	nt 1	fro	om N	ASA)					
	(/]	[]	(F]	[]	(AD		A] DEI	 LETE)
* CIL RET	rent:	ION I	RATIONA	ALE:	(If	app) 11	icab	A	DEQUA!		[]	
REMARKS: IOA DOES IOA RECOM														

REDUNDANCY SCREEN B.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3115 05-6BA-2410		NASA DATA: BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31159 HYBRID DRIV	ER CONTROLLER	(TYPE II)	
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				
CRITICA		DUNDANCY SCREE	15	CIL ITEM
FLIG HDW/F		В	С	
NASA [3 /1 IOA [3 /1	R] [P]	[F] [F]	[P] [P]	[X] * [X]
COMPARE [/] [] []	[]	[]
RECOMMENDATIONS	: (If diffe	erent from NAS	A)	
[/] [] []	[] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONALE:) ADEQUATE INADEQUATE	[X]
REMARKS: IOA DOES CONCUR	WITH NASA'S	EVALUATION OF	THE TYPE 2	HDC'S.

ASSESSMEI ASSESSMEI NASA FME	NT I	D:		C-31						DATA: LINE NEW	[х <u>ј</u>	
SUBSYSTEM MDAC ID: ITEM:			EPD&C 31160 HYBRI		RIVER	CONT	ROLLE	R (T	YPE	II)			
LEAD ANA	LYSI	? :	G. BE	AIRD)								
ASSESSME	NT:												
C		'ICAL'	ITY	F	EDUN	IDANCY	SCRE	ENS			CI		
		W/FU	_	A	.	В		С			IT.	EM	
NASA IOA	[3	/1R /1R]	[F))	[F [F]	[P]		֡֝֟֝֝֟֝֟֝֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֡֓֜֝֓֓֓֓֜֝֡֓֜֝֡֓֜	х] х]	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMENI	TTAC	ons:	(If	dif	fere	nt fr	om NA	SA)					
	[/]	[]	[]	[]	(AI	[DD/1	DEL.	· ETE)
* CIL RET	TENT	ION I	RATION	ALE:	(If	appl	icabl	A		ATE ATE	[]	X]	
REMARKS:	IRS	שדיים	NASAL	২ দথ	מונדג	ጥፐርክ (ነው ጥ ህ		-		•	,	

ASSESSMENT ASSESSMENT NASA FMEA	r ID:	1/23/8 LDGDEC 05-6BA	-311					SA DATA: ASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	:	EPD&C 31152 HYBRID	DRI	VER (CONTR	ROLLER	(TY	PE II)		
LEAD ANALY	ST:	G. BEA	IRD							
ASSESSMENT	r:									
CI	RITICAL: FLIGH	r		EDUNDA		SCREE	ns C		CIL	M
	HDW/FU	NC	A		В		C			
NASA IOA	[2 /1R [2 /1R]	[P]	[F [F]	[P [P]	[X] *
COMPARE	[/	1	[]	[]	[1	[]
RECOMMENDA	ATIONS:	(If	dif	feren	t fr	om NAS	A)			
	[/]	[]	[]	[] (A	[DD/D	ELETE)
* CIL RET	ENTION	RATION	ALE:	(If	appl	icable	AI	DEQUATE DEQUATE	[X]
REMARKS:	CONCUR	WITH NA	ASA'	s eva	LUAT	ION OF	THE	E TYPE 2	HDC	's.

ASSESSME ASSESSME NASA FME	ENT I	D:	LDGDE	C-31	153 13 - 2				ASA I BASEI		[X	;]]	
SUBSYSTE MDAC ID: ITEM:			EPD&C 31153 HYBRI	D DR	IVER	CONT	ROLLE	ER (T	YPE I	I)			
LEAD ANA	LYST	:	G. BE	AIRD									
ASSESSME	NT:												
		ICAL:	ITY I	R	EDUN	DANCY	SCRE	ENS			CIL		
	HD	W/FUI	NC	A		В		С					
NASA IOA	[3	/1R /1R]	[P]	[F]	[P]		[X]	*
COMPARE	[/]	[]	[] .	[]		[]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om NA	SA)					
	[/]	[]	[]	[]	(AE	[D/D] ELF	ETE)
* CIL RE	TENT	ION I	RATION	ALE:	(If	appl	icabl	A	DEQUA DEQUA		[X		
REMARKS: IOA CONC FAILURE	URS MODE	WITH : INA	NASA'S	ENT (ALUAT OUTPU	rion (OF TH	Е ТҮ	PE 2	HDC'	S F	OR	THE

ASSESSMEN ASSESSMEN NASA FMEA	T I		LDO	23/8 GDEC -6BA	-3									DATA: ELINE NEW	[]	X]	
SUBSYSTEM MDAC ID: ITEM:	:		EPI 31: HYI	150	D	RI	VER	co	NTI	ROLI	LER	(TY	PE	1)				
LEAD ANAI	YST	:	G.	BEA	IF	D												
ASSESSMEN	IT:																	
C		ICAL				RE	DUNI	DAN	CY	SCI	REEN	S			CI IT		ī	
	_	LIGH W/FU				A			В			С						
NASA IOA	[2	/1R /1R]		[P P]	((F]]	P P]		[X X]	*
COMPARE	(/]		[]	(]	[]		[]	
RECOMMENI	DATI	ons:		(If	d:	Lf1	ere	nt	fr	om 1	NASA	.)						
	[/]		[]	ļ	[]	[]	(A	[DD/] ELE	ETE)
* CIL RE	rent	CION	RAT	ION	L	E:	(If	aj	ppl	ica		Αl		UATE UATE	[x]	
REMARKS: IOA DOES	CON	ICUR	WIT	H NZ	\S	A ' 5	S EV	ALI	TAU	ION	OF	THI	e T	YPE 1	н	C	'S	•

ASSESSMEN ASSESSMEN NASA FMEA	VT ID:	LDGDEC	-31151			CA: IE [X] IW []
SUBSYSTEM MDAC ID: ITEM:		EPD&C 31151 HYBRID	DRIVER	CONTROLL	ER (TYPE 1)	
LEAD ANAI	LYST:	G. BEA	IRD			
ASSESSMEN	T:					
C	RITICALI FLIGHT		REDUN	DANCY SCR	EENS	CIL
	HDW/FU	-	A	В	С	ITEM
NASA IOA	,]	[P] [P]	[F] [F]	[P] [P]	[X] *
COMPARE	[/]]	[]	[]	[]
RECOMMEND	ATIONS:	(If d	liffere	nt from NA	ASA)	
	[/] [1	[]	[]	[] ADD/DELETE)
* CIL RET	ENTION F	ATIONAI	Æ: (If	applicabl	le)	
REMARKS:					ADEQUATE INADEQUATE	
IOA CONCU FAILURE M	RS WITH	NASA'S DVERTEN	EVALUA'	TION OF THUT.	HE TYPE 1 HD	C'S FOR THE

ASSESSME ASSESSME NASA FME	LOGDE	C-31	168	NASA DATA: BASELINE [X] NEW []									
SUBSYSTE MDAC ID: ITEM: CIRCUITS	EPD&C 31168 LATCH		RELAY	em' co	NTROL								
LEAD ANA	LYST	:	G. BE	AIRD									
ASSESSME	NT:												
				DANCY B	SCR	REENS		CIL ITEM					
	FLIGHT HDW/FUNC							С					
NASA IOA	[2 [2	/1R /1R]	[P]	[P [P]	[P] [P]		X]] *		
COMPARE	[/]	[]	[]	[]		[]		
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om N	IASA)					
	ĺ	/]	[]	(]	[]	(A	[.DD/DE			
	CIL RETENTION RATIONALE: (If applicable) ADEQUATE [X] INADEQUATE []												
REMARKS: IOA CONC RELAYS F	REMARKS: TOA CONCURS WITH NASA'S EVALUATION OF (FMEA 2501-1) THE LATCHING RELAYS FOR THE LANDING GEAR ARM CONTROL CIRCUITS.												

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31											
SUBSYSTEM: MDAC ID: ITEM: CIRCUITS	EPD&C 31168 LATCHING											
LEAD ANALYST:	G. BEAIRD											
ASSESSMENT:												
CRITICAL FLIGH		EDUNDANCY	SCREENS	CIL								
HDW/FU		В	С	ITEM								
NASA [2 /1R IOA [2 /1R] [P] [P]] [P]] [P]	[X] * [X]								
COMPARE [/] [] [] []	[]								
RECOMMENDATIONS:	(If dif	ferent from	m NASA)									
[/] [] [] []	[D] (ADD/DELETE)								
* CIL RETENTION I	RATIONALE:	(If applion	ADEQUA	ATE [] ATE [X]								
FMEA 2501-2 HAS I	MEA 2501-2 HAS A NONCREDIBLE FAILURE MODE (SHORTS TO GROUND) AND DA RECOMMENDS THAT THE FMEA AND ITS CIL BE DELETED. NASA NOORPORATED 2501-2 INTO 2501-1.											

ASSESSME ASSESSME NASA FME	LÍ	/23/8 DGDEC 5-6BA	:-3:			NASA DATA: BASELINE [X] NEW []										
SUBSYSTE MDAC ID: ITEM: CIRCUITS									Y (6), LDG GR 'ARM' CONTROL							
LEAD ANA	LYS	T:	G.	. BEA	IRI	D										
ASSESSME	ENT:															
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C																
	Н	DW/	FUNC		A	A		В		C			•			
NASA IOA	[3 /: 3 /:	1R] 1R]		[]	P] P]	[P]]]	P P]		[[]	*	
COMPARE	[/]		[]	C]	[]		[]		
RECOMMEN	IDAT	ION	s:	(If	di	ffer	ent f	rom	NASA)						
	[/]		(]	[]	[]	(A	[DD/	DELE	TE)	
* CIL RE		TIO	N RA	riona	LE	: (I:	f app	lica		ΑI	DEQU.		[]		
	MARKS: A CONCURS WITH NASA'S EVALUATION OF THE LDG GR "ARM" LATCHING LAYS FOR THE FAILURE MODE: FAILS CLOSED.															

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-311										
SUBSYSTEM: MDAC ID: ITEM: CIRCUITS	EPD&C 31170 LATCHING I	RELAY (6), LI	OG GR 'DOWN' CO	ONTROL							
LEAD ANALYST:	G. BEAIRD										
ASSESSMENT:											
CRITICAL: FLIGH HDW/FU	r	EDUNDANCY SCI B	REENS C	CIL ITEM							
NASA [2 /1R IOA [2 /1R] [P] [F]] [P]	[P] [P]	[X] *							
COMPARE [/] [] [N]	[]	[]							
RECOMMENDATIONS:	(If diff	ferent from 1	NASA)								
[/] [] []	[] (AI	[] DD/DELETE)							
* CIL RETENTION I	RATIONALE:	(If applical	ole) ADEQUATE INADEQUATE	[x]							
	OA CONCURS WITH NASA'S EVALUATION OF FMEA 2502-1 FOR THE LDG GF										

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31	.170A 502-2	NASA DATA: BASELINE [X] NEW []								
MDAC ID:	EPD&C 31170 LATCHING	RELAY (6), LDG	GR 'DOWN' CO	ONTROL						
LEAD ANALYST:	G. BEAIRD)									
ASSESSMENT:											
CRITICAL: FLIGH HDW/FU	-	REDUNDAN	CY SCREE	ens C	CIL ITEM						
115#/10		•	D	J							
NASA [2 /1R IOA [2 /1R] [F	?] [?] [P] P]	[P] [P]	[X] *						
COMPARE [/] [] []	. 1	[N]						
RECOMMENDATIONS:	(If dif	ferent	from NAS	SA)							
[/] [) []	[] (A)	[D] DD/DELETE)						
* CIL RETENTION	RATIONALE:	(If ap	plicable	ADEQUATE							
REMARKS: IOA RECOMMENDS TI IT HAS A NONCRED INCORPORATE 2502	IBLE FAILU	JRE MODE	ND ITS C : SHORTS	CIL BE DELET	ED, BECAUSE						

					NASA DATA: C-31171 BASELINE [X] A-2502-3 NEW []									
SUBSYSTEMDAC ID: ITEM: CIRCUITS	ITEM: LATCHING CIRCUITS					G RELAY (6), LDG GR 'DOWN)L	
LEAD ANA	LYSI	? :	G. BE	AIRD)									
ASSESSME	NT:													•
(F	CICAL LIGH	T	R	EDUNI	DANCY	SCR		CIL ITEM					
	HD	W/FU	NC	A		В		С						
NASA IOA	[2	/1R /1R]	[P))]	[P [P]	[P [P]		[X]	*
COMPARE	[N	1 /]	[]	(]	[.]		[N]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om N	IASA)						
	Į	/]	[]	[]	[]	(AI	[DD/	′DF] :LE	TE)
* CIL RE	PENT	CION :	RATION	ALE:	(If	appl	icab	· A	DEQUA DEQUA		[x]	
IOA CONCI				S EV	'ALUA'	rion	OF F	MEA 2	502-3	FOR	R 1	CHE	F	'AILURE

ASSESSME ASSESSME NASA FME	NT I	D:	1/23/8 LDGDE0 05-6BA	2-31						DATA: ELINE NEW]	
SUBSYSTE MDAC ID: ITEM:	M:		EPD&C 31172 GENERA	AL I	PURPO	SE RE	LAY	(2)					
LEAD ANA	LYST	':	G. BEZ	AIRI)								
ASSESSME	NT:												
	F	ICAL	r			DANCY		REENS			CIL ITEM		
		W/FUI		2	_	В			С				
NASA IOA	[3 [3	/1R /3]	[]	?]]	[P]	[P]		[] *]	
COMPARE	[/N]	[]	1]	[N]	[и]		[]	
RECOMMEN	DATI	ons:	(If	di	ffere	nt fr	om 1	NASA)					
	[/]	[]	[]	٠ []	(Al	[D/DC] ELETE)	
* CIL RE	TENT	'ION	RATION	ALE:	: (If	appl	ica	·	ADEQI]]	
REMARKS: IOA DOES RELAYS.	CON	CUR 1	WITH N	ASA	'S EV	'ALUAT	ION				-	RPOSE	

ASSESSM ASSESSM NASA FM	ENT]	ID:	1/23/ LDGDI 05-61	EC-31				NASA DATA: BASELINE [X] NEW []						
SUBSYST			EPD&0 31177 GENEI	2	URPO	SE RE	ELAY	(2)						
LEAD AN	ALYSI	r:	G. BI	EAIRD)									
ASSESSM	ENT:													
		rical FLIGH		F	REDUN	DANCY	SCR	REENS			CII			
		OW/FU		A		E	3	(2		111	2141		
NASA IO A	[3	3 /3]	[]	[]	[]		[]	*	
COMPARE	[/]	[]	[]	[]		[]		
RECOMME	NDATI	cons:	(Ii	f dif	fere	nt fr	om N	IASA)						
	[/]	[]	·[]	[]	(AI	[DD/I] DELE	TE)	
* CIL R	ETENI	MOI	RATION	VALE:	(If	appl	icab	•						
									ADEQUA ADEQUA		•]		
REMARKS IOA DOE: RELAYS.	-	CUR	WITH 1	'ASA	s ev	ALUAT	NOI	OF TH	HE GEI	NERAI	. PU	JRPO	SE	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-31172 05-6BA-2503-		NASA DATA BASELINE NEW	[X]			
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31172 GENERAL PURP	OSE RELAY (2)				
LEAD ANALYST:	G. BEAIRD						
ASSESSMENT:							
CRITICAL FLIGH	T	NDANCY SCRE		CIL ITEM			
HDW/FU	NC A	В	С				
NASA 3 /3 IOA [3 /3] []		[]	[] *			
COMPARE [/] []	[1	[]	[]			
RECOMMENDATIONS:	(If differ	ent from NA	SA)				
[/] []	ľ, J	[]	[] ADD/DELETE)			
* CIL RETENTION	RATIONALE: (1	f applicabl	e) ADEQUATE INADEQUATE	[]			

REMARKS:

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IOA DOES NOT CONCUR WITH NASA'S EVALUATION OF THE GENERAL PURPOSE RELAYS. IOA RECOMMENDS DELETING FMEA 2503-3, BECAUSE ITS FAILURE MODE (SHORTS TO GROUND) IS NOT A CREDIBLE FAILURE FOR THESE COMPONENTS. NASA INCORPORATED 2503-3 INTO 2503-1.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3 05-6BA-2		NASA DATA: BASELINE [X] NEW []							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31173 REMOTE P	POWER CON	TROLLER (2), 3 AMPS						
LEAD ANALYST:	G. BEAIR	RD								
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL										
HDW/FU		A	В	С	ITEM					
NASA [3 /1R IOA [3 /1R		P] [P] [P] [P] P]	[] *					
COMPARE [/] [] [] []	[]					
RECOMMENDATIONS:	(If di	fferent	from NASA)						
[/] [] [] [[] DD/DELETE)					
* CIL RETENTION	RATIONALE	: (If app	plicable)		_					
REMARKS:			I	ADEQUATE NADEQUATE	[]					
IOA CONCURS WITH OUTPUT FAILURE MO	NASA'S E	VALUATION	OF THE	RPC'S FOR	A LOSS OF					

ASSESSMENT ID NASA FMEA #:	TE: 1, : Li 0:	/23/87 DGDEC-3 5-6BA-2	1173 550-	3A -2	NASA DATA: BASELINE [X] NEW []						
SUBSYSTEM: MDAC ID: ITEM:	3	1173	POWER	R CONT	rol:	LER (2),	3 AMPS			
LEAD ANALYST: G. BEAIRD											
ASSESSMENT:											
	CALIT	Y	REDU	JNDAN	CY S	CREEN	is		CIL	Ī	
		:	A		В		C				
NASA [3 IOA [3	/1R] /1R]]	P] P]	[P] P]	[[P]	[] *]	
COMPARE [/]	[]	C]	(•]	[]	
RECOMMENDATIO	ns:	(If d	iffe	rent	from	NASA	A)				
. [/ 1	[]	[]	([] (A	[DD/DI] ELETE)	
* CIL RETENTI	ON RA	ATIONAL	E: (If ap	plic		λг	EQUATE	r	1	
						=	INAI	DEQUATE	ί	j	
REMARKS: IOA DOES NOT RECOMMENDS DE TO GROUND) IS	ELETIN S NOT	NG FMEA A CRED	255 IBLE	O-2, FAIL	BECA	USE :	ITS	FAILURE	MODI	(SHOKIS	

ASSESSMI ASSESSMI NASA FMI								-	ASA DAT BASELIN NE		х ј				
					EPD&C 31174 REMOTE POWER CONTROLLER (2), 3 AMPS										
LEAD AND	ALYS	T:	G. B	EAI	RD										•
ASSESSMI	ENT:														
	ITY REDUNDAN					NCY SCREENS					CIL ITEM				
	NC		A			В			С						
NASA IOA	[3 /3 3 /1R]	[P]	[P]]	P]	[] *]	
COMPARE	[/N]	[N]	[N]	(N]	[]	
RECOMMEN	DAT	IONS:	(I	f di	if1	fere	ent i	fro	om	NASA)				
	[/]	[]	[]	[DELETE	2
* CIL RE	TEN	TION I	RATIO	IALE	€:	(Ii	app)1 i	.ca	•		DEQUATE DEQUATE]	
REMARKS: IOA CONC VALVE RE	URS	WITH.	NASA '	S E	EVA	LUA	MION	I F	OR				_	•	

ASSESSME ASSESSME NASA FME	NT I		LDG	3/87 DEC-31 6BA-25					NASA I BASEI	DATA: LINE [X] NEW []	
SUBSYSTE MDAC ID: ITEM:	M:		EPD 311 PYR		IATC	R CON'	rro	LLER	(6)		
LEAD ANA	LYST	:	G.	BEAIRD							
ASSESSME	NT:										
		ICAL LIGH		R	EDUN	IDANCY	sc	REENS		CIL ITEM	
	_	W/FU		A		В			С		
NASA IOA	[3 [3	/1R /1R]	[P]	[P]	[P] P]	[] *	
COMPARE	[/]	[]	[]	[]	[]	
RECOMMEN	DATI	ons:	(If dif	fere	ent fr	om	NASA)			
	[/]	[]	[.]	[]	[.] (ADD/DELETE)	
* CIL RE		ON	RATI	ONALE:	(If	appl	ica		ADEQUA	ATE [] ATE []	
REMARKS: IOA CONC MODE: LC	URS				ALUA	MOITA	FOR	THE	PIC'S	WITH THE FAILURE	3

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31176	NASA BASE	DATA: LINE [X] NEW []
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31176 PYRO INITIATOR	CONTROLLER (6)	
LEAD ANALYST:	G. BEAIRD		
ASSESSMENT:			
CRITICAL: FLIGH	ITY REDUNDA F	NCY SCREENS	CIL ITEM
HDW/FU		В С	
NASA [3 /1R IOA [3 /1R] [P]] [P]	[P] [P] [P] [P]	[] *
COMPARE [/] []	[] []	[]
RECOMMENDATIONS:	(If different	from NASA)	
[/] [-]	[] []	[] (ADD/DELETE)
* CIL RETENTION 1	RATIONALE: (If a	pplicable) ADEQUA INADEQUA	
REMARKS: IOA CONCURS WITH MODE: INADVERTENT		ON FOR THE PIC'S	WITH THE FAILURE

ASSESSMENT ASSESSMENT NASA FMEA	ID:	1/23/8 LDGDEC 05-6BA	-31	ASA DATA BASELINE NEW						
SUBSYSTEM: MDAC ID: ITEM:		EPD&C 31177 PYRO I	NIT	2)						
LEAD ANALYS	ST:	G. BEA	IRD							
ASSESSMENT:	:									
CR]	TICAL		RI	EDUND	ANCY	SCREE	NS		CIL	
F	HDW/FUI		A		В		C			-
NASA [IOA [2 /1R 2 /1R]	[P]	[P]	[P]	[X] *]
COMPARE [/]	[]	[]	[]	[]
RECOMMENDA	rions:	(If	dif	feren	t fr	om NAS	A)			
ſ	/]	[] .	[]	[] (A	[.DD/D] ELETE)
* CIL RETE	NTION I	RATION	ALE:	(If	appl	icable	A	DEQUATE		
REMARKS: IOA DOES CO	ONCUR	WITH NA	ASA'	S EVA	LUAT	ION OF	TH	E PIC'S.		

ASSESSME ASSESSME NASA FME	NT	II):	LD	23/ GDE -6B	C-:									ASA DA BASELI N		์ [X	:]]	
SUBSYSTE MDAC ID:	M:			31	D&C 178 RO	IN:	IT:	IAT(OR	co	רת	ROL	LER	(:	2)				
LEAD ANA	LYS	ST:	:	G.	BE	AI:	RD												
ASSESSME	NT:	:																	
	CRI		CAL				RI	EDUI	NDA	NC	Y	SCR	EEN	S			CIL		
	H		/FU				A				В			С	•		ITE	M	
NASA IOA	[3	/1R /1R]		[P P]]	P P]]	P P]		[]	*
COMPARE	[/]		[]		[]	[]		ſ]	
RECOMMEN	DAI	CIC	ns:		(If	d:	if	fer	ent	f	rc	m N2	ASA)					
	[/]		[]		[]	[]	(AI	[DD/D		ETE
* CIL RE	TEN	T1	ON 1	RAT	ION	ALI	Ξ:	(I:	fa	pp	li	.cab]	·		DEQUAT		[]	
REMARKS: IOA DOES FAILURE ANOTHER	MOD	E:	IN	\DV									OF T	гні	-	s I	OR '		

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31	183 78-1		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31183 DIODE, 12	AMP			
LEAD ANALYST:	G. BEAIRD				
ASSESSMENT:					
CRITICAI FLIGH		EDUNDANC	Y SCREENS		CIL ITEM
HDW/FU		:	В	С	
NASA [3 /1F IOA [2 /1F	[P] [P] [F] [P] P]	[] * [x]
COMPARE [N /] [] [и] []	[N]
RECOMMENDATIONS:	(If dif	ferent f	rom NASA)		
[2 /1	?] [P] [F] [P] (AI	[A] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app		ADEQUATE ADEQUATE	
REMARKS: IOA RECOMMENDS A DIODE ISOLATES T DIODE IS ALSO IN CONTROL VALVE AN OF CREW/VEHICLE IF THE DIODE FAI	THE K6 & K7 I THE CIRCU ID THE LDG BECAUSE OF	ARM REL IT SUPPL GEAR DUM	AYS FROM YING POWE P CONTROI	THE K8 DOVER TO THE I	VN RELAYS; LDG GEAR POSSIBLE LOSS

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31				ASA DATA: BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31184 DIODE, 12	AMP					
LEAD ANALYST:	G. BEAIRD						
ASSESSMENT:							
CRITICAL FLIGH	ITY R	EDUNDANC	Y SCRE	ENS		CIL	a
HDW/FU	-		В	С		ITEN	1
NASA [3 /3 IOA [3 /3] [] []	[]	[] *
COMPARE [/] [] []	[]	[1
RECOMMENDATIONS:	(If dif	ferent f	rom NA	SA)			
[/] [] []	[[DD/DE] ELETE)
* CIL RETENTION	RATIONALE:	(If app	licabl	AI	DEQUATE DEQUATE	[]
REMARKS: IOA CONCURS WITH FAILURE MODE: S	THE NASA I			n foi	R THE ISO	LATI	ON DIODE

ASSESSMEN ASSESSMEN NASA FME	NT I	D:	1/23/ LDGDE 05-6B	C-31					ASA DA' BASELII N]	
SUBSYSTEM MDAC ID:			EPD&C 31185 DIODE	, 12	AMP							
LEAD ANA	LYSI	! :	G. BE	AIRD								
ASSESSME	NT:											
			ITY	R	EDUNI	DANCY	SCR	REENS		CII		
	_	LIGH W/FU		A		В		C	2	111	11.1	
NASA IOA	[3	3 /3]	[]	[]	[]	[] *	ŧ
COMPARE	[/]	[]	[)	[]	τ]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om N	NASA)				
	[/]	[]	[]	ſ]	[(ADD/I		ſE)
* CIL RE		MOIT	RATION	ALE:	(If	appl	icak	7	ADEQUAT ADEQUAT]	
REMARKS: IOA CONC	URS	WITH	THE N	ASA URE	EVAL MODE	UATIO	N FO	OR THE	TRANS	IENT LS TO	CONI	OUCT

ASSESSMI ASSESSMI NASA FMI	ENT	I	D:	LDGD	EC-3	1185A 580-2	NASA DATA: A BASELINE [] 2 NEW [X]						
SUBSYSTE MDAC ID:				3118	5	2 AMP							
LEAD ANA	ALYS	ST	:	G. B	EAIRI)							
ASSESSME	ENT	:											
	CRI		ICAL LIGH	ITY	F	REDUNI	DANCY	SCF	REENS			CI	
	ŀ			NC	I	1	В	ı	C	2		IT:	EM
NASA IOA	[3	/3 /3]	[[]	[]	[]		[] *]
COMPARE	[/]	[]	[]	[]		[]
RECOMMEN	[ADI	TIO	ONS:	(I	f dif	ferer	nt fr	om N	IASA)				
	[/]	Γ]	[]	[]	(A)] DELETE)
* CIL RE	TEN	T.	ION :	RATIO	NALE:	(If	appl	icab	-				
REMARKS:										DEQU DEQU]
IOA CONC SUPPRESS	URS												CONDUCT.

ASSESSME ASSESSME NASA FME	NT	I		LDG	DEC	-3	112	13 6 - 1								DA ELI N		[]	
SUBSYSTE MDAC ID: ITEM:				EPD 312 GEN	13	L	PU	IRPOS	SE	RE:	LAY	, N	ON	ILA	TC	HIN	G	(2)			
LEAD ANA	LY	ST	:	G.	BEA	IF	RD														
ASSESSME	NT	:																			
	CR		ICAL:				RE	DUNI	1AC	ICY	sc	REE	NS	3				CI	L EN	1	
]		W/FU	_			A			В				С							
NASA IOA	[2	/1R /1R]		[P P]	[F F]		[[P P]			[X X]	*
COMPARE	[N	/]		[]	(•]		[]			[]	
RECOMMEN	IDA'	TI	ons:	(If	đi	Lff	erer	nt	fr	om	NAS	A)								
	[/]		[]	(]		[]		(A)	[DD/	'DI] ELF	ETE)
* CIL RE		NT:	ION 1	RATI	ONA	.LI	Ξ:	(If	aŗ	pl	ica		•			TAU TAU					
REMARKS:	C					S	\'	EVA	ALU	JAT:	ION	OF	F	ME	ΈA	209	6-:	1 F	OI	R 1	THE

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-3 05-6BB-2	1213A 096-2	NASA DATA: BASELINE [X] NEW []						
MDAC ID:	EPD&C 31213 GENERAL	PURPOSE	RELAY, NO	NLATCHING	(2)				
LEAD ANALYST:	G. BEAIR	2D							
ASSESSMENT:									
CRITICA FLIG	LITY IT	REDUNDAN	ICY SCREEN	rs	CIL ITEM				
		A	В	С					
NASA [3 /1: IOA [3 /1:	?] [?] [P] [P] [F] [P] P]	[X] * [X]				
COMPARE [/] [] [.] [3	[]				
RECOMMENDATIONS	(If di	fferent	from NASA	۷)					
\]] [) [] [] (AI	[] DD/DELETE)				
* CIL RETENTION	RATIONALE	: (If ap	-	ADEQUATE NADEQUATE	[]				
REMARKS: IOA RECOMMENDS CREDIBLE FAILUR RELAYS. NASA I	E MODE (SH	ORTS TO	SE DELETED GROUND) F	D, BECAUSE TO THE NONI	T IS A NON				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31	214		NASA DATA: BASELINE NEW	[X]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31214 GENERAL P	urpose r	ELAY, NON	ILATCHING ((2)
LEAD ANALYST:	G. BEAIRD	•			
ASSESSMENT:					
CRITICAL FLIGH		EDUNDANC	Y SCREENS	5	CIL ITEM
HDW/FU			В	C	
NASA [2 /1R IOA [3 /1R] [P		F] [F] [P] P]	[X] * [X]
COMPARE [N /] [] [] [.]	.]
RECOMMENDATIONS:	(If dif	ferent f	rom NASA)	
[/] [] [] [] (A)	[DD/DELETE)
* CIL RETENTION	RATIONALE:	(If app		ADEQUATE NADEQUATE	
REMARKS: IOA CONCURS WITH FOR THE FAILURE	NASA'S EV	ALUATION LS OPEN.	OF THE	GENERAL PU	RPOSE RELAYS

ASSESSME ASSESSME NASA FME	NT I	D:	LDGDE	C-31	215 01 - 1			1	NASA DA BASEL		[X]	
SUBSYSTE MDAC ID:			EPD&C 31215 BLOCK	ING	DIODE	ES (9), 3	AMP					
LEAD ANA	LYST	:	G. BE.	AIRD									
ASSESSME	NT:												
		ICAL: LIGH'	ITY	R	EDUNC	ANCY	SCR	EENS			CIL		
			NC	A		B	,	C	3		ITE.	M	
NASA IOA	[3 [3	/3 /3]	[]	[]	[]		[] *	
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(If	dif	feren	t fr	om N	ASA)					
	[/]	[]	[]	ĺ]	(AE	[DD/D] ELETI	Ξ)
* CIL RE	TENT	ION I	RATION	ALE:	(If	appl	icab		DEQUAT	ישי	ſ	1	
REMARKS:									DEQUAT		[j	
IOA CONC ANTI-SKI	URS 1	WITH IL L	NASA'S	S EV	ALUAT OL CI	ION RCUI	OF T	HE BL	OCKING	DI	ODE	S IN	THE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		31211		NASA DATA BASELINE NEW	: [X]							
MDAC ID:	EPD&C 31211 BLOCKING	DIODE	(4), 12	AMP								
LEAD ANALYST:	G. BEAIR	RD										
ASSESSMENT:												
CRITICALITY REDUNDANCY SCREENS FLIGHT												
HDW/FU	-	_										
NASA [3 /1F IOA [3 /1F] [P] P]	[F] [P]	[P] [P]	[] *							
COMPARE [/] []	[и]	[]	[]							
RECOMMENDATIONS:	(If d	ifferen	t from N	ASA)								
[/] []	[]	[]	[] ADD/DELETE)							
* CIL RETENTION	RATIONAL	E: (If	applicab	le) ADEQUATE INADEQUATE	-							
REMARKS: IOA DOES CONCUR	WITH NAS	A'S EVA	LUATION (OF THE BLOCK	ING DIODES.							

	: 1/23/87 LDGDEC-31212 05-6BB-2102-		NASA DATA BASELINE NEW	[]
MDAC ID:	EPD&C 31212 BLOCKING DIO	DE (4), 12 AM	ſP	
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				
CRITICAI FLIGH HDW/FU	IT	NDANCY SCREEN B	is C	CIL ITEM
NASA [3 /1H IOA [3 /3	R-] [P]	[F] [P]	[X] *
COMPARE [/N] [N]	[N]	и ј	[N]
RECOMMENDATIONS:	(If differ	ent from NASA	۲)	
[/] []	[] [] (AI	[] DD/DELETE)
* CIL RETENTION REMARKS:	RATIONALE: (I		ADEQUATE NADEQUATE	[X]

IOA CONCURS WITH NASA'S EVALUATION.

ASSESSME ASSESSME NASA FME	NT	ID		LDG	DEC	3-3	312	222 06-1	NASA DATA: BASELINE [X] NEW []												
SUBSYSTE MDAC ID:				312 TO	222	E 8	sw]	TCF	I												
LEAD ANA	LYS	ST:		G.	BEA	AIF	RD														
ASSESSMENT:																					
CRITICALITY REDUNDANCY SCREENS FLIGHT													CII								
	I	HDW	/FUI	1C			A				В				С						
NASA IOA	[3 3	/1R /1R]		[P P]		[P P]]]	P P]			[]	*
COMPARE			/]		[]		[}		[]			[]	
RECOMMEN	DA!	rio	NS:		(If	d:	if	fere	ent	: f	r	om	NAS	A)							
	[/]		[]		[]		[]		(A) DEL	ETE)
* CIL RE	TE	NTI	ON 1	RATI	[ON	ALI	Ξ:	(I:	f a	pp	1:	ica						re re	[]	
REMARKS: IOA DOES CIRCUIT																	BR	AKE	CON	ITR	OL

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	: 1/23/87 LDGDEC-3 05-6BB-2	1222A 106-2		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31222 TOGGLE S	WITCH			
LEAD ANALYST:	G. BEAIR	2D			
ASSESSMENT:					
CRITICA: FLIG	LITY	REDUNDANC	Y SCREE	NS	CIL
		A	В	С	ITEM
NASA [3 /1] IOA [3 /1]	R] [P] [P] [P] P]	[P] [P]	[] *
COMPARE [/] [] []	[]	[]
RECOMMENDATIONS	(If di	fferent f	rom NAS	A)	
\]] [] []		[] DD/DELETE)
* CIL RETENTION	RATIONALE	: (If app) ADEQUATE INADEQUATE	[]
REMARKS: IOA RECOMMENDS CREDIBLE FAILURINASA INCORPORATI	E MODE (SH	ORTS TO G	DELETE	D, BECAUSE FOR THE TOG	IT IS A NON-

ASSESSMEI ASSESSMEI NASA FME	T	ID		LDG	3/87 DEC-3 6BB-2					:		DATA: ELINE NEW]	
SUBSYSTEM MDAC ID:	M:			EPD 312 TOG		WIT(CH								
LEAD ANA	LYS'	T:		G.	BEAIF	RD									
ASSESSME	NT:														
				ITY		RED	UNDAI	NCY	SCR	EENS			CIL		
			IGH /FU			A	•	В			С				
NASA IOA	[3	/3 /3]	[[]		[[]	[[]		[] ;	*
COMPARE	[/]	ί]		[]	[]		ſ]	
RECOMMEN	DAT	'IC	NS:		(If d	iffe	rent	fro	om N	IASA)					
	[/]	ſ]		[]	[1	(A	[DD/D		TE)
* CIL RE	ETEN	T]	ON	RAT	IONAL	E: (If a	ppli	icak			UATE UATE	[]	
REMARKS: IOA DOES TOGGLE S	CC	ONC	CUR HES	WIT FOR	H NAS MAIN	A'S S A,	EVAL B,	UAT: AND	C.	FOR	THE	BRAKE	CON	ITRO	L

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-31 05-6BB-21			NASA DATA BASELINE NEW	` (X]							
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31225 TOGGLE SW	ITCH, DPS	т										
LEAD ANALYST:	G. BEAIRD												
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C													
HDW/FUN	С	TIEF	ı										
NASA [3 /1R IOA [3 /3] [P] [P] [P]	[] *]							
COMPARE [/N] [N] [N] [n j	[]							
RECOMMENDATIONS:	(If dif	ferent fro	om NASA)										
[3 /3] [] [] [] (AD	(D/DE] LETE)							
* CIL RETENTION R	ATIONALE:	(If appli	icable)										
REMARKS:				ADEQUATE ADEQUATE]]							
IOA DOES NOT CONCESWITCH AND IOA RE	EMARKS: OA DOES NOT CONCUR WITH NASA'S EVALUATION OF THE "MAIN C" TOGGLE WITCH AND IOA RECOMMENDS CHANGING THE CRITICALITY TO 3/3												

ASSESSME ASSESSME NASA FME	ΝT	II):	LDGD	LDGDEC-31220 BASELI														
SUBSYSTE MDAC ID: ITEM:				EPD&6 3122 TOGG	0	SW1	[TC]	Н,	DP	SI	?								
LEAD ANA	LY:	ST	:	G. B	EAI	RD											•		
ASSESSME	NT	:																	
		F	LIGH	ITY I NC		RI A		NDA		Y B	SC	REEN	s	:			I L FEI	M	
NASA IOA	[2	/1R /1R]	[P P]		[P P]	[F	,] ,]		[x]	*
COMPARE	[N	/]	[]		[]	[]		(N]	
RECOMMEN	DA'	TI	ons:	(I	f d	if	fer	ent	. f	ro	om 1	NASA	۲)				•		
	[/]	(]		[]	[]	(2		/D		TE)
* CIL RE												1	A NA	DEQU	JATE JATE 2107-	Ĭ)	'HE
ANTI-SKI																			

ASSESSMENT DATE: 1 ASSESSMENT ID: 1 NASA FMEA #: (LDGDEC-31220A	NASA DATA BASELINE NEW	[X]										
	EPD&C 31220 TOGGLE SWITCH, DP	ST											
LEAD ANALYST:	G. BEAIRD	·											
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM HDW/FUNC A B C													
	IIEM												
NASA [2 /1R] IOA [3 /1R]] [P] [] [P] [P] [P] P] [P]	[X] *										
COMPARE [N /) () (] []	[N]										
RECOMMENDATIONS:	(If different f	rom NASA)											
[/]] [] [] [] (A)	[] DD/DELETE)										
* CIL RETENTION RA	ATIONALE: (If app	•											
		ADEQUATE INADEQUATE	[]										
REMARKS: IOA RECOMMENDS THAT FMEA 2107-2 BE DELETED, BECAUSE IT IS A NON- CREDIBLE FAILURE MODE (SHORTS TO GROUND) FOR THE TOGGLE SWITCH. NASA INCORPORATED FMEA 2107-2 INTO 2107-1.													

ASSESSMENT DATE ASSESSMENT ID: NASA FMEA #:	LDGDEC-	31221		NASA DATA BASELINE NEW	[X]	
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31221 TOGGLE	SWITCH, [PST			
LEAD ANALYST:	G. BEAI	RD				
ASSESSMENT:						
CRITICA FLIC		REDUNDAN	ICY SCREE		CIL ITEM	
HDW/I	TUNC	A	В	С		
NASA [3 /3 IOA [3 /3	.R] [P] [P]	[P] []	[] *	
COMPARE [/1	,] [N] [ן א	[N]	[]	
RECOMMENDATIONS	s: (If d	ifferent	from NAS	SA)		
[3 /:	3] []	[]	[] (A	[] .DD/DELET	ĽE)
* CIL RETENTION	N RATIONAL	E: (If a	pplicable	e) ADEQUATE INADEQUATE		
REMARKS: IOA DOES NOT CO GRADING FMEA 2				ON AND RECOM	MENDS DO	- NW

ASSESSME NASA FME	NT	ID:	LDGDE	C-3				1	NASA DAT BASELIN NE]		
SUBSYSTE MDAC ID:			EPD&C 31203 ANNUN		ror								
LEAD ANA	LYS	T:	G. BE	AIRI)								
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
		DW/FU	-	1	A	E	3	(C	IIE	.n		
NASA IOA	[3 /3 3 /3]	[]	[[]] []	[] *		
COMPARE	[/]	[]	[]	[]	[]		
RECOMMEN	DAT:	ions:	(If	dif	ffere	nt fr	om N	IASA)					
	[/]	(]	[]	[] (2	[ADD/DI] ELETE)		
* CIL RE	TEN	rion	RATION	ALE:	(If	appl	icak	1	ADEQUATE ADEQUATE]]		
IOA CONC	URS	WITH	NASA'	S EV	'ALUA'	TION	OF I	HE AN	TI-SKID	FAIL	LIGHT.		

ASSESSME ASSESSME NASA FME	NT :	ID:	1/2 LDG 05-	DEC-					NASA DATA: BASELINE [X] NEW []						
SUBSYSTEM MDAC ID: ITEM:	M:		EPD 312 GEN	01	PUF	POSE	FUS	SE	(8),	3	AMP				
LEAD ANA	LYS'	T:	G.	BEAII	RD										
ASSESSME	NT:														
(1	FLIG	LITY IT INC		RED A	UNDAN	CY B	SCI	REENS	c			CIL		
NASA IOA	[:	3 /1H 3 /1H	R]) [P] P]	[F F]	[P P]		[X [X]	*
COMPARE	(/]	[]	[]	ſ]		[]	
RECOMMEN	DAT:	IONS:		If di	iffe	rent	fro	om l	NASA)						
	[/]	[]	[]	[]	(AE	[D / D] ELF	ETE)
* CIL RET	ren'	TION	RATI	ONALI	Ξ: (If ap	pli	.cal	•		EQUAT	re re	[x]	
IOA DOES FUSE FOR			WITH "ENS			EVALU MODE		ON	OF T	HE	GENI	ERAL	PU	RPC	SE

ASSESSMEN ASSESSMEN NASA FMEA	3-3	312								DATA LINE NEW] 3	x]						
SUBSYSTEM MDAC ID: ITEM:	JRPOS	E I	FUS	SE	(8),	2	AMF	•											
LEAD ANAI	LYS	ST:	:	G.	BEA	\II	RD												
ASSESSMEN	VT:	;																	
C	CRI		ICALI LIGHT				RI	EDUND	AN	CY	sc	CREEN	S			-	IL TEN	1	
	F	IDV	/FUI	1C			A			В			С						
NASA IOA	[2	/1R /1R]		[P P]	[P F]]	P P]		[X X]	*
COMPARE	[N	/]		[]	[N]	(]		[]	
RECOMMENI)A	rio	ons:		(If	đ:	if	feren	it	fro	om	NASA	.)						
	[3	/1R]		[P]	[F]	[P]	(Z		/DI		ETE)
* CIL RET	rei	YT:	ION 1	RAT	ION	AL I	Ξ:	(If	ap	pl:	ica	•	A		ATE	•]	
REMARKS: IOA DOES PURPOSE I SINCE IT 3/1R	FUS	SES	s. :	[OA	RE	COI	IMIN	ENDS:	C	HAI	NG]	EVAI ING T	UA 'HE	TION REL	OF UNAN	TH:	S	CRE	EENS

ASSESSME ASSESSME NASA FME	NT I	D:	LDGDE	2-312					ASA DATA BASELINE NEW	[X]			
SUBSYSTE MDAC ID: ITEM:			EPD&C 31204 FUSE,	1 AN	1 P									
LEAD ANA	LYST	':	G. BEA	AIRD										
ASSESSME	ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM														
		W/FUI	С		ller	1								
NASA IOA	[3	/3 /3]	[]	[] *							
COMPARE	[/]	[]	[]	[]	[]			
RECOMMEN	DATI	ons:	(If	dif	feren	t fro	om NAS	SA)						
	[/]	[]	[1	[] (AI	[DD/DI] ELETE)			
* CIL RE		I MOI	RATIONA	ALE:	(If	appl:	icable	AI	DEQUATE DEQUATE	-]			
IOA CONC	URS			EVA	ALUAT	ION (OF THE	E FUS	SE IN TH	E BRA	KE/SKID			

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC- 05-6BB-	31202			A DATA: SELINE (NEW (]			
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31202 FUSE (5	AMP),	2							
LEAD ANALYST:	G. BEAI	RD								
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS FLIGHT										
HDW/FU	INC	A	В	С						
NASA [2 /1F IOA [3 /1F	[s]]	Х] *						
COMPARE [N /] []	[]	[]	[N	3			
RECOMMENDATIONS:	(If d	iffere	nt from	NASA)						
[/] []	[]	[]	•] LETE			
* CIL RETENTION	RATIONAL	E: (If	applic	ADE	QUATE []			
REMARKS: IOA DOES CONCUR	WITH NA	SA'S E	VALUATI	ON.						

ASSESSME ASSESSME NASA FME	I TK	D:	LDGD	/87 EC-31 BB-22					ASA I BASEI	ATA: LINE [NEW [_	 	
SUBSYSTE MDAC ID:			EPD&0 3120 ISOL	6	RES:	ISTOR	(3)	, 5.1	K, 1/	⁄4 WAT	T		
LEAD ANA	LYST	r:	G. B	EAIRD)								
ASSESSMI	ENT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
		DW/FU		7	1	В		C	:				
NASA IOA	[:	3 /3 3 /3]	[]	[]	[]	[- :] *]	
COMPARE	[/	1	[]	[]	(]		[)	
RECOMME	NDAT	ions:	(1	f di	ffere	nt fr	om N	IASA)					
	[/]	[]	[]	[]		[D/DE] LETE	E)
* CIL R	ETEN	TION	RATIC	NALE	: (If	appl	icab		ADEQU ADEQU		[]	
REMARKS IOA CON FOR THE	CIIDC	WITH KE-SI	H NASA KID PO	A'S E' OWER/	VALUA SWITC	TION CH SCA	OF ?	THE MI	DM IS RING	OLATI CIRCU	ON F	ESIS	TORS

ASSESSMI ASSESSMI NASA FMI		LDGDEC	7 -31200 -2248-:				ASA DATA BASELINI NEV	E [3	{]]				
SUBSYSTE MDAC ID:		EPD&C 31200 ISOLAT	ION RES	SISTOR	, 5.1	K, 1/	′4W						
LEAD ANA	LYST:	G. BEA	IRD										
ASSESSME	INT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
	FLIGHT HDW/FUNC A B C												
NASA IOA	[3 /3 [3 /3]	[]	[[]	[]	[] *]				
COMPARE	[/]	[]	[]	[)	[]				
RECOMMEN	DATIONS:	(If o	differe	nt fr	om NAS	SA)							
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* CIL RE	TENTION 1	RATIONAI	E: (If	appl	icable	AD:	EQUATE EQUATE	[[]				
IOA CONC	URS WITH	NASA'S	EVALUA	TION (F THE	ISO:	LATION	RESI	STOR.				

ASSESSMEN ASSESSMEN NASA FMEA	T DA	TE:	1/23/ LDGDE 05-6B	87 C-3 B-2	12 24	10 9-1						SA DA' ASELII N						
orra ou carrie			EDDEC							TOR	(4), 1.	21K	,	2W	t		
LEAD ANAI	YST:	1	G. BE	AIR	D													
ASSESSMEN	IT:																	
CRITICALITY REDUNDANCY SCREENS FLIGHT													IL IEM					
			1C		A			В			С							
NASA IOA	[3 [3	/1R /1R]	[P P]	[P F]	[[P P]]	x]	*	
COMPARE	[/]	[]	[N]	[]		[И]		
RECOMMEN	DATI	ons:	(I1	f di	ff	eren	t :	fro	om N	IASA)							
	[/]	[]	[F]	[]	(AI	[DD,	A /DI] ELE	ETE)	
* CIL RE	TENT	ION	RATIO	NALI	Ξ:	(If	ap	pl:	icak	ole) I	Al NAl	DEQUAT DEQUAT	re re	[]		
REMARKS: IOA DOES CONTROL CHANGING SINCE IT	CIRC THE	UIT RED	CURRE! UNDAN	NT I	LII SCI	MITIN REENS	G (RE: 2)	SIS: ADI	EVAL	UA'	TION C	OF S	H1 MC	E I MEI	RPO) (<i>1</i>)	ΙL

ASSESSMI ASSESSMI NASA FMI	ENT :	ID:	LDGD	EC-3	1208 249-:					DATA ELINI NEV) x]	
SUBSYSTI MDAC ID: ITEM:			EPD& 3120 CURR	8	LIMI	FING 1	RESIS	STOR	(4),	1.21	LK, :	2W	
LEAD AN	ALYSI	: :	G. B	EAIR	D								
ASSESSME	ENT:												
	CRIT	ICAL LIGH	ITY T]	REDUN	IDANC	SCF	REENS			CII	_	
	HE	W/FU	NC	ž	A	F	3	(3		ITI	7M	
	HDW/FUNC A B C IASA [3/3] [] [] [] IOA [3/3] [] []												
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(I1	dif	fere	nt fr	om N	ASA)					
	[/]	ſ	J	[1	[]	(A	[DD/D) ELE'	TE)
* CIL RE REMARKS: IOA CONC								A INA	DEQU DEQU	ATE ATE	[]	
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ASSESSME ASSESSME NASA FME	NT]	D:	LDGD	EC-31	209 50 - 1			ì	NASA D BASEL			
SUBSYSTE MDAC ID: ITEM:			EPD8 3120 RESI		(4),	1.8	(, 1/	′4W				
LEAD ANA	LYST	r:	G. E	BEAIRD	ı							
ASSESSME	NT:											
		TICAL FLIGH	JTY	R	EDUN	DANCY	SCF	REENS		C	IL TEM	
	-			A		E	3	(2	-		
NASA IOA	[3	3 /3]	[]	[[]	[]	[]	*
COMPARE	[/]	[]	[]	[]	(]	
RECOMMEN	DAT	cons:	(1	f dif	fere	nt fr	om N	IASA)				
	[/]	[]	[]	[]	(ADD,] /DEL	
* CIL RE	TENT	rion	RATIO	NALE:	(If	appl	licak	1	ADEQUA	TE []	
REMARKS:								INZ	ADEQUA	TE []	
IOA CONC BLEED-OF	URS			A'S AN	ALYS	IS OF	THE	E RPC,	/MDM M	ONITO	R CI	RCUIT

ASSESSMEN NASA FMEA	VT ID:	LDGDE				ASA DATA BASELINE NEW	[]	[]		
SUBSYSTEM MDAC ID:	1:	EPD&C 31207 ISOLA	rion	RESI	STOR	(4),	2.2	K, 1/2W		
LEAD ANAI	LYST:	G. BE	AIRD							
ASSESSMEN	IT:									
c	RITICAL FLIGH	-	R	EDUND	ANCY	SCRE	ENS		CII	
	HDW/FU		A		В		С		TIE	.F1
NASA IOA	[3 /3]	[]	[]	[[]	[] *]
COMPARE	[/]	[]	[]	[]	[]
RECOMMEND	ATIONS:	(If	dif:	feren	t fr	om NA	SA)			
	[/]	[]	[]	[[DD/D] ELETE)
* CIL RET	'ENTION	RATIONA	LE:	(If	appl	icabl	A	DEQUATE DEQUATE	[]
IOA CONCU	RS WITH	NASA'S	EV	ALUAT:	ION (OF TH	E MOI	NITORING	CIR	CUTT

ISOLATION RESISTORS.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31			BASELINE NEW		
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31226 REMOTE PO	WER CO	NTROLLER	(4), 10 AMP		
LEAD ANALYST:	G. BEAIRD)				
ASSESSMENT:						
CRITICAL: FLIGH		EDUNDA	NCY SCREE	ins	CIL ITEM	
HDW/FU			В	С		
NASA [3 /1R IOA [3 /1R] [F	·]	[P] [P]	[P] [P]	[]	*
COMPARE [/] []	[]	[]	[]	
RECOMMENDATIONS:	(If dif	ferent	from NAS	SA)	•	
[/] []	[]	[] (A	[] DD/DEL	
* CIL RETENTION	RATIONALE:	: (If a	applicable	≥) ADEQUATE INADEQUATE		
REMARKS: IOA CONCURS WITH DISCONNECT MAIN THE FAILURE MODE	DC BUS POV	WER TO	THE ANTI-	E RPC'S THAT	CONNE	CT OR S FOR

ASSESSM ASSESSM NASA FM	ENT ID:	LDGDI	EC-312	27 6 - 2		:	NASA DA BASELI N		x]	
SUBSYST MDAC ID ITEM:		EPD&0 31227 REMO1	7	ER COM	TROLL	ER (4)), 10 A	MP		
LEAD AN	ALYST:	G. BE	EAIRD							
ASSESSMI	ENT:									
	CRITIC. FLI	ALITY	RE	MADNUC	ICY SC	REENS		CI	_	
	HDW/		A		В	C	2	IT	EM	
NASA IOA	[3 /	3] 3]	[] []	[]	[] *]	
COMPARE	[/]	C .] []	(]	£]	
RECOMMEN	DATIONS	S: (If	diff	erent	from 1	NASA)				
	[/]	[:] [1	[[(ADD/1] DELETE	:)
* CIL RE	TENTION	N RATION	ALE:	(If ap	plical	•				
REMARKS:							DEQUATI DEQUATI]	
IOA DOES FAILURE	CONCUE	R WITH N.	ASA'S ENT OU	EVALU.	ATION	OF TH	E RPC'S	FOR	THE	

ASSESSMEN ASSESSMEN NASA FMEA	:	LDG	DEC	:-3	312	216 52 - 1									DA ELI N		[x]			
SUBSYSTEM MDAC ID: ITEM:	ſ:			EPD 312 HYB	16) I	DRI	VER	. C	ON'	TF	ROL	LER	((3)	,	TYP	E I	Ĺ			
LEAD ANAI	LYS'	r:		G.	BEA	II	RD															
ASSESSMEN	IT:																					
C			CALI				RI	EDUN	DAI	ИC	Y	SC	REE	NS	3				C:	CL CEN	1	
			/FUI				A				В				С							
NASA IOA		2 , 3 ,	/1R /1R]		[P P]		[F P]] [P P]]	X]	*
COMPARE	[]	N,	/]		[]		[N	3		[]			[N]	
RECOMMENI)AT	IO	NS:	(Ιf	d:	ifi	fere	nt	f	rc	om I	NAS.	A)								
	[,	/]		[]		[]		[]		(Al		/DI		ETE ;
* CIL RET	'EN'	TI	ON I	RATI	ONA	LI	€:	(If	a j	pr	1 1	[ca]					TAU TAU			x]	
REMARKS:	CO	NC	UR 1	WITH	I NA	SZ	\ 'S	S EV	AL	U.F	T	ОИ	OF	T	H	r	YPE	1	HI	oc '	s.	•

ASSESSME ASSESSME NASA FME	NT I	D:	LDGDE	C-31						DATA ELINE NEW	[X]	
SUBSYSTE MDAC ID: ITEM:			EPD&C 31218 HYBRI	;	IVER	CONT	ROL	LER (TYPE	3)			
LEAD ANA	LYST.	:	G. BE	AIRD)								
ASSESSME	NT:												
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
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NASA IOA	[3 [3	/1R /1R											
COMPARE	ĺ	/]	[]	[]	[3		[]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om 1	NASA)					
	[/	1	[]	[]	[]	(A	[DD/D1] ELETI	歪)
* CIL RE	TENT	ION I	RATION	ALE:	(If	appl	ical	•			_	_	
REMARKS:										JATE JATE	-]	
IOA DOES						ALUAT	ION	OF T	не ту	PE 3	HDC	FOR	THE

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31217 NASA FMEA #: 05-6BB-2262-2 NEW []																						
SUBSYSTE MDAC ID: ITEM:				EPD 312 HYB	17) [OR I	(VEF	R C	10	ITF	ROL	LER	. ((3)	,	TYP:	E :	L			
LEAD ANA	LYS	T:		G.	BEA	II	RD															
ASSESSME	NT:																					
	CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM																					
			/FUI				A				В				С							
NASA IOA		3 3	/1R /3]]	P]		[[F]]	P]			[x]	*
COMPARE	[/N]		[N]		[N]		[N]			(N]	
RECOMMEN	DAT	'IC	ons:	(If	d:	iff	fere	ent	1	r	om	NAS	A))							
	[/]		(]		[]		[]		(AI	[OD/	/DE] ELE	ETE)
* CIL RE		TI	ON E	RATI	ONA	LI	Ξ:	(If	f a	pţ)li	ca	ble				UAT TAU		_	x]	
REMARKS: IOA DOES CONCUR WITH NASA'S EVALUATION OF THE TYPE 1 HDC'S FOR																						
THE FAIL	JURE	M	ODE:	: I	NAI	V	ERT	rent	יס יו	נט	Jq'.	JT.										

ASSESSMENT DATE: 1/23/87 ASSESSMENT ID: LDGDEC-31219 NASA FMEA #: 05-6BB-2262-2 NEW []													
SUBSYSTE MDAC ID: ITEM:	М:		EPD&C 31219 HYBRI		RIVER	CONT	ROLI	LER (TYPE	3)			
LEAD ANA	LYST	':	G. BE	AIRI)								
ASSESSME	NT:												
		ICAL LIGH	ITY	F	REDUN	DANCY	SCR	REENS			CIL		
			NC	7	Ā	В		(3		TTE	М	
NASA IOA	[3 [3	/3 /3]	[]	[]]]		[] *]	,
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om N	IASA)					
	[/]	[]	[]	[]	(A	[DD/D] ELET	E)
* CIL RE	TENT	ION	RATION	ALE:	(If	appl	icab	•					
									ADEQU ADEQU		_]	
REMARKS:							ION	OF TH	E TY	PE 3	HDC	FOR	THE
FAILURE :	MODE	: IN	ADVERT	ENT	OUTP	UT.							

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-3124	0X 0-1	BASELINE NEW							
SUBSYSTEM: MDAC ID: ITEM: MEASUREMENT	31240	CELERATION SYST		COIL CURRENT						
LEAD ANALYST:										
ASSESSMENT:										
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM										
HDW/FU		В	С							
NASA [2 /1H IOA [2 /1H	R] [P]	[P] [] [P] [P] P]	[X] * [X]						
COMPARE [/] []] [][]	[]						
RECOMMENDATIONS	(If diffe	erent from NASA	7)							
[/] [] [] [[] (Al	[] DD/DELETE)						
* CIL RETENTION RATIONALE: (If applicable) ADEQUATE [X] INADEQUATE []										
REMARKS: IOA CONCURS WITH THE NASA FMEA/CIL EVALUATION										

ASSESSME ASSESSME NASA FME	NT ID:	1/23/81 LDGDEC- 06-6BA-	-313]			
SUBSYSTE MDAC ID: ITEM:		EPD&C 31102 PROXIM	ΙΤΥ	SENSOR	вох	(2)						
LEAD ANA	LYST:	G. BEA	IRD									
ASSESSME	NT:											
CRITICALITY REDUNDANCY SCREENS CIL												
	HDW/FU	-	A		В		С	ITE	1			
NASA IOA	[3 /1F [3 /1F	R] [P] [P] P]]	P] P]	[] *]			
COMPARE	[/] [• •] [3	[]	Į.]			
RECOMMEN	DATIONS:	(If d	liff	erent	from	NASA)					
	[/) [] []	[]	[(ADD/DE] ELETE)			
* CIL RE	TENTION	RATIONAL	E:	(If app	plica	able)						
DEWA DVC .						I	ADEQUAT TAUQEDAN]			
REMARKS: IOA CONCURS WITH NASA'S EVALUATION OF THE PROXIMITY SENSOR BOXES FOR THE FAILURE MODE: LOSS OF OUTPUT.												

ASSESSME ASSESSME NASA FME	II TN]	
SUBSYSTEM MDAC ID:	M:		EPD&C 31103 ISOLA	TION	DIOD)E (3), 1	AMP				
LEAD ANA	LYST	:	G. BE	AIRD								
ASSESSME	ASSESSMENT:											
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM												
FLIGHT ITEM HDW/FUNC A B C												
NASA IOA	[3 [3	/3 /3]	[]	[[]	[]	[] *	
COMPARE	[/]	[]	[]	[]	[3	
RECOMMEN	DATI(ons:	(If	dif	feren	it fr	om N	ASA)				
	[/] [] [] (ADD/DELETE)											
* CIL RE	TENT	ION :	RATION	ALE:	(If	appl	icab.	A	DEQUATE]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31103A		NASA DATA BASELINE NEW]								
MDAC ID:	EPD&C 31103 ISOLATION DIODE	E (3), 1 AMP											
LEAD ANALYST:	G. BEAIRD												
ASSESSMENT:													
CRITICALITY REDUNDANCY SCREENS CIL FLIGHT ITEM													
HDW/FUN		В	c	TTEN	1								
NASA [3 /3 IOA [3 /3] []] []]	[] *								
COMPARE [/] []	[] []	[]								
RECOMMENDATIONS:	(If different	from NASA)											
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* CIL RETENTION R	ATIONALE: (If a	1	ADEQUATE ADEQUATE	[]								
REMARKS: IOA CONCURS WITH OF DIODE FUNCTION	NASA'S EVALUATI NOT CRITICAL T	ON OF THE IS O MISSION/CE	SOLATION I	DIODE	s. Loss								

ASSESSME ASSESSME NASA FME	NT I	D:	LDGDE	C-31			,	NASA DA BASELI N	NE				
SUBSYSTE MDAC ID: ITEM:	м:), 1	AMP					
LEAD ANA	LYST	! :	G. BE	AIRD									
ASSESSME	NT:												
		'ICAL 'LIGH		R	EDUN	DANCY	SCRE	ENS			CIL		
			NC	A		В	}	(С			••	
NASA IOA	[3	/3]	[]	[]	[]		[-	*
COMPARE	[/]	[]	[]	[]		[]	
RECOMMEN	DATI	ons:	(If	dif	fere	nt fr	om NA	SA)					
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* CIL RE	TENT	CION	RATION	ALE:	(If	appl	icabl		ADEQUA:	re re	[]	
REMARKS: IOA CONC CRITICAL							Loss	OF	DIODE	FU	1CTI	ON	NOT

ASSESSMI NASA FMI	ENT :	ID:	LDGDF	C-31	1044				NASA D BASEL]	
SUBSYSTI MDAC ID ITEM:			EPD&C 31104 ISOLA		DIC	DDE (3)), 1	AMP					
LEAD AN	ALYS'	г:	G. BE	AIRD									
ASSESSMI	ENT:												
		FICAL FLIGH	ITY	R	EDUN	IDANCY	SCRE	ENS			CIL	•	
			NC	A		В			С	-	TEM		
NASA IOA	[:	3 /3 3 /3]	[]	[]	[]	1	[]	*
COMPARE	[/]	[]	[]	[]	{	•]	
RECOMME	VDAT:	cons:	(If	dif	fere	nt fro	om NA	SA)					
	ĺ	/]	[]	[]	[]		D/DE		TE)
* CIL RI	ETENT	CION :	RATION	ALE:	(If	appli	cable						
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REMARKS: IOA CONC CRITICAI	CURS	WITH MISS	NASA' ION/CR	S EV	ALUA EHIC	TION,	Loss	OF	DIODE	FUNC	TIO	N I	NOT

1100000111111	12/15/86 LDGDEC-1 NONE	NASA DATA: BASELINE NEW	[]						
SUBSYSTEM: MDAC ID: ITEM:	10210	STEERING DISCONNECT LOCK								
LEAD ANALYST:	W. WEISS	INGER								
ASSESSMENT:										
CRITICAL FLIGH		REDUNDA	NCY SCREE		CII					
HDW/FU	NC	A	В	С						
NASA [/ IOA [1 /1] [] NA]	[] [NA]	[] [NA]	[]	x] *				
COMPARE [N /N] [N]	[N]	[N]	[]	N]				
RECOMMENDATIONS:	(If di	fferent	from NAS	A)						
[1 /1] [NA]	[NA]	[NA]		A] DELETE				
* CIL RETENTION	RATIONALE	E: (If a	applicable	e) ADEQUATE INADEQUATE	[:	x]				
REMARKS: NOT CONSIDE	RED BY TH	HE NASA	FMEA/CIL							

ASSESSMENT ASSESSMENT NASA FMEA	ID:	12/15/8 LDGDEC- NONE	6 10212		NASA DATA BASELINE NEW	[]				
SUBSYSTEM: MDAC ID: ITEM:		10212	NOSE WHEEL RETAINING BOLT							
LEAD ANALYS	ST:	W. WEIS	SINGER							
ASSESSMENT:										
CRI	TICALI FLIGHT		REDUNDA	ANCY SCRE	ENS	CIL ITEM				
H	IDW/FUN	IC .	A	В	С	IIBM				
] ASAN] AOI	1 /1] [NA]	[] [NA]	[] [NA]	[] * [x]				
COMPARE [N /N] [иј	[N]	[N]	[N]				
RECOMMENDAT	IONS:	(If di	fferent	from NA	SA)					
[1 /1) [NA]	[NA]		[A] DD/DELETE)				
* CIL RETEN	TION R	ATIONALE	: (If a	pplicable	e) ADEQUATE	r 1				
REMARKS:					INADEQUATE	[]				
ADDITION TO THE	ONAL D	ATA UNCO	VERED A	FTER STU	DY COMPLETION	V ELIMINATES				
THIS IOA EV	VTATT	ON REPOR	\mathbf{T}							

ASSESSME ASSESSME NASA FME	ENT	ID	:		DEC-1		13						NASA BASI	DATA ELINI NEV	Ε	((]	
SUBSYSTEMDAC ID:				LAN 102 AXL		'DE	CELI	ERA	TI	ON	SYS	TE	MS						
LEAD ANA	ALYS	T:		W.	WEISS	IN	GER												
ASSESSMI	ENT:																		
	CRI			ITY		RE	DUN	DAN	CY	sc	REE	NS	5			CI TT	L	1	
	H		IGH' /FU			A			В	i			С					•	
NASA IOA]	1	/]	[NA]	[[N] [A]		[NA]			[x]	*
COMPARE	[N	/N]	[N]	[N	1		[N]			[N]	
RECOMME	radn	IC	ns:	(If d	iff	ere	nt	fr	om	NAS	A))						
	[1	/1]	[N?	\]	[N	[A]		[NA]	(.			A ′DI		ETE;
* CIL R		T	ON	RATI	ONAL	Ξ:	(If	ap	pl	ica	able		ADEQ NADEQ]	x]	
REMARKS	:																		

NOT EVALUATED BY NASA

ASSESSMENT ASSESSMENT NASA FMEA	r ID:	12/15/8 LDGDEC- NONE	6 10220		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	:	10220	/DECELER		TEMS	
LEAD ANALY	YST:	W. WEIS	SINGER			
ASSESSMENT	r:					
CF	CIL ITEM					
	FLIGHT HDW/FUN	ic	A	В	С	ITEM
NASA [IOA [1 /1] [] [[] [NA]	[] [NA]	[x] *
COMPARE [N /N] [иј	[א	[N]	[N]
RECOMMENDA	TIONS:	(If di	ifferent	from NAS	A)	
[1 /1] [NA] [NA]		[A] DD/DELETE)
* CIL RETE	NTION R	ATIONALE	E: (If ap	plicable		
REMARKS:	ODGE O	2 7. 2 4			ADEQUATE INADEQUATE	. ,
MOOTD BE W	FALLUR	E THAT W	OULD PRE	VENT THE	TORQUE TUBE NLG FROM LO TUBE ASSY F	E ASSEMBLY OCKING IN THI REF 02-1-010-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		NASA DATA BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERAT 10401 NLG EXTEND / RETR		
LEAD ANALYST:	J. COMPTON		
ASSESSMENT:			
CRITICAL: FLIGHT		Y SCREENS	CIL ITEM
HDW/FU		в с	1 1 1111
NASA [/ IOA [3 /3] [] [] [NA] [] [] NA] [NA]	[] *
COMPARE [N /N] [N] [и] [и]	[]
RECOMMENDATIONS:	(If different f	rom NASA)	
[3 /3] [NA] [[A] ADD/DELETE)
* CIL RETENTION	RATIONALE: (If app	ADEQUATE	
REMARKS:	NASA FMEA COVERIN	INADEQUATE G THIS FAILURE.	[]

ASSESSME ASSESSME NASA FME		12/15/8 LDGDEC- NONE			NASA DATA BASELINE NEW	: []
SUBSYSTE MDAC ID: ITEM:	M:	10601		RATION SYS		
LEAD ANA	LYST:	J. COMP	TON			
ASSESSME	NT:					
	CRITICAL FLIGH HDW/FU	r	REDUNDA A	NCY SCRE	Ens C	CIL ITEM
NASA IOA	[/ / 3] [] NA]	[NA]	[NA]	[] *
COMPARE	[N /N] [N]	[N]	[N]	[]
RECOMMEN	DATIONS:	(If d	ifferent	from NAS	5 A)	
	[3 /3] [NA]	[NA]		[A] .DD/DELETE
* CIL RE	TENTION 1	RATIONAL	E: (If a	pplicable	ADEQUATE	[]

REMARKS:

ASSESSMEN	SSESSMENT DATE: 12/15/86 SSESSMENT ID: LDGDEC-11004 ASA FMEA #: NONE							SASEI		[]							
SUBSYSTEM MDAC ID: ITEM:				11	LANDING/DECELERATION SYSTE 11004 NLG UPLOCK ACTUATOR						EMS	3							
LEAD ANALYST: J. COMPTON																			
ASSESSMEN	IT:	}																	
C	R		[CAL]				RE	DUND	/N(CY	sc	REENS	3			C]	L EM	ſ	
	F		V/FUN				A			В			С					•	
NASA IOA	[2	/ /1R]]	P]	[F]	[P]		[x]	*
COMPARE	[N	/N]		[N]	[N]	[N]		[N]	
RECOMMENI)A	rio	ons:		(If	đi	lff	erent	t :	fro	mc	NASA)	١						
	[2	/1R]		[P]	[F]	[P]	(AI				ETE)
* CIL RET	rei	T	ON I	RAT	IONA	L	E:	(If a	ap)	pli	Lca			DEQU <i>E</i> DEQU <i>E</i>		[]	
REMARKS: GEAR RELEASE T LANDING O	ГНІ	€ (GEAR	ON	E SE	CC	ONE) AFT				COMM?				3 A (CKU		WILI THE

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-11302 NONE		NASA DATA: BASELINE NEW	
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECEL 11302 NLG DOOR BUNG			
LEAD ANALYST:	W.WEISSINGER			
ASSESSMENT:				
CRITICAL FLIGH		DANCY SCREENS		CIL ITEM
HDW/FU		В	c	LIEM
NASA [/ IOA [1 /1] []] [NA]	[] [AN]] NA]	[] * [x]
COMPARE [N /N] [N]	[и]	и ј	[и]
RECOMMENDATIONS:	(If differe	nt from NASA)		
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* CIL RETENTION	RATIONALE: (If		ADEQUATE	r 1
REMARKS:				į
	D POSSIBLY INAI EN.	DVERTENTLY RE	LEASE CAUS	ING THE NLG

SUBSYSTEM: LANDING/DECELERATION SYSTEMS MDAC ID: 20205 ITEM: AXLE KIT - MLG LEAD ANALYST: W. WEISSINGER ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL FLIGHT HDW/FUNC A B C NASA [/] [] [] [] * IOA [1 /1] [NA] [NA] [NA] [X] COMPARE [N /N] [N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [1 /1] [NA] [NA] [NA] [NA] [A] * CIL RETENTION RATIONALE: (If applicable) * CIL RETENTION RATIONALE: (If applicable) * PERMARKS:	ASSESSMEN ASSESSMEN NASA FME	T	ID			.2/15/86 LDGDEC-20205 IONE										DAT ELIN NE]	
ASSESSMENT: CRITICALITY REDUNDANCY SCREENS CIL ITEM HDW/FUNC A B C NASA [/] [] [] [] * ITEM ITEM ITEM ITEM ITEM ITEM ITEM ITEM	MDAC ID:	м:			20205	20205			N SYS	TI	EMS	3									
CRITICALITY REDUNDANCY SCREENS FLIGHT HDW/FUNC A B C NASA [/] [] [] [] * IOA [1 /1] [NA] [NA] [NA] [X] COMPARE [N /N] [N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [1 /1] [NA] [NA] [NA] [NA] [A] * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []	LEAD ANAI	LYS'	т:		W. WE	WEISSINGER															
FLIGHT	ASSESSMEN	Tr:																			
COMPARE [N /N] [N] [N] [N] [N] RECOMMENDATIONS: (If different from NASA) [1 /1] [NA] [NA] [NA] [A] (ADD/DELETE * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []	(FL	IGH.	r			EDUN	DAI			SCREE	ENS							Ī	
RECOMMENDATIONS: (If different from NASA) [1 /1] [NA] [NA] [NA] [A] (ADD/DELETE * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []	NASA IOA	[1	/ /1]	[N#]			NA]	[N#]) [x]	*
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(ADD/DELETE * CIL RETENTION RATIONALE: (If applicable) ADEQUATE [] INADEQUATE []	RECOMMENI	DAT	IO	ns:	(If	d.	ifí	fere	nt	f	ro	m NAS	SA))							
ADEQUATE [] INADEQUATE []		[1	/1]	[N.	A]	1	-	NA]	[NA	1]	(AD				ETE
	* CIL RES	ren	TI	ON 1	RATION	AL	E:	(If	ap	ge	li	cable			-]]	

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-20214 NONE		NASA DATA: BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELE 20214 WEIGHT ON WHEE				
LEAD ANALYST:	W. WEISSINGER				
ASSESSMENT:					
CRITICAL: FLIGH	ŗ	DANCY SCREEN		CIL ITEM	
HDW/FUI	IC A	В	С		
NASA [/ IOA [3 /3] []] [NA]	[] [[AN]	NA]]] *]
COMPARE [N /N] [N]	[N]	N]	[]
RECOMMENDATIONS:	(If differen	t from NASA)		
[3 /3] [NA]	[NA] [[A D/DE] LETE)
* CIL RETENTION I	RATIONALE: (If	•	ADEQUATE NADEQUATE	[]
REMARKS:			-	-	-

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-20215 NONE		NASA DATA: BASELINE NEW	-]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERAT 20215 WEIGHT ON WHEELS				
LEAD ANALYST:	W. WEISSINGER				
ASSESSMENT:					
CRITICAL FLIGH	r	CY SCREENS	c	CIL ITEM	Ī
HDW/FU	NC A	Б			
NASA [/ IOA [3 /3] [NA] [] [NA] [] NA]	[[] *
COMPARE [N /N] [N] [и] [и]	[]
RECOMMENDATIONS:	(If different f	from NASA)			
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* CIL RETENTION	RATIONALE: (If app	·	ADEQUATE ADEQUATE	[]
REMARKS:		14			,

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERATION SYST 20401 MLG EXTEND / RETRACT HYD			
LEAD ANALYST:	J. COMPTON			
ASSESSMENT:				
CRITICAL FLIGH HDW/FU	_		CIL ITEM	1
nbw/ FO	NC A B	С		
NASA [/ IOA [3 /3] [] [] [] [] [] [] [] [] [] [NA]	[] *]
COMPARE [N /N] [и] [и]	[и]	[]
RECOMMENDATIONS:	(If different from NASA	۷)		
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* CIL RETENTION I	RATIONALE: (If applicable)	ADEQUATE NADEQUATE	[]
	NASA FMEA COVERING THIS F	AILURE.		

	12/15/86 LDGDEC-2 NONE			NASA DATA: BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	20601		ATION SYS R BUNGEE	TEMS		
LEAD ANALYST:	J. COMPI	гои				
ASSESSMENT:						
CRITICAL FLIGH HDW/FU	T	REDUNDA A	NCY SCREE	ens C	CIL	4
NASA [/ IOA [3 /3] [NA]	[] [NA]	[] [NA]	[] *]
COMPARE [N /N] [N]	[N]	[N]	[]
RECOMMENDATIONS:	(If di	ifferent	from NAS	A)		
[3 /3] [NA]	[NA]		[A DD/DI] ELETE)
* CIL RETENTION	RATIONALE	E: (If a	pplicable	ADEQUATE	[]
REMARKS:						

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-2:	1004		NASA DATA BASELINE NEW	
	LANDING/1 21004 MLG UPLO			STEMS	
LEAD ANALYST:	J. COMPTO	ИС			
ASSESSMENT:					
CRITICAL FLIGH HDW/FU	r		NCY SCREE	ens C	CIL ITEM
IIDN/ I'O.			В	C	
NASA [/ IOA [2 /1R] [1] P]	[] [F]	[] [P]	[] * [X]
COMPARE [N /N] [1	4]	[N]	[N]	[N]
RECOMMENDATIONS:	· (If di	fferent	from NAS	SA)	
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* CIL RETENTION	RATIONALE	(If a	pplicable	•	_
DEMA DVC .				ADEQUATE INADEQUATE	
REMARKS:	OT RELEASE	T HVDDA	III.TCAT.IV	THE PYRO	ארצוום שדדד מארצום
RELEASE THE GEAR					

LANDING GEAR HOOK IS NOT OPEN.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	12/15/86 LDGDEC-30104 NONE	NASA DATA: BASELINE [] NEW []	
SUBSYSTEM: MDAC ID: ITEM:	LANDING/DECELERATION SYSTE 30104 BRAKE PEDAL TRANSDUCER	MS	
LEAD ANALYST:			
ASSESSMENT:			
CRITICAL	- -	CIL ITEM	
FLIGHT HDW/FU	_	C	
NASA [/ IOA [1 /1] [] [] [] [NA] [NA] [] [] * NA] [X]	
COMPARE [N /N] [N] [N] [N] [N]	
RECOMMENDATIONS:	(If different from NASA)		
[1 /1] [AN] [NA] [NA] [A] (ADD/DELET:	E)
* CIL RETENTION	RATIONALE: (If applicable)	ADEQUATE [] NADEQUATE []	

CLOSED LVDT WILL RESULT IN HALF-WHEEL LOCKUP ON LANDING WITH ANTISKID OFF, CAUSING POSSIBLE LOSS OF VEHICLE. ANTISKID WILL PROVIDE PROTECTION IF ON.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-30127 NONE		SA DATA: ASELINE [] NEW []	
SUBSYSTEM: MDAC ID: ITEM:	30127	ERATION SYSTEMS		
LEAD ANALYST:		SENSORS (INSTRU	MENTATION)	
ASSESSMENT:				
CRITICAL FLIGH		DANCY SCREENS	CIL ITEM	
HDW/FU	NC A	ВС	IIEM	
NASA [/ IOA [3 /3] []] [NA]	[] [AN] [AN]] [] *	
COMPARE [N /N] [N]	[N] [N] []	
RECOMMENDATIONS:	(If differe	nt from NASA)		
[3 /3] [NA]	[NA] [NA] [A] (ADD/DELETE	3)
* CIL RETENTION I	RATIONALE: (If	AD	EQUATE [] EQUATE []	
REMARKS:		INAD	ACUTE []	

ASSESSMENT DATASSESSMENT ID: NASA FMEA #:				NASA DATA BASELINE NEW	
	EPD&C 31161 HYBRI		CONTROLLE	R (TYPE 1)	
LEAD ANALYST:	G. BE	AIRD			
ASSESSMENT:					
CRITIC. FLI	LITY	REDUND	ANCY SCRE	ENS	CIL ITEM
	UNC	A	В	С	
NASA [/ IOA [3 /	R]	[] [P]	[[] [P]	[] * [X]
COMPARE [N /	1]	[N]	[N]	[N]	[N]
RECOMMENDATION	:: (If	differen	t from NA	SA)	
[3 /	.R]	[P]	[F]	[P] (A	[A] DD/DELETE)
* CIL RETENTIO	RATION	ALE: (If	applicable	e) ADEQUATE INADEQUATE	
REMARKS: IOA RECOMMENDS FMEA/CIL. THE CIRCUITS WITHI	HDC CON	NECTS MAI	N BUS DC	1 HDC TO NA POWER TO THE	SA'S

ASSESSME ASSESSME NASA FME	NT	I		LDGDE NONE		162			ı	NASA DATA BASELINE NEV	E []
SUBSYSTE MDAC ID: ITEM:	м:			EPD&C 31162 HYBRI		IVER	CONT	ROLL	ER (7	TYPE 1)		
LEAD ANA	LY	ST	:	G. BE	AIRD							
ASSESSME	NT	:										
	CR:		ICAL LIGH		R	EDUN	DANCY	SCR	EENS		CII	
]		W/FU		A		В		C	2	ITE	EM
NASA IOA	[3	/3]	[]	[[]	[[]	[] *
COMPARE	[N	/N	1	[]	[]	[]	[]
RECOMMEN	DA!	ΓI	ons:	(If	dif	fere	nt fr	om N	ASA)			
	[3	/3]	[]	[]	[] (A	[[] DELETE)
* CIL RE	TEI	NT:	ION	RATION	ALE:	(If	appl	icab	P	DEQUATE	Ĺ	j
REMARKS: IOA RECO									E 1 H	ADEQUATE	.SA'S	

WITHIN BRAKE/SKID CONTROL BOX A.

NASA DATA:

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31	167		NASA DATA: BASELINE NEW]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31167 HYBRID DR	IVER CONT	ROLLER	(TYPE 1)		
LEAD ANALYST:	G. BEAIRD					
ASSESSMENT:						
CRITICAL FLIGH	ITY R	EDUNDANCY	SCREEN	S	CIL	
-	NC A	В		С		
NASA [/ IOA [3 /3] [] [] []	[] *
COMPARE [N /N] [] [] []	[1
RECOMMENDATIONS:	(If dif	ferent fr	om NASA)		
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* CIL RETENTION	RATIONALE:	(If appl		ADEQUATE NADEQUATE	[]
REMARKS: IOA RECOMMENDS A FMEA/CIL. THE H DS3 AND DS2.	ADDING THE IDC'S POWER	UNCOVERED LEFT/RIG	TYPE 1	HDC'S TO	NASA	's

ASSESSMENT DAT ASSESSMENT ID: NASA FMEA #:		57 31179			NASA DASEL]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31179 ANNUNC	IATOR L	JGHT ((4)			
LEAD ANALYST:	G. BEA	IRD					
ASSESSMENT:							
CRITIC FLI	ALITY	REDUN	DANCY	SCREEN	S	CII	
	FUNC	A	В		С	ITE	iM
NASA [/ IOA [3 /	3]	[]	[] []]] *]
COMPARE [N /	1]	[]	[] []	[]
RECOMMENDATION	: (If (differe	nt fro	m NASA)		
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* CIL RETENTION	RATIONA	LE: (If	appli	·	ADEQUAT NADEQUAT		j
REMARKS: IOA RECOMMENDS THE ANNUNCIATOR GEAR "ARM" AND	LIGHTS I	PROVIDE	VISUA	R LIGHT	IS TO NA	CAIC F	MEA LIST LANDING

ASSESSME ASSESSME NASA FME	TK	I	D:			180			ì	NASA D BASEI		[]	
SUBSYSTE MDAC ID: ITEM:				EPD&C 31180 ANNUN	CIAT	OR C	ONTRO	L AS	SEMBI	LY (2)				
LEAD ANA	LYS	ST	:	G. BE	AIRD									
ASSESSME	TI.	:												
	CR		ICAL LIGH	ITY	R	EDUN	DANCY	SCR	EENS			CIL		
	I		W/FU		A		В	ı	C	2		1111	.1	
NASA IOA	[[3	/ /3]	[]	[]	[[]		[]	*
COMPARE	[N	/N]	[]	[]	[]		[]	
RECOMMEN	DA!	ΓI	ons:	(If	dif	fere	nt fr	om N	ASA)					
	(3	/3]	[]	[]	[]	(AI	[D/D/		TE)
* CIL RE	TE	NT:	ION	RATION	ALE:	(If	appl	icab	1	ADEQUA ADEQUA		[]	
REMARKS: IOA RECO NASA'S F THE LAND	MMI ME	A :	LIST	. THE	ANN	UNCI	ATOR	ASSE	MBLI	OL ASS ES PRO				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC- NONE	31182		NASA DATA BASELINE NEW	
	EPD&C 31182 NOSE LA	NDING G	EAR BRAKE	UPLOCK RELEA	ASE CIRCUIT
LEAD ANALYST:	G. BEAI	RD			
ASSESSMENT:					
CRITICAL: FLIGHT		REDUNDA	ANCY SCREI	ens	CIL ITEM
HDW/FUI		A	В	С	IIEM
NASA [/ IOA [3 /1R] [P]	[] [P]	[] [P]	[x] *
COMPARE [N /N] [и ј	[N]	[N]	[N]
RECOMMENDATIONS:	(If d	ifferent	t from NAS	5A)	
[/] []	[]	[]	[] DD/DELETE)
* CIL RETENTION I	RATIONAL	E: (If a	applicable	e) ADEQUATE	r 1
DEMARKS.				INADEQUATE	
REMARKS: IOA HAS DONE AN A RELEASE CIRCUITS SHUTTLE LANDING (FMEA 200200-1). COMPONENTS IN THI DELETED, IOA RECO	1 & 2 TO SEAR BRAI IOA AND EIR OWN I	O PROVII KE UPLO NASA HA FMEA ANA	DE CONSIST CK RELEASI AVE ALREAI ALYSIS. N	TENT COVERAGI E CIRCUITRY DY COVERED TH NASA FMEA 200	E OF THE (SEE NASA HESE 0200-1 IS
NASA'S FMEA LIST	•				

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31			BASELINE NEW	[]
MDAC ID:	EPD&C 31228 TOGGLE SW	ITCH (3)				
LEAD ANALYST:	G. BEAIRD					
ASSESSMENT:						
	ITY R	EDUNDANCY	SCREENS		CIL	r.
FLIGH HDW/FU	NC A	В	С		1111	•
NASA [/ IOA [3 /3] [] [] []	[] *
COMPARE [N /N] [] [] []	[]
RECOMMENDATIONS:	(If dif	ferent fro	om NASA)			
[3 /3] [] [] [] (A)	[DD/DI] ELETE)
* CIL RETENTION	RATIONALE:	(If appl:	A	DEQUATE DEQUATE]
REMARKS: IOA RECOMMENDS A CLOSED) TO NASA' SWITCHING FOR DC	S FMEA LIS	T. THE TO	OGGLE SWI	TCHES PRO	OVIDI	E MANUAL

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	1/23/87 LDGDEC-31 NONE	1229		NASA DATA BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:		VITCH (3)			
LEAD ANALYST:	G. BEAIRI)				
ASSESSMENT:						
CRITICALI FLIGHT	TTY F	REDUNDA	NCY SCREE	ins	CIL ITEM	I
HDW/FU	IC A	7	В	С		
NASA [/ IOA [3 /1R] [F	P]	[] [P]	[] [P]	[] *
COMPARE [N /N] [N	1]	[N]	[N]	[]
RECOMMENDATIONS:	(If dif	ferent	from NAS	A)		
[3 /1R] [F)	[P]		[DD/DE	
* CIL RETENTION F	RATIONALE:	(If a) ADEQUATE INADEQUATE	[]
REMARKS: IOA RECOMMENDS AD OPEN) TO NASA'S E SWITCHING FOR DC	MEA LIST.	THE '	TOGGLE SW	ITCHES PROVI	DE M	FAILS ANUAI

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-	31230		NASA DATA: BASELINE NEW	
MDAC ID:	EPD&C 31230 CURRENT	LIMITING	RESISTOR	(3), 1.21	(, 2W
LEAD ANALYST:	G. BEAI	RD			
ASSESSMENT:					
CRITICAL: FLIGHT		REDUNDANC	CY SCREENS	;	CIL ITEM
	4C	A	В	С	TIEM
NASA [/ IOA [3 /1R] [P] [P] [P]	[] *
COMPARE [N /N] [и][N] [N]	[]
RECOMMENDATIONS:	(If d	ifferent f	from NASA)		
[3 /1R] [P] [P] [[] DD/DELETE)
* CIL RETENTION I	RATIONALI	E: (If app	olicable)	ADEQUADE	r 1
DEMA DEC.			IN	ADEQUATE IADEQUATE	[]
REMARKS: IOA RECOMMENDS AI MODE: ELEMENT OPI CURRENT TO THE RI HEATERS.	ENS) TO 1	NASA'S FME	EA LIST.	THE RESIST	ORS LIMIT

ASSESSME ASSESSME NASA FME	NT NT A	D2 #:	ATE: D:	1/23/ LDGDE NONE	87 C-31	.231				BASEL	INE]	
SUBSYSTE MDAC ID: ITEM:				EPD&C 31231 CURRE		.IMIT	ING F	ESIS	STOR (3), 1	.21F	ζ, 2 ¹	W	
LEAD ANA	LY	ST	:	G. BE.	AIRD)								
ASSESSME	NT	:												
	CR:		ICAL LIGH	ITY r	R	EDUN	DANCY	SCR	REENS			CIL		
	1	HDI	W/FU	NC	A		E	3	C	:				
NASA IOA	[3	/ /3]	[[]]]	[]		[]	*
COMPARE	[N	/N]	[]	(]	[]		[]	
RECOMMEN	DA!	ΓΙ	ons:	(If	dif	fere	nt fr	om N	ASA)					
	[3	/3]	[]	[]	[]	(AI	[DD/D] ELE'	TE)
* CIL RE	TEI	T	ION 1	RATION	ALE:	(If	appl	icab	· A	DEQUA	TE	١	1	
REMARKS:									INA	DEQUA	TE	į	j	
IOA RECO MODE: SH														
TO THE R	PC	C	ONTRO	OL CIR	CUIT	S IN	THE	BRAK	E HYR	AULIC	LIN	IE H	EAT:	ERS.

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31232		IASA DATA: BASELINE NEW	[]
SUBSYSTEM: MDAC ID: ITEM:	EPD&C 31232 REMOTE POWER CO	NTROLLER (3)	, 10 AMP	
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				
CRITICAL: FLIGH	ITY REDUNDA	NCY SCREENS		CIL ITEM
HDW/FU		В	2	11111
NASA [/ IOA [3 /1R] []] [P]	[] [[P] []	5]	[] *
COMPARE [N /N] [N]	[N]	4]	[]
RECOMMENDATIONS:	(If different	from NASA)		
[3 /1R] [P]	[P] [1	?] (AI	[] DD/DELETE)
* CIL RETENTION	RATIONALE: (If a		ADEQUATE ADEQUATE	[]
REMARKS: IOA RECOMMENDS A NASA'S FMEA LIST TO THE HYDRAULIC	. THE RPC'S CON	(FAILURE MOINECT OR DISC	DE: LOSS (OF OUTPUT) TO

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:		233	NASA DATA BASELINE NEW	
	EPD&C 31233 REMOTE PO	WER CONTROLLER	R (3), 10 AMP	
LEAD ANALYST:	G. BEAIRD			
ASSESSMENT:				
CRITICAL FLIGH		EDUNDANCY SCRE	ENS	CIL
	NC A	В	С	ITEM
NASA [/ IOA [3 /3] [] [P] []]	[] [P]	[] *
COMPARE [N /N] [n] [N]	[N]	[]
RECOMMENDATIONS:	(If dif	ferent from NA	SA)	
[3 /3] [] []	[] (A)	[] DD/DELETE)
* CIL RETENTION	RATIONALE:	(If applicabl	· · · · · · · · · · · · · · · · · · ·	
			ADEQUATE INADEQUATE	[]
REMARKS: IOA RECOMMENDS A OUTPUT) TO NASA' BUS POWER TO THE	S FMEA LIST	THE RPC'S	CONNECT OR DI	ERTENT ISCONNECT DC

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31	234				SA DATA: BASELINE NEW]	
MDAC ID:	EPD&C 31234 ISOLATION	RESIS	TOR	(3),	5.1K	(, 1/4W			
LEAD ANALYST:	G. BEAIRD								
ASSESSMENT:									
בו דרשיו	TTY R	_	NCY	SCREE	NS		CIL		
HDW/FUN	IC A		В		С		1111	•	
NASA [/ IOA [3 /3] []	[•	[]	*
COMPARE [N /N] []	[]	[]	[]	
RECOMMENDATIONS:	(If dif	ferent	fro	om NAS	A)				
[3 /3] []	[]	[] (Al	[DD/DI		
* CIL RETENTION I	RATIONALE:	(If a	ppli	cable		EQUATE	r	1	
				•	INAL	EQUATE	ί	j	
REMARKS: IOA RECOMMENDS AI ELEMENT OPENS, SI RESTRICT CURRENT MONITORING CIRCUIT	HORTS) TO BETWEEN H	NASA'S	FMI	EA LIS	T.	THE RES	ISTOR	DDI RS	₫:

ASSESSMEN ASSESSMEN NASA FMEA	IT II	D:	1/23/8 LDGDEG NONE	37 C-31:	235				ASA DATA BASELINE NEW	[]	
SUBSYSTEM MDAC ID: ITEM:	!:		EPD&C 31235 ANNUNC	CIATO	OR CO	NTRO	L ASS	EMBL:	Y			
LEAD ANAL	YST	:	G. BE	AIRD								
ASSESSMEN	T:											
C		[CAL]	TY	RI	EDUND	ANCY	SCRE	ENS		CIL		
			1C	A		В		С		ITE	M	
NASA IOA	[[3	/3]	[]	[]	[]	[]	*
COMPARE	[N	/N]	[]	[]	[]	[]	
RECOMMEND	ATIC	ons:	(If	difi	ferent	t fr	om NAS	SA)				
	[3	/3]	[]	[]	[[DD/DI] ELE	TE)
* CIL RET	ENTI	ON F	RATIONA	LE:	(If a	appl	icable	•				
									DEQUATE DEQUATE	[]	
REMARKS: IOA RECOM MODE: LOS POWER TO	S OF	roui	PUT) I	O NA	SA'S	FME2	A LIST	. 1	THE ASSEN	LY (I MBLY	PR	LURE OVIDES

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-C	31237		BASELINE NEW	_]
= -	EPD&C 31237 SIGNAL (CONDITIO	NER			
LEAD ANALYST:	G. BEAII	RD				
ASSESSMENT:						
CRITICALI FLIGHT		REDUNDA	NCY SCREE	ns	CIL ITEM	
	1C	A	В	С	IIEM	
NASA [/ IOA [3 /3] [p]	[] [P]	[] [P]	[] *
COMPARE [N /N] [N]	[N]	[N]	[]
RECOMMENDATIONS:	(If d	ifferent	from NAS	A)		
[3 /3] []	[]	[] IA)	[DD/DE] LETE)
* CIL RETENTION F	RATIONALI	E: (If a	pplicable) ADEQUATE INADEQUATE	[]
REMARKS: IOA RECOMMENDS AL OF OUTPUT, INADVE CONDITIONER PROVI	ERTENT OF	UTPUT) T PAGE RED	O NASA'S	NER (FAILURI FMEA LIST.	E MOD	SIGNAL

ASSESSMENT DATE: ASSESSMENT ID: NASA FMEA #:	LDGDEC-31239	NASA DATA BASELINE NEW	
	EPD&C 31239 SIGNAL CONDITIONE	R	
LEAD ANALYST:	G. BEAIRD		
ASSESSMENT:			
CRITICALI FLIGHT		Y SCREENS	CIL
		в с	ITEM
NASA [/ IOA [3 /3] [] [] [P] [1] [] P] [P]	[] *
COMPARE [N /N] [N] [1	и] [и]	[]
RECOMMENDATIONS:	(If different fr	rom NASA)	
[3 /3] [] [] [] (A)	[] DD/DELETE)
* CIL RETENTION R	RATIONALE: (If app	•	
		ADEQUATE INADEQUATE	
OF OUTPUT, INADVE	ERTENT OUTPUT) TO 1	ONDITIONER (FAILUR	E MODE: LOSS THE SIGNAL

BRAKE/SKID CONTROL BOX B.

APPENDIX D

CRITICAL ITEMS

APPENDIX D POTENTIAL CRITICAL ITEMS

NASA FMEA	MDAC-ID	ITEM	FAILURE MODE
02-1-001-1	20201	CHOCK CADIM CADITOMIDE	CHDUOMIDAT BATTUD
02-1-001-1 02-1-001-2	20201	SHOCK STRUT STRUCTURE	STRUCTURAL FAILUR
02-1-001-2	20202	SHOCK STRUT PISTON	INTERNAL / EXTERN
	20203	SHOCK STRUT PISTON	INTERNAL / EXTERN
02-1-002-1	20101	TIRES, MLG TYPE I	RUPTURE
02-1-003-1 02-1-003-1	20206	LOWER DRAG BRACE STRU	STRUCTURAL FAILUR
	20207	UPPER DRAG BRACE TRUN	STRUCTURAL FAILUR
02-1-003-1 02-1-003-1	20219 20220	UPPER DRAG BRACE STRU	STRUCTURAL FAILUR
02-1-003-1		CENTER DRAG BRACE TRU LOWER DRAG BRACE TRUN	STRUCTURAL FAILUR
	20221		STRUCTURAL FAILUR
02-1-004-1	20204	TORQUE ARM ASSEMBLY	STRUCTURAL FAILUR
02-1-005-1	20208	LOCK BRACE ASSEMBLY	STRUCTURAL FAILUR
02-1-005-1	20222	LOCK BRACE CENTER TRU	STRUCTURAL FAILUR
02-1-006-1	20216	UPLOCK ROLLER RETAINI	STRUCTURAL FAILUR
02-1-008-1	20209	DOWN LOCK BUNGEE	PHYSICAL BINDING
02-1-008-1	20210	DOWN LOCK BUNGEE	STRUCTURAL FAILUR
02-1-010-1 02-1-012-1	20217	TORQUE TUBE ASSEMBLY	STRUCTURAL FAILUR
	20501 20701	DOOR EXTEND / RETRACT MLG UPLOCK HOOK ASSEM	STRUCTURAL FAILUR
02-1-012-1 02-1-012-1	20701		STRUCTURAL FAILUR
02-1-012-1	20501	DOOR HOOK ACTUATION	STRUCTURAL FAILUR
02-1-013-1	20701	DOOR EXTEND / RETRACT MLG UPLOCK HOOK ASSEM	STRUCTURAL FAILUR
02-1-013-1			STRUCTURAL FAILUR
02-1-013-1	20901 20501	DOOR HOOK ACTUATUON	STRUCTURAL FAILUR
02-1-014-1	20701	DOOR EXTEND / RETRACT	STRUCTURAL FAILUR
02-1-014-1	20901	MLG UPLOCK HOOK ASSEM DOOR HOOK ACTUATUON	STRUCTURAL FAILUR
02-1-014-1	21101	MLG PYRO UPLOCK RELEA	STRUCTURAL FAILUR
02-1-015-1	21101	MLG PYRO UPLOCK RELEA	INADVERTANT FIRIN
02-1-013-2	20218	SHOCK STRUT ATTACHING	FAIL TO FIRE
02-1-017-1	20218	SUPPORT BEAM	STRUCTURAL FAILUR
02-1-018-1	20223	DOOR EXTEND / RETRACT	STRUCTURAL FAILUR
02-1-019-1	20701	MLG UPLOCK HOOK ASSEM	STRUCTURAL FAILUR
02-1-019-1	20901	DOOR HOOK ACTUATION	STRUCTURAL FAILUR
02-1-019-1	20501	DOOR EXTEND / RETRACT	STRUCTURAL FAILUR
02-1-020-1	20701	MLG UPLOCK HOOK ASSEM	STRUCTURAL FAILUR STRUCTURAL FAILUR
02-1-020-1	20701	DOOR HOOK ACTUATION	
02-1-020-1	20501	DOOR EXTEND / RETRACT	STRUCTURAL FAILUR
02-1-021-1	20701	MLG UPLOCK HOOK ASSEM	STRUCTURAL FAILUR
02-1-021-1	20901	DOOR HOOK ACTUATUON	STRUCTURAL FAILUR
02-1-021-1	30117	SELECTOR VALVE	STRUCTURAL FAILUR
02-1-023-2	30118	SELECTOR VALVE	LEAKAGE
02-1-024-1	30101	ANTI-SKID SELECT SW	JAMMED CLOSED
02-1-024-1	30101	BRAKE CIRCUIT	SWITCH MALFUNCTIO
02-1-025-2	30105	BRAKE CIRCUIT	OPEN OR SHORT CIR
02-1-025-2	30103	SKID CIRCUIT	OPEN OR SHORT CIR
02-1-026-2	30107	ANTI-SKID FAIL CIRCUIT	OPEN OR SHORT CIR OPEN OR SHORT CIR
02-1-027-1	30109	ANTI-SKID FAIL CIRCUIT	OPEN OR SHORT CIR
02 I 02/ 2	30103	THE OWIN LATE CIRCUIT	OFER OR SHORT CIR

NASA FMEA	MDAC-ID	ITEM	FAILURE MODE
	20101	PRAME / CMID CONTROL	JAMMED OPEN
02-1-028-2	30121	BRAKE / SKID CONTROL BY - PASS VALVE, HYD	FAILS TO OPEN
02-1-029-2	30131 30112	INLET FILTER, HYD MOD	CLOGGED FILTER
02-1-030-1		INLET FILTER, HYD MOD	FILTER CLOGGED
02-1-030-1	30130 30102	BRAKE PEDAL TRANSDUCE	NO TRANSDUCER DEF
02-1-032-2		HYD PRESS REG (SYS 2	FAILS CLOSED
02-1-033-2 02-1-033-2		HYD PRESS REG (SYS 1)	FAILS CLOSED
02-1-033-2	21301	MLG DOOR BOOSTER BUNG	FAILS TO FUNCTION
02-1-044-1	30125	RUDDER / BRAKE PEDAL	STRUCTURAL FAILUR
02-1-044-1	30126	RUDDER / BRAKE PEDAL	BINDING / JAMMING
02-1-050-1	30123	EXCITER RING - WHEEL	SHORT OR NO INPUT
02-1-051-1	30123	EXCITER RING - WHEEL	SHORT OR NO INPUT
02-1-051-2	30123	EXCITER RING - WHEEL	SHORT OR NO INPUT
02-1-053-1	30123	EXCITER RING - WHEEL	SHORT OR NO INPUT
02-1-066-2	30124	STATORS, ROTORS, CLIP	STRUCTURAL FAILUR
02-1-075-1	10215	SHOCK STRUT	INTERNAL / EXTERN
02-1-075-1 02-1-075-1 02-1-076-1	10216	SHOCK STRUT	INTERNAL / EXTERN
02-1-076-1	10211	TORQUE ARM ASSEMBLY	STRUCTURAL FAILUR
02-1-077-1	10202	DRAG BRACE	STRUCTURAL FAILUR
ハンー・ーロ・ノー・	10203	DRAG BRACE TRUNION	STRUCTURAL FAILUR
02-1-077-1	10221	DRAG BRACE	STRUCTURAL FAILUR
02-1-077-1	10222	DRAG BRACE TRUNION	STRUCTURAL FAILUR
02-1-077-1	10223	DRAG BRACE TRUNION	STRUCTURAL FAILUR
02-1-077-1	10224	SUPPORT BEAM	STRUCTURAL FAILUR
02-1-078-1	10204	LOCK BRACE ASSEMBLY	STRUCTURAL FAILUR
02-1-079-1		DOWNLOCK BUNGEE	PHYSICAL BINDING STRUCTURAL FAILUR
02-1-079-1		DOWNLOCK BUNGEE	ERONEOUS OUTPUT
02-1-080-1		WEIGHT ON WHEELS SENS	STRUCTURAL FAILUR
02-1-082-1		UPLOCK ROLLER RETAINI NLG UPLOCK HOOK ASSEM	STRUCTURAL FAILUR
02-1-082-1		UPLOCK ROLLER RETAINI	STRUCTURAL FAILUR
02-1-083-1	10217	STEERING COLLAR ASSEM	STRUCTURAL FAILUR
02-1-085-1	10209	NLG B/U PYRO UPLOCK	FAIL TO FIRE
02-1-097-1	11102	NLG B/U PYRO UPLOCK	INADVERTANT FIRIN
02-1-097-2 02-1-098-1	11101 10501	NLG DOOR EXTEND / RET	STRUCTURAL FAILUR
02-1-098-1	10901	NLG DOOR HOOK ACT LIN	STRUCTURAL FAILUR
02-1-098-1	10501	NLG DOOR EXTEND / RET	STRUCTURAL FAILUR
02-1-099-1	10901	NLG DOOR HOOK ACT LIN	STRUCTURAL FAILUR
02-1-102-1	11301	NLG DOOR BUNGEE ASSIS	STRUCTURAL FAILUR
02-1-104-1	11202	NLG EXTENSION BOOSTER	FAIL TO FIRE
02-1-104-2	11201	NLG EXTENSION BOOSTER	INADVERTANT FIRIN
02-1-109-1	10201	NOSE LANDING GEAR TRU	STRUCTURAL FAILUR
02-1-110-1	10101	TIRES, NLG TYPE II	RUPTURE
02-6-G08-A01	21005	MLG UPLOCK ACTUATOR	RUPTURE
02-6-G08-A02	21003	MLG UPLOCK ACTUATOR	LEAK EXTERNAL
02-6-G09-A01	20404	MLG EXTEND / RETRACT	RUPTURE
02-6-G09-A02	20402	MLG EXTEND / RETRACT	LEAK, EXTERNAL
02-6-G09-A04	20416	MLG EXTEND / RETRACT	TEMPERATURE TRANS
02-6-G09-B02	20413	MLG EXTEND / RETRACT	SHUTTLE VALVE
02-6-G09-F01	20414	MLG EXTEND / RETRACT	TIMING ORIFICE

NASA FMEA	MDAC-ID	ITEM	FAILURE MODE
02-6-H01-A01	10404	NLG EXTEND / RETRACT	DILDMID
02-6-H01-A02	10402	NLG EXTEND / RETRACT	RUPTURE
02-6-H01-A04		NLG EXTEND / RETRACT	LEAK, EXTERNAL
02-6-H01-B02		NLG EXTEND / RETRACT	TEMPERATURE TRANS
02-6-H01-F01		NLG EXTEND / RETRACT	SHUTTLE VALVE
02-6-H03-1	11005	NLG UPLOCK ACTUATOR	TIMING ORIFICE RUPTURE
02-6-H03-2		NLG UPLOCK ACTUATOR	
05-6BA-200200-1		HYBRID DRIVER CONTROL	LEAK EXTERNAL
05-6BA-2115-1		PUSHBUTTON SWITCH (2)	INADVERTENT OUTPU FAILS OPEN
05-6BA-2117-1		PUSHBUTTON SWITCH, LD	FAILS OPEN
05-6BA-2118-4		PROXIMITY SENSOR BOX	INADVERTENT OUTPU
05-6BA-2206-1	31107	BLOCKING DIODE (2) 12	ELEMENT OPENS
05-6BA-2207-1	31109	BLOCKING DIODE (2) 12	ELEMENT OPENS
05-6BA-2244-2	31123	CIRCUIT BREAKER (3 AM	FAILS OPEN
05-6BA-2300-1	31126	GENERAL PURPOSE FUSE	OPENS, PREMATURE
05-6BA-2301-1	31127	GENERAL PURPOSE FUSE	OPENS, PREMATURE
05-6BA-2302-1	31125	GENERAL PURPOSE FUSE	OPENS, PREMATURE
05-6BA-2303-1	31137	GENERAL PURPOSE FUSE	OPENS, PREMATURE
05-6BA-2356-1 05-6BA-2401-3	31128	RESISTOR (12)	ELEMENT OPENS
05-6BA-2401-3	31149	7717DDTD	INADVERTENT OUTPU
05-6BA-2401-3	31144	HYBRID DRIVER CONTROL	INADVERTENT OUTPU
05-6BA-2407-1	31158	HYBRID DRIVER CONTROL	LOSS OF OUTPUT
05-6BA-2407-2	31158		LOSS OF OUTPUT
05-6BA-2408-1	31156		LOSS OF OUTPUT
05-6BA-2409-1	31154		LOSS OF OUTPUT
05-6BA-2410-1	31159		LOSS OF OUTPUT
05-6BA-2410-2 05-6BA-2413-1			INADVERTENT OUTPU
05-6BA-2413-2	31127		LOSS OF OUTPUT
05-6BA-2415-1			INADVERTENT OUTPU
05-6BA-2415-2	31150	HYBRID DRIVER CONTROL	LOSS OF OUTPUT
05-6BA-2501-1	31151	TATCHING DELAY (C)	INADVERTENT OUTPU
05-6BA-2502-1	31170	HYBRID DRIVER CONTROL LATCHING RELAY (6) LATCHING RELAY (6) LATCHING RELAY (6)	FAILS OPEN
05-6BA-2502-3	31171	LATCHING RELAY (6)	FAILS OPEN
05-6BA-2576-1	31177	PYRO INITIATOR CNTRL	FAILS CLOSED
05-6BA-2578-1	31183	DIODE, 12 AMP	LOSS OF OUTPUT
05-6BB-2096-1	31213	GENERAL PURPOSE RELAY	ELEMENT OPENS FAILS OPEN
05-6BB-2096-2	31213	GENERAL PURPOSE RELAY	
05-6BB-2096-3	31214	GENERAL PURPOSE RELAY	FAILS CLOSED
05-6BB-2102-2	31212	BLOCKING DIODE (4)	SHORTS
05-6BB-2107-1	31220	TOGGLE SWITCH, DPST	FAILS OPEN
05-6BB-2107-2	31220	TOGGLE SWITCH, DPST	FAILS OPEN
05-6BB-2240-1	31201	GENERAL PURPOSE FUSE	OPENS, PREMATURE
05-6BB-2241-1	31205	GENERAL PURPOSE FUSE	OPENS, PREMATURE
05-6BB-2246-1	31202	FUSE (5 AMP), 2	OPENS, PREMATURE
05-6BB-2249-1	31210	CURRENT LIMITING RESI	ELEMENT OPENS
05-6BB-2262-1	31216	HYBRID DRIVER CONTROL	LOSS OF OUTPUT
05-6BB-2262-2	31217	HYBRID DRIVER CONTROL	INADVERTENT OUTPU
05-6BB-2270-1	31240	RESISTOR (1 OHM) (2W)	OPEN (ELECTRICAL)
NONE NONE	10210		STRUCTURAL FAILUR
HOHE	10212	NOSE WHEEL RETAINING	CORROSION, STRUCT

NASA FMEA	MDAC-ID	ITEM	FAILURE MODE
NONE	10213	AXLE	CORROSION, STRUCT
NONE	10220	TORQUE TUBE ASSEMBLY	STRUCTURAL FAILUR
NONE	10401	NLG EXTEND / RETRACT	BROKEN ROD / LINK
NONE	10601	NLG DOOR OVER-CENTER	STRUCTURAL FAILUR
NONE	11004	NLG UPLOCK ACTUATOR	BROKEN ROD / LINK
NONE	11302	NLG DOOR BUNGEE ASSIS	STRUCTURAL FAILUR
NONE	20205	AXLE KIT - MLG	STRUCTURAL FAILUR
NONE	20214	WEIGHT ON WHEELS SENS	SHORTED OPEN
NONE	20215	WEIGHT ON WHEELS SENS	SHORTED CLOSED
NONE	20401	MLG EXTEND / RETRACT	BROKEN ROD / LINK
NONE	20601	DOOR OVER-CENTER BUNG	STRUCTURAL FAILUR
NONE	21004	MLG UPLOCK ACTUATOR	BROKEN ROD / LINK
NONE	30104	BRAKE PEDAL TRANSDUCE	SHORT / CLOSED
NONE	30127	TRANSDUCERS, SENSORS	FAILURE - NO DATA
NONE	31161	HYBRID DRIVER CONTROL	LOSS OF OUTPUT

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	N.		

APPENDIX E DETAILED ANALYSIS

This appendix contains the IOA analysis worksheets supplementing previous results reported in STSEOS Working Paper 1.0-WP-VA86001-25, Analysis of the Landing/Deceleration Subsystem, (19 January 1987). Prior results were obtained independently and documented before starting the FMEA/CIL assessment activity. Supplemental analysis was performed to address failure modes not previously considered by the IOA. Each sheet identifies the hardware item being analyzed, parent assembly and function performed. For each failure mode possible causes are identified, and hardware and functional criticality for each mission phase are determined as described in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986. Failure mode effects are described at the bottom of each sheet and worst case criticality is identified at the top.

LEGEND FOR IOA ANALYSIS 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 Screen A:

- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
- NA = Not Applicable

Redundancy Screens B and C:

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

INDEPENDENT ORBITER ASSESSMENT ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 2/22/88 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LANDING/DECELERATION SYSTEMS FLIGHT: 2/1R MDAC ID: 31240 ABORT: 2/1R

ITEM: RESISTOR (1 OHM) (2W) ANTI-SKID VLV COIL CURRENT

MEASUREMENT

FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: P. BYNUM SUBSYS LEAD: SCHMECKPEPER

BREAKDOWN HIERARCHY:

- 1) BRAKE AND ANTI-SKID
- 2) FWD LCA-1,2,3
- 3) RESISTOR (1 OHM) (2W) CURRENT SENSORS (4)

4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	2/1R
ONORBIT:	/NA	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	2/1R		•

REDUNDANCY SCREENS: A [P] B [P] C [P]

LOCATION: 40V51A2

PART NUMBER:

CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, THERMAL SHOCK,

VIBRATION

EFFECTS/RATIONALE:

POSSIBLE LOSS OF ANTI-SKID PROTECTION DUE TO LOCKED WHEEL/BRAKE.

REFERENCES:

APPENDIX F

NASA FMEA TO IOA WORKSHEET CROSS REFERENCE/RECOMMENDATIONS

This section provides a cross reference between the NASA FMEA and corresponding IOA analysis worksheet(s) included in Appendix E. The Appendix F identifies: NASA FMEA Number, IOA Assessment Number, NASA criticality and redundancy screen data, and IOA recommendations.

Appendix F Legend

Code Definition

- 1. IOA recommends downgrading the criticality.
- IOA recommends upgrading the criticality.
- 3. IOA recommends changing the effects field.
- 4. IOA concurs with NASA's evaluation of the FMEA.
- 5. IOA generated a non-credible failure mode.
- 6. IOA recommends that the FMEA be deleted because it is not a credible failure for that particular component or components.
- 7. IOA recommends changing NASA's redundancy screen fields to conform to NSTS 22206
- 8. IOA recommends generating a new FMEA for an uncovered component and/or failure mode.
- 9. IOA recommends combining FMEA's together that are criticality 3, to conform to NSTS 22206.
- 10. NASA's FMEA/CIL revaluation deleted this failure mode as a non-credible failure.
- 11. IOA recommends deletion of this item from the CIL.
- 12. IOA recommends the addition of this item to the CIL listing.
- 13. NASA transferred the FMEA/CIL to another subsystem.

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AFFENDIX F

NASA FMEA TO IDA WORKSHEET CROSS REFERENCE / RECOMMENDATIONS

i IDS	ENT IF LERS	:			1					RECO	MENDATIONS #	
: NASA : FHEA NUMSER	: IOA ASSEGSMENT NUMBE	: : : :	ORIT	: S	CRE	ENS C	3 3 3	CRIT	SCRI	9 0	(SEE LEGEND CODE)	1950E
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02-1-001-2		1			IA N.				: 90 !	MA NO	1 8.12	X
1	LDGDEC-20203				IA N							r Y
1 02-1-002-1	LDGDEC-20101				IA N						· -	-•
02-1-003-1	: LDGDEC-2020&			1 N	IA N	A NA		1/1	! NA !	NA NA	: 8	¥
:	1 LDSDEC-20207	1			A N				I NA I	NA NA	1 8.12	1
i	LDGDEC-20219	1	1/1	1 N	IA N.	A NA		1/1	: NA I	NA NA	1 8.12	X
:	: LDGDEC-20220	1	1/1	: N	A N	A NA	# I	1/1	I NA I	NA NA	1 9.12	Ĭ,
1	1 LDGDEC-20221	1	1/1	1 N	A N	A NA	1.7	1/1	: NA 1	AA AA	1 8.12	X
1 02-1-004-1	: LDGDEC-20204	2 :	1/1	1 N	A Ni	NA	11	1	E L		1 4	
02-1-005-1	LD6DEC-20208	: 1	1/1	1 8	A M	A NA	13	1	:		; 4	
:	: LD6DE0-20222	, ,		: N	A N	AM F	11	1/1	i NA I	AA NA	1 8.12	X
02-1-006-1	: LDGDEC-20216	; ;	• •		IA N				;		1 4	
02-1-007-1	: LDGDEC-20211	; ;			A N				į		1 4	
1 02-1-008-1	LD6DEC-20209	i !				¥ P					1 2.8.12	χ
	: LDGDEC-20210	1 1					11				1 2,8,12	X
1 92-1-009-1	LDGDEC-20212	11			A N			•			1	
	LDGDEC-20213	- 11			A N			•			4	
1 02-1-010-1	: LD60EC-20217				A N				1		1 4	
: 02-1-012-1	: LDGDEC-20501	11			A NA				i		1 4	
i	LDGDEC-20701	11			A M			<i>i</i>	i		1 4	
: 65 + 647 +	LDGDEC-20901	1:			A NA			<i>i</i>	i		1.4	į
02-1-013-1 ,	: LDGDEC-20501A : LDGDEC-20701A	::			A NA A NA			i	1		: 4 i	
	LDGDEC-20701A	1 1			A NA			<i>i</i>			14	i
02-1-01 4 -1	: LDGDEC-205018	11	• • •		m mr A NA			1	i F		; 4 ;	
! !	: LD6DEC-20701B	!!			A NA			1	,		1 4	i
!	LOGDEC-20901B	1 1			A NA			,	<u>.</u>		1 4	i
02-1 - 01 5- 1	LDGDEC-21101	!!			A NA			,	!		1 4.13	
02-1-015-2	LDGDEC-21102	- 11	•			. ,		2/18	N M		1 2.13	
02-1-017-1	: LDBDEC-20218	11			A NA			/	, .,	,	1 4	:
02-1-018-1	: LDGDEC-20223	1 :			A MA			1			1.4	į
02-1-019-1	: LD60EC-20501C	: :	1/1	: Ni	A NA	NA	1 1	1	i i		1 4	
	: LOGDEC-20701C	; ;	1/1	l M	A NA	NA	11	/	i		1.4	:
	. LDGDEC-20901C	4 i t i	1/1	: N	A NA	NA	11	/ /			1 4	!
72-1-020-1	: LDGDEC-20501D	1 7		. M	A NA	NA	11	/ /			: 4	:
	1 LDGDEC-207010	1 1	1/1	i N	A NA	MA	11	į	:		[<u>4</u>]	:
	LDGDEC-209010				A NA			1 1			1.4	
02-1-021-1	: LD6DEC-20501E				A NA			/ 1	į		4	*
	: LDGDEC-20701E				A NA			1 1			1 4	:
	: LDGDEC-20701E				A NA			/ 1	l		1 4	
02-1-022-1	: LDGDEC-30114		3/18					/ :	_	_	! 4	
02-1-022-2	! LDGDEC-30113		2/1R				11	3/1R (1 1.11	;
02-1-023-1	/ LDGDEC-30119		3/1R				11		NA N	A NA		;
02-1-023-2	LDGDEC-30117		1/1	; Ni	H NA	NA		/ ;			1 4	
	i	! !		i			11	i			i	i

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IDE	ENTIFIERS	1	N	ASA			11		10	A R	ECOM	MENDATIONS 	
MASA FMEA NUMBER	: IDA : ASSESSMENT NUMBE	R II		i A	B	5	1 1	H¥,'F	i A	Ē	C	I ISEE LEGENO CODE.	. 198
:=====================================	:===:=================================	== <u> </u>		===: : NA			:		= == P		==== P	(=====================================	.;==== ;
)2-1-024-1	: LDBDEC-30101	1	3/1 R		٥		! !	3/3	. MA	MA	NA	: 1	:
)2-1-025-1	DADED-30104		3/18		2		11		i			; 4	i
02-1-025-2	LDGDED-30105	1		 	F	F	1 1	1/1	: AA	NA	NA	: 2	i y
) <u>[-1-(26-1</u>	1 LD00E0-30168		3/1R		F	F	::	3/3	. NA	NA	NA.	· •	
02-1-016-2	LDBD E 0-30107	,	2/15	; p	F	P	. !	3/3	1 84	e A GH	NA	;	1
)2-1-027-1	LD6DES-30109	1	2/18	F	F	p		3/3	NA	NA	NA	1.11	
03-1-027-2	: LDGDEC-30109A	;	2/1R	1 7	F	F	1.1	3/3	. MA	MA	NA	1 1.11	,
02-1-028-1	LDGDEC-30122	1	3/1R	1 P	۶	P	1 1	7	1			! 4	i !
02-1-028-2	: LDGDEC-30121	1	1/1	i Ni	A NA	NA	11	1	1			1 4	;
)2-1-028-J	: LDGDEC-30120		3/18	! P	2	٩	::		1			4	i
)2-1-029-1	LDGDEC-30115	1	3/3	1 14	N A	NA	1 1	1	i			‡ 4	1
)2-1-029-2	: LDGDEC-30116		3/3	1 14	NA NA	NA	11	2/1R	l P	F	F	8.12	1 %
,	LD8DEC-30131	1		l N	A NA	NA	11	2/1R	P	Ρ	P	1 2.3.8,12	i X
)2-1-030-1	LDGDEC-30112									Р		1 2.8.12	; X
, <u>, , , , , , , , , , , , , , , , , , ,</u>	: LDGDED-30130		3/1R		•		; ;			F	F	1 2.3.8.12	; X
2-1-032-1	: LDGDEC-30103	i			ρ	P	1 1		,	•	•	! 4	Ţ
)2-1-032-2	: LDGDEC-30102		2/1R		Р		11		!			! 4	:
)2-1-033 -1	LDGDEC-30110	,	3/18		P	•	11		!			1 4	1
)2-1-033 -2	LDGDEC-30111		3/1R		, P		11		! P	p	Đ	1 2.8.12	X
/2-1-033-2	: LDGDEC-30129				P		; ;			E	p P	1 2.3	. Y
10 + A74 +	: LDGDEC-30127	(NA.			i i I	1	,	. 1.3 ! 4	1 /
)2-1-03 4-1		i 1				NA NA		1	,			· 1	1
)2-1-044-1	LDGDED-30125	1	•			NA NA		7	i 1			. т 1 <u>Д</u>	!
5 4 050 4	LDGDES-30125				4 N E Q		11	3/3	i FNA	MA.	MA.	. 7 . 1.11	1
)2-1-050- 1	LDGDEC-30123	1.1	2/1R 2/1R	; r	9	г Р	11					1 1.11	1
02-1-051-1	: LDGDED-30123A	1			r P		1 4				NA NA		1
)2-1-051-2	LDGDEC-30123B	1.7	2/1R	; P ! P	F	P	11				NA NA		i i
02-1-053-1	: LDGDEC-30123C		2/1R		•	r p	1 1	3/3 1/1	: NH : P	P P	,	1 8.12	, X
)2-1-066-2	LDGDEC-30124	, 1	3/1R		P	r NA	11	• •	. F	٦	ŗ	: 0.1. : 4	· A
)2-1-075-1	: LDGDEC-10215	1	• • •						i sia	MΛ	ÞΑ	•	1
	LDGDEC-10216	1 1	•										·
)2-1-076-1	: LDGDEC-10211	1	2/14										
)2-1-077-1	1 LDGDEC-10202	1						1/1					1 X
	LDGDEC-10203		1/1										, A
	LDGDEC-10221					NA .			:			8.12	i A
	LDGDED-10222							1/1					7 A
	LDGDES-10223	11						1/1					1 A
 .	LD6DEC-10224							1/1	i ma	ЖН			
/2 -1 -9 78-1	LDGDEC-10204	; ;										1 4	1 6
)2-1-077-1	LDGDEC-10205		3/1R									8.12	1 1
	1 LDBDES-10306		3/1R									(8. 12	1 1
)]-1-090-1	1 L060ED-19214										p.		
	LD6DEC-10218	- 11									P		
	; LDBDEC-10219	i							; p	٢	Ρ	· •	;
2-1-081-1	: LDG0EC-10207	1 1							i			4	i
	! LDGDEC-10208	1							i			1 4	:
)2-1-082-1	: LDGDEC-10217		1/1						i			1 4	1
	L D GDEC-10701		1/1									: 4	i
2-1-083-1	LDGDEC-10217A		1/1						l NA	NA		1 8.12	
2-1-085-1	: LDGDEC-10209		3/1R		P							: 4	
	!	11		1			1 1		1			!	ŧ.

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126	NTIFIERS						:: IOA RECOMMENDATIONS #					
NASA FHEA NUMBER	1 104 ASSESSMENT NUMBER	11 (RIT	: 3	CRE	ENS	1	CRIT			OTHER (SEE LEGEND CODE)	
)2-1-097-1	: LDGDE2-11102								: NA	NA NA		
	: LD9DE0-11101										: 13	,
02-1-098-1	: LDGDEE-10501					NA			į		1.4	:
	LDGDEC-10901					NA.					; 4	1
)2-1-099-1	: LDGDEC-10501A					NA.		-			3	1
		-				A NA			1 114	MA MA	1 3.12	
02-1-102-1						NA			1		. d	1
02-1-104-1		Н				A NA			ŀ		1 4.13	•
2-1-104-2		11				NA F			i		1 4.13	1
02-1-109-1	: LDG DE C-10201					NA			NA	NA NA	; B,12	i X
02-1-110-1	LDGDEC-10101					NA			1		† 4	:
)2-5-608-A01	: LDGDEC-21005		2/1R	; P	۶	P	2		;		: 3	ŧ i
02-6-608-A02	: LDSDEC-21003	1 1	2/1R	۱ ۲	Ē	P	1 3	I	:	F	1 3.4	1
) 2-6-6 08-A03			3/3	: N	A NA	MA	1	/			. 4	i J
)2-5-809-A01				l N	A NA	NA.	1 1	. 1	!		1 4	! !
)2-5-609-A02			3/3	. N	A NA	NA	13	2/1R	; F	FP	1 2.8,12	i X
)2-6-609-A03			3/3	: N	A NA	HA.	1 1		;		† 4	i I
)2-6- G 09 -A 0 4	! LDGDEC-20416	1 1	2/1R	: P	ρ	þ	7 1	2/1R	! P	FF	1 3	i
)2-6- G 09-801	LDGDEC-20412	1 7	3/3	i N	À NA	NA.	1 1				1 4	!
02-6-609- B 02	: LDGDEC-20413	1 1	1/1	; N	A NA	NA	11	I	1		4	!
02-6-609-001	: LDGDEC-20411	1 1	3/3	! N	A NA	NA	1 1	#	1 i		4 4	1
02-6-609-001			3/3	i N	A NA	NA		1	1		; 4	r k
)2-6- G 0 9- D02	LDGDEC-20410	11	3/3	: N	A NA	NA	1 1	i			1 4	,
)?-e-509-E∂1	: LDGDEC-20408	i 1	3/3	N	A NA	NA	1 }	1	5		1 4	i
)2-5-80 9- E02	: LDBDEC-20408A	1 7	3/3	i N	A MA	MA	::	/	r i		1.4	•
02-5-609 - F01	: LDGDEC-20414	1 1	1/1	l N	A MA	NA.	, ;	I	:		; 4	: i
2-5-609-601	: LD6DED-20406	1 1	373	l N	A MA	NA	1 1	1	; •		1 4	:
)2-6-809-H01	: LDBDEC-20415	F +	3/3	1 N	A NA	NA	11	;	:		; 4	÷
)2-6-609-H02	: LDGDEC-20415A	11	3/3	i N	A MA	NA	1 2	1	!		1 4	<u>}</u>
)2- a- 509-J01	LDGDEC-20407		3/3	1 N	A NA	MA		1	1		1 4	t t
2-5-609-302	: LDGDEC-20407A	1 :	3/3	: N	A NA	NA	1 1	1			1.4	!
)2- 6-909-K 01		1 :	3/3	: N	A MA	NA	1 1	1	i I		4	!
)2-6-612-1	LDGDEC-30128	11	3/1R	P	P	P	1:	1	1		1 4	
)2-6-H01-A01	LDGDEC-10404	11	1/1	l N	A NA	MA	;;	1) i		4	;
02-6-H01-R02	: LDGDEC-10402	11	3/3	N	A NA	NA	1 1	2/1R	P	FP	: 2	
)2-6-H01-A03	: LDGDEC-10403	1 1	3/3	i N	A NA	NA	11	I) :		1 4	
)2-6-H01-A04	: LDGDEC-10415	1 1	2/1R	P	۶	P	1 1	2/18	p	F P	, 3	
)2-5-H01-B01	: LDGDEC-10412	11	3/3	: N:	A NA	NA		1			ļ 4	i
)2-6-H01-802	LDGDEC-10413	1 1	1/1	N	A NA	NA		1			1 4	
02-a-H01-C01			3/3	l N	A KA	NA	L 1	į			1 4	
)2-5-991-E01						NA		1			· <u> </u>	
)2-o-H0:-002						NA			1		1 4	
)2-6-HC1-E01						NA					: 4	
02-a-H01-E02						MA			:		: 4	
)2-4-H01-F01						NA.					· 4	
02-6-H01-G01						MA					1 4	
)2-6-H01-H01						NA.					4	
)2-6-M01-M01)2-6-M01-M02						NA.					1 4	
)2-4-H01-301						NA					! 4	
)2-6-H01-J02						NA					! 4	
/L g=0V1=2V2		11	U/U	1 (4)	1 11	1115	11		ı		• *	

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	: 10A : ASSESSMENT NUMBER	1 !		: A	8	С	r i	CRIT	: A	8	0	(SEE LEGEND CODE)	
=====================================	=====================================	:;; ;;		: NA			= ; ;	;====== ; /	;===			1.4	
1 02-5-403-1	: LDGDEC-11005	; ;	2/1R	: P	P	P	í	2/1R	: P	F	P	1 3	!
: 02-3-H03-2	LDGDEC-11003	. !	2/1R	NA	MA	NA	} .	2/18	F	F	F	1 8.12	
	LDGDEC-11096	1 1	3/3	1 84	NA	NA	1	i /	;			; 4	:
: 05-068A-2401-1	LDGDEC-31147	: :	3/1R	P	F	Ė.	ŀ		1			7 4)
	: LDGDEC-31147A	. !	3/18	1 2	£	ē		1 /				; 4	
	: LDGDES-31224	1,	3/18	P	P	۶	F	1	٩	۶	P	1 4	:
	LDGDEC-31155	1 5	3/3	i i			1	1 2	:			1 4	:
		1 !	3/1R	P	Ρ	P	F	1				1 6.10	,
	LDGDEC-31164	11	3/1R	: P	P	P	1	<i>f</i>	1			1 5.10	1 1
•	: LDGDEC-31145	13	3/1R	۱۶	P	p	F .	1	!			a.10	!
!	LDGDEC-31166	: :	3/1R	: P	P	ρ	1	1	t i	F		1 6.10	:
* * * * * * * * * * * * * * * * * * *	LDGDEC-31181	11	3/18	P	۶	P	i i	i = i	ł i			1 4.10	
: 05-8BA-2113-1	: LDGDEC-31119	11	3/3	j			i	1	;			1 4	1
	LDGDEC-31113	11	2/1R	F	p	P	1 :	l /	ļ			1.4	
1 00 020 2210 1	LDBDEC-31114A	11	1	!			1		•			1 5.10	
	1 1 DGDEC-31114	11	1/1)			÷	3/3	,			1 5.11	ı X
	LDGDEC-31115	: }	3/3	1			;	1 /	:			; 4	•
1 05-59A-2116-2	: LDGDEC-31115A	11					ŀ	1	• •			: 5.10	
	: LDGDEC-311150	1 1	2/1R	! P	F	٩	!		;			1 1.9,11	X
		11		. P	þ	p	;			_		· ·	X
	LDGDEC-31118A			 1 MA	NA	•			,	-		1 5.10	1
, ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		11			P	D						1 1.11	, X
	: LDGDEC-31101	11				•	1		!			1 4	t i
, ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		11	_	:	•	Ċ	i		!			1 4) i
		13		:			;					1 4	1
1 05-5BA-2205-1	LD6DEC-31105	11		!			!		:			1 4	, i
	: 1 DGDEC-31105A	1 1		! E	F	ē	:		!			1.11	χ
1 05-68A-2206-1	LDGDEC-31107	; ;				P	ì		:			1.4	
	: LD90EC-31108	!!		!	•	,	1		· }			1 4)
1 05-58A-2207-1		11		! P	F	P	1.		1			1 4	:
		1 }			•		1		!			1 4	
		11		!			; ;	1	,			1 4	! i
	: LDGDED-31122A	1 1		ė į			1		1			1 4	1
	: LDGDES-31121	11		; P	P	Р	1:		l i			1 4	
	LD6DEC-31120	F 1		;			1		,			1 4	i i
	LDGDEC-31111	1 1		P	ρ	P	1		Į.			1 4	
	LDGDED-31112	11		1			-					1 4	
		1:		<u>,</u>			;		! !			1 4	
		11		; P	۶	P	1		}			1 4	:
		1 !			F	P	ŀ		!			i 4	1
	. LDGDEC-31126A	1 2		1			į		1			1 5.10	1
72 22 2 2	LD6DEC-3:127	11		P	F	£	ŀ		!			: <u>4</u>	1
	1 1DGDES-31127A	11		!			1)			5.10	1 2
	: LDGDEC-31125			; P	P	P	ŀ		P	F	ρ	1 1.7	. X
	: LDGDED-31137	11			P	P	1		<u>,</u>	F		1 7	1 X
+ 05-6BA-2303-2	LDGDEC-31137A	11		1			ŀ		/ i			1 6.10	r I
	LDGDEC-31130			1			1		i i			; 4	i
1 05-68A-2351-2	: LDBDEC-31130A	11					1		1			1 6.10	!
1 05-6BA-2352-1	LDGDEC-31132	* 1		!			;		:			1 4	ł
)		11		1			i		i i			} }	;
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: DENT	TIFIERS		N.	asa					IDA RECOM	MENDATIONS :	
NASA FMEA NUMBER	: IDA ! ASSESSMENT NUMBER			: SC A	R22 B	ENS C		CRIT HW/F	1 GEREENS 1 A B C	: OTHER : (SEE LEGENC CODE)	ISSUE
1 05-68A-2353-1	LDGDEC-31134	11	3/3	ļ			11	1	i	. 4	; !
) 05-6PA-1354-1	LD0DEC-31134	1 !	3/3	;			1 1	1	i i	1 4	•
1 05-684-2356-1	LDGDEC-31128	11	3/18	P	Ē	P	1 1	1	1	1 4	
: ::5-68A-2356-2	1 LOGDEC-31129	;;	3/3	!			1 1	7	1	. 4	1
1 05-EBA-2I57-1	: LOGDEC-31138	1 1	3/3	1			3 1	ž.		. 1	!
: 05-66A-23 6 0-1	1 LD9DED-31133	11	3/3	:			1 1	1	ì	† 4	
: 05-684-2361-1	LDGDEC-31135	-11	3/3	:			1 1	1		! 4	
: 05-6BA-2361-2	: LDGDEC-31135A	1 1	3/3				11	- /	i	. 4	,
: 05-48A-2362-1	: LDGDEC-31139	11	3/3	i			11	- 1,	1	; 4	
1 05-68A-2362-2	! LDGDEC-31139A	1 1	3/3	; •			11	•		1 4	
1 05-88A-2363-1	LDGDEC-31131	11	3/3	1 5		.	1 1	!	i	; 4 : 4 : 7	i
1 05-5BA-2400-1	! LDGDEC-31140	11	3/1R 3/3] P	٦	۶	11			; 4.13 : 4.17	r I
1 05-6BA-2400-2 1 05-6BA-2401-3	: LDGDEC-31141 : LDGDEC-31149	11	•	; ! P	2	٤	i i	1	!	4.13 4	; !
: 05-68 A -2401-3	: LDGDEU-31149 : LDGDEC-31143	11	271R 371R	• •	r p	þ	11	7	1	; 4 : 4	.
1 05-68A-2402-2	LD6DEC-31143	11	3/1R	, r ! P	ر و	Г 6	: £	1	1	. 4 . <u>4</u>	i i
1 05-68A-2402-3	LDGDEC-311434		2/1R	1 F	P	r D	11	,	:	, T : g	i I
1 05-68A-2403-1	: LDGDEC-3:144	11	3/3	1 F	r	f	2.1	4	1	: 1 : 4.9	: I
1 05-4BA-2403-2	LDGDEC-31148A	11	3/3 3/3	,			1 1	,	• •	. 4. 9	. !
: 05-6BA-2404-1	: LDSDEC-31142	11	3/3	1			11	,	1		!
1 05-6BA-2404-2	: LDSDEC-31142A	11	3/3	!			-	7	1	4.9	
1 05-68A-2404-3	LDBDEC-31142B	11	3/3	: !				1	1	! &	λ
: 05-68A-2405-1	LDGDEC-31146	11	3/3				- 11	, j	<u>.</u>	4. 9	
05-58A-2405-2	LDGDEC-31146A	11	3/3	:			1:	į	}	4.9	
05-58A-2405-3	: LDGDEC-31145B	11	3/3				1.7	1	4		Ă
1 05-6BA-2406-1	: LDGDEC-31145	1 1	3/18	P	P	P	! !	3/3	i i	1.9	, K
1 05-4BA-2405-2	LDGDEC-31145A	: :	3/3				1 1 1 1	1	; !	4.9	
: 05-6BA-2406-3	1 LD6DEE-311458	1 1	3/3				11	1	1	. 6	Å
1 05-68A-2407-1	: LDGDEC-31158	::	2/18	۴	?	P	[]	7))	4	
05-6BA-2407-2	: LDGDEC-31158A	11	2/1R 3	P	٩	P	1 1	1	1 !	4	
: 05-6BA-2407-3	1 LDGDEC-311588	1 1	3/3 3				::	1) 	5	X
05-6BA-2408-1	: LDGDEC-31156	1 1	3/1R :		F	۶	11	ŕ	j	4	
1 05-65A-2408-2			3/3 1				11	I		4	,
1 05-6BA-2409-1			3/1R 1		P	P				7.12	X
05-69A-2410-1			3/1R :				11	/		4	i
7 95-6EA-2410-2	LDGDEC-31160		3/1R :				11	/		4	;
: 05-58A-2413-1		11						1		4	;
: 05-58A-2413-2					F		1 !	1		4	
1 05-68A-2415-1		† 1 1 i	2/18		F	P		1		4	Î
05-5BA-2415-2			3/18 1		-	P	11	1	:		
. 05-6BA-3501-1							11	į,			!
1 05-85A-2501-2	: LD8DEC-31168A	1 1	2/1R :				1:	1		: .	\$:
1 05-69A-2501-3		11	3/18		P F		11	1		4	1
1 05-68A-2502-1		1 1	2/18 1		r D		11	,		4	
05-48 A-2 502-2 05-4 8 A-2502-3			2/1R 1 2/1R 1		P P		11	+ +		. 4 :	
: V5-68A-25V2-3 ! 05-68A-25V3-1		11	= 271R (= 3/1R (р Р		11	1		. 4	;
/ 05-68A-2503-2		: i	3/3	۲	Г	٢	11	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;		4	i i
: 05+6BA-2503-3		1 1	3/3 (3/3 (11	1		á :	X 1
05-68A-2550-1		1 1	3/1R	p	p	Ρ	4 3	ŗ		4	A 1
. 99 95 4 7 950-1		1 :	- 91 LR 1	i		1	11	/		· · · · · · · · · · · · · · · · · · ·	į
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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY –
ENGINEERING SERVICES
16055 SPACE CENTER BLVD, HOUSTON, TEXAS 77062

Independent Orbiter Assessment Assessment of the Landing/Deceleration FMEA/CIL

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 Landing / Deceleration (LDG/DEC) hardware, 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 NASA FMEA/CIL baseline with proposed Post 51-L updates included. A resolution of each discrepancy from the comparison is provided through additional analysis as required. This report documents the results of that comparison for the Orbiter LDG/DEC hardware.

The IOA product for the LDG/DEC analysis consisted of 259 failure mode worksheets that resulted in 124 potential critical items being identified. Comparison was made to the NASA baseline (as of 19 November 1986) which consisted of 267 FMEA's and 120 CIL items. The comparison determined if there were any results which had been found by the IOA but were not in the NASA baseline. This comparison produced agreement on all but 75 FMEA's which caused differences in 51 CIL items. Figure 1 presents a comparison of the proposed Post 51-L NASA baseline, with the IOA recommended baseline, and any issues.

The issues arose due to differences between the MASA and IOA FMEA/CIL preparation instructions. NASA had used an older ground rules document which has since been superseded by the NSTS 22206 used by the IOA. After comparison, there were no discrepancies found that were not already identified by NASA, and the remaining issues may be attributed to differences in ground rules.

NASA FORMAL REPORT

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NASA SCIENTIFIC AND TECHNICAL DOCT _ENT AVAILABILITY AUTHORIZATION (DAA)

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an supter 3/3/89 (Facility Use Only) #sponsible NASA Project Officer, Technical Monitor, or other appropriate Original presentations, reports, papers, and proceedings that contain scientific Control No. ... mation. Explanations are on the back of this form and are presented in ☐ Modified NHB 2200.2, "NASA Scientific and Technical Information Handbook." CAPROJECT IDENTIFICATION (Information contained on report documentation page should not be repeated except title, date and contract number) Independent Orbiter Assessment ating NASA Organization: JSC VA orming Organization (if difference HcDannell - Datial AS contract/Grant/Interagency/Project Number(s) NAS9 = 17650 various CR-185570 Document Date: Document Number(s) _____V&P\$QUS (For presentations or externally published documents, enter appropriate information on the intended publication such as name, place, and date of conference, periodical or journal title, or book title and publisher: These documents must be routed to NASA Headquerters, International Affairs Division for approval. (See Section VII)) H. AVAILABILITY CATEGORY Check the appropriate category(les): Security Classification: | Secret | Secret RD | Confidential | Confidential RD | Municipal Confidential | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential RD | Confidential R Export Controlled Document - Documents marked in this block must be routed to NASA Headquarters. International Affairs Division: for approval □ITAR □ EAR **NASA Restricted Distribution Document** ☐ FEDD ☐ Limited Distribution ☐ Special Conditions-See Section III Document disclosing an invention e until aix months have elapsed after submission of this form, unless a different relea ☐ Documents marked in this block must be withheld from release date is established by the appropriate counsel. (See Section IX). Publicly Available Document El Publicly available documents must be unclessified and may not be export-controlled or restricted distribution documents. ☐ Copyrighted ☐ Not copyrighted III. SPECIAL CONDITIONS Check one or more of the applicable boxes in each of (a) and (b) as the basis for special restricted distribution if the "Special Conditions" box under NASA Restricted Distribution Document in Section II is checked. Guidelines are provided on reverse side of form. e. This document contains: ☐ Information subject to special contract provision Preliminary information ☐ Foreign government information Commercial product test or evaluation results ☐ Other—Specify _ b. Check one of the following limitations as appropriate: ☐ NASA contractors and U.S. Government agencies only U.S. Government agencies only □·U.S. Government agencies and U.S. Government agency contractors only Card Made coessed as checked in Sectors II and III.

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