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.

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 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

Seq. Task No.: [1]... Facility: [2]... OMI Page Count: [3].
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.: 1.330  Facility: OPE  OMI Page Count: 725
OMI No.: V1002  OMI Title: SHUTTLE LANDING-POST LANDING CONVOY

OPERATIONS -KSC (LPS)
Subtask OMI(s): 12004  13012  03053  03028
0605:  V3109   V3528   V3537   V1091
V3521:

Prerequisite Task OMI:

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

OMI: 170-0971  070-1115  H70-0508  S70-1218  S70-1226  S70-0508  S70-2534  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:  

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<td>Quality:</td>
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<td>0.0</td>
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Issues:  

Technology Need Description:  

Technology Candidates Identified:  

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 2.000  Facility: CPF  OML No.: V5029
OMI No.: V5099  OML Title: ORBITER SPOTTING, LIFTING AND
LEVELING
Subtask OML(s): V5099

Prerequisite Task OML:

Hazard: Y Level:
QE: H70-0570  H70-0760  A70-0600  H70-0590
P72-1001

Vehicle Power Required: N  LCC Support Required: Y

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.

Personal:

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<tr>
<td>Quality</td>
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<td>0.0</td>
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<tr>
<td>LCC Sup.</td>
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<td>0.0</td>
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<tr>
<td>Support</td>
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Time: 4.0

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Reg. Task No: 3.000 Facility: OPF
OMI No: V1158 OMI Title: OMS/RCS DESERVING (LPS)

Subtask OMI(s): V3511 , 03415 , W3103

Prerequisite Task OMI:
Level: Y Vehicle Power Required: Y
Grade: 570-0784-XX , 570-0865-XX , A70-0671-04 , A70-0672-XX ,
A70-1084 , F70-0031-02 , S70-0679-XX , S70-0695-XX

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

<table>
<thead>
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<th>Remarks</th>
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<td>N/A</td>
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<tr>
<td>LCC Ops</td>
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<td>N/A</td>
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<tr>
<td>Support</td>
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Issues: DESIGN CRITERIA AUTOMATION COST/MANHOURS ACCESSIBILITY

Technology Need Description:

Technology Candidates Identified:

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### Technology Identification Sheet

- **Seq. Task No:** 4.000
- **GMI No:** V70321
- **GMI Title:** OME TRICKLE PURGE ACTIVATION/DEACTIVATION

#### Prerequisite Task GMI:

- **Prerequisite Task GMI:**
  - Vehicle Power Required: N
  - IOC Support Required: N
  - MBE: 570-0031-001(2), 570-0570-3(SLS), 570-0704-11(12), 570-0065-XX
  - 570-0968-XX, 570-1228-1(2), 570-0700-XX

#### Activity Description:

To perform necessary operations to support the OME trickle purge hook up, activation, deactivation.

### Personnel:

<table>
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<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<td>Engineers</td>
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<td>N/A</td>
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**Total:** 1, 24.2, Time: 12.8

### Technology Need Description:

### Technology Candidates Identified:
Technology Identification Sheet

Reg Task No: S.000  Facility: OFF  GML Case No: 007
Cost Center: ORBITER 프레드 크리 스 탠 (LPS)

Subtask DML(s): V3542  V3502  V7507  V7511
V7512  V5033  V5034  V9811-L1
V7814  I3117  M2063  03412

Intraactivity Task DML:

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

DSE: C70-0530  C70-0439  C70-0743-2  C70-0537  C70-0590  570-0786-2  570-1220  572-1106-1

Activity Description: TO PROVIDE INSTRUCTIONS TO DETANK AND INSERT ORBITER 프레드 LO2 AND LH2 TANKS AT OFF USING LPS.

Personnel:

Head Count  Man Hours  Remarks

Tech, Tech: 4  192.0
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: 4  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-MH BATTERY
3. NAS BATTERIES (LONG TERM)
4. LI/SCC2 BATTERIES (LONG TERM)

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Technology Identification Sheet

Trial Task No: 6.200 Facility: OFF GMI Page Count: 167
GMI No: V5372 GMI Title: PYRO REMOVAL AND SYSTEM SAFING

Subtask GMI(s):

Prerequisite Task GMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: H70-0545-2 SN2, H72-1006 SN1, A72-1014, E70-0011
H72-1203, H72-1005

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

Personnel:

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<th>Remarks</th>
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<tr>
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<tr>
<td>Quality</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Page Task No: 7.000 Facility: OFF
GMI No: V5687

GMI Title: TVC/SSME GSE INSTALLATION/REMOVAL

Subtask GMI(s): V2270, V3508, V3512

Prerequisite Task GMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: A70-0501, A70-0903, A70-1056, M70-0629
M70-0021, M70-0024, S70-0902, 872-1107-1

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

Personnel:

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<th>Personnel</th>
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Issues:

Technology Need Description:

Technology Candidates Identified:
### Technology Identification Sheet

**Reg. Task No:** 2500  
**Facility:** OPF  
**OMI Page Count:** 25  
**OMI Task:** V5803  
**OMI Title:** ORBITER FERRY KIT REMOVAL AND PREPARATION FOR ORBITER ACCESS

**Subtask OMI(s):**  
-  
-  
-  
-  

**Prerequisite Task OMI:**  
-  
-  
-  
-  

**Hazard:** Y  
**Level:**  
**Vehicle Power Required:** N  
**LCO Support Required:** N  
**GSE:** A70-0603, A70-0657, A70-0672-XX, A70-0702, A70-0706, A70-0797, A70-0791, A70-1011

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

### Personnel:

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**Issues:** ACCESSABILITY

**Technology Need Description:**

**Technology Candidates Identified:**
Technology Identification Sheet

Reg. Task No: 9.008  Facility: OFF  OML Page Count: 446
OML No: V5017  OML Title: CREW SYSTEMS DESTRUCTION

Subtask OML(s): V5024  V5067

Prerequisite Task OML:

Hazard: Y  Level:  Vehicle Power Required: N  LCC Support Required: N
SSE: A70-0541, P70-0805, P70-0806, H70-0857, A70-0712, A70-0796

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

Personnel:

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Issues:  

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No.: 10,000 Facility: OFF
CMI No.: V9001VL1-VL4 CMI Page Count: 1347
CMI Title: ORBITER POWER UP/DOWN-OFF (OFF)

Subtask UMI(s): V3500 , V3502 , V3507 , V3512
V1104 , C2008

Prerequisite Task UMI:

Hazard: N Level:
Vehicle Power Required: Y LCC Support Required: Y
SSE: C70-0507 , C72-1079 , C72-1250 , S70-0599-1,
S70-0500-2 , C70-0532 , C70-0910 , E70-0010

Activity Description: PROVIDE STANDARD INSTRUCTIONS FOR ORBITER POWER UP AND
DOWN INCLUDING THE SSE REQUIRED FOR THE BASIC SUPPORT SYSTEMS, I.E. 2PD, INSTRUMENTATION, ECLS AND DPS.

Personnel:

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<th>Head Count</th>
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Issues: DESIGN CRITERIA ; COST/MANPOWER ; REQUIREMENTS ; EXPERT SYSTEM

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Section Task No: 11.000 Facility: OFF
OMI No: V5012
(OMI)
OMI Title: ORDANCE INSTALLATION AND CHECKOUT

Subtask OMI(s): S3500  , S6005  , V1006  , V3502
V9001  , V9002.07  , V9024

Prerequisite Task OMI:

Hazard: Y Level:

GSE: H72-1003  , C72-1127-2  , C72-1128  , H72-1014
H72-1005  , E70-0011  , H72-0565-02  , H72-1006

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

Personnel:

<table>
<thead>
<tr>
<th>Task</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
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<td>LCC/Doc:</td>
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<tr>
<td>Support:</td>
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<tr>
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<tr>
<td>Total:</td>
<td>11</td>
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</tbody>
</table>

Issues: SAFETY

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

Technology Candidates Identified: NITINOL APPLICATION (NITINOL - A
WICKEL-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
CMI No: V1184

PROCEDURES (LPS)

Support CMI(s):

Pre-requisite Task CMI:

Hazard: N Level:

Vehicle Power Required: Y

LOC Support Required:

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

Personnel:

<table>
<thead>
<tr>
<th>Tech. Tech.</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tr>
<td>LOC Ops.</td>
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<td>0.2</td>
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<td>Total</td>
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Issue: TIME/ON-LINE : REQUIREMENTS : 

Technology Need Description: 

Technology Candidates Identified: 
Technology Identification Sheet

DOE Task No.: 13000  Facility: OFF  OML Page Count: 142
OML No.: V1200  OML Title: ORBITER FLIGHT RECORDER DUMP TO SEE DURING POST LANDING OPERATIONS
Subtask OML(s): , , , ,

Prerequisite Task OML: , , , ,
Hazard: N  Level: , , , ,
Vehicle Power Required: N  LCC Support Required: N
GSE: , , , ,

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

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech.:  1  12.0
Elect. Tech.:  4  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:  5  60.0  Time: 12.0

Issues: FAULT DETECTION : REQUIREMENTS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

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

**Seq. Task No.**: 14.800

**GMI No.**: V1003.01-03

**GMI Title**: CAUTION AND WARNING TURNAROUND

**Verification (LPS)**

**Subtask GMI(s)**: 9001, V9001, V9036

**Prerequisite Task GMI**: 

**Hazard**: N

**Level**: 

**Vehicle Power Required**: Y

**LCC Support Required**: Y

**GSE**: 

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

---

**Personnel**: 

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man Hours</th>
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<td>LCC Ops</td>
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**Issue**: DESIGN

**Technology Need Description**: SEE TIS 57 (V1003)

---

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

Seq_Task_No: 15.000     Facility: OFF     OMI Page_Count: 1769
OMI No: V5043VL1-VL3     OMI Title: SSME HEAT SHIELD INSTALLATION AND
REMOVAL
Subtask OMI(s): V3508     , V3512     , V3511     , V2272
V5057     , V1007
Prerequisite Task OMI:

hazard: Y Level: Vehicle Power Required: N     LCC Support Required: N
SSE: H70-0022-1     , H70-0855-1     , H70-1352     , H70-0541-01
A72-1323     , H70-0538

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

Personnel:

<table>
<thead>
<tr>
<th></th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Elec_Tech:</td>
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</table>

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
Desc: C72-1109, C72-1127-2

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

Personnel:  
Head Count  Man Hours  Remarks
Mech. Tech:  3  12.0  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:  3  12.0  Time: 4.3

Issues:  

Technology Need Description:  

Technology Candidates Identified:  
Technology Identification Sheet

Seq. Task No: 17,000  Facility: OPF  QMI Page Count: 1030
CMI No: V1011.21-.07  QMI Title: SSME ENGINE LEAK AND FUNCTIONAL (LPS)
Subtask CMI(s): V1171, V9001VL4, V9002VL1

Prerequisite Task CMI:

Hazard: Y  Level: Vehicle Power Required: Y  LCC Support Required: Y
SSE: S72-1106-2, C72-1227, S70-0670-XX, C70-0907, C70-0743-XX, S70-0675-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:

<table>
<thead>
<tr>
<th>Personnel</th>
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<th>Remarks</th>
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<td>Engineering</td>
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Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANPOWER : RELIABILITY

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 18.000  | Facility: ODF  | OMI Page Count: 36
OMI No: V115  | OMI Title: ORBITER ATTITUDE REFERENCE

Subtask OMI(s):  |  |

Prerequisite Task OMI:  |  |

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

ESE:  |  |

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

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: 4.0

Issues: TIME/ON-LINE  |  |

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 19.000  Facility: OPF  CMI Page Count: 648
OUI No: V5006.01-03  OMI Title: PAYLOAD BAY DOOR OPENING TO 145 OR
160 DEGREE MAINTENANCE POSITION (LPS)
Subtask OML(s): 03110   , V3508   , V0001VL1   , S7500
V0034
Prerequisite Task OML:
Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
SGM: A70-0560   , A70-0893   , C70-0807   , C70-0870   ,
H70-0529   , H70-0728   , H70-0829   , H72-0826-5

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

Personnel:  Head Count  Man Hours  Remarks
Tech. Tech:  0  96.0  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  96.0  Time: 12.0

Issues: ACCESSABILITY :DESIGN :REQUIREMENTS :TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:
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:  Head Count  Man Hours  Remarks
Mech. Tech:   2   6.0
Elect. Tech:   3   9.0
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  15.0
Time:          3.0

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 OML Page Count: 1856
OML No: V1009.01-.05 OML Title: MPS LEAK AND FUNCTIONAL TEST (LPS)

Subtask OML(s): V1171
S3500, V3502, V9061

Prerequisite Task OML:

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:

<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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Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
## Technology Identification Sheet

**Seg. Task No:** 22.000  
**Facility:** OFF  
**OGI Page Count:** 153  
**OGI Title:** CABIN AIR RECIRCULATION INSPECTION

**Subtask OGI(s):**

Prerequisite Task OGI:

**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.

### Personnel

<table>
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<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
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<tbody>
<tr>
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<td>LCC Ops</td>
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<td>Support</td>
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### Issues

- ACCESSABILITY
- DESIGN
- MAINTAINABILITY

### Technology Need Description:

### Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 23.000  Facility: OFF  OML Page Count: 1031
OML No: V5E02  OML Title: SPACE SHUTTLE MAIN ENGINE LRU
COMPONENT REMOVAL/INSTALLATION-HIGH PRESSURE OXIDIZER TURBOPUMP (LPS)
Subtask OML(s): V5012, V5043, V3509, V5057, V9002, V3553

Prerequisite Task OML:

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 OMF (HOR).

Personnel:

<table>
<thead>
<tr>
<th>Role</th>
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Issues: ACCESSIBILITY : MAINTAINABILITY : RELIABILITY : DESIGN

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 24.000 Facility: OFF OMI Page Count: 263
OMI No: V506 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, 03205
Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: H70-1203, H70-0526, H70-0774, A70-0501, S70-0902, S70-0695-2, A70-0963, H70-0565

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SSME HIGH PRESSURE FUEL TURBOPUMP (LRU) IN THE OFF (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  36.0
Total:  9  324.0  Line:  36.0

Issues: ACCESSIBILITY  :  MAINTAINABILITY  :  RELIABILITY  :  DESIGN

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 25.000  Facility: OEE  GMI Page Count: 44
GMI No: V0032  OEE Title: POST FLIGHT INSPECTION LESS TPS

Subtask GMI(s): ,

Prerequisite Task GMI:

Hazard: Y Level: Vehicle Power Required: N MCC Support Required: N
GSE: A70-0724, A70-0894, C70-0799, C70-0897

Activity Description: TO PERFORM VISUAL/NDT INSPECTIONS REQUIRED BY OMRS AND OME 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
MCC Ops: 0 0.0  N/A
Support: 0 0.0  N/A
Engineering: 0  
Total: 3 396.0  Time: 132.0

Issues: TECHNOLOGY :COST/MANPOWER :

Technology Need Description:  

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 26.000
OMI No: V003

Facility: DPF
OMI Title: ORBITER SHAKEDOWN INSPECTION INTERNAL

OMI Page Count: 102

Subtask OMI(s):

Prerequisite 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:

<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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<tr>
<td>Elec. Tech.</td>
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<tr>
<td>LCC Ops.</td>
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<tr>
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<tr>
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<tr>
<td>Total</td>
<td>4</td>
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Issues: MAINTAINABILITY : DESIGN CRITERIA : REQUIREMENTS

Technology Need Description:

Technology Candidates Identified:
**Technology Identification Sheet**

**Sec. Task No:** 27.000  
**CMI No:** V6028  
**CMI Title:** INSULATION INSPECTION  
**OMI Title:** POST FLIGHT ORBITER REUSABLE SURFACE  
**OMI Page Count:** 51  
**Subtask OMI(s):**  

**Prerequisite Task OMI:**  
**Hazard:** N  
**Level:**  
**GGP:** A72-0912-1  
**Vehicle Power Required:** N  
**LCC Support Required:** N  

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

### Personnel:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
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<tr>
<td>Elec. Tech.</td>
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<td>LCC Ops</td>
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<td>13</td>
<td>632.0</td>
<td>Time: 60.0</td>
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</table>

**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 ACOUSTO-OPTIC SENSING FEASIBLE  
- PHASE II WILL REFINES AND QUALIFY SENSOR, PROTOTYPE THE SYSTEM  
- BACKSCATTER X-RAY IMAGERY WILL BE INVESTIGATED UPON RECEIPT OF TILES.

* ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 28.000  Facility: OFF  OMI Page Count: 456
OMI No: VC024VL1-VLA  OMI Title: THERMAL PROTECTION SYSTEM RSI

MAINTENANCE

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N  Level: N  GSE:

Vehicle Power Required: N  LCD Support Required: N

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.

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>Engineering</td>
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Total: 0  Man Hours: 0.0  Time: 48.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 29.000  Facility: OPE  GMI Page Count: 279
GMI No.: V1053  OMI Title: ECLSS CABIN SENSOR FUNCTIONAL TEST
Subtask OMI(s): V3511  V3512
Prerequisite Task OMI:
Hazard: N  Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: C70-0748, 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 FP02 SENSORS PLUS A FUNCTIONAL TEST OF THE CABIN PRESSURE SENSOR.

Personnel: Head Count  Man Hours  Remarks
Mech. Tech.: 1  12.0  N/A
Elec. Tech.: 4  40.0  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: 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 IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No.: 30,200  Facility: OPF  OML Page Count: 24
OMI No.: V7335  OML Title: WINDOW POLISHING FOR CONTAMINATION REMOVAL

Subtask OMI(s):  
Prerequisite Task OMI:  

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>Role</th>
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<th>Man Hours</th>
<th>Remarks</th>
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<tr>
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<tr>
<td>Total</td>
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<td>120.0</td>
<td>Time: 60.0</td>
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</table>

Issues: TECHNOLOGY : MAINTAINABILITY : COST/MANHOURS :

Technology Need Description: POSSIBLE DESIGN SOLUTIONS INCLUDE:
* DEVELOP A NEW MATERIAL FOR THE WINDSHIELD WITH 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
* SEI (CRYSTALLINE CARBON TECHNOLOGY INITIATIVE)
* PENN STATE (CONSORTIUM ON DIAMOND FILM)
* NASA/LARC
* POLYCRYSTALLINE MgAl2O4 SPINEL (FOR HIGH PERFORMANCE WINDOWS)
* USE NITINOL TO JETTISON AN OVERLAY
Technology Identification Sheet

Seg. Task No: 31.000  Facility: GPF  OML Page Count: 210
OMI No: V1022  OML Title: FUEL CELL AND FOED SYSTEM TEST - (LP3)

Subtask OML(s): V3500 , V3502 , V3507 , V3511
V3512 , V3515 , V3527 , V5033 , V5034
V7001VL1 , V9014

Prerequisite Task OML:

Hazard: N  Level: Vehicle Power Required: Y  LCC Support Required: N
GSE: C70-0907 , C70-0743-2 , C70-0834-1,-2 , C72-1227
S70-0531-1,-2 , S70-0678-1,2,3 , S72-1106-1 , A70-0864

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

Personal:  Head Count  Man Hours  Remarks
Mech. Tech:  2  144.0
Elec. Tech:  1  72.0
Quality:  1  72.0
LCC Ops:  2  144.0
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  6  432.0  Time:  72.0

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: OPF  OMI Page Count: 372
OMI No: V3500  OMI Title: WASTE MANAGEMENT SYSTEM LEAK AND

Subtask OMI's: V3500 , V3511 , V3512 , V5967
V9001 , V9014

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: Y  LDC Support Required: Y
GSE: C70-0007 , C70-0743-001 , H70-0561-005 , A70-0658-002 ,
M70-0022 , S70-0791-2 , S70-0656 , P70-1013

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:

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<tr>
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<td>LDC Ops:</td>
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<td>Support:</td>
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<td>Engineering:</td>
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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:
GSE:

Vehicle Power Required: N  LCC Support Required: N

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

Personal:

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<th>Head Count</th>
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<td>LCC Ops.</td>
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<tr>
<td>Engineering</td>
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<td>476.0</td>
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Issues: TECHNOLOGY  :COST/MANHOURS  :DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Task OMI: V7002.01-10

Subtask OMI(s): S3500, V1133, V9001

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0096, C70-0094, S72-0041, S72-0043
S72-0052, S70-0061-1, S72-0044-3, S72-0044-4

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

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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Issues: TECHNOLOGY: COST/MANHOURS: DESIGN CRITERIA:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 35.000  Facility: OPP  OML Page Design: 76
OML No: V1/31  OML Title: ORBITER HYDRAULIC SYSTEM BN2

ACCUMULATOR SERVICING (LPS)
Subtask OML(s): V9001VL1, V9011, V9014

Prerequisite Task OML:

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 SAME
RETURN ACCUMULATOR TO FLIGHT PRESSURES IT SERVICING REQUIRED.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  3   72.0  N/A
Elect. Tech:  2   48.0  N/A
Quality:  0   0.0  N/A
EPC 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

Sequence Task No: 36.000  
OMI No: V9022  
OMI Title: ET UMBILICAL DOOR POSITIONING  
OMI Page Count: 52

Subtask (OMI(s)): V900:VL1

Prerequisite Task OMI:

Hazard: N  
Level:  
Vehicle Power Required: Y  
LCC Support Required: Y  
Use: A70-0603, A70-1031

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

Personnel:  

<table>
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<tr>
<th>Personnel</th>
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<td>QC Ops</td>
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Issues: COST/MANHOURS : REQUIREMENTS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 37.000  Facility: OFF  OMI Page Count: 209
OMI No.: V1123  OMI Title: ECLS ARE FUNCTIONAL TEST (LPS)

Subtask OMI(s): V3501, V9001VL1, V3511, V3512

Prerequisite Task OMI:

Hazard: N  Level:
GSE: C70-0548-01, C70-0679-03, C70-0796

Vehicle Power Required: Y  LCC Support Required: Y

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:  Head Count  Man Hours  Remarks
Mech. Tech.: 1  4.0
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: 4  16.0  Time: 4.0

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   GMI.Page.Count: 57
GMI_No.: V1134   GMI.Title: WATER DRAIN AND HAZARDOUS GASE DETECTION LINE VERIFICATION AND DRAIN/VENT FILTER REPLACEMENT
Subtask GMI(s):   

Prerequisite Task GMI:   
Hazard: N   Level:   Vehicle Power Required: N   LCC Support Required: 

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

Personnel: Head Count Man Hours Remarks
Mech. Tech.: 4 32.0   
Eng. Tech.: 2 16.0   
Quality: 0 0.0 N/A   
ATT. Stat.: 0 0.0 N/A   
Support: 0 0.0 N/A   
Engineering: 0 0.0 N/A   
Total: 0 48.0 Time: 2.0

Leads: DESIGN   MAINTAINABILITY

Technology Need Description:   

Technology Candidates Identified:   

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 39.000  Facility: OPF  OMI Page/Line: 7-4
OHI No: V1079  OMI Title: APU LUBE OIL SERVICING ignores

Subtask OMI(s): 63500  V9014  V3504  V3514

Transmit site Task OMI:

Hazrd: Y Lavel: Vehicle Power Required: Y  LOC Support Required:

GSE: 070-0743-002  070-0679-11  070-0779-3  070-0679-2
070-0709-11A  072-0694-5  070-0613  070-0752

Activity Description: PERFORM POST-FLIGHT CONTINGENCY SAMPLING & UPLAGE CHECK.
MAGNETIC CHIP INSPECTION, GEARBOX REPRESSURIZATION, OFFLOAD OIL AND PURGE WITH
GME. 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:

<table>
<thead>
<tr>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
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<tbody>
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<td>Mach. Tech:</td>
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Issues: TECHNOLOGY REQUIREMENTS DESIGN CRITERIA

Technology Need Description:

Technology Candidates Identified: 

11.01.2021 Page 1 of 10

OF POOR QUALITY
Technology Identification Sheet

Task No.: 40000  Facility: OFF  OMI No.: V3608  OMI: STAR TRACKER INSPECTION AND CLEANING

Related OMI(s): V3608, V3609, V3611

Prerequisite Task OMI:

Vehicle Power Required: Y  LCC Support Required: Y

Use: 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:  Head Count  Man Hours  Remarks

Mech. Tech:  1  3.0  
Elect. Tech:  1  3.0  
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: 2  16.0  Time: 0.4

Issues: TECHNOLOGY

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

Subtasks OMI(s): V3500, V9001, V3511, V3512, V7223, V9014, V2350, V3508, V3502

Prerequisite Task OMI:

Hazard: N  Level:  Vehicle Power Required: Y  LCC Support Required: Y
OPE: 770-0743-002, 770-0679-11, 770-0786, 770-1232, 770-0618-006

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

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>32.0</td>
<td></td>
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<tr>
<td>Elec. Tech</td>
<td>3</td>
<td>24.0</td>
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<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>
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<td>Engineering</td>
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<tr>
<td><strong>Total</strong></td>
<td>7</td>
<td>56.0</td>
<td><strong>Time:</strong> 0.0</td>
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</table>

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: A2.000  Facility: OFF  QMI Page Count: 1899
QMI No: V1005  QMI Title: ORBITER COMM. SYSTEM TEST (LPS)

Subtask QMI(s): D2013  , S3500  , V3502  , V3518
V99019L1  ,

Prerequisite Task QMI:

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.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  0  0.0  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:  3  24.0  Time:  3.0

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seg. Task No.: 43.000  Facility: OFF  OMI Page Count: 185  OMI No.: V1052
OMI Title: AIR DATA SYSTEM FUNCTIONAL CHECKOUT  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.

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  3  24.0  N/A
Elec. Tech:  2  16.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  2  14.0  N/A
Total:  5  40.0  Time:  3.0

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  OML Page Count: 324
OML No: V1076  OML Title: ORBITER WCCS FUNCTIONAL TEST

Subtask OML(s):

Prerequisite Task OML:

Hazard: N Level: Vehicle Power Required: N  LCC Support Required: N
GSE: 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>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<tbody>
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<td>192.0</td>
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<td>LCC Ops</td>
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<td>0.0</td>
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<td>0.0</td>
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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 PAY.
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: OFF  QMI Page Count: 616
QMI No: V1003  QMI Title: ORBITER NAV AIDS SYSTEM TEST (LPS)

Subtask QMI(s):

Prerequisite Task QMI:

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

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:

<table>
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<tr>
<th></th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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<td>Quality</td>
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<td>LCD Ope.</td>
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Issues: FAULT DETECTION

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 46.000  Facility: OPF  OMS Page Count: 199
OMI No: V1099  OMS Title: LANDING GEAR FUNCTIONAL TEST (LPS)

Subtask OMI(s): $3500  V9001VLL  V9002

Prerequisite Task OMI:
Hazard: Y  Level:  Vehicle Power Required: Y  ECC Support Required: Y
SSE: A70-0601  A70-0696  H70-0570  C70-0394  S70-0646  X70-0013-007

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

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  7  56.0
Elect. 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:  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

Seq. Task No: 47.000  
OMI No: V1018.02-04  
DESERVICING (LPS)  
Subtask OMI(s):  

Prerequisite Task OMI:  

Hazard: N  
GSE: S70-0775-2, S70-0790-1, S70-1231, A70-0792-3, A70-0790-2, S70-1232

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

<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>24.0</td>
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<tr>
<td>Elect. 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 Des.</td>
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<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
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<tr>
<td>Engineering</td>
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<tr>
<td>Total:</td>
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<td>48.0</td>
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Issues: TECHNOLOGY  
DESIGN CRITERIA  
REQUIREMENTS

Technology Need Description:  

Technology Candidates Identified:  

This page is of poor quality
Technology Identification Sheet

Seq. Task No: 48.000  Facility: OFF  OMI Page Count: 361
OMI No: V1033  OMI Title: POTABLE WATER SERVICING - WET SYSTEMS
KSC LANDING (LPS)
Subtask OMI(s): S9001VL1, V3502, V3504, V9001VL1
V9014

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-743-1, C70-1153, S70-0742, S70-0782-1, S70-0974

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

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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<td>120.0</td>
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<tr>
<td>Elec. Tech.</td>
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<tr>
<td>Quality</td>
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<td>0.0</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>0.0</td>
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<tr>
<td>Engineering</td>
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<tr>
<td>Total</td>
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<td>163.0</td>
<td>Time: 24.3</td>
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</table>

Issues: DESIGN

Requirements: TECHNOLOGY

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seg. Task No: 49.000  Facility: OPF  OMI Page Count: 370
OMI No: V1178  OMI Title: KU-BAND COMM/RADAR SYSTEMS TEST (LPS)

Subtask OMI(s): S3500, V1114, V1184, V3508
V3526, V3546, V5006.01, V9001VL1, V9001VL2

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
OSE: C70-0625, C70-0705, C70-0720, C70-0727, C70-0727-0, C70-1188

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

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>
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<td>16.0</td>
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<td>Elec. Tech.</td>
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<tr>
<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>
<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>
<td>Total</td>
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<td>56.0</td>
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</table>


Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No.: 50.000  Facility: OPF  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:
Hazard: N  Level:

Vehicle Power Required: Y  LCC Support Required: Y
SRC: Z70-0010-6, A70-0605-1

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

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  3  24.0
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:  3  24.0  Time:  9.2

Issues: TECHNOLOGY

Technology Need Description:
SEE TIS 5 (V1091)

Technology Candidates Identified:
SEE TIS 5 (V1091)
Technology Identification Sheet

Seq. Task No: 51.000

Facility: Off

OEM No: V1073

OEM Title: FUEL CELL SINGLE CELL VOLTAGE TEST (LFS)

Subtask OEM(s): S3500, V1050, V1091, V1120

V3502, V3507, V3511, V3512, V3515

V9001, V9014, V9016

Prerequisite Task OEM:

Vehicle Power Required: Y

LCC Support Required: Y

SSE: C70-0807, C70-0854, S70-0590, S70-0679-1

S70-0675-1, S70-0698-1, S70-0615-2, S70-0825-1, S70-0825-1, 2

Activity Description: TO PROVIDE PROCEDURES TO CONDUCT A SINGLE CELL VOLTAGE TEST (both the TAFEL TEST and GN2 DIAGNOSTIC TEST) OF THE ORBITER FUEL CELLS.

Personal:

Personnel: Head Count Man Hours Remarks

Mech. Tech: 3 0.0 N/A

Elect. Tech: 2 0.0 N/A

Quality: 2 0.0 N/A

LCC Ops: 2 0.0 N/A

Support: 0 0.0 N/A

Engineering: 0 0.0 N/A

Total: 9 0.0 Time: 0.0

Issues: TECHNOLOGY : TIME/ON-LINE :

Technology Need Description:

SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 5 (V1091)
Technology Identification Sheet

Seq. Task No: 52,000  Facility: OFF  OML Page Count: 351
OML No: V1077  OML Title: ORBITER/ET UMBILICAL CLOSEOUT DOOR

FUNCTIONAL TEST (LPS)
Subtask OMLs: S3500, V3502, V9001VL1

Prerequisite Task OML:

Hazard: N  Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: A70-0603, 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  Facility: OFF  OMI Page Count: 381
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 Level: Vehicle Power Required: N  LCC Support Required: N
GSE: 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:  Head Count  Man Hours  Remarks
Mech. Tech:  16  128.0  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:  16  128.0

Issues: COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

Prerequisite Task OMI:

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 PAG PRESSURE, DRAIN APU CAVITY DRAIN SYSTEM CATCH BOTTLES, AND PERFORM FUNCTIONAL TEST OF CATCH BOTTLE RELIEF VALVES AND ALCOHOL-FLOOD CAVITY DRAIN SYSTEM.

Personnel: Head Count Man Hours Remarks
Mech. Tech: 5 120.0
Elect. 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.: 55.000 Facility: OFF GMI Title: MASTER EVENT CONTROLLER/PYROTECHNIC
OMI No.: V1000 GMI Page Count: 550
INITIATOR CONTROLLER VERIFICATION (LPS)

Subtask OMI(s): V1000, V3502, V3507, V9001
53500

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C72-0202, C72-1128, E70-0011, C72-1280-1
C72-1127-2

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 GEAR.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
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<th>Remarks</th>
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<tr>
<td>LCC Ops.</td>
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<tr>
<td>Support</td>
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Time: 24.0

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: 7166  OMI Title: LANDING GEAR MAINTENANCE

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

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  4  288.0  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
Total:  4  288.0  Time: 72.0

Issues: DESIGN : REQUIREMENTS : TECHNOLOGY

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

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

Prerequisite Task OMI:

Hazard: N Level:  Vehicle Power Required: Y  LCC Support Required:  
GSE: C70-0807, C72-1250, C72-1079, S70-0508-2, C72-1233, C72-1337

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

Personnel:  Head Count  Man Hours  Remarks
Mech. Tech:  2  24.0  N/A
Elec. Tech:  4  46.0  N/A
Quality:  0  0.0  N/A
LCC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  72.0  Time: 12.0

Issues: FAULT DETECTION : DESIGN

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Technology Identification Sheet

Seq. Task No: 58.000   Facility: O/P   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, H70-0820, A70-1085

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

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: 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 59.000
OMI No.: V9019
Title: ORBITER MPS VACUUM JACKETED LINE

Checks and Servicing
Subtask OMI(s): V3527

Prerequisite Task OMI: ,
Hazard: N Level: ,
GSE: C70-1227

Activity Description: OBTAIN VACUUM READINGS ON THE MPS VACUUM-JACKETED PROPELLANT LINES PER ML0510-0030

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: 0.0

Issues: 

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No: 60.000 Facility: OFF OMI Page Count: 0
OMI No: N/A OMI Title: TPS WATERPROOFING

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: N LCC Support Required: N

QSE:

Activity Description: APPLY WATERPROOFING TO THE TPS TILE.

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>
<td>0</td>
<td>0.0</td>
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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>
<td>0</td>
<td>0.0</td>
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<tr>
<td>LCC Op.</td>
<td>0</td>
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<td>N/A</td>
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<tr>
<td>Support</td>
<td>0</td>
<td>0.0</td>
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<td>Engineering</td>
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<td>Total</td>
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</tr>
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Issues: TECHNOLOGY :COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 61.000
DML No: V1180
CHECKOUT (LPS): Subtask GMI(s): I2003, I2022, I3053, M2061, M3095, M3096, M3141, Q3415, V2119, W3103
Activity Description: TO DEMONSTRATE APS OMS/RCS GHE REGULATOR, CHECK VALVE AND RELIEF VALVE/BURST DISC FUNCTIONAL OPERATION AFTER EXTENDED NON-TEST PERIODS.

Personnel:

<table>
<thead>
<tr>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mech, Tech:</td>
<td>7</td>
<td>504.0</td>
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<tr>
<td>Elec, Tech:</td>
<td>3</td>
<td>216.0</td>
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<tr>
<td>Quality:</td>
<td>0</td>
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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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<tr>
<td>Engineering:</td>
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Total: 10 720.0

Issues: Time: 72.0

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seg. Task No: 62.000
Facility: OPF
OMI No: V1048
OMI Title: NOSE WHEEL STEERING CONTROL BOX
CHECKOUT (LPS)
Subtask OMI(s): V3500

Prerequisite Task OMI: V9991VL2, V9991VL3, V9992.01

Hazard: Y Level: Vehicle Power Required: Y
GSE: C70-0769

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>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Elec. Tech.</td>
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<td>12.0</td>
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<tr>
<td>Quality</td>
<td>0</td>
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<tr>
<td>Engineering</td>
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Total: 8 | 32.0 | N/A | Time: 4.0

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  Facility: OPF  OMI Page Count: 310
OMI No: V1005  OMI Title: BRAKE/ANTI-SKID CONTROL SYSTEM TEST
(LFS)
Subtask OMI(s): V3500 , V9001VL1 , V9001VL3 , V9002.01

Prerequisite Task OMI:
Hazard: Y Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: A70-0771 , A70-0787 ,

Activity Description: TO VERIFY THE SIGNALS, INTERFACES AND VOTING LOGIC OF THE
BRAKE AND SKID CONTROL SYSTEM.

<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>
<td>3</td>
<td>12.0</td>
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<tr>
<td>LCC Ops:</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

Reg. Task No: 64.000
OMI No: V1004

Facility: CFF
OMI Title: FLIGHT CONTROL AEROSURFACE CHECKOUT
OMI Page Count: 305
LPS

Subtask OMI(s): V3500, S9001, V1123, V9002.01
V9002.02, V9002.05

Prerequisite Task OMI:

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

Personnel:

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<th>Head Count</th>
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<th>Remarks</th>
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<td>28.0</td>
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<tr>
<td>Elec. Tech.</td>
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<td>12.0</td>
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<tr>
<td>Quality</td>
<td>0</td>
<td>0.0</td>
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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: 65.000 Facility: OFF
OMI No: V1053 OMI Title: FLIGHT CONTROL MPS TVC CHECKOUT AND SRB SIMULATED INTERFACE VERIFICATION (LPS)
Subtask OMI(s): S3500, S9001, V1123, V3502
V3503, V3504, V5057, V9001VL1, V9002

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCD Support Required: Y
USE: 670-0796  M70-002

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

Personnel: Head Count Man Hours Remarks
Mech. Tech: 1 8.0
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: 4 32.0 Time: 8.0

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

Seq. Task No.: 67.000 Facility: GPF OMI Page Count: 45
OMI No.: V1001 OMI Title: SSME ELECTRICAL INTERFACE
VERIFICATION (LPS)
Subtask OMI(s): V9001VL4

Prerequisite Task OMI:

Hazard: N Level:
GSE:

Vehicle Power Required: Y LCC Support Required: Y

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

Personnel: Head Count Man Hours Remarks
Mech. Tech: 1 4.0
Elect. 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: 4 16.0 Time: 4.0

Issues: 

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 68.000
OML No: V001
AND DESERVICING (LPS)
Subtask OML(s): V9001 , V9014 , S3500

Prerequisite Task OML:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: S70-0691-1 , S70-0691-2, S70-0825-1, S70-0825-2
S70-0825-3 , S70-0832-6

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

Personnel: Head Count Man Hours Remarks
Mech. Tech: 3 36.0
Elec. Tech: 3 36.0
Quality: 0 2.0 N/A
LCC Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 6 72.0 Time: 13.0

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: 69.000  Facility: OPI  GMI Page Count: 373  
GMI No.: V5050  GMI Title: CREW EQUIPMENT INTERFACE TEST

Subtask GMI(s): V5010, V5067, V5097

Prerequisite Task GMI:

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

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:

<table>
<thead>
<tr>
<th>Role</th>
<th>Head Count</th>
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<th>Remarks</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Elec. Tech.</td>
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<tr>
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<tr>
<td>LCC Ops.</td>
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</table>

Issues: DESIGN  COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

OMI No: V1201

Subtask OMI(s): V1111, V1171, V3535

Prerequisite Task OMI:

Hazard: N  Level:

GSE: A70-0702, S70-0534, S70-0695-2, S70-0695-8, 270-0023

Vehicle Power Required: Y  LCC Support Required: Y

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
OMI No: V1032
OMI Title: ORBITER CLOSEOUT PRIOR TO MOVE TO VAB

OMI Page Count: 32

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:

<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>LCC Ops</td>
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<td>0.0</td>
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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
OMI No: V1176
OMI Title: PAYLOAD BAY CLOSEOUT CLEANING-OPF
OMI Page Count: 146

Subtask OMI(s): V1508
Prerequisite Task OMI:
Hazard: N Level:
GSR:
Vehicle Power Required: N  LCC Support Required: N

Activity Description: TO CLEAN ACCESSIBLE PAYLOAD BAY SURFACES TO ONE OF THREE CLEANLINESS LEVEL OPTIONS AND TO QUALITATIVELY ASSESS THE TYPES AND LEVELS OF VARIOUS CONTAMINANTS WITH THE INTENT OF IMPROVING CONTAMINATION CONTROLS.

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>144.0</td>
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<tr>
<td>Elec. Tech.</td>
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<td>0.0</td>
<td>N/A</td>
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<td>Quality</td>
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<tr>
<td>LCC Ope.</td>
<td>0</td>
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<tr>
<td>Support</td>
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<tr>
<td>Engineering</td>
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Issues: COST/MANHOURS : REQUIREMENTS : DESIGN : TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

Subtask OMI(s): S3500, S9001, V9001VL1

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y  LCD Support Required: Y
GSE:

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:
LCD Ops: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 4 16.0 Time: 4.2

Issues: FAULT DETECTION:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 74.000  Facility: OPF  OMI Page Count: 738
OMI No: V1037  OMI Title: AMMONIA BOILER SERVICING, OPERATIONS
AND DESERVING (LFS)
Subtask OMI(s): I2003, M2063, M3011, M3022, M3039, W3103, S9001VL1, V9014

Prerequisite Task OMI:

Hazard: Y  Level:  Vehicle Power Required: Y  LCC Support Required: Y
GSE: S70-0654, S70-0776, S70-1201-1, S70-1201-2, S70-1201, S70-1211, S70-0695-3

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:

<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>Total:</td>
<td>10</td>
<td>240.0</td>
<td>Time: 24.0</td>
</tr>
</tbody>
</table>

Issues: COST/MANHOURS : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 75.000  Facility: OFF  CM Title: HEADS UP DISPLAY SYSTEM (HIDS, PDU)

CHECKOUT (LPS)
Subtask(s):

Prerequisite Task CM:
Hazard: N  Level:  Vehicle Power Required: Y  LOC Support Required: Y

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

<table>
<thead>
<tr>
<th>Personnel</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 Ops:</td>
<td>0</td>
<td>2.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support:</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>Engineering:</td>
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<tr>
<td>Total:</td>
<td>4</td>
<td>14.0</td>
<td>Time: 4.0</td>
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</table>

Issues: FAULT DETECTION:

Technology Need Description:

SEE TIS 57 (V1.003)

Technology Candidates Identified:

SEE TIS 57 (V1.003)
Technology Identification Sheet

Reg. Task No: 76.902
DNL No: V1028
UNIT CHECKOUT (LPC)
Support DNL(s): V3500

Pre requisite Task DNL:
Hazard: N Level:

Vehicle Power Required: Y LDC Support Required: Y

Activity Description: 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 ADB, ADB, ANV, F1 AND EFT ADI)

<table>
<thead>
<tr>
<th>Personnel</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>
</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>4</strong></td>
<td><strong>16.0</strong></td>
<td>Time: 4.0</td>
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</tbody>
</table>

Issue: FAULT DETECTION : REQUIREMENTS : SEE TIS 57 (V1003)

Technology Need Description:

Technology Candidates Identified:

SEE TIS 57 (V1003)

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seq. Task No.: 72.000
OMI No.: V1030
(MDDS) CHECKOUT (LPS)
Subtask OMI(s): S2500, S9001, V9001VL

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: Y
LCD Support Required:

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

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>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>
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<td>MDS Test:</td>
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<td>8</td>
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Issue: FAULT DETECTION : REQUIREMENTS :

Technology Need Description:

SEE TIS 57 (V1030)

Technology Candidates Identified:

SEE TIS 57 (V1030)
Technology Identification Sheet

Seq. Task No.: 78.000
OMI No.: V1171
OMI Title: MPS/SSME PRESSURIZATION OPERATION

Prerequisite Task OMI:

Facility: DPF

OMI Page Count: 597

Vehicle Power Required: Y
LCD Support Required: Y
GSS:

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: 2 0.0 N/A

Elect. Tech: 0 0.0 N/A

Mech: 2 0.0 N/A

LCR Tech: 0 0.0 N/A

Support: 0 0.0 N/A

Engineering: 0 0.0 N/A

Total: 2 0.0 N/A

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 79,000  Facility: OPF
OML No: V1007  OML Title: PVD STRUCTURAL LEAKAGE/POSITIVE
PRESSURE TESTING AND FILTER MAINTENANCE (LP5)
Subtask OML(s): V1111, V3511, V3512, V3555, V5067

Energy/Time Task OML:
Hazard: N Level: Vehicle Power Required: Y LCD Support Required: Y
ISE: A70-0767, C70-1187-2, F70-0033-1, S70-0538
F70-0050, S70-1310

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 PVC VENT
FILTERS.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mach. Tech</td>
<td>2</td>
<td>48.0</td>
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<tr>
<td>Elec. Tech</td>
<td>2</td>
<td>48.0</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>LCD Serv.</td>
<td>0</td>
<td>0.0</td>
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<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>2.0</td>
<td>N/A</td>
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<tr>
<td>Total</td>
<td>4</td>
<td>98.0</td>
<td>Time: 24.2</td>
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</table>

Issues: MAINTAINABILITY : DESIGN CRITERIA : TIME/ONLINE :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Task Number: 50.000
Facility: OPE

GRL Orden: 16

GRL title: PAYLOAD BAY DOOR CLOSING-HORIZONTAL

Release Order: 03119

V3508, V3506, V300001

Pre-requisite Task GRL:

Target: Y Level:
Vehicle Power Required: Y
LGR Support Required:

CRL: 970-6868, 978-0887, 978-0878

-70-0929, 970-6728, H78-0329, H72-0025-6

Activity Description: CLOSING OF PAYLOAD BAY DOORS PRIOR TO ROLL OUT FROM OPE.

Carolyn: Head Count: Man Hours: Remarks:

Task 1: 2: 26.8

Task 2: 1: 12.5

Task 3: 2: 8.0

Task 4: 1: 8.0

Task 5: 1: 8.0

Total: 9: 72.3

Time: 12.3

Target: TIME/ON-LINE: DESIGN CRITERIA: REQUIREMENTS:

Technology Need Description:

Technology Candidate Identified:

OF POOR QUALITY
Technology Identification Sheet

Seg. Task No: V1003 Facility: OFF GMI Page Count: 246

GMI No: V1003 GMI Title: ORBITER FLIGHT CONTROL FREQUENCY

RESPONSE TEST (LPS)

Subtask GMI(s): S3500, V9002.03, V5057, V9022, V7023

Prerequisite Task GMI:

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.

Personnel:

Mech. Tech: 0 Head Count: 0.6 Man Hours: 0.0 Remarks: N/A

Elect. Tech: 0 N/A

Quality: 0 N/A

LCC. Ops: 0 N/A

Support: 0 N/A

Engineering: 0 N/A

Total: 0 N/A Time: 0.0

Issues: MAINTENABILITY

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)
Title: ORBITER WEIGHT AND CENTER OF GRAVITY DETERMINATION USING PLATFORM SCALES AND ORBITER 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, C70-0894, H70-0508, H70-0570, H70-0748, P72-1001

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

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>16</td>
<td>192.6</td>
<td></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>
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<tr>
<td>Engineering</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>16</td>
<td>192.6</td>
<td>Time: 12.0</td>
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Issues: DESIGN (GSE): REQUIREMENTS : TIME/ON-LINE : COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 33.000, 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
OSE:

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

Personnel:

<table>
<thead>
<tr>
<th>Group</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>122.0</td>
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<tr>
<td>Elec. Tech.</td>
<td>1</td>
<td>42.0</td>
<td></td>
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<tr>
<td>Quality</td>
<td>0</td>
<td>0.2</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>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>Total</td>
<td>5</td>
<td>242.0</td>
<td>Time: 42.0</td>
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</table>

Issues: DESIGN

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 84.082
OMI No.: VT5.1

Facility: OFF
OMI Page Count: 0
OMI Title: INSTALL PAYLOAD BAY ACCESS

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N
Level:
GSE:

Vehicle Power Required: N
LCC Support Required: N

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

<table>
<thead>
<tr>
<th>Personnel</th>
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<th>Remarks</th>
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<tr>
<td>Mech. Tech.</td>
<td>4</td>
<td>6.0</td>
<td>N/A</td>
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<tr>
<td>Elec. Tech.</td>
<td>2</td>
<td>0.2</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 Alpha</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>2</td>
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<td>N/A</td>
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<tr>
<td>Engineering</td>
<td>6</td>
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<tr>
<td>Total</td>
<td>4</td>
<td>6.0</td>
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</table>

Time: 6.0

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 85.002
GMI No: N/A
RECONFIGURATION Subtask DMI(s):

Prerequisite Task DMI:
Hazard: N Level:

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

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>
<td></td>
</tr>
<tr>
<td>Quality:</td>
<td>3</td>
<td>0.0</td>
<td>N/A</td>
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<tr>
<td>LCC Ops:</td>
<td>2</td>
<td>0.2</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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<td>0.2</td>
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<td>Total:</td>
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Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANHOURS : TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Org. Task No: 36.000 Facility: OFF
OML No: N/A OML Title: PAYLOAD BAY RECONFIGURATION (MECH & ELECT)
Subtask OML(s):
Prerequisite Task OML:
Hazard: Y Level:
GSE:

Vehicle Power Required: N LCC Support Required: N

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

Personal:

<table>
<thead>
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<th>Personnel</th>
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<th>Remarks</th>
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<tr>
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<td>Mech.</td>
<td>0</td>
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<tr>
<td>Quality</td>
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<td>N/A</td>
</tr>
<tr>
<td>LCC Supp</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>
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<tr>
<td>Engineering</td>
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<td>0.0</td>
<td>N/A</td>
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<td>Total</td>
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Issues: TIME/ON-LINE : COST/MANHOUR : REQUIREMENTS : DESIGN CRITERIA

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: 67.000
OMI No.: N/A
RMS/TANK SET OPPORTUNITY
Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level:

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

Activity Description: SCHEDULE OPPORTUNITY TO PERFORM RADIATOR FUNCTIONAL TEST, KU BAND TEST, RMS INSTALLATION AND TEST, AND FUEL CELL TANK SET INSTALLATION/REMOVAL.

Personnel:  Head Count  Man Hours  Remarks

Mech. Tech:  4  480.0
Elec. Tech:  3  360.0
Quality:  0  0.0  N/A
LCC Ope:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  2  0.0  N/A
Total:  7  940.0  Time:  120.0

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: SS008 Facility: OFF
OMI No: N/A OMI Page Count: 3

OMI Title: ORBITER/PAYLOAD BAY INTERFACE

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.

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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</tr>
<tr>
<td>Elec. Tech</td>
<td>4</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 User</td>
<td>0</td>
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<tr>
<td>Support</td>
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<td>Engineering</td>
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Total: 4 288.0 Time: 72.0

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 101.000
OMI No: T5244

Facility: VAB
OMI Title: TPS CLOSEDOUT, ORBITER JACK PADS
OMI Page Count: 74

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 LH2 TANK SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT ORBITER JACK PADS AND APPLY POLYURETHANE FOAM.

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>N/A</td>
</tr>
<tr>
<td>Elec. Tech.</td>
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<td>0.2</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>
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<td>0.0</td>
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<tr>
<td>Engineering</td>
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<td>0.0</td>
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Total: 0 0.0 | Time: 16.0

Issues:

Technology Need Description:

Technology Candidates Identified:
## Technology Identification Sheet

<table>
<thead>
<tr>
<th>Activity Description: HOISTING AND MATING ORBITER 7'0 EXTERNAL TANK AND UMBILICAL HOOK-UPS. 1) TO MATE ORBITER/ET UMBILICALS. 2) CONFIGURE GSE TO MONITOR ET TANK PRESSURE. 3) INSTALL ORB/ET UMBILICAL PURGE CURTAINS. 4) TO INSTALL ORB ORD AT VAB PER OMI V2093 AND V2094.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal:</strong></td>
</tr>
<tr>
<td>Mech. Tech:</td>
</tr>
<tr>
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<td>Quality:</td>
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<td>LCC Supp:</td>
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<td>Time:</td>
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<td>Remarks:</td>
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<td>Mech. Tech:</td>
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<td>Quality:</td>
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<td>Remarks:</td>
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<tr>
<td>Technology Need Description:</td>
</tr>
<tr>
<td>Technology Candidates Identified:</td>
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</tbody>
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Technology Identification Sheet

Seq. Task No.: 192.000 Facility: VAR
GMI No.: T5048 GMI Page Count: 100
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: A72-0853 A78-3604 A78-3605

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

Personnel:

<table>
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<tr>
<th></th>
<th>Head Count</th>
<th>Min Hours</th>
<th>Remarks</th>
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<tr>
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Time: 4.0

Issues:

Technology Need Description:

Technology Candidates Identified:
**Technology Identification Sheet**

**Seq. Task No:** 103.002  
**OMI No:** B5304  
**Facility:** VAB  
**OMI Page Count:** 452  
**OMI Title:** SRB SYSTEMS MATE AND CLOSEOUT

**Subtask OMI(s):**

**Prerequisite Task OMI:**

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

**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.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
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<th>Remarks</th>
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<td>Quality</td>
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<tr>
<td>LCC Ops:</td>
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<td>Support:</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: VAB  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.

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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<th>OMI Title</th>
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<td>104.000</td>
<td>T1205</td>
<td>YAB</td>
<td>ET CONTINGENCY PRESSURIZATION-ORBITER</td>
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MATE HB-1/3

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Prerequisite Task OMI:

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<th>Vehicle Power Required:</th>
<th>LCC Support Required:</th>
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<tbody>
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<td></td>
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99E:

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

<table>
<thead>
<tr>
<th>Personnel</th>
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<td>LCC Opr.:</td>
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<td>Support:</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

Subtask OMI(s): B1041, B5003, S0020, S3500, S9001, S3022, T1449, V1149, V1503, V5029, V9002

Prerequisite Task OMI:

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

GSE: E78-0006, C70-1181, C72-1126, C78-0903, C77-0202, C72-0031, C72-1127-2, C78-5007

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

Personnel:  Head Count  Man Hours  Remarks

Mech. Tech:  Y  2.0  N/A

Elect. Tech:  Y  0.0  N/A

Quality:  Y  0.0  N/A

LCC Des:  Y  0.0  N/A

Support:  Y  0.0  N/A

Engineering:  Y  0.0  N/A

Total:  Y  2.0  Time: 37.0

Issues:

Technology Need Description:

Technology Coordinates Identified:
Technology Identification Sheet

Reg. Task #/ Ref. Task: 107.302
OMI No: 59020

Tests (Exp): SHUTTLE FLIGHT CONTROL INTEGRATION
B1005, B1009, B1026, B5024, S9021, S9022, V1123

Prerequisite Task OMI:

OMI: 

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

OMI: A77-0175, S72-8750-1

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

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

Time: 6.5

Technology Need Description:

Technology Candidates Identified: CRITICAL PAGE IS OF POOR QUALITY.
Technology Identification Sheet

Sec. Task No: 100.00C  Facility: VAR  OMI Page Count: 38
OMI No: T5048  OMI Title: EXTERNAL TANK (ET) PRE-MOVE

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>
<thead>
<tr>
<th>Mechanic</th>
<th>Tech</th>
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<th>Man Hours</th>
<th>Remarks</th>
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<td>LCC Ops</td>
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<td>Support</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 109.000  Facility: VAB  OMI Title: SHUTTLE TRANSFER AND MATE TO PAD
OMI No: A5214  OMI Page Count: 78

Subtask OMI(s): B5306  C9002  C9010  M3051
M3139  Q3016  Q5001  G6014
S3001  T6248  V1111  V3509

Prerequisite Task OMI:
Hazard: Y  Level: 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 AND THE MOVE AND MATE TO PAD ON SECOND DAY OPERATION.

Personnel:

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

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

Quality: 0  Man Hours: 0.0  Remarks: N/A

LCC Ops: 0  Man Hours: 0.0  Remarks: N/A

Support: 0  Man Hours: 0.0  Remarks: N/A

Engineering: 0  Man Hours: 0.0  Remarks: N/A

Total: 0  Man Hours: 0.0  Time: 10.0

Leader:  

Technology Need Description:

Technology Candidate Identified:
Technology Identification Sheet

Sec. Task No: T1001 Facility: WAB OMI No: T1205 OML Title: INSTALLATION/REMOVAL OF GO2 PRESS LINE BLANK-OFF PLATE - INTEGRATION CELL
Subtask OML(s): T1001 T1201

Prerequisite Task OML:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
SSE: A78-3423-01 A78-3423-02 C78-1229 P78-3137-1-102

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

Personnel:

<table>
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<th></th>
<th>Head Count</th>
<th>Man Hours</th>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 111.000 Facility: VAB OMI Page Count: 78
OMI No: T120
OMI Title: INSTALLATION/REMOVAL OF GH2 PRESS LINE BLANK-OFF PLATE, INTEGRATION CELL
Subtask OMI(s): S9201, S9001, T1001, T1050

Prerequisite Task OMI:
Hazard: Y Level:
Vehicle Power Required: N LCC Support Required: Y
SSE: A79-3623-01, A79-3623-02, C79-1229, 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:        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:      2           0.0        N/A
Total:            2           0.0        Time: 5.0

Issue:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

Subtask OMI(s): B5306, M3139, S3001, 05002, 03006, 03016, 05001, 06014, 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:  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. Supp:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A
Total:  0  0.0  Time:  8.0

Issues:  :

Technology Need Description:  :

Technology Candidates Identified:  :
Technology Identification Sheet

Seg. Task No: 201.000  Facility: PAD  GMI Page Count: 466
GMI No: 50009  GMI Title: SHUTTLE LAUNCH PAD VALIDATION WITH CONTINGENCY APU CONFIDENCE RUN (LPS)
Subtask OMI(s): SEE PAGE 15 TO 24 FOR 179 SEPARATE TASK CALLOUTS

Prerequisite Task OMI:
Hazard: Y  Level: Vehicle Power Required: Y
GSE: H70-0865 A70-0643-2

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/E1 ALIGNMENT. VERIFY SSY RF/INSTRUMENTATION INTERFACES WITH THE PAD. PERFORM/VERIFY PERFORMANCE OF APU'S VIA APU CONFIDENCE RUN PERFORMANCE TEST.

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 221.000  Facility: PAD
OMI No.: S0017  OMI Title: TERMINAL COUNT DEMONSTRATION (LPS)
OMI Page Count: 949

Subtask OMI(s): SEE PARA 1.1.3, FOR 66 SUBTASK, LISTING

Prerequisite Task OMI:

Hazard: Y  Level:  
LCC 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 SAFING AND RECYCLE TO T-20 MIN.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head-Count</th>
<th>Man-Hours</th>
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Time: 24.0

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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 223.000  
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  
GSE: U72-1196-2, 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:  
Mech. Tech: 0  
Elect. Tech: 0  
Quality: 0  
LCC Ops: 0  
Support: 0  
Engineering: 0  
Total: 0

Man Hours: 0.0  
Remarks: N/A

Time: 44.0

Issues: TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 204,000 Facility: PAD OMI No.: 50024
OMI Title: PRELAUNCH PROPELLANT SERVICING (LPS)

OMI Page Count: 496

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 BRS HYDRAULIC POWER UNIT (HPU) FUEL SUPPLY MODULE WITH FUEL AND GN2 PRECHARGE. SERVICES PRSD SYSTEM WITH LO2 & LH2.

Personnel:

<table>
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<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
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Issues: TIME/ON-LINE COST/MANHOURS DESIGN REQUIREMENTS

Technology Need Description:

Technology Candidate Identified:
Technology Identification Sheet

Section Task No.: 205.000  Facility: PAD  OMI Page Count: 266
O MI 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
GSE: 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:

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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: 901
OMI No: V9002.01-10   OMI Title: HYDRAULIC POWER UP/DOWN

Subtask OMI(s): S3500   V1133   V9001

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y   LCC Support Required: Y
OMI: A70-0596   C70-0994   S72-0841   S70-0843   S70-0952   S70-0861-1   S72-0844-3   S72-0844-4

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

Personnel:

Mech. Tech: 7   Man Hours: 0.0   Remarks: 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: 7   0.0

Time: 28.0

Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No.  207.008  Facility:  PAD  OMI Page Count:  539
OMI No.: V1046  OMI Title:  SSME LEAK AND FUNCTIONAL (VERTICAL)

(LFS) (CONTINGENCY)

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, S70-0702, 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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Issues:

Technology Need Description:

Technology Candidates Identified:
# Technology Identification Sheet

**Seg. Task No.** 202.002  
**GMI No.** S1005  
**GMI Title:** LO2 TOTAL SYSTEM DEW POINT AND ET CONDITIONING  
**OMI No:** SI05  
**Subtask OMI(s):** G6150, G9101, L02-9006, M3011, M350C, S9001, V1171, V5057  
**Prerequisite Task OMI:**  
**Hazard:** Y  
**Level:**  
**GSE:** S72-1106-2  
**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 H20 MAX PER G0124. TO PURGE MAIN FILL AND DRAIN INCLUDING CROSS COUNTRY LINE THRU THE TASK DRAIN LINE WITH GN2.. FOR A DEW POINT OF 113 PPM.  
**Vehicle Power Required:** Y  
**LCC Support Required:** Y

## Personnel

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## Technology Need Description:

Technology Candidates Identified:

![Image of poor quality](image-url)
Technology Identification Sheet

Seq. Task No: 709.000
OMI No: S1000
OMI Title: ET/FACILITY LH2 SYSTEM CONDITIONING

Subtask OMI(s): S6250, S6250

Prerequisite Task OMI:

Vehicle Power Required: Y
LCC Support Required: Y

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

Personnel:

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Time: 12.0

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 210.00k Facility: PAD QMI Page Count: 510
QMI No: V1103.01-03 QMI Title: EXTRAVEHICULAR MOBILITY

UNIT/FUNCTIONAL CHECKOUT (LPS)
Subtask OMI(s): M3095, M6020, S3500, V3502, V3512, V3528, V5057, V5067, V6003, V9001, V11
Prerequisite Task OMI:
Hazard: Y Level: 
Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0962, C70-0743-001, S70-0698-1, S70-0698-3, S70-0634-1, 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: 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 Supp: 0 0.0 N/A
Support: 0 0.0 N/A
Engineering: 0 0.0 N/A
Total: 0 0.0

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: 111.000
OMI No: V1149
Facility: PAD
OMI Title: T-0 UMBILICALS INTERFACE LEAK CHECKS

(LPS)

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

Prerequisite Task OMI:

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

GSE: F70-0027, S30-0517, S70-0529, S70-0623-1, S72-0685-1, S72-0686-1, S72-1107-1, S72-1107-13

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.

Personnel: 

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Issues: MAINTAINABILITY : DESIGN

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 212.002  Facility: PAD  OMI Page Count: 182
OMI No: V2303  OMI Title: FCSS/PRSD DEWAR SERVICING LO2 AND LH2
COMBINED LOADING

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, S70-1222, 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:

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Total: 0  0.0  Time: 7.0

Issues:

Technology Needs Description:

Technology Candidate Identified:
# Technology Identification Sheet

**Seg. Task No.:** 213.000  
**Facility:** PAD  
**OMI No.:** S006711-3  
**OMI Title:** SHUTTLE COUNTDOWN (LPS)  
**OMI Page Count:** 2487

**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:** S70-0583-C,R  
- **S70-0018-5**  
- **S70-0719**  
- **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 PROPPELANTS AND GASES TO THE SHUTTLE FOR LAUNCH.
3) TO LAUNCH THE SHUTTLE.
4) TO PERFORM INITIAL PAD SAFING AFTER LAUNCH.

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**Issues:**

**Technology Need Description:**

**Technology Candidates Identified:**


Technology Identification Sheet

Baseline Task No.: 300,400
OMI No.: N0133

Facility: PAD
OMI Title: SHUTTLE - CARGO INSTALLATION CONTROL
OMI Page Count: 34

Subtask OMI(s): A2203, B1519, E1933, E5506, N5033, N5433, V1173, V3545, V9023

Prerequisite Task OMI:

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.

Personnel:

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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 301.000
OMI No.: N0433
(IUS EXAMPLE)
Subtask OMI(s): A2700
V1117
V1184

Prerequisite Task OMI:
Vehicle Power Required: Y
LCC Support Required: Y

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

Personnel:
Mech. Tech: 0
Elect. Tech: 0
Quality: 0
LCC User: 0
Support: 0
Engineering: 2
Total: 0

Man Hours: 0.0

Remarks: N/A

Time: 26.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

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

Subtask OMI(s):

Prerequisite Task OMI: Hazard: N  Level: pr.

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

Activity Description: PAM

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Issues: Time: 51.0

Technology Need Description:

Technology Candidate Identified:
Technology Identification Sheet

Sec. Task No: 303.000  Facility: PAD  GSE:  E70-0727
OMI No: N0431  OMI Title: CARGO/ORBITER INTERFACE TEST (LPS)
(FIG EXAMPLE)

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

Prerequisite Task OMI:

Hazard: Y  Level:
GSE:  E70-0727  

Vehicle Power Required: Y  LCC Support Required: Y

Activity Description: SUPPORT MDAC PAYLOAD AS REQUIRED DURING P/L CHECKOUT.
(FIG EXAMPLE)

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  N/A
Total:  0  0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 304.000  OMI No: N0130
OMI Title: SFACELAB EXAMPLE

OMI Page Count: 0

Subtask OMI(s):

Prerequisite Task OMI:
Hazard: N Level: 
OSE:

Activity Description: SFACELAB

Personnel:

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<tr>
<th>Role</th>
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<th>Remarks</th>
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<td>Quality</td>
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<tr>
<td>LCC Ops</td>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 325.000
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:

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<tr>
<th>Personnel Type</th>
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Total: 0

Time: 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

OMI No: T5149  OMI Title: ET OFF-LOAD MOVE AND SECURE IN

CHECKOUT/STORAGE CELL
Subtask OMI(s): 03016, 12003, 12045, 12047
03008, 03011, 03203, 03235, T1102
T1103, T5128, T5148, Te048

Prerequisite Task OMI:

Hazard: Y Level:
Vehicle Power Required: N  LCC Support Required: N
GSE: H78-0030-2, H78-0047, H78-3004, H78-3006
H78-3028, H78-3040, M78-0063

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

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>N/A</td>
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<tr>
<td>Quality</td>
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<td>0.0</td>
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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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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 402.000 Facility: ET C/O CELL OMI Page Count: 206
OMI No: T5128 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: need 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 N/A
Total: 0 0.0 Time: 8.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 403.000  Facility: ET C/O 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

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No: 404.000  Facility: ET C/O CELL  OMI: Page Count: 102

OMI Title: LH2 TANK PREPS, PURGE, PRESS AND

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:  Task 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:  3  0.0  N/A
Total:  0  0.0  Time:  20.0

Issues:

Technology Need Description:

Technology Candidate Identified:
**Technology Identification Sheet**

**Seg. Task No:** 485.000  
**OMI No:** T6149  
**Facility:** ET O/C CELL  
**OMI Title:** ET RECEIVING INSPECTION  
**OMI Page Count:** 64

**Subtask OMI(s):**

**Prerequisite Task OMI:**

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

**GSE:** A72-0856, A72-0856, A72-3604

**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.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Man-Hour</th>
<th>Remarks</th>
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<td>Engineering</td>
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**Issues:**

**Technology Need Description:**

**Technology Candidate Identified:**
Technology Identification Sheet

Sec. Task No.: 102.002
OMI No.: T5046
OMI Title: INSTALL AND REMOVE INTERTANK ACCESS KIT

Subtask OMI(s): T6447

Prerequisite Test: OMI:

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

C/E: A72-0807 A70-3604 A70-5603

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

Personnel: Task Count Max Hours Remarks
Master Tech: 1 2.0 N/A
Electrical: 2 0.2 N/A
Mechanical: 2 0.2 N/A
Laser: 2 0.2 N/A
Product Engineering: 0 2.0 N/A

Total: 5 0.0

Time: 32.0

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:

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<tr>
<th></th>
<th>Head Count</th>
<th>Man-Hours</th>
<th>Remarks</th>
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<tr>
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<td>Support:</td>
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<td>Engineering:</td>
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Time: 16.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 409.002               Facility: ET G/O CELL               OMI Page Count: 156
OMI No: T6448                          OMI Title: SUCP AND SUCE QUICK DISCONNECT POST

LAUNCH REFURBISHMENT

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

GSE: A78-3621               F78-0048

Vehicle Power Required: N               LCC Support Required: N

Activity Description: TO REFURBISH/LEAK TEST GROUND HALF OF GUPC QUICK DISCONNECT, ONE 7 IN. GH2 VENT AND SIX 3/8 IN. PRESSURIZATION QUICK DISCONNECTS AFTER LAUNCH.

Personnel:

<table>
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<tr>
<th>Role</th>
<th>Head Count</th>
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<th>Remarks</th>
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<tbody>
<tr>
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Issues:

Technology Need Description:

Technology Candidate Identified:

ORIGINAL PAGE IS OF POOR QUALITY
Technology Identification Sheet

Seg. Task No: 407.000 Facility: ET C/O CELL  OMI Page Count: 27
OMI No: T1109  OMI Title: LH2/L02 TANK LEAK TEST

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/L02 WHICH ARE DIRECTLY EXPOSED TO TANK PRESSURE IS WITHIN SPECIFICATIONS.

Personnel:

<table>
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Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 410.002
OMI No.: T1147
PLATE (GUCP):
Subtask OMI(s):

Prerequisite Task OMI:
Hazard: Y Level:
CSE:

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

Vehicle Power Required: N
LCC Support Required: N

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

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 Time: 48.0
Total: 0 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

OMI No: T1107  OMI Title: ET ANCILLARY LEAK AND FLOW TEST

(Subtask OMI(s)): T1101, T1102, T1103

Pre-requisite Task OMI:

Hazard: Y  Level:  

Vehicle Power Required: N  LCC Support Required: N

GSE: C78-1239, 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:  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
LLC Ops:  0  0.0  N/A
Support:  0  0.0  N/A
Engineering:  0  0.0  N/A

Total:  0  0.0  Time:  56.0

Issues:  

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Segment Task No.: 412.020
OMI No.: 75143

COMPONENTS
Subtask OMI(s):

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

Personnel: Head Count Man Hours Remarks
Mech. Tech: 0 0.3 N/A
Elect. Tech: 0 0.3 N/A
Quality: 0 0.3 N/A
LCC Org: 0 0.3 N/A
Support: 0 0.6 N/A
Engineering: 1 2.0 N/A

Total: 3 2.3 Time: 6.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 413.000  Facility: ET C/O CELL  OMI Page Count: 162
OMI No.: T5142  OMI Title: SRSS ORDNANCE INSTALLATION

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:  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  N/A
Total:  0  0.0  Time: 24.0

Issues:

Technology Need Description:

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 11 (V5012)
Technology Identification Sheet

Seq. Task No.: 11
OMI No: T1145

Facility: ET C/D CELL
OMI Title: PURGE BARRIER SEAL INSTALLATION

OMI Face Count: 70

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N
Level: 1
GSE:

Vehicle Power Required: N
LCC Support Required: N

Activity Description: INSTALL PURGE BARRIER SEALS AND INSPECT UMBILICALS.

Personnel:

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<th>Man Hours</th>
<th>Remarks</th>
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<tr>
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<tr>
<td>Elec. Tech.</td>
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Time: 64.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No.: 415.000
OMI No.: T5141

Facility: ET C/C CELL
OMI Page Count: 82
OMI Title: TPS CLOSEOUT, AFT HARDPOINT

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y
Level:

Vehicle Power Required: N
GSE:

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.

Personnel:

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Head Count</th>
<th>Man Hours</th>
<th>Remarks</th>
</tr>
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<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0.0</td>
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</table>

Total: 0 0.0

Issues:

Time: 24.0

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Segment Task No: 416.000
OMI No: TI136
CHECK PORTS
Subtask OMI(s):

Prerequisite Task OMI:
Facility: ET C/D CELL
OMI Title: TPS CLOSEOUT, HELIUM INJECT LEAK
OMI Page Count: 54
Vehicle Power Required: N
LCC Support Required: N
GSE:

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

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 N/A
Total: 0 0.0 N/A

Time: 16.0

Issues:
Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 417.000
OMI No: T5238
OMI Title: TPS CLOSEOUT, HELIUM INJECT BOX

Task No: 417.000
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

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

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: 16.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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. Title: GH2/G02 VENT VALVE FUNCTIONAL TEST-
333  OMI Title: GH2/G02 VENT VALVE FUNCTIONAL TEST-
Subtask OMI(s):  

Prerequisite Task OMI:

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/G02 VENT VALVES OPEN AND CLOSE
WITHIN THE SPECIFIED TIMES, AND THAT THE VALVES CRACK AND RESEAT WITHIN THE
SPECIFIED PRESSURES. TO LEAK CHECK THE GH2/G02 VENT VALVE PILOT SENSE PORTS.

<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>
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<td>N/A</td>
</tr>
<tr>
<td>Elec. Tech:</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 Ope:</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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<td>0.0</td>
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</table>

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Subtask OMI(s): T1101, T1195

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

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>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>LCC Ops.</td>
<td>0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Support</td>
<td>0</td>
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</tr>
<tr>
<td>Engineering</td>
<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>6.0</strong></td>
<td><strong>Time: 72.0</strong></td>
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Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 420.000 Facility: ET O/O CELL OMI Page Count: 146
OMI No: T1108 CMI Title: LO2/LH2 DISCONNECT 17-IN. FLAPPER
Valve Measurement, Verification and Inspection-HP-2/4 Checkout Cell
Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level:

Activity Description: Measure and verify the angle and tip load of the LO2/LH2
17-IN. Disconnect Flapper Valves. Verify the Flapper Valve Fairing
Configuration on the LO2/LH2 Disconnect Valves. Verify the proper torque on
the LO2/LH2 17-IN. Disconnect Flapper Valve Stops.

Personnel:

Personnel Head Count Man Hours Remarks
Mech. Tech: 2 2.0 N/A
Elect. Tech: 0 0.0 N/A
Quality:
LCC Ops: 0 0.0 N/A
Support:
Engineering: 0 0.0 N/A
Total: 2 2.0 Time: 48.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Sec. Task No: 421.000
OMI No: T6248

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>
<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>
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<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>LCC Eng.</td>
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<td>N/A</td>
</tr>
<tr>
<td>Support</td>
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<td>N/A</td>
</tr>
<tr>
<td>Engineering</td>
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<td>N/A</td>
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</tbody>
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Total: 0  0.0  

Issues: 

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seg. Task No.: 422.003  Facility: ET C/O CELL  OMI Page Count: 24c
OMI No.: T5148  OMI Title: PREP ET CHECKOUT CELL/STORAGE CELL

Subtask OMI(s):

Prerequisite Task OMI:

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

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: 0.2  Remarks: N/A
Elec. Tech: 0  0.0  N/A
Quality: 0  0.0  N/A
LCC Ope: 0  0.0  N/A
Support: 0  0.0  N/A
Engineering: 0  0.0  N/A
Total: 2  0.0  Time: 6.0

Issues:

Technology Need Description:

Technology Candidates Identified:
Technology Identification Sheet

Seq. Task No: 423.002

Facility: ET C/D CELL

OMI No: T5147

OMI Title: ET MOVE FROM STORAGE CELL TO CHECKOUT CELL/FROM CHECKOUT CELL TO STORAGE CELL

Subtask OMI(s): I2003, I2026, O3008, O6003, O3022, O3010, O3235, S0003, T5128, T5140, 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: 

Mech. Tech: 0, 0.2, N/A
Elec. Tech: 0, 0.0, N/A
Quality: 0, 0.2, N/A
LCC Des: 0, 0.0, N/A
Support: 0, 0.2, N/A
Engineering: 0, 0.0, N/A

Total: 0, 0.0, Time: 6.0

Issues: 

Technology Need Description:

Technology Candidates Identified: