Shuttle Ground Operations
Efficiencies/Technologies Study

AEROSPACE OPERATIONS

TECHNICAL INFORMATION SHEETS (TIS)
VOLUME 5 of 5

FINAL REPORT - Phase 1
KENNEDY SPACE CENTER

NAS10-11344
May 4, 1987

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SHUTTLE GROUND OPERATIONS EFFICIENCIES/TECHNOLOGIES STUDY

TECHNICAL INFORMATION SHEETS

FINAL REPORT - VOL 5
- PHASE 1 -
MAY 4, 1987

KENNEDY SPACE CENTER
NAS10-11344

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SPACE SHUTTLE GROUND OPERATIONS EFFICIENCIES/TECHNOLOGIES STUDY PHASE 1 FINAL REPORT

The final report for the Shuttle Ground Operations Efficiencies/Technologies Study is made up of five volumes.

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</tr>
</tbody>
</table>

**Volume 1**

The Executive Summary volume provides a brief overview of the major elements of the Study, reviews the findings, and reflects the development of the recommendations resulting from the Study.

**Volume 2**

The Ground Operations Evaluation volume describes the breadth and depth of the various Study elements selected as a result of an operational analysis conducted during the early part of the Study. Analysis techniques used for the evaluation are described in detail. Elements selected for further evaluation are identified; the results of the analysis documented; and a follow-on course of action recommended. The background and rationale for developing recommendations for the current Shuttle or for future programs is presented.

**Volume 3**

The Final Presentation Material volume contains the most recent version of the charts used in the Final Phase 1 Oral Briefing at KSC on April 6, 1987, and to the STAS (Space Transportation Architecture Study) IPR-5 (Interim Program Review) held at MSFC on April 8, 1987. The KSC, April 6 notation in the title block was used for both packages because the reviews were held so closely together. This volume contains all charts in their final form and any differences from charts presented are minor.

**Volume 4**

The Preliminary Issues Database (PIDB) was assembled very early in the Study as one of the fundamental tools to be used throughout the Study. Data was acquired from a variety of sources and compiled in such a way that the data could be easily sorted in accordance with a number of different analytical objectives. The system was computerized to significantly expedite sorting and make it more usable. This volume summarizes the information contained in the PIDB and provides the reader with the capability to manually find items of interest. How that information was used in this Study is explained in greater detail in Volumes 2 and 3.

**Volume 5**

The Technology Information Sheet volume was assembled in database format during Phase 1 of the Study. This document was designed to provide a repository for information pertaining to 144 OMI (Operations and Maintenance Instructions) controlled operations in the OPF, VAB and PAD. It provides a way to accumulate information about required crew sizes, operations task time duration (serial and/or parallel), special GSE required, and identification of a potential application of existing technology -- or the need for the development of a new technology item.
The Technology Identification Sheet (TIS) is an expanded version of the Resource Identification Sheet (RIS) that was in the original Study Plan. The TIS contains a description of the activity, location, facility and equipment requirements, hazard level, subtask procedures and manpower requirements. In addition, it now contains vehicle power requirement, LCC Support requirement, associated issues, technology needs, and technology candidates. Each task has been assigned a task sequence number to provide for downstream manipulation.

The manhour and headcount data on the TIS Sheets are incomplete because the data was not obtainable from the SPC or NASA. Technician data for the OPF was the only data made available and is incorporated.

The "Technology Need" and "Technology Candidates" descriptions have been completed only for the seven technology tentpoles identified in the study.

The TIS sequence task number was used to group the OMI's by usage location, i.e.,

1 - 88 are the top level OMI's performed in the OPF
100 - 111 are the top level OMI's performed in the VAB
200 - 213 are the top level OMI's performed at the PAD
300 - 305 are examples of spacecraft support OMI's at the PAD
401 - 423 are the top level OMI's performed in the ET checkout cell.

The Technology Identification Sheet Database consists of up to four entry screens. The printed sheets combine the most significant information into one sheet per task number. All of the information on the first screen is printed. The second screen contains the GSE equipment required. The equipment nomenclature is omitted from the GSE equipment entries on the second screen, but the part number is printed. The third and fourth screens contain space for the technology need description and the technology candidates identified and is printed in its entirety.

A sample of the printout appears on the next page with an explanation of all the fields.
Technology Identification Sheet

OMI No.: [4] ... OMI Title: [ACTUAL TITLE PRINTED ON OMI].
Subtask OMI(s): [5].
Prerequisite Task OMI: [6].
Hazard: Level: [7]. Vehicle Power Required: LCC Support Required: GSE: [8].

Activity Description: [BRIEF DESCRIPTION OF OMI OPERATION]

Personnel: Head Count Man Hours Remarks
Elec. Tech.: .
Quality: .
LCC Ops: .
Support: .
Engineering: .
Total: .

Time: [12].

Issues: [13].

Technology Need Description:

[ THIS AREA TO BE USED FOR ANY NEEDS FOR IMPROVEMENT ]
[ IDENTIFIED FROM A REVIEW OF THE PROCEDURE ]

Technology Candidates Identified:

[ THIS AREA TO BE USED FOR A BRIEF DESCRIPTION ]
[ OF TECHNOLOGY IMPROVEMENT POSSIBILITIES ]

NOTES
[1] AN INTERNALLY ASSIGNED NUMBER USED BY STUDY TEAM.
[2] USAGE LOCATION SUCH AS OPF, VAB OR THE PAD.
[3] NUMBER OF PAGES IN THE OMI REVISION REVIEWED.
[4] OMI NUMBER AS IT APPEARS ON DOCUMENT.
[5] 14 MOST SIGNIFICANT SUBTASK OMIS LISTED IN OMI UNDER REVIEW.
[6] OMI THAT MUST HAVE BEEN PERFORMED BEFORE THIS ONE CAN BE RUN.
[7] HAZARDOUS - YES OR NO, LEVEL OF HAZARD, VEHICLE POWER NECESSARY TO
PERFORM THIS OMI - YES OR NO, AND LCC INVOLVEMENT REQUIRED - YES OR NO.
[8] 8 MOST SIGNIFICANT GSE EQUIPMENT SETS REQUIRED FOR PERFORMANCE OF THIS OMI
[9] MAXIMUM NUMBER OF PERSONS REQUIRED TO PERFORM OMI.
[10] HOURS REQUIRED BY THIS CATEGORY.
[11] N/A WILL APPEAR IF NO INFORMATION WAS AVAILABLE FOR THIS TASK.
[12] LENGTH OF TIME REQUIRED TO PERFORM THIS OMI
[13] PRELIMINARY ISSUES DATA BASE ISSUES IDENTIFIED DURING REVIEW OF THIS OMI.
Technology Identification Sheet

Seq. Task No: 1.000  Facility: Off  OMI Page Count: 735
OMI No: V1092  OMI Title: SHUTTLE LANDING-POST LANDING CONVOY
OPERATIONS - KSC (LPS)
Subtask OMI(s): I2016 13012 63053 63230
Subtask OMI(s): V3109 V3528 V3537 V1091
Prerequisite Task OMI:
Hazard: Y  Level:  Vehicle Power Required: Y  LCD Support Required:
DSE: 170-0991  C70-1115  H70-0508  S70-1218
S70-1226  S70-0506  S70-0534  P72-1001

Activity Description: TO PROVIDE OVERALL CONTROL OF ALL RELATED ACTIVITIES DURING ANY LANDING OPERATIONS AND DETAILED PREPLANNED APPROVED ACTIONS AUTHORIZED IN THE EVENT OF ANY EMERGENCY OR CONTINGENCY.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  27  162.0
Elec. Tech:  4  24.0
Quality:  0  0.0  N/A
LCD Tech:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  3  2.0  N/A
Total:  31  166.0  Line:  6.0

Issues:

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No.: 2.000  Facility: CPF  GMI Page Count: 82

GMI No.: V5039

LEVELING

Subtask GMI(s): V3508

Prerequisite Task GMI:

Hazard: Y  Level:

GSE: H70-0570, H70-0760, A70-0600, H70-0598, P72-1001

Activity Description: PREPARE ORBITER FOR NORMAL MAINTENANCE BY LIFTING AND LEVELING ORBITER TO 400 AT 253 INCHES OFF CPF FLOOR, USING ORBITER PLATFORM LIFT SYSTEM.

Personnel:  

Mech. Tech.: 14  56.0  N/A
Crew Tech.: 0  0.0  N/A
Quality: 0  0.0  N/A
GSE: 0  0.0  N/A
Support: 0  0.0  N/A
Engineering: 0  0.0  N/A

Total: 14  56.0  Time: 4.0

Issues:

Technology Need Description:

Technology Candidates Identified:  

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Reg. Task No: 3.000  Facility: OFF  OMM Page Count: 1167
OMM No: V1156  OMM Title: OMS/RCS DESERVING (LPS)

Subtask OMM(s): V3511  03415  W3103

Pre requisite Task OMM:

Level:  Y  Vehicle Power Required: Y  LCC Support Required: Y

GSE: S70-0784-XX  S70-0865-XX  A70-0671-04  A70-0672-XX
A70-1084  F70-0031-02  S70-0679-XX  S70-0695-XX

Activity Description: PERFORM OFF ORBITER DESERVING OF FRCS AND OMS PDD/XFD
SYSTEM FOLLOWING FLIGHT. DESERVING WILL OFF-LOAD EXCESS PROPELLANT FROM TANKS, AND DRAIN AND PURGE PROPELLANT DISTRIBUTION SYSTEM TO PREPARE OMS/XFD SYSTEM AND FRCS FOR PRE-FLIGHT SERVICING OR REMOVAL FROM ORBITER.

Personnel:  

<table>
<thead>
<tr>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>3</td>
<td>168.0</td>
</tr>
<tr>
<td>Elec. Tech:</td>
<td>3</td>
<td>168.0</td>
</tr>
<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total:</td>
<td>6</td>
<td>336.0</td>
</tr>
</tbody>
</table>

Issues: DESIGN CRITERIA  AUTOMATION  COST/MANHOURS  ACCESSIBILITY
Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Segment Task No.: 4.000  Facility: OFF  OMI Page Count: 150
OMI No.: V9021  OMI Title: OME TRICKLE PURGE ACTIVATION/DEACTIVATION

Subtasks/OMI(s): 

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N  LCC Support Required: N

Activity Description: TO PERFORM NECESSARY OPERATIONS TO SUPPORT THE OME TRICKLE PURGE HOOKUP, ACTIVATION, DEACTIVATION.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>2</td>
<td>24.2</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>2.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Tech.</td>
<td>4</td>
<td>2.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Supt.</td>
<td>1</td>
<td>2.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineer</td>
<td>2</td>
<td>2.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>24.2</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Time: 12.0

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Reg. Task No: 5068
DMS No: V091

Facility: OFF

DMS Title: ORBITER FRED CRY- BRAIN (LP)

Subtask DMS (s): V3043, V3502, V7597, V7511
V7512, V5033, V5034, V7511
V7018, 13117, M2038, 03412

Execution Task DMS:

Hazard: Y Level:

Vehicle Power Required: Y LCC Support Required:

5068: C70-0666, C70-0639, C70-0743-2, C70-0637
C70-0590, S70-0766-2, S70-1220, S72-1106-1

Activity Description: TO PROVIDE INSTRUCTIONS TO DETANK AND INERT ORBITER
FRED LO2 AND LH2 TANKS AT OFF USING LFS.

Personnel:

Head Count: 4
Man Hours: 192.0
Remarks: N/A

Tech. Tech:

Elect. Tech:

Quality:

LCC Ops:

Support:

Engineering:

Total:

192.0

Issues: DESIGN CRITERIA: COST/MANHOURS

Technology Need Description: DEVELOP NEW, HIGH POWER-DENSITY FUEL CELLS OR
BATTERIES THAT REQUIRE SIGNIFICANTLY LESS ON-LINE MAINTENANCE THAN THE CURRENT
FUEL CELL SYSTEM, REPLACE THE CURRENT FUEL CELLS.

Technology Candidates Identified:

Early candidates appear to be:

1. ALKALINE/ALKALINE REGENERATIVE FUEL CELL SYSTEM (RFCS)
2. INDIVIDUAL PRESSURE VESSEL (IPV) NI-M2 BATTERY
3. NAS BATTERIES (LONG TERM)
4. LI/SECI2 BATTERIES (LONG TERM)

Original Page Is Of Poor Quality
Technology Identification Sheet

Subtask OMIs:

Prerequisite Task OMIs:

Hazard: Y Level:

Vehicle Power Required: N   LCC Support Required: N

GSE: H72-0565-2 SN2, H72-1006 SN1, A72-1014, E70-0011

Activity Description: TO REMOVE EXPENDED PYRO DEVICES AND SECURE CONTINGENCY PYRO SYSTEMS.

Personnel:

Head Count: Man Hours: Remarks:

Mech. Tech: 3 24.0

Elec. Tech: 3 24.0

Quality: 0 0.0 N/A

LCC Ops: 0 0.0 N/A

Support: 0 0.0 N/A

Engineering: 0 0.0 N/A

Total: 6 48.0 Time: 8.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Page No.: 7.000  Facility:  Off  GSE Code Count:  201
GSE Code: V5057  GSE Title: TVC/SSME GSE INSTALLATION/REMOVAL

Subtask GSE(s): V2270, V3508, V3512

Prerequisite Task GSE:

Hazard: N  Level: N  Vehicle Power Required: N  LED Support Required: N
GSE: A70-0501, A70-0983, A70-1056, M70-0029, M70-0021, M70-0024, S70-0902, S72-1107-1

Activity Description: TO PROVIDE OPERATIONAL INSTRUCTIONS FOR INSTALLATION, USE AND REMOVAL OF LISTED GSE TO SUPPORT SSME, HYDRAULIC OR GN&C SUBSYSTEM TESTING.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  4  32.0  N/A
Elec. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LDC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  4  32.0  Time:  12.0

Issues:

Technology Need Description:  

Technology Candidates Identified:  

**Technology Identification Sheet**

**Seq. Task No.:** 2.000  **Facility:** OPF  **OMI Page Count:** 25

**OMI No:** V5057  **OMI Title:** ORBITER FERRY KIT REMOVAL AND PREPARATIONS FOR ORBITER ACCESS

**Subtask OMI(s):**

**Prerequisite Task OMI:**

**Hazard:** V  **Level:**

**Vehicle Power Required:** N  **LCD Support Required:** N

**QSE:** A70-0683, A70-0657, A70-0672-XX, A70-0702, A70-0796, A70-0797, A70-0971, A70-1011

**Activity Description:** TO REMOVE ORBITER FERRY KIT AND PREPARE ORBITER FOR ACCESS

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCD Ops</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
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<td><strong>Total:</strong></td>
<td><strong>0</strong></td>
<td><strong>0.0</strong></td>
<td><strong>Time:</strong> 0.0</td>
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</table>

**Issues:** ACCESSIBILITY

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Reg. Task No.: V5600
CMI No.: V5017

Facility: OFF

CMI Page Count: 416

CMI Title: CREW SYSTEMS DESTRUCTION

Subtask CMI(s): V5024, V5067,

Prerequisite Task CMI:

Hazard: Y Level:

Vehicle Power Required: N
LCC Support Required: N

SSE: A70-0541, P70-0305, P70-0906, A70-0957,
A70-0712, A70-0796

Activity Description: REMOVE CREW SYSTEMS EQUIPMENT FROM ORBITER AFTER THE COMPLETION OF A MISSION.

Personnel:

Head Count Man Hours Remarks
Mesh. Tech: 5 48.0
Elec. Tech: 2 16.0
Quality: 0 0.0 N/A
LCC. Opn: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A

Total: 8 64.0 Time: 8.5

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 10.000  Facility: OFF  OMI Page Count: 1567
OMI No: V9001VL1-0L4  OMI Title: ORBITER POWER UP/DOWN-ON/OFF (OPF)

Subtask OMI(s): V3500  , V3502  , V3507  , V3512
V1184  , C2009  ,

Prerequisite Task OMI:

Hazard: N  Level:  Vehicle Power Required: Y  LCC Support Required: Y
SSE: C70-0807  , C72-1079  , C72-1250  , C70-0898-1  , S70-0500-2  , C70-0532  , C70-0910  , E70-0012

Activity Description: PROVIDE STANDARD INSTRUCTIONS FOR ORBITER POWER UP AND DOWN INCLUDING THE SSE REQUIRED FOR THE BASIC SUPPORT SYSTEMS, I.E., EPDM, INSTRUMENTATION, ECS/ES AND DPS.

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Cler. Tech.</td>
<td>4</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>3</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops.</td>
<td>6</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Total</td>
<td>13</td>
<td>0.0</td>
<td>Time: 3.0</td>
</tr>
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</table>

Issues: DESIGN CRITERIA :COST/MANPOWER :REQUIREMENTS :EXPERT SYSTEM

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 11.000  Facility: OFF  GMI Page_Count: 250
GMI No: V5012  GMI Title: ORDNANCE INSTALLATION AND CHECKOUT
(LPS)
Subtask GMI(s): V3500  , S6005  , V1006  , V3502  
  V9001  , V9002.07  , V9024  

Prerequisite Task GMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: H72-1003  , C72-1127-2  , C72-1128  , A72-1014  
  H72-1005  , E70-0011  , H72-0565-02  , H72-1006

Activity Description: INSTALL AND ELECTRICALLY CONNECT ORBITER ORDNANCE IN THE OFF.

Personnel:  Head Count  Man Hours  Remarks
  Mech. Tech:  5  142.0  
  Elec. Tech:  5  164.0  
  Quality:  0  0.0  N/A  
  LCC Ops:  0  0.0  N/A  
  Support:  0  0.0  N/A  
  Engineering:  0  0.0  N/A  
Total:  11  312.0  Time:  44.0

Issues: SAFETY  :

Technology Need Description: REPLACE ORDNANCE DEVICES WITH NON-EXPLOSIVE DEVICES.

Technology Candidates Identified: NITINOL APPLICATION (NITINOL = A NICKEL-TITANIUM "MEMORY" ALLOY, CAN BE MECHANICALLY DEFORMED AND THEN RETURNED TO ORIGINAL SHAPE BY HEAT WHILE EXERTING UP TO 300K PSI).
Technology Identification Sheet

Seq. Task No.: 12.000
OML No.: V-1504
PROCEDURES (LPS)
Contact OML(s):

Prerequisite Task OML:

Hazard: N Level:

Vehicle Power Required: Y
LDD Support Required:

Activity Description: TO LOAD, PATCH, DUMP, AND COMPARE SOFTWARE FROM THE MASS MEMORY UNITS OR GPC'S.

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech. Tech.</td>
<td>3</td>
<td>36.0</td>
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<tr>
<td>Elec. Tech.</td>
<td>3</td>
<td>40.2</td>
<td></td>
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<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LDD Ops.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Support</td>
<td>0</td>
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<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
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<td><strong>6</strong></td>
<td><strong>76.0</strong></td>
<td><strong>Time: 16.0</strong></td>
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</table>

Issues: TIME/ON-LINE REQUIREMENTS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Des. Task No.: 13.000  
OMI No.: V1200  
OMI Page Count: 142  
OMI Title: ORBITER FLIGHT RECORDER DUMP TO SIE  
DURING POST LANDING OPERATIONS  
Subtask OMI(s):  

Prerequisite Task OMI:  

Hazard: N  
Level:  

Vehicle Power Required: N  
LCC Support Required: N  
GSE:  

Activity Description: ORBITER OPS 1, OPS 2 AND PAYLOAD RECORDER DUMP TO SIE  
DURING POST LANDING OPS TO RETRIEVE FLIGHT DATA FROM THE ORBITER OPS AND  
PAYLOAD FLIGHT TAPE RECORDER.

Personnel:  

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>1</td>
<td>12.0</td>
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</tr>
<tr>
<td>Elec. Tech.</td>
<td>4</td>
<td>48.0</td>
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<tr>
<td>Quality</td>
<td>0</td>
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<tr>
<td>LCC Ops</td>
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<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Support</td>
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<tr>
<td>Total</td>
<td>5</td>
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</tr>
</tbody>
</table>

Issues: FAULT DETECTION : REQUIREMENTS :  

Technology Need Description:  

SEE TIS 57 (V1003)  

Technology Candidates Identified:  

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No.: 14.000   Facility: DPF   OMI Page Count: 139
OMI No.: V1004.01-03   OMI Title: CAUTION AND WARNING TURNAROUND
VERIFICATION (LPS)
Subtask OMI(s): S9001, V9001, V9036

Prerequisite Task OMI:
Hazard: N Level:
Vehicle Power Required: Y   LCC Support Required: Y
OSE:

Activity Description: PERFORM ANNUNCIATOR AND TONE CHECKS BETWEEN EACH FLIGHT.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tbody>
<tr>
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<td>1</td>
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<tr>
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<td>3</td>
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<td>Quality</td>
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<tr>
<td>LCC Ops</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Support</td>
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<td>Engineering</td>
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<td>Total</td>
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<td>16.0</td>
<td>Time:</td>
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</table>

Issues: DESIGN
        FAULT DETECTION
        RELIABILITY

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task_No: 15.000  Facility: OPP  OMI Page Count: 1767
OMI No: V5043VL1-2L3

REMOVAL

Subtask OMI(s): V350B  , V3512  , V3511  , V2272
V5057  , V1007

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: N  LCC Support Required: N

SPE: H70-0020-1  , H70-0855-1  , H70-1352  , H70-0541-01
A72-1323  , H70-0508

Activity Description: PROVIDE INSTRUCTIONS FOR INSTALLATION AND/OR REMOVAL OF SOME MOUNTED AND ORBITER MOUNTED HEAT SHIELD SEGMENTS.

Personnel:

Head Count  Man Hours  Remarks
Mech. Tech:  15  1440.0  
Elect. Tech:  2  192.0  
Quality:  0  0.3  N/A
LCC Opn:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  17  1632.0  Time:  96.0

Issues: DESIGN : TIME/ON-LINE : COST/MANHOURS : ACCESSIBILITY

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seg. Task No.: 16.000  Facility: OFF  OMI Page Count: 63
OMI No.: V5056  OMI Title: ORBITER AFT FUSELAGE GAS SAMPLER

MODULE DISASSEMBLY, BUILDUP AND CHECKOUT

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level:  Vehicle Power Required: N  LCC Support Required: N
OOG: C72-1107  C72-1127-2

Activity Description: TO PROVIDE DISASSEMBLY, BATTERY PACK REMOVAL, ASSEMBLY AND CHECKOUT INSTRUCTIONS FOR ORBITER AFT FUSELAGE GAS SAMPLES.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
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<td>12.0</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Page: Task No: 17000 Facility: OPP OMI Page Count: 1030

OMI No: V1011.21-.07 OMI Title: SSME ENGINE LEAK AND FUNCTIONAL (LPS)

Subtask OMI(s): V1171, V9001VL4, V9002VL1

Prerequisite Task OMI:

Hazard: Y Level:

Vessel Power Required: Y LCC Support Required: Y

Base: S72-1106-2, C72-1227, S70-0670-XX, C70-0907, C70-0743-XX, S70-0695-XX, Z70-0018-04, A34-0329030

Activity Description: ACCOMPLISH THE FOLLOWING: HPFTP & MCC DRYING, TURBOPUMP INT. CHECKS; INT/EXT INSPECTION OF MAJOR COMP’S; INTEGRITY OF ME FLUID SYS; VERIFY INTEGRITY OF SSME HGM, LOX, & LH2 FLUID SYS’S; PNEUMATIC CHECKOUT & LEAK CHECKS & ROUTINE MODULE CHECKOUT OF SSME’S; AND OPERATIONAL INTEGRITY OF ALL SSME/ORBITER FLUID & ELECTRICAL INTERFACES FOLLOWING 10 ENGINE STARTS.

Personnel:

Mech. Tech: 9 Head Count: 1320.0 Man Hours: 744.0 Remarks: N/A

Elec. Tech: 3
Quality: 0
LCC Ops: 0
Support: 0
Engineering: 0

Total: 12 2064.0 Time: 252.0

Issues: DESIGN CRITERIA REQUIREMENTS COST/MANPOWER RELIABILITY

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 18.000
OMI No: V1113
OMI Title: ORBITER ATTITUDE REFERENCE

Activity Description: TO DETERMINE ORBITER ROLL, PITCH AND YAW ANGLES

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
<td>LCC Ops.</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>Support</td>
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<td>0.0</td>
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<td><strong>0.0</strong></td>
<td><strong>Time:</strong></td>
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Issues: TIME/ON-LINE

Technology Needs Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 19.000 Facility: OPF CMI Page Count: 648

CMI No: V5005.01-93 CMI Title: PAYLOAD BAY DOOR OPENING TO 145 OR 160 DEGREE MAINTENANCE POSITION (LPS)

Subtask CMI(s): J3110, V3508, V9001VL1, S750C

V6034

Prerequisite Task CMI:

Hazard: Y Level: Vehicle Power Required: Y

SSE: A70-0568, A70-0863, C70-0807, C70-0870, H70-0529, H70-0728, H70-0829, H72-0828-5

Activity Description: POSITION PAYLOAD DOORS TO THE 145 OR 160 DEGREE MAINTENANCE POSITION TO ALLOW ACCESS TO THE PAYLOAD BAY, RADIATOR MECHANISMS, ETC.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
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<td>96.0</td>
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<td>Man Hours</td>
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<td>Quality</td>
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<td>Support</td>
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<tr>
<td>Engineering</td>
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<tr>
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<td>3</td>
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Issues: ACCESSABILITY DESIGN REQUIREMENTS TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 20.000  Facility: OPE  OMI Page Count: 49
OMI No: V1173  OMI Title: REMOTE MANIPULATOR POSITIONING

MECHANISM STOW/DEPLOY VERTICAL/HORIZONTAL

Subtask OMI(s): V9901VL1

Prerequisite Task OMI:

Hazard: N  Level: N  Vehicle Power Required: Y  LCC Support Required: Y

Activity Description: TO STOW OR DEPLOY THE RMPM/RMS TO FACILITATE ACCESS TO PAYLOAD BAY AREA.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>Mech. Tech</td>
<td>2</td>
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<td></td>
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<tr>
<td>Elec. Tech</td>
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<td>9.0</td>
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<tr>
<td>Quality</td>
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<tr>
<td>LCC Ops</td>
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<td>0.0</td>
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<tr>
<td>Support</td>
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<td>N/A</td>
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<tr>
<td>Engineering</td>
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Issues: DESIGN CRITERIA : FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Sec. Task No: 21.000 Facility: OPF
O.M. No: V1009.01-.05 O.M. Title: MPS LEAK AND FUNCTIONAL TEST (LPS)

Subtask O.M.(s): V1171, S3500, V3502, V9001

GSE: C70-0903, C70-1227, C70-0796, E70-0036, E70-0602, C70-0807, A70-0640-3, S70-0695-2, -2

Activity Description: TO INSPECT THE 1000 MICRON SCREENS IN THE MAIN ENGINE FEED LINES AT THE OUTLET SIDE OF THE PREVALVES; PERFORM TIP LOAD AND FLAPPER ANGLE MEASUREMENTS ON THE 17 IN. OD'S AND VERIFY MPS COPPER PATHS, COMPONENT AND ELECTRICAL CHECKS.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 5 1320.0
Elec. Tech: 3 792.0
Quality: 0 0.0 N/A
LCC O.M: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 8 2112.0 Time: 264.0

Issues: DESIGN MAINTAINABILITY TIME/ON-LINE COST/MAN/POWER

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Techology Identification Sheet

Seq. Task No: 22,000 Facility: OFF OMI Page Count: 163
OMI No: V6010 OMI Title: CABIN AIR RECIRCULATION INSPECTION

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N GSE:

Activity Description: TO PERFORM ROUTINE MAINTENANCE ON THE CABIN FAN, IMU, AND AVIONICS BAY 1, 2, 3 DEBRIS SCREENS. THE CONDENSING HEAT EXCHANGER WILL BE INSPECTED FOR CORROSION AND BIOLOGICAL GROWTH, WATER SAMPLES WILL BE OBTAINED FROM THE CONDENSING HEAT EXCHANGER AND ANALYZED FOR BIOLOGICAL GROWTH. TOTAL SYSTEM WILL BE INSPECTED AND VACUUMED.

<table>
<thead>
<tr>
<th>Personnel:</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
<td>Mech. Tech:</td>
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<td>Elec. Tech:</td>
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<td>Quality:</td>
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<td>LCC Ups:</td>
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<tr>
<td>Support:</td>
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<td>Engineering:</td>
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Issues: ACCESSABILITY : DESIGN : MAINTAINABILITY :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 23.000   Facility:  OPEF   OMI Page Count: 1031
OMI No: V5E02   OMI Title: SPACE SHUTTLE MAIN ENGINE LRU
COMPONENT REMOVAL/INSTALLATION-HIGH PRESSURE OXIDIZER TURBOPUMP (LPS)
Subtask OMI(s): V3512 , V5043 , V3508 , V5057
V9002 , V3553

Prerequisite Task OMI:

Hazard: Y Level:  Vehicle Power Required: Y  LOC Support Required: Y
GSE: H70-0565 , H70-0774 , H70-0773 , A70-1265
H70-1208 , A70-0865 , H70-0529

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SSME HIGH PRESSURE
OXIDIZER TURBOPUMP (LRU) IN THE OPEF (HOR).

Personnel:       Head Count  Man Hours  Remarks
Mech. Tech:  6          216.0
Elec. Tech:  0          0.0
Quality:  2        72.0
LCC Ops:  0          0.0  N/A
Support:  0          0.0  N/A
Engineering:  1        72.0
Total:  9       360.0

Time: 36.0

Issues: ACCESSABILITY MAINTAINABILITY RELIABILITY DESIGN

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 24.000   Facility: OPF   OMI Page Count: 265
OMI No: V5E06   OMI Title: SPACE SHUTTLE MAIN ENGINE LRU
COMPONENT REMOVAL/INSTALLATION HIGH PRESSURE FUEL TURBOPUMP
Subtask OMI(s): V3512, V3553, V5043, V3508, V5057, V9002, V9001VL1, 03119, 13205

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
SSE: H70-1203, H70-0528, H70-0774, A70-0501, 
S70-0902, S70-0695-2, A70-0983, H70-0565

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SSME HIGH PRESSURE FUEL TURBOPUMP (LRU) IN THE OPF (HOR).

Personnel:

<table>
<thead>
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<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
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<td>LCC Ops:</td>
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<td>Support:</td>
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<td>324.0</td>
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Issues: ACCESSIBILITY: MAINTAINABILITY: RELIABILITY: DESIGN

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 25.000 Facility: OPF
O&M No: V6002 O&M Title: POST FLIGHT INSPECTION LESS TFG

OMI Page Count: 44

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
O&M: A70-0724 , A70-1084 , C70-0799 , C70-0897

Activity Description: TO PERFORM VISUAL/NDT INSPECTIONS REQUIRED BY CMRS AND OMF AND TO SHAKE DOWN ACCESSIBLE AREAS FOR FLIGHT INDUCED DAMAGE/DEFECTS.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 3 396.0
Elec. Tech: 0 0.0 N/A
Quality: 0 0.0 N/A
O&M Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 3 396.0 Time: 132.0

Issues: TECHNOLOGY COST/MANPOWER

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 26.0000  Facility: OPF  OMI Page Count: 132
OMI No: 93801  OMI Title: ORBITER SHAKE-DOWN INSPECTION INTERNAL

Subtask OMI(s): , , , ,
Pre-requisite Task OMI: , , , ,
Hazard: N Level: , Vehicle Power Required: N  LCC Support Required: N
GSE: S70-0902 , S70-0903 , ,

Activity Description: TO PERFORM AN INTERNAL VISUAL AND PHYSICAL INSPECTION OF ORBITER VEHICLE.

Personnel:

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<tr>
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<th>Remarks</th>
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<tr>
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<tr>
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<td>96.0</td>
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Issues: MAINTAINABILITY : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 27.000 Facility: OPR OMI Page Count: 51

OMI No: V4228 OMI Title: POST FLIGHT ORBITER REUSABLE SURFACE

INSULATION INSPECTION Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LGC Support Required: N

GSE: A72-0312-1

Activity Description: TO PERFORM POST-LANDING AND PRE-FERRY VISUAL SURVEY/INSPECTION OF ORBITER THERMAL PROTECTION SUBSYSTEM (TPS)

Personal:

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<thead>
<tr>
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<tr>
<td>Engineering</td>
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Total: 13  632.0 Time: 60.0

Issues: TECHNOLOGY :COST/MANHOURS :

Technology Need Description: A RELIABLE TEST METHOD TO INSPECT THE TILE SYSTEM TO INCLUDE: CRACKS OR WATER IN THE TILE ADEQUATE BOND LINE AND CONDITION OF FILLER BAR INSPECTION METHOD SHOULD BE NON-INVASIVE, AUTOMATED, AND CAPABLE OF COMPUTER ANALYSIS.

Technology Candidates Identified:

* ACoustIC EXCITATION/LASER SENSING
  * NASA/ KSC FUNDED STUDY
  * EG&G/IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
* PHASE I COMPLETED - NON-CONTACTING ACCUSTIC-OPTIC SENSING FEASIBLE
* PHASE II WILL REFINISH AND QUALIFY SENSOR, PROTOTYPE THE SYSTEM
* BACKSCATTER X-RAY IMAGERY WILL BE INVESTIGATED UPON RECEIPT OF TIMES.
Technology Identification Sheet

Seq. Task No: 28.000
OMI No: VC024VL.1-01A
OMI Type: MAINTENANCE

OMI Title: THERMAL PROTECTION SYSTEM RSI

OMI Page Count: 656

Prerequisite Task OMI:

Facility: OFF
Vehicle Power Required: N
LCC Support Required: N
GSE:

Activity Description: TO PROVIDE GUIDELINES FOR EVALUATION AND REWORK OF TPS SYSTEM CONDITIONS. OUTLINES PROCESSING STEPS AND INDICATES REQUIRED INSPECTION BUY-OFF TO SUPPORT PLANNING AND PROCESS CONTROL.

Personal:

<table>
<thead>
<tr>
<th>Position</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Lab. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

Total Man Hours: 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: 29,000
GMI No.: V1053
Subtitle GMI(s): V3511

Facility: OPF
GMI Title: ECLSS CABIN SENSOR FUNCTIONAL TEST

OMI Page Count: 279

Prerequisite Task GMI:

Hazard: N Level: Vehicle Power Required: Y
GSE: C70-0743, C70-1173, A70-0658, C72-0031
M72-0022, S70-0790-9, A14-0034-2

Activity Description: TO PERFORM INSTALLATION, REMOVAL AND CHECKOUT OF O22 AND FGO2 SENSORS PLUS A FUNCTIONAL TEST OF THE CABIN PRESSURE SENSOR.

Personnel:

Mech. Tech.: 1 12.0
Elec. Tech.: 4 40.0
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 5 52.0

Time: 12.0

Issues: FAULT DETECTION

Cost/Manhours:

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

ORIGINAL PAGE 19
OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 30.000 Facility: ODF
GMI No: 97381 OMI Title: WINDOW POLISHING FOR CONTAMINATION REMOVAL

Subtask GMI(s):

Prerequisite Task GMI:

Hazard: N Level:
GSE: A70-0580

Vehicle Power Required: N LCC Support Required: N

Activity Description: TO POLISH ORBITER EXTERNAL WINDOW SURFACE FOR CONTAMINATION REMOVAL.

Personnel:

<table>
<thead>
<tr>
<th></th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>2</td>
<td>120.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Total: 2 120.0

Time: 60.0

Issues: TECHNOLOGY : MAINTAINABILITY : COST/MANHOURS :

Technology Need Description: POSSIBLE DESIGN SOLUTIONS INCLUDE:
* DEVELOP A NEW MATERIAL FOR THE WINDSHIELD WTH SURFACE THAT CONTAMINATION WILL NOT ADHERE TO.
* PROVIDE AN OVERLAY OR TREATMENT THAT COULD EITHER BE JETTISONED AFTER ASCENT OR REMOVED AFTER FLIGHT.
* REDESIGN SRB SEP MOTOR EXHAUST TO PREVENT IT FROM IMPINGING ON THE WINDOWS.

Technology Candidates Identified: POSSIBLE CANDIDATES:
* CARBON COATING WITH HARDNESS PROPERTY OF DIAMONDS
* ION BEAM OR SPUTTERING
* CHEMICAL VAPOR DEPOSITION
* APPLICATION R&D
* S3IO (CRYSTALLINE CARBON TECHNOLOGY INITIATIVE)
* PENN STATE (CONSORTIUM ON DIAMOND FILM)
* NASA/LSRC
* POLYCRYSTALLINE MGALZ04 SPINEL (FOR HIGH PERFORMANCE WINDOWS)
* USE NITINOL TO JETTISON AN OVERLAY
Technology Identification Sheet

Seq. Task No: 31.000 Facility: ORF OME Page Count: 210
CMI No: V1022 OME Title: FUEL CELL AND PRED SYSTEM TEST -(LP)

Subtask OME(s): V3500, V3501, V3512, V3515, V5033, V5034
V7001VL1, V9014

Prerequisite Task OME:

Hazard: N Level: 

Vehicle Power Required: Y LCC Support Required: Y

SSE: C70-0307, C70-0743-2, C70-0834-1-2, C72-1227,
S70-0531-1-2, S70-0696-1, S72-1196-1, A70-0894

Activity Description: TO PROVIDE PROCEDURE FOR VERIFICATION OF FUEL CELL/PRED INSTRUMENTATION AND CONTROLS INCLUDING FUNCTIONAL OPERATIONS OF SYSTEM RELIEF VALVES AND CONTROLS CIRCUITS ON ORBITER VEHICLE.

Personal:

<table>
<thead>
<tr>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>2</td>
<td>144.0</td>
</tr>
<tr>
<td>Elec. Tech:</td>
<td>1</td>
<td>72.0</td>
</tr>
<tr>
<td>Quality:</td>
<td>1</td>
<td>72.0</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>2</td>
<td>144.0</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
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<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total:</td>
<td>6</td>
<td>432.0</td>
</tr>
</tbody>
</table>

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)
SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 57 (V1003)
SEE TIS 5 (V1091)
Technology Identification Sheet

Task No: 32.000  Facility: DPF  OMI Page Count: 372
OMI No: V1026  OMI Title: WASTE MANAGEMENT SYSTEM LEAK AND

FUNCTIONAL TEST (LPS)
Subtask OMI(s): V3500 , V3511 , V3512 , V5267
V9001 , V9014

Prerequisite Task OMI:

Hazard: N  Level:

Vehicle Power Required: N  LDC Support Required: Y

CSE: C70-0007 , C70-0743-001 , H70-0561-005 , A70-0658-002 ,
M70-0022 , S70-0791-2 , S70-0656 , P70-1213

Activity Description: TO PROVIDE PROCEDURES TO INSTALL WASTE COLLECTOR, TO TEST
WASTE SUBSYSTEM AND WASTE WATER MANAGEMENT SYSTEM, AND PERFORM WASTE MANAGEMENT
SYSTEM TURNAROUND OPERATIONS.

Personal:

<table>
<thead>
<tr>
<th>Type</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. Tech.</td>
<td>5</td>
<td>120.0</td>
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<td>Elec. Tech.</td>
<td>3</td>
<td>192.0</td>
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<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LDC Ops</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Total</td>
<td>8</td>
<td>512.0</td>
<td>Time: 64.0</td>
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</table>

Issues: TECHNOLOGY : TIME/OFF-LINE : TIME/ON-LINE :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 33,000  Facility: OFF  OMI Page Count: 66
OMI No.: V6012  OMI Title: HYDRAULIC SYSTEM INSPECTION

Subtask OMI(s): V3511, V5057, V5064, V9002.08

Prerequisite Task OMI:

Hazard: N  Level:  Vehicle Power Required: N  LCC Support Required: N

GSE:

Activity Description: TO INSPECT THE HYDRAULIC SYSTEM PREFLIGHT AND POSTFLIGHT TO DETECT SYSTEM DEGRADATION.

Personal:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>3</td>
<td>204.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>4</td>
<td>272.0</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Engineering</td>
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<tr>
<td>Total</td>
<td>7</td>
<td>476.0</td>
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</table>

Issues: TECHNOLOGY :COST/MANHOURS :DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seg. Task No: 34.000 Facility: OPF OML No: V7002.901.10 OML Title: OPF-VEHICLE HYDRAULIC POWER UP/DOWN

Subtask OML(s): S3500 , V1133 , V9001

Prerequisite Task OML:

Hazard: Y Level:

Vehicle Power Required: Y LCC Support Required: Y

GSE: A70-0696 , C70-0894 , S72-0841 , S72-0843 , S72-0952 , S72-0861-1 , S72-0844-3 , S72-0844-4

Activity Description: APPLY HYDRAULIC GROUND POWER TO THE ORBITER TO SUPPORT HYDRAULIC OR ANY ASSOCIATED SUBSYSTEM TESTING.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>3</td>
<td>140.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>3</td>
<td>72.0</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Org.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>6.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>212.0</td>
<td>Time: 68.0</td>
</tr>
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</table>

Issues: TECHNOLOGY :COST/MANHOURS :DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 35.000  
Facility: OPP  
OEM Page Data: 76  

OEM No: V1111  
OEM Title: ORBITER HYDRAULIC SYSTEM BN2

Prerequisite Task OMI:  
Hazard: N  
Level:  
Vehicle Power Required: Y  
LDC Support Required: Y  

GSE: Z70-0018-2-3, C70-0743-007, S70-0646

Activity Description: TO DETERMINE ACCUMULATOR PRECHARGE PRESSURE AND TO PRECHARGE THE ORBITER HYDRAULIC SYSTEM BOOTSTRAP ACCUMULATORS AND THE SME RETURN ACCUMULATOR TO FLIGHT PRESSURES IT SERVICING REQUIRED.

Personnel:  
Head Count  
Man Hours  
Remarks

Mech. Tech: 3  
48.0  
N/A

Elect. Tech: 2  
0.0  
N/A

Quality: 0  
0.0  
N/A

LDC Ops: 0  
0.0  
N/A

Support: 0  
0.0  
N/A

Engineering: 0  
0.0  
N/A

Total: 5  
120.0  
Time: 24.0

Issues: TECHNOLOGY :COST/MANHOURS :DESIGN CRITERIA : 

Technology Need Description: 

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 36,000 Facility: OFF OML Title: ET UMBILICAL DOOR POSITIONING
OML No: V9022 OML Page Count: 52

Subtask OML(s): V900: VLI

Prerequisite Task OML:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
USE: A70-0606, A70-1031

Activity Description: PROVIDE PROCEDURES FOR POSITIONING THE ET UMBILICAL DOORS, DOOR LATCHES AND CENTERLINE LATCHES TO SUPPORT OPERATIONAL AND MANUFACTURING REQUIREMENTS.

<table>
<thead>
<tr>
<th>Personnel:</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>3</td>
<td>324.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech:</td>
<td>3</td>
<td>324.0</td>
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<td>Quality:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>QC Ops:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total:</td>
<td>6</td>
<td>648.0</td>
<td>Time: 108.6</td>
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</table>

Issues: COST/MANHOURS : REQUIREMENTS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 37.000  Facility: OPF  OML Page Count: 209
OML No: V1123  OML Title: ECLSS ARE FUNCTIONAL TEST (LPS)

Subtask OML(s): V3601, V9001VL1, V3511, V3512

Prerequisite Task OML:

Hazard: N  Level: Vehicle Power Required: Y  LCC Support Required: Y
GEE: C70-0546-01  , S70-0679-03  , C70-0796

Activity Description:
TO PERFORM OPERATIONS NECESSARY TO FUNCTIONALLY TEST THE
ARS WATER COOLANT LOOPS, CABIN TEMPERATURE CONTROL AND HUMIDITY SEPARATOR
SYSTEMS, AND AVIONICS BAYS AND IMU AIR CIRCULATION CONDITIONING SYSTEM.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech, Tech:</td>
<td>1</td>
<td>4.0</td>
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<tr>
<td>Elec, Tech:</td>
<td>3</td>
<td>12.0</td>
<td></td>
</tr>
<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Total:</td>
<td>4</td>
<td>16.0</td>
<td>Time: 4.0</td>
</tr>
</tbody>
</table>

Issues: FAULT DETECTION :TIME/ON-LINE : |

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 38.000 Facility: OFF OMI Page Count: 57
OMI No: V1134 OMI Title: WATER DRAIN AND HAZARDOUS OIL DETECTION LINE VERIFICATION AND DRAIN/VENT FILTER REPLACEMENT
Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required:
OSR: S70-0765, S70-0771, S70-0772, S70-0813-05
S73-0657, A70-0702, S34-0166-01

Actual Description: TO REMOVE RESIDUAL WATER ACCUMULATION FROM ORBITER FUEL AND NOSE WHEEL DRAIN LINES AND TO VERIFY NO LEAKS IN THE FUEL AND ROOFLIGHT DRAIN LINES AND THE NOSE SENSOR LINES UNDER VACUUM CONDITIONS.

Personnel | Head Count | Man Hours | Remarks
--- | --- | --- | ---
Mach Tech | 4 | 32.0 | 
Eng Tech | 2 | 16.0 | 
Quality | 0 | 0.0 | N/A
LCC Supp | 0 | 0.0 | N/A
Support | 0 | 0.0 | N/A
Engineering | 0 | 0.0 | N/A
Total | 6 | 48.0 | Time: 2.0

Lesson: DESIGN : MAINTAINABILITY 

Technology Need Description: 

Technology Candidates Identified: 

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 39.000 Facility: OPE Facility Code: 716
OML No: V1679 OML Title: APU LUBE OIL SERVICING LPS

Subtask OML(s): V3509, V9014, V3504, V9014V1

Transquisite Task OML:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OML: 070-0742-002, 070-0775-01, 070-0778-3, 070-0679-2,
070-0790-11A, 072-0574-5, 072-0613, 070-0752

Activity Description: PERFORM POST FLIGHT CONTINGENCY SAMPLING & ULLAGE CHECK, MAGNETIC CHIP INSPECTION, GEARBOX REPRESSURIZATION, OFFLOAD OIL AND PURGE WITH OML. REMOVE FLIGHT FILTER, INSTALL FLUSH FILTER & FLUSH, REPLACE FLIGHT FILTER AND LEAK TEST. MONITOR DELTA PRESSURES BETWEEN ALL APU GEARBOXES AND RESPECTIVE DRAIN CAVITIES.

Personnel: Head Count Man Hours Remarks
Mech. Tech.: 4 192.0
Electric Tech.: 2 96.0
Quality: 0 0.0 N/A
LCC Spec.: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 6 288.0 Time: 48.0

Issues: TECHNOLOGY REQUIREMENTS DESIGN CRITERIA

Technology Need Description:

Technology Candidates Identified:

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## Technology Identification Sheet

**Reg. Task No.** 40.000  
**Facility:** OPP  
**OMI No.:** V6005  
**OMI Title:** STAR TRACKER INSPECTION AND CLEANING  
**OMI Page Count:** 46

**Subtask OMI(s):** V3508, V3509, V3511

**Prerequisite Task OMI:**

**Hazard:** N  
**Level:**  
**Vehicle Power Required:** Y  
**LCC Support Required:**

**Dep:** A70-0087, A70-1019, H70-0787

**Activity Description:** TO PROVIDE A PROCEDURE FOR INSPECTION, CLEANING, REMOVAL AND INSTALLATION OF THE STAR TRACKER, PROTECTIVE WINDOW AND LIGHT SHADE.

## Personnel

<table>
<thead>
<tr>
<th></th>
<th>Head Count</th>
<th>Man-Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech. Tech.</td>
<td>1</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>1</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Deps.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
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<td>Engineering</td>
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<td><strong>Total</strong></td>
<td>2</td>
<td>16.0</td>
<td><strong>Time:</strong> 0.4</td>
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**Issues:** TECHNOLOGY

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seq. Task No: 41.000  Facility: OPF  OMI Pace Count: 175
OMI No: V1153  OMI Title: AFU WATER SERVICING (LPS)

Subtask OMI(s): V3500 , S9001 , V3511 , V3512
V7223 , V9014 , V2350 , V3508 , V3502

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y  LCC Support Required: Y
GSE: C70-0743-002 , S70-0679-11 , S70-0786 , S70-1232
Z70-0619-006

Activity Description: TO PERFORM THE FOLLOWING OPERATION ON THE PRIMARY AND
SECONDARY PUMP/VLV COOLING WATER TANKS AND THE INJECTOR COOLING TANK, OFFLOAD,
DIAPHRAGM LEAK TEST AND SERVICING.

Personnel:  Head Count  Man Hours  Remarks
 Mech. Tech:  4  32.0  N/A
 Elec. Tech:  3  24.0
 Quality:  0  0.0  N/A
 LCC Ops:  0  0.0  N/A
 Support:  0  0.0  N/A
 Engineering:  0  0.0  N/A
 Total:  7  56.0  Time:  2.0

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

OMI No: V1005  OMI Title: ORBITER COMM. SYSTEM TEST (LPS)

Subtask OMI(s): D2013  S3500  V3502  V3518
V99819L1

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: A70-0386  C70-0625  C70-0724-1  C70-0725-1
C70-0727

Activity Description: TO PERFORM A COMPLETE VERIFICATION OF ALL OF THE ORBITER COMMUNICATION SYSTEMS.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>3</td>
<td>24.0</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>24.0</td>
<td>Time: 3.0</td>
</tr>
</tbody>
</table>

Issues: FAULT DETECTION:

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 43.000  Facility: OFF  OMI Page Count: 166
OMI No: V1062  OMI Title: AIR DATA SYSTEM FUNCTIONAL CHECKOUT
(LPS)
Subtask OMI(s): S3500, V3502, V9001
Prerequisite Task OMI: 
Hazard: N  Level: 
GSE: 
Vehicle Power Required: Y  LCC Support Required: Y

Activity Description: TO VERIFY FUNCTIONAL PATHS OF THE AIR DATA SYSTEM INCLUDING PROBE HEAT/DEPLOY SWITCH, DISCRETES, ANALOGS, AND TO MEASURE THE ACCURACY OF THE AIR DATA PRESSURE TRANSDUCER ASSEMBLIES.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>3</td>
<td>24.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>2</td>
<td>16.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>5</strong></td>
<td><strong>40.0</strong></td>
<td><strong>Time:</strong> <strong>3.0</strong></td>
</tr>
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</table>

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 44.000  Facility: OPF  OME Page Count: 324
OMI No: V1076  OMI Title: ORBITER WCCS FUNCTIONAL TEST

Subtask OMI(s):  

Prerequisite Task OMI:  

Hazard: N  Level:  

Vehicle Power Required: N  LCC Support Required: N

OSS: S70-0532  A70-0958  S70-0989  S70-0980-XXX

Activity Description: TO PROVIDE PROCEDURES TO VERIFY THE FUNCTIONAL CORRECTNESS OF THE ORBITER WINDOW CAVITY CONDITIONING SYSTEM.

Personnel:

<table>
<thead>
<tr>
<th></th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>3</td>
<td>288.0</td>
<td></td>
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<tr>
<td>Elec. Tech.</td>
<td>2</td>
<td>192.0</td>
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</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Engineering</td>
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<tr>
<td>Total</td>
<td>5</td>
<td>480.0</td>
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</tr>
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</table>

Issues: TECHNOLOGY COST/MANHOURS TIME/CYCLE

Technology Need Description:
POSSIBLE ALTERNATIVES INCLUDE:
1. A NEW DESICCANT WITH RELIABLE INDICATORS FOR VISUAL INSPECTION.
2. IMPROVE ACCESSIBILITY OF THE DESICCANT ASSEMBLIES.
3. A NEW METHOD TO CONTROL THE MOISTURE INGESTED OR TRAPPED IN THE CAVITIES BETWEEN THE WINDOW PANES.

Technology Candidates Identified: TECHNOLOGY SEARCH RESULTS:
1. NO DESICCANT HAS BEEN IDENTIFIED WITH THE DESIRED PROPERTIES.
2. DESICCANT ASSEMBLIES COULD BE RELOCATED TO THE PAYLOAD BAY.
3. BUILT-IN DRY PURGED FOR USE DURING THE ASCENT AND DESCENT PORTION OF THE FLIGHT.
Technology Identification Sheet

Seq. Task No: 45.000  Facility: ORF  QM Page Count: 412
CMI No: V1008  QMI Title: ORDITER NAV AIDS SYSTEM TEST (LPS)

Subtask CMI(s):  

Prerequisite Task CMI:  

Hazard: Y Level:  
Vehicle Power Required: Y  LCD Support Required: Y  SEE:  

Activity Description: VERIFY NO EXCESSIVE AIR LEAKS IN THE WAVE GUIDE RUN BETWEEN MIDDECK AND ANTENNAS. VERIFY ALL TACANS PASS ACTIVATION AND SELF-TEST REQUIREMENTS AND SYSTEM FUNCTIONS WITHIN ACCEPTABLE LIMITS.

Personnel:  Head Count  Man Hours  Remarks

Mech. Tech: 1  0.0  
Elec. Tech: 3  24.0  
Quality: 0  0.0  N/A  
LCD Opr: 0  0.0  N/A  
Support: 0  0.0  N/A  
Engineering: 0  0.0  N/A  
Total: 4  32.0  Time: 0.0  

Issues: FAULT DETECTION  :

Technology Need Description:

SEE TIS 57 (V1003)  

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Req. Task No: 46.000  Facility: OPF  OMI Page Count: 198
OMI No: V1098  OMI Title: LANDING GEAR FUNCTIONAL TEST (LPS)

Subtask OMI(s): S3500, V9001VL, V9002

Prerequisites Task OMI:

Hazard: Y Level:  Vehicle Power Required: Y  LCC Support Required: Y
SEE: A70-0601, A70-0696, H70-0570, C70-0394,  S70-0646, 270-0018-007

Activity Description: TO PROVIDE PROCEDURES FOR VERIFICATION OF PROPER OPERATION OF THE ORBITER LANDING GEAR/DOOR SYSTEM.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>7</td>
<td>56.0</td>
<td></td>
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<tr>
<td>Elec. Tech:</td>
<td>3</td>
<td>24.0</td>
<td></td>
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<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
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<tr>
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<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
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</table>

Total: 10 80.0  Time: 8.0

Issues: FAULT DETECTION : TIME/ON-LINE : COST/MANHOURS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seg. Task No: 47.000  Facility: OFF  OMI Page Count: 314
OMI No: V1618.02-04  OMI Title: APU/HYDRAULIC WATER SPRAY BOILER

Subtask OMI(s):  

Prerequisite Task OMI:  

Vehicle Power Required: Y  LCC Support Required: Y

GSE: S70-0775-2, S70-0790-1, S70-1231, Z70-0016-0,
A70-0792-3, A70-0790-2, S70-1232,

Activity Description: TO SERVICE ORBITER SPRAY BOILERS WITH WATER AND GASEOUS NITROGEN.

Personnel:  

Head Count  Man Hours  Remarks
Mech. Tech.:  3  24.0  N/A
Elect. Tech.:  3  24.0  N/A
Quality:  0  0.0  N/A
LCC Doc.:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  6  48.0  Time: 3.0

Issues: TECHNOLOGY : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 48.000  Facility: OPP  OMI Page Count: 361
OMI No: V1035  OMI Title: POTABLE WATER SERVICING - WET SYSTEMS
KSC LANDING (LPS)

Subtask OMI(s): S9001VL1, V3502, V3504, V9001VL1

Prerequisite Task OMI:

Hazard: Y  Level:
Vehicle Power Required: Y  LCC Support Required: Y

SSE: C70--743-1, C70-1153, S70-0742, S70-0757-2
S70-0974

Activity Description: TO SERVICE THE POTABLE WATER SYSTEM WITH 3-5 PPM IODINE/ WATER FOR FLIGHT CREW CONSUMPTION AND FLASH EVAPORATOR USE.

Personnel:

<table>
<thead>
<tr>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>2</td>
<td>40.0</td>
</tr>
<tr>
<td>Elec. Tech:</td>
<td>2</td>
<td>40.0</td>
</tr>
<tr>
<td>Quality:</td>
<td>5</td>
<td>120.0</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>Total:</td>
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</table>

Issues: DESIGN: REQUIREMENTS : TECHNOLOGY : INTERFACE

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seg. Task No: 49.000  Facility: OFF  OMI Page Count: 390  OMI Title: KU-BAND COMM/RADAR SYSTEMS TEST (LPS)

OMI No: V1176  Subtask OMI(s): S3500, V1164, V1184, V3508, V5006.01, V9001VL1, V9001VL2

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y

SGE: C70-0925, C70-0725, C70-0727, C70-0727-0, C70-1188

Activity Description: TO VERIFY THAT THE ORBITER KU-BAND COMMUNICATIONS/RADAR SYSTEM OPERATES WITHIN SPECIFIED LIMITS.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  2  16.0
Elec. Tech:  5  40.0
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  7  56.0  Time: 8.0

Issues: FAULT DETECTION  :COST/MNHOURS  :TIME/ON-LINE

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No.: 50.000  Facility: ORF  OMI Page Count: 120
OMI No.: V1077  OMI Title: ORBITER FUEL CELL COOLANT SERVICING

AND SAMPLING (LPS):
Subtask OMI(s): V2051, V3511, V9014, V9016

Prerequisite Task OMI:  
Hazards: N  Level:  

Vehicle Power Required: Y  LCC Support Required: Y

ASS: 270-0010-6, A70-0695-1

Activity Description: TO PROVIDE PROCEDURES TO MEASURE COMPRESSIBILITY AND SAMPLE THE FUEL CELL COOLANT LOOPS.

Personnel:  

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>3</td>
<td>24.0</td>
<td></td>
</tr>
<tr>
<td>Eng. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>24.0</td>
<td>Time: 9.2</td>
</tr>
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</table>

Issues: TECHNOLOGY

Technology Need Description:

SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 5 (V1091)
Technology Identification Sheet

<table>
<thead>
<tr>
<th>Seq. Task No.</th>
<th>Facility</th>
<th>GMI No.</th>
<th>GMI Title</th>
<th>GMI Page Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>51,000</td>
<td>ORF</td>
<td>V1073</td>
<td>FUEL CELL SINGLE CELL VOLTAGE TEST</td>
<td>216</td>
</tr>
</tbody>
</table>

(LPS)

Subtask GMI(s): S3500, V1050, V1091, V1120, V3507, V3511, V3512, V3515, V9001, V9014, V9016

Prerequisite Task GMI:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Y Level</th>
<th>Vehicle Power Required</th>
<th>LCC Support Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSE:</td>
<td>C70-0307</td>
<td>C70-0854, S70-0590, S70-0679-1, S70-0695-1, S70-0696-1,2,3, S70-0815-2,3, S70-0825-1,2</td>
<td></td>
</tr>
</tbody>
</table>

Activity Description: TO PROVIDE PROCEDURES TO CONDUCT A SINGLE CELL VOLTAGE TEST (BOTH THE TAFEL TEST AND GND2 DIAGNOSTIC TEST) OF THE ORBITER FUEL CELLS.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech</td>
<td>3</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>0.0</td>
<td>Time: 2.0</td>
</tr>
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</table>

Issues: TECHNOLOGY

Technology Need Description:

SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 5 (V1091)
Technology Identification Sheet

Seq. Task No: 52.000  Facility: OFF  OMI Page Count: 356
OMI No: V1077  OMI Title: ORBITER/ET UMBILICAL CLOSEOUT DOOR

FUNCTIONAL TEST (LPS)
Subtask OMI(s): S3500  V3502  V9001VL1

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y  LCC Support Required: Y
GSE: A70-0601  A70-1031  H70-0865

Activity Description: TO PROVIDE PROCEDURES FOR VERIFICATION OF PROPER OPERATION OF THE ORBITER/ET UMBILICAL CLOSEOUT DOORS AND LATCHES POWER DRIVE UNITS.

Personnel:  Head Count  Man Hours  Remarks

Mech. Tech: 3  24.0
Elec. Tech: 3  24.0
Quality: 0  0.0  N/A
LCC Ops: 0  0.0  N/A
Support: 0  0.0  N/A
Engineering: 0  0.0  N/A
Total: 6  48.0  Time: 8.0

Issues: DESIGN  TIME/ON-LINE  COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 53.000  
OMI No: V5069  
OMI Title: ORBITER JACK TRANSFER TO AND FROM H70-0570 BODY JACKS & A70-0799 LANDING GEAR SUPPORT STANDS  
Subtask OMI(s): V5014, V5103, V3508  

Prerequisite Task OMI:  
Hazard: N  
OMI Level: N  
Vehicle Power Required: N  
LCC Support Required: N  
CSE: A70-0999, H70-0570, H70-0768, C70-0743-7 SN67, Z70-0018  

Activity Description: TO TRANSFER ORBITER TO BODY JACKS OR L.G. SUPPORT STANDS AS REQUIRED TO SUPPORT OTHER SCHEDULED OPERATIONS.

Personnel:  
Mech. Tech: 16  
Elec. Tech: 0  
Quality: 0  
LCC Ops: 0  
Support: 0  
Engineering: 0  
Total: 16  
Man Hours: 128.0  
Remarks: N/A  
Time: 5.0

Issues: COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 54,000 Facility: OFF OML Page Count: 509
OML No: V1196 OML Title: APU POST FLIGHT FUEL SYSTEM

Subtask OML(s):

Prerequisite Task OML:

Hazard: Y Level: 
Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0743-002 , C70-0743-004 , F70-0013-006 , S70-0679-02 , S70-0679-11 , S70-0757 , S70-0758 ,

Activity Description:
TO VENT APU FUEL TANKS AND FUEL MANIFOLDS TO PAD PRESSURE, DRAIN APU CAVITY DRAIN SYSTEM CATCH BOTTLES, AND PERFORM FUNCTIONAL TEST OF CATCH BOTTLE RELIEF VALVES AND ALCOHOL-FRUSH CAVITY DRAIN SYSTEM.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 5 120.0
Elec. Tech: 2 48.0
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 7 168.0 Time: 24.0

Issues: TECHNOLOGY :COST/MANHOURS :DESIGN :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: V1003  Facility: OFF  OMI Page Count: 558
OMI No.: V1003  OMI Title: MASTER EVENT CONTROLLER/ PYROTECHNIC

INITIATOR CONTROLLER VERIFICATION (LPS)
Subtask OMI(s): V1003, V3501, V3507, V9001

Pre-requisite Task OMI:

Hazards: N Level: 
GSE: C77-0202, C72-1128, E70-0011, C72-1280-1

Activity Description: TO FUNCTIONALLY VERIFY OPERATIONS OF EACH MASTER EVENT CONTROLLER. TEST AND VALIDATE ALL ORBITER MEC/PIC FUNCTIONS AND VALIDATE ALL ORBITER, ET, SRB, AND GROUND INTERFACES. VERIFY MANUAL PIC/LCA FUNCTIONS, FIRE EXTINGUISHERS AND LANDING GEARS.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
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<td>48.0</td>
<td></td>
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<tr>
<td>Elec. Tech:</td>
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<td>0.0</td>
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</tr>
<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
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<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<td>Total:</td>
<td>5</td>
<td>120.0</td>
<td>Time: 24.0</td>
</tr>
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</table>

Issues: FAULT DETECTION : COST/MANHOURS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seg. Task No: 56.000  Facility: OFF  OMI Page Count: 355
OMI No: V1165  OMI Title: LANDING GEAR MAINTENANCE

Subtask OMI(s):  

Prerequisite Task OMI:  

Hazard:  Y  Level:  

Vehicle Power Required: N  LCC Support Required: N
GSE:  

Activity Description: TO PERFORM NORMAL MAINTENANCE AND INSPECTION OF MAIN AND NOSE LANDING GEAR.

Personnel:  

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
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<tr>
<td>LCC Ops</td>
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<tr>
<td>Support</td>
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<tr>
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<tr>
<td>Total</td>
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<td>Time: 72.0</td>
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Issues: DESIGN REQUIREMENTS TECHNOLOGY

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 57.000  
OMI No: V1003  
OMI Title: ORBITER POWER SYSTEM VALIDATION  
OMI Page Count: 120

Subtask OMI(s): S3500, V1004, V3507, V3511
V9001

Prerequisite Task OMI:

Hazard: N  
Level:  
GSE: C70-0807, C72-1250, C72-1079, S70-0508-2
C70-0898, C70-0519, C72-1233, C72-1337

Activity Description: TO FUNCTIONALLY EXERCISE AND VERIFY THE ELECTRICAL POWER DISTRIBUTION AND CONTROL SYSTEM AND ITS INTERFACES.

<table>
<thead>
<tr>
<th>Personnel</th>
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<tr>
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Issues: FAULT DETECTION : DESIGN

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
### Technology Identification Sheet

**Seq. Task No.:** 58.000  
**Facility:** OFF  
**OMI Page Count:** 340  
**OMI No.:** V5011  
**OMI Title:** APS POD REMOVAL/INSTALLATION AND PREP. FOR TRANSPORT  
**Subtask OMI(s):** 03119, 03205, V3511, V3555  
**Prerequisite Task OMI:**

- **Hazard:** N  
- **Level:**  
- **Vehicle Power Required:** N  
- **LCC Support Required:** N  
- **CSE:** H70-0046, H70-0679-3, -4, H70-0511-4, A70-1007, A70-0603, H70-0713, H70-0628, A70-1085  

**Activity Description:** TO REMOVE SAFED APS PODS FROM ORBITER FOR TRANSPORT TO HYPER CHECKOUT FACILITY AND INSTALLATION OF PODS AFTER CHECKOUT.

---

### Personnel:

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**Total:** 0  

**Time:** 0.0

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### Technology Need Description:

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### Technology Candidates Identified:
Technology Identification Sheet

Sect. Task No: 59.000
OMI No: V9919

CHECKS AND SERVICING
Subtask OMI(s): V3527

Prerequisite Task OMI:

Hazard: N Level:
GSE: C70-1227, A70-1004

Vehicle Power Required: N LCC Support Required: N

Activity Description: OBTAIN VACUUM READING ON THE MPS VACUUM-JACKETED PROPELLANT LINES PER ML0519-0030

Personnel:

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Time: 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 48.000 Facility: OFF
CMI No.: N/A OMI Page Count: 0
OMI Title: TPS WATERPROOFING

Subtask OMI(s): , , ,

Prerequisite Task OMI: , , ,

Hazard: N Level: , , ,
GSE: , , ,

Vehicle Power Required: N LCC Support Required: N

Activity Description: APPLY WATERPROOFING TO THE TPS TILE.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 0 0.0 N/A
Elec. Tech: 0 0.0 N/A
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 0 0.0

Time: 108.2

Issues: TECHNOLOGY :COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 61.000  Facility: ORF  DMI Page Count: 1214
DMI No: V1180  DMI Title: RIGHT AND LEFT APS POD FUNCTIONAL
CHECKOUT (LFS):

Subtask CMI(s): I2003, I2022, I3053, M2061
M2063, M3095, M3096, M3141, Q3415
V2119, W3103

Prerequisite Task CMI:

Hazard: Y Level: Vehicle Power Required: Y  LCC Support Required: Y
GSE: C72-1227, S70-0865-XX, S70-1119-X, C70-0743
C70-0884-1, S70-0784, S70-0547, S70-0548

Activity Description: TO DEMONSTRATE APS OMS/RCS GME REGULATOR, CHECK VALVE AND RELIEF VALVE/BURST DISC FUNCTIONAL OPERATION AFTER EXTENDED NON-TEST PERIODS.

Personnel:

Head Count  Man Hours  Remarks
Mech. Tech:  7  504.0  
Elec. Tech:  3  216.0  
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  10  720.0  Time:  72.0

Issues:

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 62,000
DMI No: V1048
CHECKOUT (LPS)
Subtask OMI(s): V3500
Prerequisite Task OMI:

Vehicle Power Required: Y

Activity Description: TO VERIFY LOGIC ASSOCIATED WITH NOSE WHEEL STEERING AND RESPONSE TO MANUAL AND GPC COMMANDS, VERIFY NO RESPONSE IN CASTER (OFF) MODE AND FAIL LIGHT CYCLES PROPERLY.

Personnel:

<table>
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Issues: FAULT DETECTION : TIME/ON-LINE :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
**Technology Identification Sheet**

**Seg. Task No:** 63.000  
**Subtask OMI(s):** V3500, V9001VL1, V9001VL3, V9002.01  
**OMI No:** V1005  
**Omi Title:** BRAKE/ANTI-SKID CONTROL SYSTEM TEST

**Prerequisite Task OMI:**

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<td>Total</td>
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**Issues:** FAULT DETECTION :COST/MANPOWER :MAINTAINABILITY :

**Technology Need Description:**

SEE TIS 57 (V1003)

**Technology Candidates Identified:**

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 64.000  Facility: CPF  DMI Page Count: 305
OMI No: V1060  DMI Title: FLIGHT CONTROL AEROSURFACE CHECKOUT
(LPS)

Subtask OMI(s): V3500, S9001, V1123, V9002.01, V9002.02, V9002.03

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: C70-0561

Activity Description: TO FUNCTIONALLY CHECK THE PROPER OPERATION AND ACCURACY OF
THE ORBITER’S AEROSURFACE FLIGHT CONTROL SYSTEMS.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  7  28.0
Elec. Tech:  3  12.0
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  10  40.0  Time:  4.0

Issues: FAULT DETECTION  :  DESIGN

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 65000
OMI No: V1003
OMI Title: FLIGHT CONTROL MPS TVC CHECKOUT AND
SRB SIMULATED INTERFACE VERIFICATION (LPS)

Subtask OMI(s): S3500, S9001, V1123, V5502
V3503, V5504, V5657, V9001VL1, V9092

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y
OMI: C70-0796, M70-0021

Activity Description: TO VERIFY THE COMMAND, FEEDBACK AND FAILURE DETECTION AND
FUNCTIONAL OPERATION OF THE ORBITER ASCENT THRUST VECTOR CONTROL.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 4 16.0
Elec. Tech: 3 12.0
Quality: 0 0.0 N/A
LCC Supp: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A

Total: 7 28.0 Time: 4.0

Issues: FAULT DETECTION : MAINTAINABILITY : COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Subtask OMI(s): V9001VL1, V9001VL2, V9001VL4, V1123, V1171

Hazard: Y Level:  
Vehicle Power Required: Y  
LCC Support Required: Y

Activity Description: TO PROVIDE AN INTEGRATED BUS REDUNDANCY TEST WHICH INCLUDES ALL ORBITER VEHICLE SYSTEMS CONTAINING BUS REDUNDANT DESIGN.

Personnel:

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Issues: FAULT DETECTION : TIME/ON-LINE : COST/MAN/HOURS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seg. Task No: 67.000
OEM No: V1001
OEM Title: SSME ELECTRICAL INTERFACE

Activity Description: PROVIDE STANDARD INSTRUCTION TO TEST ALL CIU AND SSME CONTROLLER COPPER PATHS AFTER ENGINE INSTALLATION, AFTER ELECTRICAL LRU REPLACEMENT AND AFTER ENGINE HOT FIRING.

Personnel:

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Remarks: Time: 4.0

Issues: 

Technology Need Description: 

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 68.000 Facility: DPF OMI Page Count: 324
OMI No: V041 OMI Title: ECLSS NITROGEN AND OXYGEN SERVICING
AND DESERVICING (LPS)
Subtask OMI(s): V9001 V9014 S3500

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
LSE: 370-0691-1 370-0691-2 370-0825-1 370-0825-2
370-0825-3 370-0832-6

Activity Description: TO SERVICE AND DE-SERVICE THE ECLSS GN2 AND GO2 SYSTEMS TO
DESIRABLE PRESSURE.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 3 36.0
Elec. Tech: 3 36.0
Quality: 0 0.0 N/A
LCC One: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 6 72.0 Time: 12.0

Issues: DESIGN CRITERIA : REQUIREMENTS : TIME/ON-LINE : COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Segment Task No.: 69.000  Facility: OFF  OMI Page Count: 373
OMI No.: V5050  OMI Title: CREW EQUIPMENT INTERFACE TEST

Subtask OMI(s): V5010  V5067  V5097

Prerequisite Task OMI:

Hazard: N  Level:  Vehicle Power Required: N  LCC Support Required: N
GSE: A70-0519  A70-0543-3  A70-0668  A70-0719  A70-0798  A70-0883  A70-0962  H70-0829

Activity Description: PERFORM THE MECHANICAL INTERFACE CHECKS OF FCE, INCLUDING
CCTV, COAS AND FLIGHT BINOCULARS, IN ON-ORBIT CONFIGURATIONS. PRIMARY FUNCTION
INCLUDES: FIT CHECK OF FCE (ESPECIALLY THAT WHICH IS NEW TO A PARTICULAR
MISSION) AND/OR GSE LIGHTING.

Personnel:

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<th>Man Hours</th>
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Time: 24.0

Issues: DESIGN                      COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 70.000 Facility: OFF OML Page Count: 225
OMI No: V1201 OML Title: MPS/SSME HELIUM SIGNATURE TEST

Subtask OMI(s): V1111, V1171, V3535

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSF: A70-0702, S70-0534, S70-0695-2, S70-0695-8
770-0023

Activity Description: PERFORM LEAK CHECK OF ISOLATED MPS/SSME SYSTEMS USING VARIAN MASS SPECTROMETER AND PURGE AIR FLOW IN AFT SECTION.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 4 192.0
Elec. Tech: 3 144.0
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 7 336.0 Time: 48.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 71.000  Facility: OPF  OMI Page Count: 32
OMI No: V1032  OMI Title: ORBITER CLOSEOUT PRIOR TO MOVE TO VAB

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N  Level:

Vehicle Power Required: N  LCC Support Required: N

CSE:

Activity Description: PREPARE ORBITER FOR WEIGHT AND BALANCE AND MOVE TO VAB.

Personnel:

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Issues: COST/MANHOURS : REQUIREMENTS : TIME/ON-LINE : CA

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 72.000  Facility: OPF  OMI Page Count: 146
OMI No.: V178  OMI Title: PAYLOAD BAY CLOSEOUT CLEANING-OPF

Subtask OMI(s): V1508

Prerequisite Task OMI:

Hazard: N  Level: 

Personnel:

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</tr>
<tr>
<td>Elec. Tech:</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total:</td>
<td>4</td>
<td>144.0</td>
</tr>
</tbody>
</table>

Time: 36.0

Issues: COST/MANHOURS REQUIREMENTS DESIGN TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Reg. Task No: 73.000  
OMI No: V1059  
OMI Page Count: 10

Facility: OPF  
OMI Title: DPS COMPUTER COMPLEX CHECKOUT (LPS)

Subtask OMI(s): S3500  
S90001  
V90001VL1

Prerequisite Task OMI:

Hazard: N  
Level:  
GSE:

Vehicle Power Required: Y  
LCD Support Required: Y

Activity Description: PROVIDES INSTRUCTIONS FOR APPLYING ELECTRICAL POWER TO THE DATA PROCESSING SUBSYSTEM (DPS) AND PERFORMING DPS SUBSYSTEM LEVEL TESTS TO VERIFY SYSTEM READINESS TO SUPPORT ORBITER CHECKOUT AND PROCESSING.

Personnel:  
Head Count: Man Hours  
Remarks

- Mach. Tech: 1  4.0
- Elec. Tech: 3  12.0
- Quality: 0  0.0  N/A
- LCD Ops: 0  0.0  N/A
- Support: 0  0.0  N/A
- Engineering: 0  0.0  N/A

Total: 4  16.0

Issues: FAULT DETECTION

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 74.000  
OMI No: V1037  
OMI Title: AMMONIA BOILER SERVICING, OPERATIONS AND DESERVICING (LFS)

Subtask OMI(s): I2003, M2063, M3011, M3039, M3039, W3103, S9001VL1, V9014

Prerequisite Task OMI: -ASK OMI

Hazard: Y  
Level: GSE: $70-0654, $70-0776, $70-1201-1, $70-1201-2, $70-1201, S70-0695-3, S70-1211

Vehicle Power Required: Y  
LCC Support Required: Y

Activity Description: TO PERFORM OPERATIONS NECESSARY TO SERVICE, DE-TANK AND SAFE THE NH3 STORAGE TANKS AND TO CONNECT THE NH3 VENT, OPERATE NH3 BOILER AND DE-TANK.

Personnel:  
Mech. Tech: 7  
Elec. Tech: 3  
Quality: 0  
LCC Ops: 0  
Support: 0  
Engineering: 0

Head Count  Man Hours  Remarks
7  
3  
0  
0  
0  
0

Total: 10  240.0  Time: 24.0

Issues: COST/MANHOURS: DESIGN CRITERIA: REQUIREMENTS:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: T85.000
TMI No: V1177
CHECKOUT (LPS)

Subtask SMI(s):  

Prerequisite Task SMI:  

Hazard: N  Level:  

Vehicle Power Required: Y  LOF Support Required: Y

OSS:  

Activity Description: TO FUNCTIONALLY VERIFY PROPER OPERATION OF HEADS UP DISPLAY ELECTRONICS UNIT (HDEU) AND PROPER OPERATION OF PILOT DISPLAY UNIT (PDU).

Personnel:  

Head Count  Man Hours  Remarks

Mech. Tech:  1  4.0  
Elect. Tech:  3  12.0  N/A
Quality:  0  0.0  N/A
LCO Ops:  0  2.0  N/A
Support:  0  0.0  N/A

Total:  4  16.0  Time: 4.0

Issues: FAULT DETECTION :  

Technology Need Description:

SEE TIS 57 (V1203)

Technology Candidates Identified:

SEE TIS 57 (V1203)
Technology Identification Sheet

Reg. Task No.: 76.900
CML No.: V1008
CML Title: DEDICATED DISPLAY AND DISPLAY DRIVER
CML Page Count: 1

UNIT CHECKOUT (LOC):
C9001

Pre-requisite Task CML:

Hazard: N Level:

Vehicle Power Required: Y
LOC Support Required: Y

Note: TO FUNCTIONALLY VERIFY PROPER OPERATION OF THE DISPLAY DRIVER UNITS (DDU'S) AND THE PROPER OPERATION ACCURACY AND INTEGRITY OF THE DEDICATED DISPLAYS (FORWARD, LEFT HAND AND RIGHT ADI, AMI, ANVI, FSI AND AFT ADI)

Personal:

<table>
<thead>
<tr>
<th>Task</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech. Tech.</td>
<td>1</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>3</td>
<td>12.0</td>
<td></td>
</tr>
<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LOC Test:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering:</td>
<td>4</td>
<td>16.0</td>
<td>Time: 4.0</td>
</tr>
</tbody>
</table>

Issues: FAULT DETECTION : REQUIREMENTS

Technology Need Description:

SEE TIC 57 (V1003)

Technology Candidates Identified:

SEE TIC 57 (V1003)

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 77.000

OMI No: V1030
(MCDS) CHECKOUT (LPS)

Subtask OMI(s): S3500

Prerequisite Task OMI:

Hazard: N Level:

GSE:

OMI Title: MULTIFUNCTION CRT DISPLAY SYSTEM

Vehicle Power Required: Yes
LCD Support Required: No

Activity Description: TO PROVIDE FUNCTIONAL CHECKOUT OF THE ORBITER MCDS CONSISTING OF ON-BOARD DISPLAY ELECTRONICS UNITS (DEU), DISPLAY UNITS (DU) AND KEYBOARD UNITS (KBU).

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech_Tech</td>
<td>5</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
<td>Elec_Tech</td>
<td>3</td>
<td>12.0</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Other Ops</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>32.0</td>
<td>Time: 4.0</td>
</tr>
</tbody>
</table>

Issues: FAULT DETECTION REQUIREMENTS

Technology Need Description:

SEE TIS 57 (V1030)

Technology Candidates Identified:

SEE TIS 57 (V1030)
Technology Identification Sheet

Reg. Task No: 79.000 Facility: OPP
OMI No: V1171 OMI Title: MPS/SSME PRESSURIZATION OPERATION
OMI No: V1182 OMI: G6125, G6150, G6235, G625Y1221
OMI: V5037

Prerequisite Task OMI: 

Vehicle Power Required: Y LCD Support Required: 

GSP: 

Activity Description: REPETITIVE TASK OMI TO ALLOW MPS/SSME SYSTEMS TO BE PRESSURIZED TO SUPPORT VEHICLE FLOW.

Personal: Head Count Man Hours Remarks
Mech. Tech: 0 0.0 N/A
Elect. Tech: 0 0.0 N/A
Quality: 0 0.0 N/A
L.E. Tech: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 0 0.0 N/A

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: 79.000  Facility: OPF  OML Task Count: 57
OML No.: V1807  OML Title: PYD STRUCTURAL LEAKAGE/POSITIVE

PRESSURE TESTING AND FILTER MAINTENANCE (LPS)

Subtask OML(s): V1111, V3511, V3512, V3552, V5067

Energy Level Task OML:

Hazard: N  Vehicle Power Required: Y  LCD Support Required: Y
ISE: A70-0759, C70-1237-2, F70-0033-1, S70-0033, S70-0250

Activity Description: TO DETERMINE THE LEAKAGE ACROSS THE ORBITER'S TUBES AND STRUCTURAL BULKHEADS AND FOR COMPARTMENTS TO MAINTAIN A POSITIVE PRESSURE UNDER NORMAL PURGE FLOWRATES AND INSTRUCTIONS TO REMOVE AND REPLACE PYD VENT FILTERS.

Personal:

<table>
<thead>
<tr>
<th>Personal</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech:</td>
<td>2</td>
<td>48.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech:</td>
<td>2</td>
<td>48.0</td>
<td></td>
</tr>
<tr>
<td>Qualify:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LOC Eng.:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Engineering:</td>
<td>0</td>
<td>0.0</td>
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</tr>
<tr>
<td>Total:</td>
<td>4</td>
<td>96.0</td>
<td>Time: 24.2</td>
</tr>
</tbody>
</table>

Issues: MAINTAINABILITY : DESIGN CRITERIA : TIME/ONLINE :  

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Facility: OPE

GM Title: PAYLOAD BAY DOOR CLOSING-HORIZONTAL

Pre-requisite Task GM:

Activity Registration: CLOSING OF PAYLOAD BAY DOORS PRIOR TO ROLLCUT FROM OPE.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Lead Count</th>
<th>Man-Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technician</td>
<td>3</td>
<td>76.8</td>
<td></td>
</tr>
<tr>
<td>Foreperson</td>
<td>1</td>
<td>12.3</td>
<td></td>
</tr>
<tr>
<td>Manager</td>
<td>0</td>
<td>0.2</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineer</td>
<td>0</td>
<td>0.2</td>
<td>N/A</td>
</tr>
<tr>
<td>Instructor</td>
<td>0</td>
<td>0.2</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>89.0</td>
<td>Time: 12.8</td>
</tr>
</tbody>
</table>

Legend: LINE/OFF-LINE  DESIGN CRITERIA  REQUIREMENTS

Technology Need Description:

Technology Candidate Identified:

Page is of poor quality
Technology Identification Sheet

Seg. Task No: 81.0090  Facility: OFF  OMI Page Count: 246
OMI No: V1034  OMI Title: ORBITER FLIGHT CONTROL FREQUENCY

RESPONSE TEST (LPS)
Subtask OMI(s): S3500, V9022, V5057, V9022, V7023

Prerequisite Task OMI:
Hazard: Y Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: A70-0999, S72-0841, H70-0570

Activity Description: DEMONSTRATE THE DYNAMIC PERFORMANCE OF THE FLIGHT CONTROL SYSTEM BY CONDUCTING A FREQUENCY RESPONSE TEST (FRT) AND/OR A STEP RESPONSE TEST ON THE FOLLOWING: AEROSURFACES, MPS-TVC SYSTEM.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LCC Ops</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0.0</td>
<td>Time: 0.0</td>
</tr>
</tbody>
</table>

Issues: FAULT DETECTION; DESIGN; MAINTAINABILITY

Technology Need Description:
SEE TIS 57 (V1003)

Technology Candidates Identified:
SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 61.002  Facility: OFF  OMI Page Count: 122
OMI No: VS10  OMI Title: ORBITER WEIGHT AND CENTER OF GRAVITY DETERMINATION USING PLATFORM SCALES AND OFF PLATFORM LIFTING SYSTEM
Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: N  LCC Support Required: N
GSE: A70-0544, A70-0600, C70-0994, H70-0508
H70-0570, H70-0758, P72-1001

Activity Description: TO CONFIGURE FOR AND PERFORM A THREE POINT ORBITER WEIGHING

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  16  192.0  N/A
Elect. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  16  192.0  Time:  12.0

Issues: DESIGN/GSE: REQUIREMENTS TIME/ON-LINE COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 63.000  Facility: OFF  OMI No: N52XX  OMI Page Count: 0

OMI Title: DOWN CARGO OFFLOAD/DECONFIGURE

Subtask OMI(s):

Prerequisite Task OMI:  

Hazard: Y  Level:  

Vehicle Power Required: N  LCC Support Required: N

Activity Description: REMOVE ANY CARGO, CARGO EQUIPMENT OR CARGO RELATED SHUTTLE EQUIPMENT REMAINING FROM THE PREVIOUS MISSION.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>4</td>
<td>122.0</td>
<td></td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>1</td>
<td>48.0</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>9</td>
<td>0.2</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Cgs.</td>
<td>6</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>6</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>240.0</td>
<td>Time: 48.0</td>
</tr>
</tbody>
</table>

Issues: DESIGN  

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 84.002
OMI No.: V75.2

Subtask OMI(s): 

Prerequisite Task OMI: 

Hazard: N
Level: 

Vehicle Power Required: N
LCC Support Required: N

GSE: 

Activity Description: INSTALL PAYLOAD ACCESS PLATFORMS IN THE ORBITER PAYLOAD BAY TO PROVIDE ACCESS TO CARGO AND AIRBORNE SUPPORT EQUIPMENT.

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>User Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>4</td>
<td>32.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Sp.</td>
<td>0</td>
<td>0.0</td>
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</tr>
<tr>
<td>Support</td>
<td>0</td>
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<tr>
<td>Engineering</td>
<td>3</td>
<td>32.3</td>
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</table>

Total: 9

Issues: TIME/ON-LINE ; DESIGN ; REQUIREMENTS ; COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
## Technology Identification Sheet

**Seg., Task No:** N/A  
**OMI No.:** N/A  
**RECONFIGURATION:** N/A  
**Subtask OMI(s):** N/A  

**Prerequisite Task OMI:** N/A  
**Hazard:** N  
**Level:** N/A  
**Vehicle Power Required:** N  
**LCC Support Required:** N  
**CSE:** N/A  

**Activity Description:** REMOVE EQUIPMENT FROM AFT FLIGHT DECK USED TO SUPPORT CARGO ON PREVIOUS MISSION AND INSTALL EQUIPMENT REQUIRED TO SUPPORT NEXT MISSION.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech</td>
<td>0</td>
<td>0.2</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech</td>
<td>2</td>
<td>336.0</td>
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<tr>
<td>Quality</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops:</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>6</td>
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<td>N/A</td>
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<tr>
<td>Total:</td>
<td>2</td>
<td>336.0</td>
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</table>

**Time:** 168.0

**Issues:** DESIGN CRITERIA : REQUIREMENTS : COST/MANHOURS : TIME/ON-LINE

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Subtask GMI(s):

Prerequisite Task GMI:

Hazard: Y Level:

Vehicle Power Required: N  LCC Support Required: N

GSE:

Activity Description: RECONFIGURE THE PAYLOAD BAY BRIDGES (KEEL & LONGERON) AND SMCH CABLES TO SUPPORT NEXT MISSION.

Personal:  Task Count  Man Hours  Remarks
Mech. Lead:   4    768.0
Elect. Tech:    3   876.0
Quality:      2    0.0   N/A
LCC Lead:      2    0.0   N/A
Support:       2    0.0   N/A
Engineering:   3    0.0   N/A
Total:         7  1344.0  Time:  172.0

Issues: TIME/ON-LINE : COST/MANHOUR : REQUIREMENTS : DESIGN CRITERIA

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: 07.000  
OMI No.: N/A  
OEM Title: PAYLOAD BAY RADIATOR FUNCTIONAL/KU/  
Vehicle Power Required: N  
LCC Support Required: N  
Activity Description: SCHEDULE OPPORTUNITY TO PERFORM RADIATOR FUNCTIONAL TEST, KU BAND TEST, RMS INSTALLATION AND TEST, AND FUEL CELL TANK SET INSTALLATION/REMOVAL.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>4</td>
<td>480.0</td>
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<tr>
<td>Elec. Tech.</td>
<td>3</td>
<td>360.0</td>
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</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Spec.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
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</tr>
<tr>
<td>Total:</td>
<td>7</td>
<td>940.0</td>
<td>Time: 120.0</td>
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</table>

Issues: TIME/ON-LINE, COST/MANHOURS, DESIGN CRITERIA, REQUIREMENTS

Technology Need Description:

Technology Candidates Identified:
**Technology Identification Sheet**

<table>
<thead>
<tr>
<th>Seg. Task No.</th>
<th>Facility</th>
<th>OMI Title</th>
<th>OMI Page Count</th>
</tr>
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<tbody>
<tr>
<td>82.000</td>
<td>OFF</td>
<td>ORBITER/PAYLOAD BAY INTERFACE</td>
<td>2</td>
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</tbody>
</table>

**Subtask OMI(s):**

**Prerequisite Task OMI:**

**Hazard:** N  
**Level:**  
**Vehicle Power Required:** Y  
**LCC Support Required:** Y

**GSE:**

**Activity Description:** VERIFY THE COPPER PATHS OF THE ORBITER TO THE CARGO INTERFACE PLATE IN THE PAYLOAD BAY.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech</td>
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<td>289.0</td>
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<tr>
<td>Quality</td>
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<td>0.0</td>
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</tr>
<tr>
<td>LCC Doc</td>
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<tr>
<td>Support</td>
<td>0</td>
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<tr>
<td>Engineering</td>
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</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>4</strong></td>
<td><strong>289.0</strong></td>
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</table>

**Time:** 72.0

**Issue:** COST/MANHOURS  
**MANHOURS:** TIME/ON-LINE  
**Requirements:** DESIGN CRITERIA

**Technology Need Description:**

**Technology Candidates Identified:**
**Technology Identification Sheet**

<table>
<thead>
<tr>
<th>Seq. Task No:</th>
<th>Facility:</th>
<th>OMI No:</th>
<th>OMI Title:</th>
<th>OMI Page Count:</th>
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<tbody>
<tr>
<td>101.000</td>
<td>VAB</td>
<td>T5244</td>
<td>TPS CLOSEDUT, ORBITER JACK PADS</td>
<td></td>
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**Subtask OMI(s):**

**Prerequisite Task OMI:**

**Hazard:** N  **Level:** N  **Vehicle Power Required:** N  **LCC Support Required:** N

**Activity Description:** PERFORM NECESSARY TASKS TO PREPARE LH2 TANK SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT ORBITER JACK PADS AND APPLY POLYURETHANE FOAM.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>Mech. Tech.</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
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<td>Elec. Tech.</td>
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<td>0.3</td>
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<tr>
<td>Quality</td>
<td>2</td>
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<tr>
<td>Test Crew</td>
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<tr>
<td>Support</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Engineering</td>
<td>2</td>
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**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Subtask OMI(s): S301, S302, T1203, T1248, V2064, V2093, V2094, V3508, V3509, V5029, V6030, V9005

Activity Description: HOISTING AND MATING ORBITER TO EXTERNAL TANK AND UMBILICAL.
1) HOIST ORBITER/ET UMBILICALS.
2) CONFIGURE GSE TO MONITOR ET TANK PRESSURE.
3) INSTALL ORBITER/ET UMBILICAL PIPING.
4) INSTALL ORBITER/ET UMBILICAL PURGE CURTAINS.
5) HOIST SS/ET UMBILICALS.

Personal: Mech. Tech: 0, 0.0, N/A; Elec. Tech: 0, 0.0, N/A; Quality: 0, 0.0, N/A; LCC: 0, 0.0, N/A; Support: 0, 0.0, N/A; Engineering: 0, 0.0, N/A; Total: 0, 0.0, Time: 88.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

### Seq. Task No.: 102.000  
### Facility: VAR  
### GMI Title: INSTALL AND REMOVE INTERTANK ACCESS KIT  
### Subtask OMI(s): T6447  
### Prerequisite Task OMI:  
### Hazard: Y  
### Level: Vehicle Power Required: N  
### LCC Support Required: N  
### GSE: A72-0893, A78-3604, A78-3605  

**Activity Description:** INSTALL INTERTANK ACCESS KIT AND RELATED EQUIPMENT. REMOVE INTERTANK ACCESS KIT AND RELATED EQUIPMENT.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
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<th>Remarks</th>
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<tbody>
<tr>
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<tr>
<td>Elec. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Quality</td>
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<td>LCC Ops</td>
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**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seq. Task No.: 135.002
OMI No.: 85304
OMI Title: SRB SYSTEMS MATE AND CLOSEOUT

Facility: VAB
OMI Page Count: 452

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y
Level: 

Vehicle Power Required: N
LCC Support Required: N
GSE:

Activity Description: TO PROVIDE INSTRUCTIONS FOR THE SRB CLOSEOUT TASKS TO BE PERFORMED IN VAB HE-1/3 FROM PREPARATIONS FOR ET MATE THROUGH PREPARATIONS FOR ROLLOUT.

Personnel:

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<thead>
<tr>
<th>Group</th>
<th>Hand Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Mech. Test:</td>
<td>0</td>
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<tr>
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<td>0</td>
<td>0.0</td>
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<tr>
<td>Quality:</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LCC Ops:</td>
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<td>0.0</td>
<td>N/A</td>
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<td><strong>2</strong></td>
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Time: 17.0

Issues:

Technology Need Description:

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 11 (V5012)
Technology Identification Sheet

Seq. Task No: 105.000  Facility: YAB  OMI Page Count: 64
OMI No: T1201  OMI Title: ET VENT VALVE OPERATION - SS20

Subtask OMI(s): S9001, T1001

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N  LCC Support Required: Y
GSE: C72-1280, C77-0202-XXX, E78-0006

Activity Description: TO OPEN AND CLOSE THE ET VENT VALVES WITH THE ET MATED TO THE ORBITER IN THE INTEGRATION CELL.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  0  0.0  N/A
Elec. Tech:  0  0.0  N/A
Quality:  0  5.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  0  0.0

Issues:  

Technology Need Description:  

Technology Candidates Identified:
**Technology Identification Sheet**

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<th>VAB</th>
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<td>T1205</td>
<td>OMI Title:</td>
<td>ET CONTINGENCY PRESSURIZATION-ORBITER</td>
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<td>MATE HB-1/3</td>
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<td>Subtask OMI(s):</td>
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<td>Hazard: N Level:</td>
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<tr>
<td>Vehicle Power Required:</td>
<td>N</td>
<td>LCC Support Required:</td>
<td>N</td>
<td></td>
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</table>

**Activity Description:**

INITIATE ET LO2 AND LH2 TANK PRESSURE MONITOR. ACCOMPLISH CONTINGENCY PRESSURIZATION OF LO2 AND LH2 TANKS.

**Personnel:**

<table>
<thead>
<tr>
<th></th>
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<th>Remarks</th>
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</thead>
<tbody>
<tr>
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<td>N/A</td>
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<tr>
<td>Elec. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Ops.</td>
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<td>0.0</td>
<td>N/A</td>
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<td>Support</td>
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<tr>
<td>Engineering</td>
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<td>0.0</td>
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<td>0.0</td>
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**Issues:**

- :

**Technology Need Description:**

- :

**Technology Candidates Identified:**

- C - 2
Technology Identification Sheet

Seq. Task No: 106.002 Facility: VAB OMI Page Count: 440
OMI No: S0008 OMI Title: SHUTTLE INTERFACE TEST (LPS)

Subtask OMI(s): B1061, S0002, S3500, S7001, S7002, S7003, V14, V149, V1499, V5027, V5029, V9002

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
Precaution: Y

GSE: 806-0006, 80-1161, 80-1128, 80-003, 807-0002, 807-0031, 807-1127-2, 807-5007

Activity Description:
1) VERIFY ORBITER/MLP INTERFACES.
2) VERIFY ORBITER/ET ELECTRICAL AND FLUID INTERFACES.
3) VERIFY ORBITER/SSB INTERFACES.
4) VERIFY FUNCTIONAL OPERATION OF SRI SYSTEMS.

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man-Hours</th>
<th>Remarks</th>
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<tbody>
<tr>
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<tr>
<td>Elec. Tech.</td>
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<td>0.0</td>
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<td>LCQ Des.</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Reg. Task Age: 107,202
OMI No.: 060020
OMI Title: SHUTTLE FLIGHT CONTROL INTEGRATION

Subtask OMs: E1001

Prerequisite Task OMs:

Hazard: Y Level: Vehicle Power Required: Y
GSE: A77-0179

ACTIVITY DESCRIPTION: TO VERIFY COMMAND, FEEDBACK AND FAILURE DETECTION INTERFACES AND FUNCTIONAL OPERATION OF THE SHUTTLE SRB FLIGHT CONTROL SYSTEM.

<table>
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<tr>
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<th>Remarks</th>
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<tbody>
<tr>
<td>Communications</td>
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<td>Flight Test</td>
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<td>Procedure</td>
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<td>Electrical</td>
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Time: 6.5

Technology Need Description:

Technology Candidates Identified:

COMPLIMENT PAGE IS OF POOR QUALITY.
Technology Identification Sheet

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<th>T5248</th>
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Prerequisite Task OMI:
Hazard: N Level: Vehic. Power Required: N LCC Support Required: N GSE: N/A

Activity Description: TO PROVIDE DETAILED INSTRUCTIONS FOR PERFORMING INSPECTION OF EACH EXTERNAL TANK (ET), ET/ORBITER (ORB) INTERFACE AND ET/SOLID ROCKET BOOSTER (SRB) INTERFACE PRIOR TO MOVE OPERATIONS.

<table>
<thead>
<tr>
<th>Personnel:</th>
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<tr>
<td>Elec. Tech.</td>
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<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>LCC Ops.</td>
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<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Support</td>
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Technology Need Description:  

Technology Candidates Identified:
**Technology Identification Sheet**

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<td>A5214</td>
<td>OMI Title</td>
<td>SHUTTLE TRANSFER AND MATE TO PAD</td>
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<td>Subtask OMI(s)</td>
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<td>M3139</td>
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<td>Hazard: Y Level:</td>
<td>Vehicle Power Required: N</td>
<td>LCC Support Required: Y</td>
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<td></td>
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</table>

**Activity Description:** TO PROVIDE SEQUENTIAL INSTRUCTIONS FOR KSC OPERATIONS TO EFFECTIVELY TRANSFER THE SSV/MLP FROM VAB TO PAD. DOCUMENT IS WRITTEN FOR THE CT TO MOVE UNDER THE MLP ON THE FIRST DAY AND THE MOVE AND MATE TO PAD ON SECOND DAY OPERATION.

**Personnel:**

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Mech. Tech.</td>
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<tr>
<td>Elec. Tech.</td>
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<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LCC Ops</td>
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<tr>
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**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Sec. Task No.: T1002 Facility: VAB GMI Title: INSTALLATION/REMOVAL OF GO2 PRESS
GMI No: T1201 GMI Page Count: 62 LINE BLANK-OFF PLATE - INTEGRATION CELL
Subtask GMI(s): T1001, T1201

Prerequisite Task GMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
SSE: A79-3623-01, A78-3623-02, C78-1229, P78-3137-1-102

Activity Description: TO INSTALL GO2 PRESS LINE BLANK-OFF PLATE TO SUPPORT ORBITER ENGINE/PROPELLATION SYSTEM TESTING.

Personnel:

<table>
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<tr>
<th>Personnel</th>
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<tr>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 111.000  Facility: VAF  OMI Page Count: 78

OMI No: T120

LINE BLANK-OFF PLATE, INTEGRATION CELL

Subtask OMI(s): G9201, S9001, T1001, T1050

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N  LCC Support Required: Y

SSE: A79-3623-01, A79-3623-02, C78-1229, P78-3137-1-101

Activity Description: TO INSTALL GH2 PRESS LINE BLANK-OFF PLATE, TO SUPPORT ENGINE/PROPULSION SYSTEM TESTING IN VAB INTEGRATION CELL. THE BLANK-OFF PLATE MAY BE REMOVED, IF REQUIRED, AT PAD A PER OMI T1401, OR IN THE INTEGRATION CELL PER THIS OMI.

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech. Tech.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
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<tr>
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<tr>
<td>LCC Ops.</td>
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<td>Support</td>
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<td>Engineering</td>
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Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 200.000  Facility: PAD  OMI Page Count: 152
OMI No: A5214  OMI Title: SHUTTLE TRANSFER AND MATE TO PAD

Subtask OMI(s): B5306, C5002, C9010, M3051
M3139, C3006, G5001, G6014
S3001, S3002, 76248, V1111, V3509

Prerequisite Task OMI: 
Hazard: Y Level: 
GSE: 

Vehicle Power Required: N  LCC Support Required: Y

Activity Description:
TO PROVIDE SEQUENTIAL INSTRUCTIONS FOR KSC OPERATIONS TO EFFECTIVELY TRANSFER THE SSV/MLP FROM VAB TO PAD. DOCUMENT IS WRITTEN FOR THE CT TO MOVE UNDER THE MLP ON THE FIRST DAY OF THE MOVE AND MATE TO PAD ON SECOND DAY OPERATION.

Personnel:

<table>
<thead>
<tr>
<th>Personnel Type</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
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Total: 0 0.0

Time: 8.0

Issues: 

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 291.000  Facility: PAD  OMI Page Count: 466
OMI No: 50099  OMI Title: SHUTTLE LAUNCH PAD VALIDATION WITH
CONTINGENCY APU CONFIDENCE RUN (LPS)
Subtask OMI(s): SEE PAGE 15 , THRU 24 FOR , 179 SEPARATE , TASK CALLOUTS

Prerequisite Task OMI:
Hazard: Y  Level: Vehicle Power Required: Y  LCC Support Required: Y
OMI:  
GSE: H70-0865, A70-0640-2

Activity Description: PERFORM/VERIFY STS/MLP/PAD ELECTRICAL/PNEUMATIC/MECH.
INTERFACES. PERFORM/VERIFY LOX PAD/MLP MATE AND FUNCT CHECKS.
PERFORM/VERIFY LH2 PAD/MLP MATE AND FUNCT CHECKS. PERFORM/VERIFY GOX VENT
ARM/ET ALIGNMENT. VERIFY SSV RF/INSTRUMENTATION INTERFACES WITH THE PAD.
PERFORM/VERIFY PERFORMANCE OF APU'S VIA APU CONFIDENCE RUN PERFORMANCE TEST.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  0  0.0  N/A
Elect. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  Time:  34.0

Total:  0  0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
**Technology Identification Sheet**

**Task:** Terminal Count Demonstration (LPS)

**Subtask OMI(s):** See Para 1.1.3, for 66 SUBTASK, LISTING

**Prerequisite Task OMI:**

- **Hazard:** Y
- **Level:**
- **Vehicle Power Required:** Y
- **LPC Support Required:** Y
- **GSE:** S70-1232, S70-0932-2, S72-0685-1, S72-1107-1
- **S70-0749, S70-1226-3, S70-0547, S70-0546**

**Activity Description:**
1) To demonstrate the sequence of crew operations required to prepare for shuttle launch from crew suiting through GLS cut-off (T-5 sec.)
2) To evaluate crew operation time lines.
3) To evaluate the inter-agency interfaces.
4) To interface the flight crew and the launch test team dress rehearsal.
5) To demonstrate launch abort saving and recycle to T-20 min.

**Personnel:**

<table>
<thead>
<tr>
<th>Role</th>
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**Time:** 24.0

**Issues:** TIME/ON-LINE: COST/MANOURS: REQUIREMENTS:

**Technology Needs Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seg. Task No: 223.000  Facility: FAD  OMI Page Count: 120
OMI No: V1202  OMI Title: MPS/SSME HELIUM SIGNATURE TEST

Subtask OMI(s): V1171  V1122  G6250  G6205
G6105

Prerequisite Task OMI:

Hazard: N  Level: Vehicle Power Required: Y  LCC Support Required: Y
GSE: U72-1186-2  S72-0685-X  A70-0668  A70-0698  C70-0743-7-068  C70-1187-001  F70-0033-1  S70-0534

Activity Description: PERFORM LEAK CHECK OF ISOLATED MPS/SSME SYSTEMS WITH HELIUM USING HAZ GAS DETECTION SYSTEM.

Personal:

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<tr>
<th>Personal</th>
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Time: 44.0

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq_Task No: 204.000  Facility: PAD  OMI Page Count: 496
OMI No: 52024  OMI Title: PRELAUNCH PROPELLANT SERVICING (LPS)

Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF 55 DIFFERENT SUBTASK OMI'S

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: S70-0547, S70-0548

Activity Description: SERVICES HYDRAZINE FOR EACH APU FOR NORMAL FLIGHT AND LOAD NITROGEN TO THE REQUIRED FILL ENVELOPE AFTER HYDRAZINE SERVICING. SERVICES 20 FRCS, ARCS, OMS PROPELLANT TANKS AND GHE, GN2 TANKS TO FLIGHT LOADS WITH N2O4, MMH, GHE AND GN2. SERVICES BAF HYDRAULIC POWER UNIT (HPU) FUEL SUPPLY MODULE WITH FUEL AND GN2 PRECHARGE. SERVICES PRSD SYSTEM WITH LO2 & LH2.

<table>
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<th>Remarks</th>
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Time: 100.0

Issues: TIME/ONLINE, COST/MANHOURS, DESIGN, REQUIREMENTS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No.: 205.000  Facility: PAD  OMI Page Count: 26
OMI No: S5009  OMI Title: FINAL ORDNANCE

INSTALLATION/CONNECTION AND AFT CLOSEOUT (LPS):
Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF , 42 SEPARATE , SUBTASK OMI'S ,

Prerequisite Task OMI:
Hazards: Y  Level: Vehicle Power Required: Y  LCC Support Required: Y
OPE: C72-1127-2

Activity Description: 1) INSTALL SRSS FLIGHT CODE. 2) PERFORM SRSS OPEN/CLOSED LOOP TESTS. 3) PERFORM POWER OFF STRAY VOLTAGE CHECKS, SHIELD TO GROUND RES.
CHECKS & ELECT CONNECT ALL PYRO DEVICES. 4) CONNECT ET & SRB SRSS CDF ASSY'S TO S&A DEVICES. 5) ET I/T CLOSEOUT. 6) CONNECT SRB IGN S&A CABLES & FULL PINS. 7) PIC RES & ROTATION. 8) SRB MECH CLOSEOUT 9) CARGO STRAY VOLTS 10) FINAL CONF

Personnel:
Mech. Tech: 0  Head Count  Man Hours: 0.0  Remarks: N/A
Elec. Tech: 0
Quality: 0
LCC Ops: 0
Support: 0
Engineering: 0
Total: 0  0.0  Time: 100.0

Issues: SAFETY: TIME/ON-LINE

Technology Need Description:
SEE TIS 57 (V1003)
SEE TIS 11 (V5012)

Technology Candidates Identified:
SEE TIS 57 (V1003)
SEE TIS 11 (V5012)
Technology Identification Sheet

Seq. Task No: 206.000  Facility: PAD  OMI Page Count: 904
OMI No: V9002.01-10  OMI Title: HYDRAULIC POWER UP/DOWN

Subtask OMI(s): S3506  , V1133  , V9001  

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
SSE: A70-0596  , C70-0094  , S72-0841  , S70-0843  , S70-0952  , S70-0661-1  , S72-0844-3  , S72-0844-4

Activity Description: APPLY HYDRAULIC GROUND POWER TO ORBITER TO SUPPORT HYDRAULIC OR ANY ASSOCIATED SUBSYSTEMS TESTING.

Personal:  Hour Count  Man Hours  Remarks
Mech. Tech:  2  0.0  N/A
Elect. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  0  0.0

Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 207.006  
OMI No: V-1049  
(OMI Title: SSME LEAK AND FUNCTIONAL (VERTICAL))

Subtask OMI(s):  

Prerequisite Task OMI:  

Hazard: Y  
Level:  
Vehicle Power Required: N  
LCC Support Required: N

GSE: A70-0668, A70-0698-1, C70-0902, C70-0907, S70-0902, S70-0905

Activity Description:
1) PERFORM CONTINGENCY LEAK AND FUNCTIONAL C/O IN VERTICAL
2) VERIFY SSME SYSTEM INTEGRITY FOLLOWING A PAD ABORT AFTER MAIN ENGINE IGNITION.

Personnel:

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<th>Personnel</th>
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Time: 30.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 202.002  Facility: PAD  OMI Page Count: 112
OMI No.: S1005  OMI Title: LO2 TOTAL SYSTEM DEW POINT AND ET

CONDITIONING
Subtask OMI(s): G6150, G9101, L02-9006, M3011, M3500, S9001, V1171, V5057

Prerequisite Task OMI:
Hazard: Y Level:
GSE: S72-1106-2
Vehicle Power Required: Y  LCC Support Required: Y

Activity Description: TO PURGE THE EXTERNAL TANK, TSM VENT, ORBITER AND ENGINES, AND ENGINE BLEEDLINE WITH GN2 FROM THE S72-0685-3 PANEL FOR A DEWPOINT OF 113 PPM H20 MAXIMUM. TO VERIFY REPLENISH FILL SYSTEM AND VAPORIZER FOR A DEW POINT OF 22 PPM H2O MAX PER G2124. TO PURGE MAIN FILL AND DRAIN INCLUDING CROSS COUNTRY LINE THRU THE TANK DRAIN LINE WITH GN2.. FOR A DEW POINT OF 113 PPM.

<table>
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Time: 12.0

Issues:

Technology Need Description:

Technology Candidates Identified:

...
Technology Identification Sheet

Seq. Task No: 209.000
OMI No: S1000
OMI Title: ET/FACILITY LH2 SYSTEM CONDITIONING

Subtask OMI(s): S6250
V5500
V5057

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: 

Activity Description: TO PURGE AND SAMPLE THE ET LH2 TANK AT LC39A. TO PURGE AND SAMPLE THE LH2 STORAGE AND TRANSFER SYSTEM.

Personnel:

Mech. Tech: 4
Elec. Tech: 2
Quality: 0
LCC Opt: 0
Support: 0
Engineering: 0
Total: 6

Man Hours: 0.0

Remarks: N/A

Time: 12.0

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 210.0010 Facility: PAD OMI Page Count: 510
OMI No.: V1103.01-03 OMI Title: EXTRAVEHICULAR MOBILITY

UNIT/FUNCTIONAL CHECKOUT (LPF)
Subtask OMI(s): M3095 , M6020 , S3500 , V3502
V3512 , V5057 , V5057 , V6003
V9001 , VL1

Prerequisite Task OMI:

Hazard: Y Level: Prerequisite Task OMI:
Vehicles Power Required: Y LCC Support Required: Y
GSE: A70-0962 , C70-0743-001 , S70-0690-1 , S70-0690-3 ,
S70-0834-1 , S70-0834-2 , S70-0787-2 , S72-1106-1

Activity Description: PROVIDE EMU INTERFACE VALIDATION TESTS AT OPF.
PROVIDE EMU FUNCTIONAL CHECKOUT AT PAD. (TWO UNITS)

PROVIDE EMU FUNCTIONAL CHECKOUT AT PAD. (2 EMU’S AND 1 SPARE)

Personnel:

<table>
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<th>Remarks</th>
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Issues: FAULT DETECTION : TIME/ON-LINE : DESIGN CRITERIA :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 211.000
OMI No: VI149
OMI Title: T-0 UMBILICALS INTERFACE LEAK CHECKS

Facility: PAD
OMI Page Count: 240

Subtask OMI(s): G6105, G6150, G6205, S9001, S3500, T1101, V9017, V5057, V1171

Prerequisite Task OMI:

Hazard: Y
Level: 
GSE: F70-0027, S70-0517, S70-0529, S70-0823-1, S72-0665-1, S72-0666-1, S72-1107-1, S72-1107-13

Vehicle Power Required: Y
LCC Support Required: Y

Activity Description:
1) LEAK CHECK THE INTERFACES BETWEEN THE ORBITER AND THE T-0 UMBILICALS AND THE ORB/ET DISCONNECTS.
2) TIMING OF ORB/ET DISCONNECT VALVES.
3) VERIFICATION OF LOC/LHC ORBITER/ET DISCONNECT CAVITY FORCES.

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Issues: MAINTAINABILITY : DESIGN

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 212.000  Facility: PAD  OMI Page Count: 182
OMI No: V2385  OMI Title: FCSS/PRSD DEWAR SERVICING LO2 AND LH2
(COMBINED LOADING) (LPS)
Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF 35 SEPARATE SUBTASK OMI’S.

Prerequisite Task OMI:
Hazard: Y  Level:  Vehicle Power Required: N  LCC Support Required: Y
GSE: C72-0811  S70-0817  S70-0830-2  S70-1220  S70-1222  S72-0694-6  S72-0697-3  S72-0699-2

Activity Description: PROVIDE THE NECESSARY STEPS TO SERVICE THE LO2 AND LH2 FCSS/PRSD DEWAR FOR SUBSEQUENT ORBITER PRSD CRYO LOADING OPERATION. THIS NEW OMI WILL BE USED FOR INITIAL SYSTEM VALIDATION OF THE S70-0817 SYSTEM (PAD B) AND SUBSEQUENT OPERATIONAL SERVICING OF THE ORBITER PRSD SYSTEM (PAD A AND PAD D).

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  0  0.0  N/A
Elec. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC Sup:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  0  0.0  Time:  7.0

Issues:  
Technology Need Description:

Technology Candidate Identified:
Technology Identification Sheet

Seg. Task No: 213.000  Facility: PAD  GMI Page Count: 2487
OHI No: S0007VL1-4  GMI Title: SHUTTLE COUNTDOWN (LPS)

Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF REQUIRED SUBTASK OMI'S

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
SSE: S70-0508-C,R  , Z70-0018-S  , A70-0719  , S70-1220  , S70-1228-01,-02, S72-1107-01  , S70-1232  , S70-0613

Activity Description: 1) TO PROVIDE THE SEQUENCE OF OPERATIONS REQUIRED TO PREPARE THE SHUTTLE FOR LAUNCH.
2) TO SERVICE CERTAIN PROPELLANTS AND GASES TO THE SHUTTLE FOR LAUNCH.
3) TO LAUNCH THE SHUTTLE.
4) TO PERFORM INITIAL PAD SAFING AFTER LAUNCH.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  0  0.0  N/A
Elec. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  0  0.0  Time: 60.0

Issues:  :  :

Technology Need Description:

Technology Candidates Identified:
## Technology Identification Sheet

**Subtask OMI(s):** A2293, E6000, V1176

**Prerequisite Task OMI:**

**Hazard:** Y

**Level:**

**Vehicle Power Required:** Y

**LCC Support Required:** Y

**Activity Description:** PROVIDE THE INTEGRATION CONTROL OF THE TRANSFER OF PAYLOADS TO THE PAD, PAYLOAD INSTALLATION IN THE PCR AND PAYLOAD INSTALLATION IN THE ORBITER.

(1US EXAMPLE)

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Mech. Tech.</td>
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<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
<td>0</td>
<td>0.0</td>
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</tr>
<tr>
<td>Quality</td>
<td>0</td>
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</tr>
<tr>
<td>LCC Supp.</td>
<td>0</td>
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<td>Support</td>
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<td>Engineering</td>
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**Total:** 0 0.0

**Time:** 80.0

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seq. Task No: 701.000
OMI No: N0433
IUS EXAMPLE

Subtasks: OMM (s): A2700
V1117

OMI Title: CARGO/ORBITER INTERFACE TEST (LPS)

OMI Page Count: 104

OMI File Count:

Prerequisite Task OMM:

Hazard: Y Level:

GSE:

Vehicle Power Required: Y LCC Support Required: Y

Activity Description: SUPPORT MDAC PAYLOAD AS REQUIRED DURING P/L CHECKOUT.

Personnel:
Mech. Tech:
Elec. Tech:
Quality:
LCC Ops:
Support:
Engineering:

Head Count:
0
0
0
0
0
2

Man Hours:
0.0
0.0
0.0
0.0
0.0
0.0

Remarks:
N/A
N/A
N/A
N/A
N/A
N/A

Total:
0
0.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Time: 26.0
**Technology Identification Sheet**

**Seq. Task No:** 382.000  
**OMI No:** N0131  
**OMI Title:** PAM EXAMPLE  
**Facility:** PAD  
**OMI Page Count:** 0

**Subtask OMI(s):**

**Prerequisite Task OMI:**

**Hazard:** N  
**Level:**

**GSE:**

**Vehicle Power Required:** N  
**LCC Support Required:** N

**Activity Description:** PAM

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<tbody>
<tr>
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<tr>
<td>Elec. Tech.</td>
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**Total:** 0  
**Time:** 51.0

**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Sec. Task No: 305.000   Facility: PAD   OMI Page Count: 94
OMI No: N0431   OMI Title: CARGO/ORBITER INTERFACE TEST (LPS)

Subtask OMI(s): E0431   , E1528   , E1543   , S3500
S9001   , V1117   , V3528   , V9001

Prerequisite Task OMI:

Hazard: Y Level:
GSE: C70-0727

Vehicle Power Required: Y   LCC Support Required: Y

Activity Description:SUPPORT MDAC PAYLOAD AS REQUIRED DURING F/L CHECKOUT.

(PAM EXAMPLE)

Personnel:

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<td>LCC Ops</td>
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<td>0.0</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 304.000
OMI No: N0130

Subtask OMI(s):
Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: N  LCC Support Required: N

Activity Description: SPACELAB

Personnel:

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<th>Man Hours</th>
<th>Remarks</th>
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<tr>
<td>Elec. Tech.</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 305.000  
OMI No: N0430  
(SPACELAB EXAMPLE)  
Subtask OMI(s):  
Prerequisite Task OMI:  
Hazard: N  
Level:  
GSE:  

Vehicle Power Required: N  
LCC Support Required: N

Activity Description: SPACELAB

Personnel:  
Mech. Tech: 2  
Elec. Tech: 3  
Quality: 2  
LCC Ops: 2  
Support:  
Engineering:  

Head Count:  
Man Hours:  
Remarks: N/A  

Total:  
Time: 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 401.020
OMI No: T5149
CHECKOUT/STORAGE CELL
Subtask OMI(s): 03016, 03011, 03208, 03235, T1102
OMI Title: ET OFF-LOAD MOVE AND SECURE IN
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N  LCC Support Required: N
GSE: H78-0839-2, H78-0847, H78-3004, H78-3006, H78-3028, H78-3040, M78-0053

Activity Description: ET BARGE OFF-LOAD, MOVE TO VAB, REMOVE FROM TRANSPORTER, TRANSLATE TO VERTICAL AND INSTALL IN THE ET CHECKOUT/STORAGE CELL.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 0 0.0 N/A
Elec. Tech: 0 0.0 N/A
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
LCC Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 0 0.0 Time: 24.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

OMI Title: PREF ET CHECKOUT CELL/STORAGE CELL-HB-2

Subtask: OMI(s):

Prerequisite Task OMI:

Hazard: Y  Level:

Vehicle Power Required: N  LCC Support Required: N

GSE:

Activity Description: PLACE CHECKOUT/STORAGE CELL IN CONFIGURATION NECESSARY FOR RECEIPT AND INSTALLATION OF AN ET.

Personnel:

<table>
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<tr>
<th>Personnel</th>
<th>Need Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
<td>Elec. Tech.</td>
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<td>N/A</td>
</tr>
<tr>
<td>Quality</td>
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<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LCC Ops</td>
<td>2</td>
<td>0.0</td>
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<tr>
<td>Support</td>
<td>2</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Engineering</td>
<td>2</td>
<td>0.0</td>
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<tr>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 403.000 Facility: ET C/D CELL OMI Page Count: 114
OMI No.: T1102 OMI Title: LO2 TANK PREPS, PURGE, PRESSURIZATION
AND SAMPLING
Subtask OMI(s): T1101, T2001
Prerequisite Task OMI:
Hazard: Y Level: GSE:
Vehicle Power Required: N LCC Support Required: N

Activity Description: TO REMOVE SHIPPING AND STANDBY PRESSURIZATION GSE AND
REFRESSURIZE THE LO2 TANK, IF REQUIRED, TO LEAK TEST AND STANDBY PRESSURE
LEVELS. TO INSPECT THE 2 IN. DISCONNECT. TO SAMPLE THE LO2 TANK FOR DEW POINT.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 0 0.0 N/A
Elec. Tech: 0 0.0 N/A
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 2.0 N/A
Total: 0 0.0 Time: 20.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 404.000
OMI No: T1103
OMI Title: LH2 TANK PREPS, PURGE, PRESS AND LEAK TEST
Facility: ET C/D CELL
GMI Page Count: 102

SAMPLING
Subtask OMI(s): T1101, T2001

Prerequisite Task OMI:
Hazard: Y
Level:
Vehicle Power Required: N
LCC Support Required: N
GSE:

Activity Description: TO REMOVE SHIPPING AND STANDBY PRESSURIZATION GSE AND REPRESSURIZE THE LH2 TANK, IF REQUIRED, TO LEAK TEST AND STANDBY PRESSURE LEVELS. TO INSPECT 2 IN. AND 4 IN. DISCONNECTS. TO PURGE THE LH2 TANK WITH GHE, REPRESSURIZE AND SAMPLE FOR PERCENT HELIUM AND DEW POINT.

Personnel: Head Count Man Hours Remarks
Mech. Task: 0 0.0 N/A
Elect. Task: 0 0.0 N/A
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 3 0.0 N/A
Total: 0 0.0 Time: 20.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 465.006  Facility: ET O/C CELL  OMI_No: 76149  OMI_Title: ET RECEIVING INSPECTION

Subtask OMI(s):  

Prerequisite Task OMI:  


Activity Description: TO PROVIDE NECESSARY DETAILED INSTRUCTIONS TO PERFORM RECEIVING INSPECTION ON EACH EXTERNAL TANK (ET), ITS ASSOCIATED SHIP-LOOSE HARDWARE AND ENGINEERING CONFIGURATION VERIFICATION AFTER ARRIVAL AT KSC.

Personal:  

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<tr>
<th>Role</th>
<th>Man.Count</th>
<th>Man.Hours</th>
<th>Remarks</th>
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<tbody>
<tr>
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<tr>
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Time: 42.0

Technology Need Description:

Technology Candidate Identified:
**Technology Identification Sheet**

**Task No:** 100.000  
**OMI No:** T5042  
**OMI Title:** INSTALL AND REMOVE INTERTANK ACCESS KIT  
**QC Code:** T6447  

**Prerequisite OMI:**  
**Hazard:** N  
**Vehicle Power Required:** N  
**LPC Support Required:** N  
**CGS:** A72-0001, A72-3004, A78-5605  

**Activity Description:** INSTALL INTERTANK ACCESS KIT AND RELATED EQUIPMENT. REMOVE INTERTANK ACCESS KIT AND RELATED EQUIPMENT.

<table>
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<tr>
<th>Personnel</th>
<th>MAN POWER</th>
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<tbody>
<tr>
<td>Desig. Eng.</td>
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**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**

*ORIGINAL PAGE IS OF POOR QUALITY*
**Technology Identification Sheet**

**Seg. Task No:** 407.000  
**Facility:** ET C/O CELL  
**OMI Page Count:** 154  
**OMI No:** 56005  
**OMI Title:** SHUTTLE PYROTECHNICS DEVICES  
**Receiving Inspection, Storage, and Preinstallation Acceptance**

**Subtask OMI(s):**

**Prerequisite Task OMI:**

**Hazard:**  
**Y Level:**

**Vehicle Power Required:** N  
**LCC Support Required:** N

**GSE:** C72-1109, C72-1127-2, C72-1228, C77-0194, C77-0363

**Activity Description:** TO PERFORM A VISUAL EXAMINATION FOR DAMAGE AND DEGRADATION, FLIGHT CERTIFICATION, AND ELECTRICAL CHECKOUT PRIOR TO PLACING DEVICES IN STORAGE, TO CONDUCT PREINSTALLATION INSPECTION AND PERFORM FLIGHT BOX BUILDUP.

**Personnel:**

<table>
<thead>
<tr>
<th>Role</th>
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<th>Remarks</th>
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**Total:** 0  
**Man Hours:** 0.0  
**Remarks:** Time: 16.0

**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seq. Task No: 469.000  Facility: ET C/D CELL  OMI Page Count: 156
OMI No: T614B  OMI Title: GUPC AND GUCF QUICK DISCONNECT POST

LAUNCH REFURBISHMENT
Subtask OMI(s):  

Prerequisite Task OMI:  

Hazard: N Level:  

Vehicle Power Required: N  LCC Support Required: N

GSE: A78-362!  , F78-0048

Activity Description: TO REFURBISH/LEAK TEST GROUND HALF OF GUPC QUICK DISCONNECT, ONE 7 IN. GHZ VENT AND SIX 3/8 IN. PRESSURIZATION QUICK DISCONNECTS AFTER LAUNCH.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  0  0.0  N/A
Elect. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC OIM:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  0  0.0  Time:  96.0

Issues:

Technology Need Description:

Technology Candidate Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Subtask OMI(s):
Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N

GSE: A72-0853, A78-0856, A78-3604, C78-1229

Activity Description: TO VERIFY THAT LEAKAGE OF THE PENETRATIONS, FLANGES AND CLOSURES OF THE ET LH2/LO2 WHICH ARE DIRECTLY EXPOSED TO TANK PRESSURE IS WITHIN SPECIFICATIONS.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 0 0.0 N/A
Elec. Tech: 0 0.0 N/A
Quality: 0 0.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 0 0.0 N/A

Time: 40.0

Issues:

Technology Need Description:

Technology Candidates Identified:
**Technology Identification Sheet**

**Sen. Task No:** 410.002  
**OMI No:** T1147  
**PLATE (GU, GF):**  
**Subtask OMI(s):**  
**Prerequisite Task OMI:**  
**Hazard:** Y  
**Level:**  
**GSE:**  

**OMI Title:** INSTALL GROUND UMBILICAL CARRIER  
**Facility:** ET C/O CELL  
**OMI Page Count:** 106

**Vehicle Power Required:** N  
**LCC Support Required:** N

**Activity Description:** INSTALL AND MECHANICALLY CONNECT THE INTERTANK (I/T) GUUCP TO THE ET AND TO THE CHECKOUT CELL FACILITY SERVICES.

<table>
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<td>Elec. Tech:</td>
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**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**
**Technology Identification Sheet**

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<td>ET O/O CELL</td>
<td>176</td>
<td>ET ANCILLARY LEAK AND FLOW TEST</td>
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**OMI Title:**
ET ANCILLARY LEAK AND FLOW TEST

**OMI No:** T1107

**Facility:** ET O/O CELL

**OMI Page Count:** 176

**OMI Title:** ET ANCILLARY LEAK AND FLOW TEST

**Subtask OMI(s):**
- T1101
- T1102
- T1103

**Prerequisite Task OMI:**

**Hazard:** Y Level:  

**Vehicle Power Required:** N  

**LCC Support Required:** N

**GSE:** C78-1229, C78-5202

**Activity Description:**
PROVIDE THE PROCEDURES FOR LEAK TESTING THOSE ET LINES AND COMPONENTS WITHIN THE INTERTANK NOT DIRECTLY EXPOSED TO LO2 AND LH2 TANK INTERNAL PRESSURE AND FOR VERIFYING FLOW IN INTERTANK PURGE AND NOSE FAIRING PURGE SYSTEM.

**Personnel:**

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man. Hours</th>
<th>Remarks</th>
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<tr>
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<td>Elec. Tech.</td>
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<td>Quality</td>
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**Issue:**

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seg. Task No: 412.020
OMI No: 75143
COMPONENTS

OMI Title: INSTALL ET RANGE SAFETY SYSTEM

Facility: ET O/C CELL

Prerequisite Task OMI:

Subtask OMI(s):

Hazard: N Level:

GSE:

Vehicle Power Required: N
LCC Support Required: N

Activity Description: TO INSTALL ET RANGE SAFETY SYSTEM FLIGHT COMPONENTS PRIOR TO SRSS FUNCTIONAL TESTING.

Personnel:

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Total: 0 2.0

Time: 6.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 413.000
OMI No: T5142
OMI Title: SRSS ORD NANCE INSTALLATION

Facility: ET C/O CELL
OMI Page Count: 162

Subtask OMI(s): T1104, T1107

Prerequisite Task OMI:

Hazard: Y Level:
Vehicle Power Required: N
LCC Support Required: N
GSE: A78-0056, M75-0077-1, M78-0077-2

Activity Description: INSTALL AND CONNECT THE ET SRSS LINEAR SHAPED CHARGE (LSC) IN LO2 AND LH2 CABLE TRAYS. MECHANICALLY INSTALL SAFE AND ARM DEVICE. INSTALL LO2/LH2 RUBBER DAMS AND CABLE TRAY COVERS.

Personnel:

<table>
<thead>
<tr>
<th>Position</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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Issues:

Technology Need Description:

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 11 (V5012)
Technology Identification Sheet

Seq. Task No: A11-000
OMI No: T1145

OMI Title: PURGE BARRIER SEAL INSTALLATION

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: N
LCC Support Required: N

GSE:

Activity Description: INSTALL PURGE BARRIER SEALS AND INSPECT UMBILICALS.

Personnel:

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Issues:

Technology Need Description:

Technology Candidates Identified:
# Technology Identification Sheet

**Seq. Task No:** 415.000  
**OMI No:** T5141  
**Facility:** ET C/C CELL  
**OMI Title:** TPS CLOSEOUT, AFT HARDPOINT  
**OMI Page Count:** 82

## Subtask OMI(ies):

## Prerequisite Task OMI:

## Hazard: Y  
**Level:**

## GSE:

## Vehicle Power Required:** N  
**LCC Support Required:** N

### Activity Description:

PERFORM NECESSARY TASKS TO PREPARE LH2 TANK SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT AFT HARDPOINT CLOSEOUT AND APPLY POLYURETHANE FOAM.

<table>
<thead>
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<th>Remarks</th>
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**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Seq. Task No: 416.993
OMI No: T5136
CHECK PORTS
Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level: GSE:

OMI Title: TPS CLOSEOUT, HELIUM INJECT LEAK

Vehicle Power Required: N LCC Support Required: N

Activity Description: PERFORM NECESSARY TASKS TO PREPARE LO2 FEEDLINE SUBSTRATE, AND EXISTING THERMAL PROTECTION SYSTEM FOR APPLICATION OF POLYURETHANE FOAM L744A.

Maintenance: 0
Electronics: 0
Quality: 0
LCC Ops: 0
Support: 0
Engineering: 0

Total: 0

Time: 16.0

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 471.000
OMI No: T5238
OMI Title: TPS CLOSEOUT, HELIUM INJECT BOX

Facility: ET C/C CELL
OMI Page Count: 6

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:
Vehicle Power Required: N
LCC Support Required: N
GSE:

Activity Description: PERFORM NECESSARY TASKS TO PREPARE SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT HELIUM INJECT BOX CLOSEOUT AND APPLY L744A POLYURETHANE FOAM.

Personnel:

<table>
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<tr>
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<td>Elec. Tech.</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:

Time: 16.0

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 418,000  Facility: ET C/O CELL  OMI Page Count: 147
OMI No.: T101  OMI Title: GH2/GO2 VENT VALVE FUNCTIONAL TEST-
Subtask OMI(s):  OMII
Prerequisite Task OMI:  OMII
Hazard: Y Level:  Vehicle Power Required: N  LCC Support Required: Y
GSE: C78-1229  C78-1273  C78-1273-32

Activity Description: TO VERIFY THAT THE GH2/GO2 VENT VALVES OPEN AND CLOSE
WITHIN THE SPECIFIED TIMES, AND THAT THE VALVES CRACK AND RESEAT WITHIN THE
SPECIFIED PRESSEURES. TO LEAK CHECK THE GH2/GO2 VENT VALVE PILOT SENSE PORTS.

<table>
<thead>
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<th>Personnel</th>
<th>Head Count</th>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 417.000  
OMI No: T3160  
Facility: ET C/O CELL  
OMI Title: ET ELECTRICAL ALL SYSTEMS TEST HB-4/2  
OMI Page Count: 303

Subtask OMI(s): T1101, T1195

Prerequisite Task OMI:

Hazard: Y  
Level:  
Vehicle Power Required: Y  
LCC Support Required: Y  
GSE:  

Activity Description: TO PERFORM ELECTRICAL CIRCUIT INTEGRITY, MATE GSE CABLES, VERIFY RESISTANCE THRESHOLDS, LOAD LEVELS, ENERGY OUTPUTS, VERIFY SRSS AND ASSOCIATED SRB AND ORBITER ELECTRICAL INTERFACES, OPERATIONAL INSTRUMENTATION SYSTEM, TUMBLE SYSTEM, ET HEATER SYSTEM AND DISCONNECT ELECTRICAL AND GCP PNEUMATICS GSE FROM ET PRIOR TO ET TRANSFER TO INTEGRATION CELL.

Personnel:  
Mech. Tech: 0  
Elect. Tech: 0  
Quality: 0  
LCC Ops: 0  
Support: 0  
Engineering: 0  

Head Count  Man Hours  Remarks

0  0.0  N/A
0  0.0  N/A
0  0.0  N/A
0  0.0  N/A
0  0.0  N/A  

Total: 0  0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

OMI No: T1108  CMI Title: LO2/LH2 DisCONNECT 17-IN. Flapper
VALVE MEASUREMENT, VERIFICATION AND INSPECTION-HB-2/4 CHECKOUT CELL
Subtask OMI(s):

Prerequisite Task OMI:
Hazard: Y Level:

Vehicle Power Required: N  LCC Support Required: N


Personnel:  Head Count  Man Hours  Remarks

Mech. Tech:  2  3.0  N/A
Elec. Tech:  0  0.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Supp.:  2  3.0  N/A
Engineering:  0  0.0
Total:  2  0.0  Time:  48.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 421.000
OMI No: T6248

Facility: ET C/O CELL
OMI Title: EXTERNAL TANK (ET) PREMOVE INSPECTION
OMI Page Count: 38

Subtask OMI(s): T5048

Prerequisite Task OMI:

Hazard: N Level:
Vehicle Power Required: N
LCC Support Required: N
GSE:

Activity Description: TO PROVIDE DETAILED INSTRUCTIONS FOR PERFORMING INSPECTION OF EACH EXTERNAL TANK (ET), ET/ORBITER (ORB) INTERFACE AND ET/SOLID ROCKET BOOSTER (SRB) INTERFACE PRIOR TO MOVE OPERATIONS.

Personnel:

<table>
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<th>Personnel</th>
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<th>Remarks</th>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 422.003
OMI No: TS148
OMI Title: PREP ET CHECKOUT CELL/STORAGE CELL

Facility: ET C/O CELL

OMI Page Count: 246

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level: 

Vehicle Power Required: N  LCC Support Required: N

Activity Description:
PLACE CHECKOUT/STORAGE CELL (VAB HB-2/-4) IN CONFIGURATION NECESSARY FOR RECEIPT AND INSTALLATION OF AN ET.

Personnel:

Mech. Tech: 0  Man Hours: 0.0  Remarks: N/A

Elec. Tech: 0

Quality: 0

LCC Ope: 0

Support: 0

Engineering: 0

Total: 0

Time: 6.0

Issues:

Technology Need Description:

Technology Candidate Identified:
Seg. Task No: 423.000  Facility: ET C/O CELL  OMI Title: ET MOVE FROM STORAGE CELL TO CHECKOUT CELL/FROM CHECKOUT CELL TO STORAGE CELL

Subtask OMI(s): 12006, 12026, 03008, 06006
03022, 03016, 03235, 50003, T5128
T5148, T6248

Prerequisite Task OMI:

Hazard: Y  Level:  

Vehicle Power Required: N  LCC Support Required: N

GSE: H78-0839-2, H78-0847, H78-3006, H78-3008
H78-3028, H78-3040, M78-0063

Activity Description: MOVE ET FROM STORAGE CELL AND SECURE IN CHECKOUT CELL OR FROM CHECKOUT CELL AND SECURE IN STORAGE CELL.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
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Issues:

Technology Need Description:

Technology Candidates Identified: