

*Expendable Launch Vehicle*

**Mars Surveyor Program 2001 Orbiter  
(2001 Mars Odyssey)**

# **Launch Site Support Plan**



**APPROVAL PAGE****Scope of Agreement**

The National Aeronautics and Space Administration (NASA) Expendable Launch Vehicle (ELV) mixed fleet manifest authorizes the launch of this payload. This Launch Site Support Plan (LSSP) is an agreement among the NASA Launch Site Integration Manager (LSIM), the Payload Project Representative, and the Launch Service Provider (LSP) as to the products and services necessary for successful and cost-effective launch site processing in John F. Kennedy Space Center (KSC) facilities. By signing this LSSP, the NASA LSIM, the Payload Project Representative, and the LSP verify that all plans and requirements contained herein have been coordinated with appropriate launch site personnel and payload project personnel.

**Signatures**

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**Revision and Control**

All publications of this LSSP are controlled in the NASA Technical Documentation System. This system can be accessed through the World Wide Web at <http://tdsearch.ksc.nasa.gov/> for the purposes of retrieving the latest copy of this LSSP. Revisions to this LSSP are tracked on the revision log provided. Any comments, corrections, or updates should be directed to:

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## LSSP REVISION LOG

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## REFERENCE DOCUMENTATION AND PROCESSING GUIDELINES

The following list of references is provided for use in planning and implementing a smooth launch site processing flow in accordance with local, state, and federal regulations.

### Launch Site Requirements Documentation

- |                    |   |
|--------------------|---|
| 1. EWR 127-1       | <i>Range Safety Requirements</i>  |
| 2. KHB 1710.2D     | <i>KSC Safety Practices Handbook</i>                                    |
| 3. KHB 1860.1C     | <i>Ionizing Radiation Protection Program</i>                            |
| 4. KHB 1860.2B     | <i>Non Ionizing Radiation Protection Program</i>                        |
| 5. KMI 1860.1D     | <i>KSC Radiation Protection Program</i>                                 |
| 6. KMI 2570.1      | <i>KSC Radio Frequency Management Control Implementation Plan</i>       |
| 7. K-STSM-14.2.1D  | <i>KSC Payload Facility Contamination Control Requirements Plan</i>     |
| 8. NASA-STD-8719.8 | <i>Expendable Launch Vehicle Payload Safety Review Process Standard</i> |

### Launch Site Reference Documentation

- |                   |  |
|-------------------|--|
| 1. KCI-HB-5340.1C | <i>Payload Facility Contamination Control Implementation Plan</i>  |
| 2. K-ELV-11.2     | <i>Guide for Expendable Launch Vehicle Payload Processing at the Kennedy Space Center and Cape Canaveral Air Force Station</i> |
| 3. KHB 1040.1G    | <i>Hurricane Preparation and Recovery Annex H</i>  |
| 4. KHB 1610.1B    | <i>KSC Security Handbook</i>   |
| 5. KHB 8800.7C    | <i>Hazardous Waste Management</i>  |
| 6. KMI 1800.2C    | <i>KSC Hazard Communication Program</i>  |
| 7. K-STSM-14.1.1  | <i>Facilities Handbook for Building AE</i>   |
| 8. KDP-KSC-P-1278 | <i>Hurricane Emergency</i>   |
| 9. K-STSM-14.1.7  | <i>Facilities Handbook for Spacecraft Assembly and Encapsulation Facility Number 2</i>   |

Launch Service Provider and Range Documentation

1. MDC 99H0030A      *Delta II-Mars'01 Mission Specification*
2. MDC H 3224D      *Delta II Payload Planners Guide*
3. MDC G1665      *Delta II Complex 17 Spacecraft Accommodations Guide*
4. Boeing Mandatory      *Tethering Requirements*  
    Action Notice #90-02

MARS Surveyor 2001 Project Specific Documentation

1. MSP01-98-0030      *Spacecraft Integration, Test, Launch & Operations Plan,  
    Volume 3, Launch Site Processing*
2. MSP01-2000-0232      *Orbiter Pack & Ship/Transportation Plan*
3. M01-MS-S-055      *Launch Countdown*
4. M01-MS-B-058      *Orbiter Emergency Off-Load Operations*
5. PRD      *MSP'01 Unique Program Requirements Document*

## **1.0 PAYLOAD PROJECT DESCRIPTION**

The following organizations are involved in the concept, design, development, and launch of MSP'01:

- a. Sponsored by NASA's Office of Space Science (Code S)
- b. Managed by the Jet Propulsion Laboratory (JPL)
- c. Provided by Lockheed-Martin Astronautics Operations (LMAO)
- d. Launched by Boeing on a Delta II

The MSP'01 is a planetary launch program consisting of a Mars Orbiter spacecraft. The Orbiter will be launched from Kennedy Space Center, Florida aboard a Delta II 7925 vehicle. The prime objectives of the MSP'01 mission are:

- To globally map the elemental composition of the Martian surface and to determine the abundance of hydrogen in the shallow subsurface;
- Acquire high spatial and spectral resolution maps of surface mineralogy;
- Acquire high spatial resolution images of surface morphology;
- Characterize the Martian surface radiation environment as related to radiation-induced risk to human explorers

In April 2001, 2001-Mars Odyssey will be launched aboard a Delta II 7925 launch vehicle from Space Launch Complex (SLC) 17 at the Cape Canaveral Air Force Station (CCAFS). Further information on the payload project can be found on the World Wide Web at <http://mars.jpl.nasa.gov/2001/>. Information relating to the Delta II project can be found on the World Wide Web at <http://www.boeing.com/defense-space/space/delta/deltahome.htm>.

## **2.0 LAUNCH SITE PROCESSING**

### **2.1. PAYLOAD LAUNCH SITE PROCESSING**

The payload will be transported from the LMAO plant in Denver to the Kennedy Space Center to undergo final integration, testing, and launch. A diagram of the launch site processing flow activities is included as figure 1.0 in appendix B.

Launch site processing products and services requested by the payload project are listed in the Support Requirements Matrix (appendix D). The LSIM and the MSP'01 Assembly, Test, and Launch Operations (ATLO) Manager have developed the detailed launch site processing requirements for the payload, and the KSC commitment for providing these requirements is listed. At the baseline publication of this LSSP, all requirements in the Support Requirements Matrix with a to be determined

(TBD) in the KSC Y/N column will be worked in a timely manner for final resolution prior to their need.

The following are payload-unique processing requirements and special agreements between the payload customer and the launch site personnel:

a. Special purge requirements

The Orbiter's THEMIS instrument requires a near continuous gaseous Nitrogen (GN<sub>2</sub>) purge during processing at 20 standard cubic feet per hour. During transport and pad operations, the purge will be provided by the LSP contractor through a flight interface. The purge downtime for the entire ATLO flow is not to exceed 1-hour outage in a 24 hr period and will be tracked by the spacecraft customer.

b. Special transportation requirements

The MSP'01 Orbiter spacecraft will arrive on a C-17 at the KSC Shuttle Landing Facility (SLF). For transportation between the SLF and the Spacecraft Assembly and Encapsulation Facility Number 2 (SAEF-2), KSC will provide one air-ride lowboy (spacecraft) and one flatbed (ground support equipment). Ordnance (category B) will arrive at CCAFS via surface carrier and be delivered to the 45<sup>th</sup> Space Wing (45 SW) contractor for storage in the ordnance area until scheduled for ordnance activities.

c. Special handling guidelines

During SAEF-2 ordnance operations, the following radio frequency (RF) restrictions will be in effect: no hand-held radios, cell phones, or pagers.

d. Payload-unique facility requirements

- Spin balance operations work area located outside hazardous area but within 100-ft of customer provided spin balance table (SAEF-2, room 103).
- Battery storage facility
- Lockable cabinet for radioisotope calibration source

e. Special gases/commodities

Non-flight: facility gaseous Helium (GHe), facility gaseous Nitrogen (GN<sub>2</sub>), liquid Nitrogen (LN<sub>2</sub>), and breathing air

Flight: high purity gaseous Helium (GHe), Hydrazine (N<sub>2</sub>H<sub>4</sub>), and low iron Nitrogen Tetroxide (N<sub>2</sub>O<sub>4</sub>)

f. Use of KSC personnel support for off-line processing

- (1) Facility propellants scrubber operator
- (2) Water deluge ball-valve operators
- (3) Breathing Air/SCAPE support
- (4) Propellants supply support
- (5) Gas/Propellants sampling support
- (6) Environment monitoring (vapor detection)

g. Use of special Tool Control Plan

Tool control procedures for the MSP'01 spacecraft will follow the guidelines as specified in KHB 1710.2 and Boeing Mandatory Action Notice #90-02 (for Boeing-Delta integrated activities).

h. Special safety restrictions or waivers

None identified

i. Special security requirements

None identified

j. Special personnel protection requirements

Self-contained atmospheric protective ensemble (SCAPE) training and equipment for up to eight spacecraft personnel supporting propellant loading and pressurization operations. Propellant detection monitoring at SAEF-2 at the beginning of shifts.

k. Extensive administrative network support

## 2.2. LAUNCH SERVICE PROVIDER LAUNCH SITE REQUIREMENTS

The following LSP integrated activities with the spacecraft require NASA-coordinated launch site support. These activities require coordination between the LSIM and the LSP.

- a. Mating payload to third stage
- b. Encapsulating payload into fairing
- c. Encapsulating payload into transport canister
- d. System performance testing
- e. Planning of contingency propellant offloading

Detailed launch site processing requirements requested by the Boeing-Delta Program for the payload launch site flow are negotiated by the LSIM and the Boeing Spacecraft Coordinator. Launch site-processing products and services requested by the launch vehicle provider are included in the attached Support Requirements Matrix (appendix D). Any requirements in the Support Requirements Matrix with a TBD listed in the KSC commit column will be resolved in a timely manner prior to need.

The following are launch vehicle-unique processing requirements and special agreements between the LSP and the launch site personnel:

- a. Special temperature and/or humidity requirements

There are no special temperature or humidity requirements for this launch site flow.

- b. Special purge requirements

A continuous GN<sub>2</sub> purge will be maintained to the spacecraft during transportation and hoisting operations.

- c. Use of special Tool Control Plan

Boeing Mandatory Action Notice #90-02

## 2.3. LAUNCH SITE CONTINGENCY PLANNING

During the payload launch site flow, the following agreements will be honored during the specified contingency activities.

### 2.3.1. Severe Weather/Natural Disasters

- Lightning

The MARS'01 ORBITER project will adhere to the KHB 1710.2D guidelines for spacecraft operations in the event a lightning condition is announced.

For operations within the SAEF-2 during a Phase 1 "Lightning Advisory," the operations team will:

- 1) Terminate all hazardous operations as soon as possible (finish suspended crane operations as quickly as possible, safe all fueling or ordnance work immediately).
- 2) Safeguard all inactive GSE by isolating it from facility power and ensure proper grounding is in place.
- 3) Continue test operations, but prepare for a possible Phase 2 announcement.

- Hurricane

The Mars '01 Orbiter will not be processing at KSC during the hurricane season, but if needed the hurricane contingency plans to protect KSC facilities used for payload processing are detailed in KDP-KSC-P-1278, *Hurricane Emergency*.

### **2.3.2. Wild Fires/Controlled Burns**

During wild fires or controlled burns within five miles upwind of the SAEF-2, the SAEF-2 heating, ventilating and air conditioning (HVAC) fresh-air make-up will be shut down.

### **2.3.3. Emergency Plan for Processing Facility**

Reference VB-E2 letter dated November 27, 2000 for the MSP'01 implementation of KCA-013, Memorandum of Agreement on Operation of Firex Water Deluge Systems in Payload Processing Facilities.

### **2.3.4. Power Outages**

Uninterruptible power supply (UPS) service will be provided for EGSE located in SAEF-2 (30 kilovolt ampere (kVA) minimum) and spacecraft control room (20 kVA minimum). In the event of a loss of utility power, these UPS units will provide power to specific user loads until their batteries are depleted. The time available for the spacecraft use of the UPS power will depend on the actual loads.

### **2.3.5. Launch Scrub/Turnaround**

Reference MARS'01 Orbiter procedure M01-MS-S-055 *Launch Countdown* for the spacecraft launch scrub/turnaround plan.

### 2.3.6. Contingency Propellants Off-Load

Reference MARS'01 Orbiter procedure M01-MS-B-058 *Orbiter Emergency Off-Load Operations* for the detailed plans in case of a contingency propellant off-load.

## 3.0 DELIVERABLES

The deliverables matrix in table 1.0 of appendix C provides a listing of the necessary launch site deliverables required from the payload project to the launch site in coordination with the LSIM. The deliverables matrix in table 2.0 of appendix C provides a listing of the necessary launch site deliverables required from the LSP to the launch site in coordination with the LSIM. These are dynamic matrices and may be updated following the publication of this LSSP. Contact the LSIM to assure you have the latest copy of the deliverables lists.



## APPENDIX A – ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms are used in this document. A more comprehensive listing is contained in NASA Reference Publication 1059 Revised, *Space Transportation System and Associated Payloads: Glossary, Acronyms, and Abbreviations*.

45 SW	45 <sup>th</sup> Space Wing
AL	airlock
ATLO	assembly, test, and launch operations
CCAFS	Cape Canaveral Air Force Station
CCTV	closed circuit television
CDR	Critical Design Review
COMSEC	Communications Security
COPV	composite over-wrap pressure vessel
CPSM	Customer Processing Support Manager
CR	clean room
CSU	channel service unit
CWA	clean work area
DOAMS	Distant Object Attitude Measurement System
DSN	NASA Deep Space Network
DSU	data service unit
EGSE	electrical ground support equipment
EIS	environmental impact statement
ELSA	emergency life support apparatus
ELV	Expendable Launch Vehicle
EPA	Environmental Protection Agency
EWR	Eastern and Western Range
gal	gallon
GDS	Ground Data System
GHe	gaseous Helium
GHz	Gigahertz
GMT	Greenwich Mean Time
GN <sub>2</sub>	gaseous Nitrogen
GOR	ground operations review
GPS	Ground Positioning System
GSE	ground support equipment

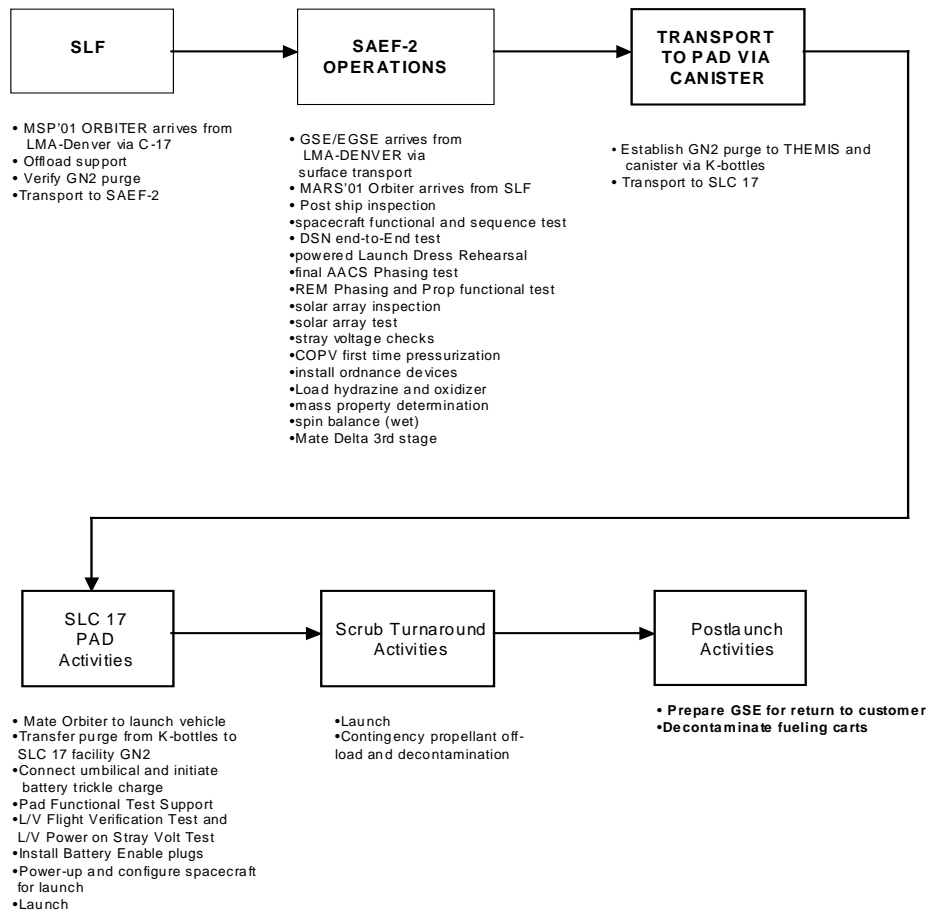
**APPENDIX A – ABBREVIATIONS AND ACRONYMS** (continued)

HPF	Hazardous Processing Facility
HVAC	heating, ventilating, and air conditioning
IGOR	Intercept Ground Optical Recording (system)
JPL	Jet Propulsion Laboratory
Kbps	kilobits per second
KDP	Kennedy Documented Procedure
kg	kilogram
KHB	Kennedy Handbook
kHz	kilohertz
KMI	Kennedy Management Instruction
KSC	John F. Kennedy Space Center
kVA	kilovolt ampere
LAN	local area network
lbs	pounds
LMA	Lockheed-Martin Astronautics
LMAO	Lockheed-Martin Astronautics Operations
LN <sub>2</sub>	liquid Nitrogen
LSIM	Launch Site Integration Manager
LSP	Launch Service Provider
LSSP	Launch Site Support Plan
MDC	Mission Director's Center
MGSE	mechanical ground support equipment
MHz	megahertz
MSP'01	MARS Surveyor Program 2001
MSPSP	Missile Systems Prelaunch Safety Package
N <sub>2</sub> H <sub>4</sub>	Hydrazine
N <sub>2</sub> O <sub>4</sub>	Nitrogen Tetroxide
NASA	National Aeronautics and Space Administration
NTSC	National Television Standards Code
NVR	non-volatile residue

**APPENDIX A – ABBREVIATIONS AND ACRONYMS** (continued)

OIS-D	operational intercommunications system-digital
OJT	on the job training
ORT	operational readiness test
PAF	payload adaptor fitting
PAO	Public Affairs Office
PC	personal computer
PDR	Preliminary Design Review
PHE	propellant handlers ensemble
POC	point of contact
PON	payload operations network
PPF	payload processing facility
ppm	parts per million
PRP	Personnel Reliability Program
psig	pounds per square inch gauge
PWQ	Process Waste Questionnaire
RF	radio frequency
RS	recommended standard
RTG	Radioisotope Thermoelectric Generator
SAEF-2	Spacecraft Assembly and Encapsulation Facility Number 2
S/C	spacecraft
SCAPE	self-contained atmospheric protective ensemble
scf	standard cubic feet
SLC	Space Launch Complex
SLF	Shuttle Landing Facility
TBD	to be determined
TLM	telemetry
TTACS	Test Telemetry and Command System
TVC	toxic vapor check
UPS	uninterruptible power supply
V	volt
VHS	video home system

## APPENDIX B - FIGURES



NOTE: All hazardous operations are denoted in bold italics.

Figure 1.0. MSP-'01 Launch Site Processing Flow

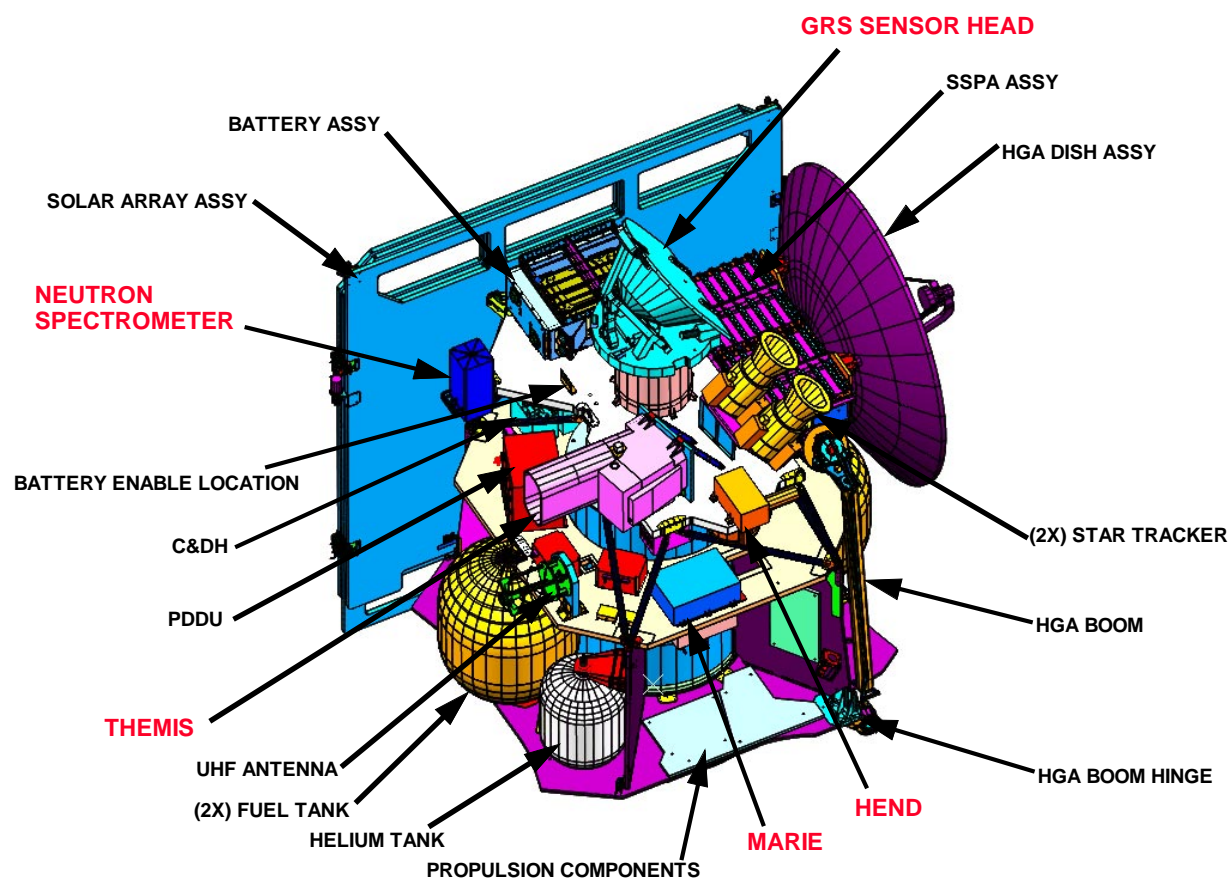
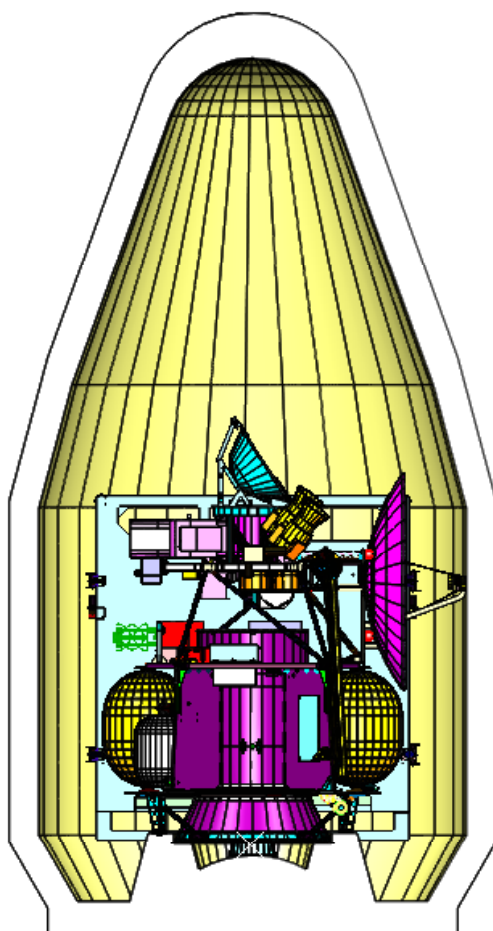
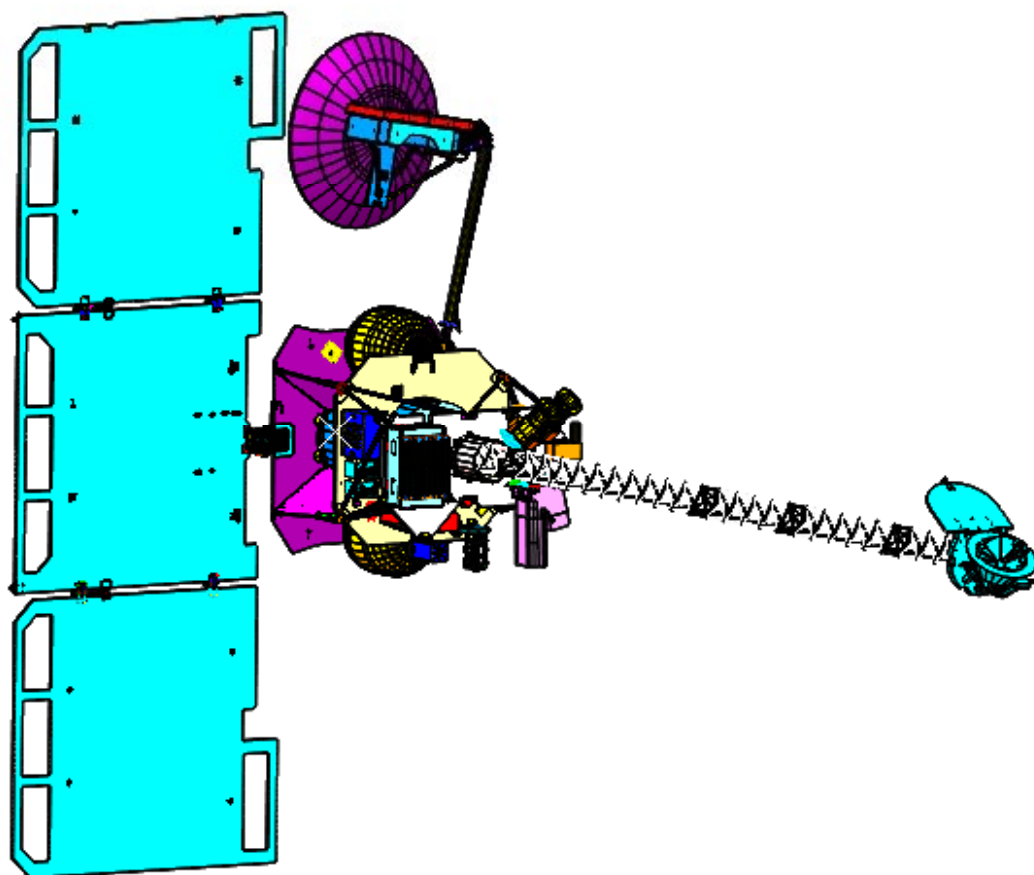


Figure 2.0. MSP-'01 Orbiter Instruments



**Figure 3.0 Orbiter Flight System in Launch Configuration**



**Figure 4.0 MSP-01 Orbiter Flight System in Science Relay Configuration**

## APPENDIX C - TABLES

Table 1.0 ELV Launch Site Deliverables (Spacecraft Program)

ELV Spacecraft Program Deliverables  
 Spacecraft Program = MARS'01-ORBITER  
 Rev. Date = 6/00

Arrival Date 1/9/01  
 Launch Date 4/7/01

Track #	Item	Requirement	Submittal Time	Need Date
P-1	Provide Briefing Info for Program Introduction and Range Tailoring	EWB 127-1	18 - 24 months prior to arrival	< >
P-2	Submit Draft Missile System Prelaunch Safety Package (1)	EWB 127-1	45 days prior to PDR	4/00
P-3	Provide Input to Publish Preliminary LSSP (3)	K-ELV-11.2	18 months prior to arrival	6/7/00
P-4	Provide Input to Publish Baseline LSSP (3)	LSSP Template	15 months prior to arrival	6/7/00
P-5	Submit Non-Standard Security Requirements (COMSEC, RTG's, etc...)	KHB 1610	14 months prior to arrival	N/A
P-6	Submit Non-Standard Contamination Requirements	KSTSM-14.2.1	14 months prior to arrival	6/7/00
P-7	Submit Personnel Badging Info. for Foreign Nationals (PRP input) (2)	K-ELV-11.2	12 months prior to arrival	5/30/00
P-8	Submit Radio Frequency Authorization Form	KMI 2570.1	12 months prior to arrival	5/30/00
P-9	Submit Use Authorization Documentation (ionizing & non-ionizing)	K-ELV-11.2	12 months prior to arrival	6/23/00
P-10	Identify and Submit Program Assignment of Single POC for Waste Management	K-ELV-11.2	12 months prior to arrival	6/23/00
P-11	Submit Final Information for EIS (AF Form 813)	Cal EPA	12 months prior to arrival	N/A
P-12	Submit Preliminary MSPSP (1)	EWB 127-1	45 days prior to CDR	10/10/00
P-13	Submit Personnel Badging Info. for Non-Foreign Nationals (PRP input) (2)	K-ELV-11.2	6 months prior to arrival	6/3/00
P-14	Submit Administrative Network Information Checklist	Payload Specific	4 months prior to arrival	8/22/00
P-15	Deliver Deployment Plan to Resident Office	Payload Specific	4 months prior to arrival	8/22/00
P-16	Submit Final List of all Customer Procedures	EWB 127-1	90 days prior to arrival	10/10/00
P-17	Submit Process Waste Questionnaires	KMI 1800.2	60 days prior to arrival	10/10/00
P-18	Submit Material Safety Data Sheets	KMI 1800.3	60 days prior to arrival	10/10/00
P-19	Submit Final MSPSP (1)	EWB 127-1	45 days prior to hardware shipment	10/10/00
P-20	Participate in Pre-Ship Review (T-Con) and Submit Final Arrival Day Badging Request (5)	Payload Specific	45 days prior to arrival	12/13/00
P-21	Submit Final Arrival/Transportation Plans and Schedules (4)	K-ELV-11.2	45 days prior to arrival	11/28/00
P-22	Submit Hurricane Plan (if not part of LSSP)	KHB 1040	45 days prior to arrival	N/A
P-23	Submit Ground Operation Review Charts to KSC (LSIM)	LSIM	45 days prior to arrival	11/15/00
P-24	Submit Waste Management Training Memo	K-ELV-11.2	30 days prior to arrival	11/28/00



# K-ELV-14.010-BL-MSP 01

ELV Spacecraft Program Deliverables  
Spacecraft Program = MARS'01-ORBITER  
Rev. Date = 6/00

Arrival Date 1/9/01  
Launch Date 4/7/01

Track #	Item	Requirement	Submittal Time	Need Date
P-25	Participation in Ground Operation Review	K-ELV-11.2	30 days prior to arrival	11/29/00
P-26	Final Submittal of all Medical Certification	K-ELV-11.2	30 days prior to arrival	11/28/00
P-27	Obtain Certification of KSC Safety Compliance	NASA-STD-8719.8/EWR 127-1	30 days prior to arrival	11/28/00
P-28	Maintain Solvent Log	KHB 8800.7	on arrival	1/9/01
P-29	Submit Pad Contingency Off-load Procedure	EWR 127-1	45 days prior to payload transport to pad	2/13/00
P-30	Submit Hazardous Customer Standalone Procedures	K-ELV-11.2	55 days prior to first use	10/28/00
P-31	Submit Personnel Training Class Dates	K-ELV-11.2	30 days prior to need date	11/28/00
P-32	Submit Non-hazardous Customer Standalone Procedures	K-ELV-11.2	10 days prior to first use	12/5/00
P-33	Submit Camera Pass Request (for CCAS only)	KMI 1610	2 weeks prior to need	3/15/00
P-34	Submit Permits for Welding/Hot Work (if needed)	KHB 1710	1 week prior to need	A/R

The number of submittals, frequency, and submittal dates are tailored for each program via the Range/NASA Safety organizations.

The K-ELV-11.2 guideline specifies 4 months; however, the current process is taking significantly longer.

LSSP publish and release dates are unique and tailored for each mission.

K-ELV-11.2 guideline specifies 6 months; however, final input at 45 days is typically sufficient.

K-ELV-11.2 guideline specifies 6 months; however, 90 days is typically sufficient.

Note: Shaded items have been developed for this program only.

Table 2.0 ELV Launch Site Deliverables (Launch Vehicle Provider)

ELV Spacecraft Program Deliverables  
Launch Vehicle Provider = BOEING-DELTA  
Rev. Date = 6/00

First Support Date  
Launch Date

[Date]  
4/7/01

Track #	Item	Requirement	Submittal Time	Need Date
V-1	Provide Briefing Info for Program Introduction and Range Tailoring	EWB 127-1	18 - 24 months prior to arrival	N/A
V-2	Submit Draft Missile System Prelaunch Safety Package (1)	EWB 127-1	45 days prior to PDR	N/A
V-3	Provide Input to Publish Preliminary LSSP (3)	K-ELV-11.2	18 months prior to arrival	6/23/00
V-4	Provide Input to Publish Baseline LSSP (3)	LSSP Template	15 months prior to arrival	8/29/00
V-5	Submit Non-Standard Security Requirements (COMSEC, RTG's, etc...)	KHB 1610	14 months prior to arrival	N/A
V-6	Submit Non-Standard Contamination Requirements	KSTSM-14.2.1	14 months prior to arrival	N/A
V-7	Submit Personnel Badging Info. for Foreign Nationals (PRP input) (2)	K-ELV-11.2	12 months prior to arrival	N/A
V-8	Submit Radio Frequency Authorization (RFA) Form	KMI 2570.1	12 months prior to arrival	N/A
V-9	Submit Use Authorization Documentation (ionizing & non-ionizing)	K-ELV-11.2	12 months prior to arrival	N/A
V-10	Identify and Submit Program Assignment of Single POC for Waste Management	K-ELV-11.2	12 months prior to arrival	6/23/00
V-11	Submit Final Information for EIS (AF Form 813)	Cal EPA	12 months prior to arrival	N/A
V-12	Submit Preliminary MSPSP (1)	EWB 127-1	45 days prior to CDR	N/A
V-13	Submit Personnel Badging Info. for Non-Foreign Nationals (PRP input) (2)	K-ELV-11.2	6 months prior to arrival	N/A
V-14	Submit Administrative Network Information Checklist	Payload Specific	4 months prior to arrival	N/A
V-15	Deliver Deployment Plan to Resident Office	Payload Specific	4 months prior to arrival	N/A
V-16	Submit Final List of all Customer Procedures	EWB 127-1	90 days prior to arrival	9/5/00
V-17	Submit Process Waste Questionnaires	KMI 1800.2	60 days prior to arrival	10/10/00
V-18	Submit Material Safety Data Sheets	KMI 1800.3	60 days prior to arrival	10/10/00
V-19	Submit Final MSPSP (1)	EWB 127-1	45 days prior to hardware shipment	N/A
V-20	Participate in Pre-Ship Review (T-Con) and Submit Final Arrival Day Badging Request (5)	Payload Specific	45 days prior to arrival	N/A
V-21	Submit Final Arrival/Transportation Plans and Schedules (4)	K-ELV-11.2	45 days prior to arrival	N/A
V-22	Submit Hurricane Plan (if not part of LSSP)	KHB 1040	45 days prior to arrival	N/A
V-23	Submit Ground Operation Review Charts to KSC (LSIM)	LSIM	45 days prior to arrival	N/A
V-24	Submit Waste Management Training Memo	K-ELV-11.2	30 days prior to arrival	10/31/00
V-25	Participation in Ground Operation Review	K-ELV-11.2	30 days prior to arrival	10/29/00
V-26	Final Submittal of all Medical Certification	K-ELV-11.2	30 days prior to arrival	N/A

ELV Spacecraft Program Deliverables  
 Launch Vehicle Provider = [Launch Vehicle Provider]  
 Rev. Date = [Date]

First Support Date [Date]  
 Launch Date [Date]

Track #	Item	Requirement	Submittal Time	Need Date
V-27	Obtain Certification of KSC Safety Compliance	NASA-STD-8719.8/EWR 127-1	30 days prior to arrival	N/A
V-28	Maintain Solvent Log	SBCEPA	on arrival	3/20/01
V-29	Submit Pad Contingency Off-load Procedure	EWR 127-1	45 days prior to payload transport to pad	N/A
V-30	Submit Hazardous Procedures	K-ELV-11.2	55 days prior to first use	10/28/00
V-31	Submit Personnel Training Class Dates	K-ELV-11.2	30 days prior to need date	N/A
V-32	Submit Non-hazardous Procedures	K-ELV-11.2	10 days prior to first use	10/28/00
V-33	Submit Camera Pass Request (for CCAFS only)	KMI 1610	2 weeks prior to need	N/A
V-34	Submit Permits for Welding/Hot Work (if needed)	KHB 1710	1 week prior to need	N/A

The number of submittals, frequency, and submittal dates are tailored for each program via the Range/NASA Safety organizations.

The K-ELV-11.2 guideline specifies 4 months; however, the current process is taking significantly longer.

LSSP publish and release dates are unique and tailored for each mission.

K-ELV-11.2 guideline specifies 6 months; however, final input at 45 days is typically sufficient.

K-ELV-11.2 guideline specifies 6 months; however, 90 days is typically sufficient.

Note: Shaded items have been developed for this program only.

**NOTE:** Those items that do not apply to the LSP will be indicated by (N/A) in the “Need Date” column.

## APPENDIX D – GENERIC PAYLOAD SUPPORT REQUIREMENTS MATRIX

The following Support Requirements Matrix contains items needed to meet the requirements of the payload customer, the LSP, and the launch site team in order to implement a successful launch site flow for MSP'01-ORBITER.

KEY:

Tracking Number (REQ. NO.)

Location (LOC.)

Control Room (CNT RM)  
 Hazardous Processing Facility Air Lock (HPF AL)  
 Hazardous Processing Facility Clean Room (HPF CR)  
 Payload Processing Facility Air Lock (PPF AL)  
 Payload Processing Facility Clean Room (PPF CR)  
 Miscellaneous (MISC)  
 Office Areas (OFFICE)  
 Pad (PAD)

Category (CAT.)

Administrative Items (Admin)  
 Communications Needs (Comm)  
 Environmental Requirements (Environ)  
 Equipment Provided by Facility (Equip (Facility))  
 Equipment Provided by Fluids Groups (Equip (Fluids))  
 Equipment Provided by Launch Site Labs (Equip (Lab))  
 Equipment Provided by Miscellaneous Areas (Equip (Misc))  
 Equipment Provided by Transportation Groups (Equip (Transport))

Category (CAT.) (contd.)

Extras – Nicety Items (Extras)  
 Administrative and Mission Network Needs (Networks)  
 Public Affairs Support (PA)  
 Power Requirements (Power)  
 Resident Office/Badging Needs (RO)  
 Security Requirements (Security)  
 Launch Site Services Required (Service)  
 Processing Area Requirements (Space)  
 Items from Launch Site Stock Cribs (Stock)  
 Training Needs (Training)

Requested Item (ITEM)Details of Requested Item (REQUIREMENT DESCRIPTION)Recipient of Item Provided (RECIPIENT)

Delta 3<sup>rd</sup> Stage (Boeing)  
 MSP'01-ORBITER Spacecraft (MARS'01)  
 MSP'01-ORBITER Spacecraft Propellant Ops-Specific (LMA-PROP)

Test or Timeframe the Requirement is Needed (REQUIRED FOR)

Hazardous Processing Facility (SAEF-2)  
 Optional Service (OPTNL)  
 SLC-17 interface, command/telemetry, and verification testing plus launch (PAD)  
 Pre-flight (PREF)  
 Post-flight (POSTF)  
 Voice and data requirements from launch through spacecraft separation (POSTL)  
 Spin balance operations (SPIN)  
 Transportation services (TRANS)

Supplier of Item Provided (COMMIT SOURCE)Status of Ability to Provide Requirement – Yes or No? (Y/N)

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
10	CNT RM	Admin	Chairs	# / Type: 20 / Computer console-type chairs (assume use of both Bldg 1061 control rooms)	MSP'01-Orbiter	PREF PAD POSTF	5301	556416 Y
20	CNT RM	Admin	Copiers	# / Estimated # of Copies: One / Six reams per week (Room 134/135)	MSP'01-Orbiter	PREF PAD POSTF	5301	556417 Y
30	CNT RM	Admin	Fax	# of Lines / # of Machines: One line / One fax machine (Room 134/135)	MSP'01-Orbiter	PREF PAD POSTF	2769	556463 Y
40	CNT RM	Admin	Bookcases	# / Size: Two / 5-shelf bookcases	MSP'01-Orbiter	PREF PAD POSTF	5301	556418 Y
50	CNT RM	Admin	Phones	# of Lines / # of Phones 12 digital lines / 12 digital phones (Rooms 134/135); 4 analog lines (with no phones) in Room 135	MSP'01-Orbiter	PREF PAD POSTF	2780	556474 556485 TBD
60	CNT RM	Admin	Tables	# / Size: 24 tables (Rooms 134/135) / approximately 2.5' x 5'	MSP'01-Orbiter	PREF PAD POSTF	5301	556419 Y
80	CNT RM	Power	Electrical Outlets	# / Spec / Connector: 12 outlets / 120V single phase 30 A / standard, with ground	MSP'01-Orbiter	PREF PAD POSTF	5305	556513 Y
90	CNT RM	Power	Generators	# / Capacity / Items to Cover: One / 300kVA / Critical S/C powered activities. An electrician to be available to switch to generator if needed.	MSP'01-Orbiter	PREF PAD POSTF	5305	556514 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
100	CNT RM	Power	UPS	# / Capacity / Items to Cover: Facility UPS / 5 kVA, 120 volts / 30 minutes minimum for contingency	MSP'01-Orbiter	PREF PAD POSTF	5305	556510 Y
110	CNT RM	Security	Locks	Type of Coverage: Cipher locks with electronic security system, when requested	MSP'01-Orbiter	PREF PAD POSTF	5303	556502 Y
120	CNT RM	Security	Fire Protection	Type of Coverage: Provide dry-charged fire extinguisher for S/C control room	MSP'01-Orbiter	PREF PAD POSTF	5302	556461 Y
130		Comm	RF Link	Obtain RF authorization for the following X-band frequencies: Uplink: 7155.377316 MHz Downlink: 8406.851853 MHz Power: Downlink, 15.0 watts	MSP'01-Orbiter	PREF PAD POSTF	1405	556375 556376 Y
140		Comm	RF Link	Require control of Range radars to 50 volts per meter from 14KHz to 40 GHz during transport and on pad. This is an RF protection requirement.	MSP'01-Orbiter	TRANS PAD	3431	556533 556534 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
150		Comm	RF Link	<p>Provide one bi-directional x-band link between HPF and MIL-71 for Mars Orbiter command and telemetry with SMA type connectors. Uplink and downlink frequencies are as follows:</p> <p>Uplink:</p> <ul style="list-style-type: none"> <li>Frequency: 7155.377316 MHz</li> <li>Modulation: PM/PSK/NRZ</li> <li>Subcarrier Frequency: 16 kHz sinewave, 0.5 to 1.5 radians peak mod index</li> </ul> <p>Downlink:</p> <ul style="list-style-type: none"> <li>Frequency: 8406.851853 Mhz</li> <li>Modulation: PM/BPSK</li> <li>Subcarrier Frequency: 25 and 375 kHz squarewave, 0.5 to 1.4 radians mod index</li> <li>Output Power: 15.0 Watts</li> </ul>	MSP'01-Orbiter		2200 2766	556377 Y
155		Comm	Data Circuit	Provide two (primary and backup) 1024 Kbps full-duplex RS-530 data circuits for Mars Orbiter ATLO data terminated with male Cisco 530 DTE connectors between HPF spacecraft control room and JPL during spacecraft processing and pad operations	MSP'01 – Orbiter		2200 2766	556432 Y
160		Comm	Data Circuit	Provide two 110 Kbps Bi-Phase RS-422 data circuits for spacecraft telemetry TLM-1 and spacecraft TLM-2 terminated with ITT Pomona, Triaxial, Male 3600 connectors between HPF and MIL-71 during spacecraft processing and pad operations	MSP'01-Orbiter		2200 2766	556432 Y
170		Comm	Data Circuit	Provide two (primary and backup) full duplex T-1 data circuits for Mars Orbiter Command and Telemetry (TTACS Kentrox) terminated with female DB-15 connectors (transmit on pins 1 and 9, receive on pins 3 and 11) between HPF and HPF spacecraft control room during spacecraft processing.	MSP'01-Orbiter		2200 2766	556432 Y



REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
190		Comm	Data circuit	Provide two 110 Kbps Bi-Phase RS-422 data circuits for spacecraft telemetry TLM-1 and spacecraft TLM-2 terminated with ITT Pomona, Triaxial, Male, 3600 Connectors between HPF and MIL-71 during spacecraft processing and pad operations.	MSP'01-Orbiter		2200 2766	556432 Y
200		Comm	Data circuit	Provide two (prime and backup) full-duplex T-1 data circuits for Mars Orbiter Command and Telemetry (TTACS Kentrox) terminated with female DB-15 to connectors (transmit on pins 1 and 9, receive on pins 3 and 11) between SLC17 and HPF spacecraft control room during spacecraft processing.	MSP'01-Orbiter		2200 2766	556438 Y
230		Comm	Data circuit	Provide one full-duplex T-1 data circuit for Orbiter Emergency Command Workstation Control terminated with male Cisco 530 DTE connectors between SLC-17 Blockhouse Spacecraft GSE area and HPF S/C control room during pad operations. LMA/JPL GDS group will provide Cisco routers for the Control Room and the Block House. NASA/KSC will provide Kentrox CSU/DSUs. This circuit shall be diversely routed from the circuits specified in Req. No. 200.	MSP'01-Orbiter		2200 2766	556442 Y
240		Comm	Data circuit	Provide one 0 to 224 Kbps full-duplex DSN Blocked data circuit between MIL-71 and JPL, Pasadena Ground Communication Facility during spacecraft processing and pad operations.	MSP'01-Orbiter		2200 2766	556434 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
250		Comm	Voice	Provide seven full duplex local voice nets between HPF spacecraft control room, Spin Control area (SAEF-2 Rm 103), HPF high bay, JPL Project Manager's office, the HPF conference room, and Hangar AE during spacecraft processing. Voice net names (and function) include: ORB ATLO (Mars Orbiter ATLO coordination) ORB TEST (Mars Orbiter Data coordination) ORB DATA (Mars Orbiter Data coordination) ORB ORT (Mars Orbiter Operational Readiness Test coordination) ORB CC (Mars Orbiter Communications Coordination). DSN Track (DSN coordination) DSN Coord (DSN coordination)	MSP'01-Orbiter		2730 2760	556396 Y
260		Comm	Voice	Extend four full duplex voice nets to MIL-71 during spacecraft processing and pad operations. Voice nets include: ORB TEST ORB DATA ORB ORT ORB CC.	MSP'01-Orbiter		2730 2760	Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
270		Comm	Voice	Provide nine voice nets between KSC and JPL, Pasadena. Voice nets with full duplex capability include: ORB ATLO ORB TEST ORB DATA ORB CC ORB ORT during spacecraft processing and pad operations. Voice nets with monitor only capability include: CT DOWN (Launch Operations) CT BU (Launch Operations backup) CMTRY (Launch/Flight commentary) MET (Weather Status) during pad operations.	MSP'01-Orbiter		2730 2760	556408 556434 Y
280		Comm	Voice	Provide standard set of spacecraft customer Delta voice nets to HPF spacecraft control room and Hangar AE MDC during pad operations. These voice nets are: Countdown (Launch Operations) Countdown Backup (Launch Operations Backup) Met (Weather) Launch/Flight Commentary.	MSP'01-Orbiter		2730 2760	556397 556388 Y
290		Comm	Voice	Provide for the Mars Orbiter Test Conductor in the HPF spacecraft control room to have talk capability on the Countdown Net (Launch Operations) and Countdown Backup (Launch Operations backup) voice nets during pad operations.	MSP'01-Orbiter		2730 2760	556426 Y
300		Comm	Voice	Provide three full duplex voice nets for Mars Orbiter personnel at SLC-17 during pad operations. Voice net names include: ORB ATLO ORB TEST ORB DATA.	MSP'01-Orbiter		2730 2760	556384 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
310		Comm	Voice	Provide twelve non-hazardous area OIS-D lightweight communication headsets and nine ELV wireless OIS-D headsets for spacecraft team use during spacecraft processing and pad operations. *Can only provide three-four wireless headsets	MSP'01-Orbiter		2700	556381 556382 Y*
315		Comm	Voice	Provide two portable OIS-D end instruments, with four headsets each, for use in HPF highbay.	MSP'01-Orbiter		2741	556411 Y
316		Comm	Voice	Provide external speakers for OIS units in HPF clean room, HPF control room, trailers, and HPF conference room. *Except for HPF clean room which is "N" due to the fact that external speakers cannot be GN <sub>2</sub> purged.	MSP'01-Orbiter		2741	556411 Y*
320		Comm	Modem	Provide four analog telephone lines in spacecraft control room, one analog line in each trailer, two analog telephone lines in the highbay, and three analog telephone lines in office support areas for modems to support calls during spacecraft processing and pad operations.	MSP'01-Orbiter		2766 5301	556485 Y
350		Comm	Modem	Provide one analog telephone line in SLC-17 Block house and one analog telephone line in the SLC-17 white room to support calls (for GN <sub>2</sub> purge sensaphone) during pad operations.	MSP'01-Orbiter		2766 5301	556486 Y
360		Comm	Network	Provide 10baseT LAN connectivity terminated with male RJ-45 connectors for fifty PC or MAC computers, and five network printers in the spacecraft buildings and trailers during spacecraft processing and pad operations. Subject to change pending decision from Project.	MSP'01-Orbiter		2766 5301	556487 Y
365		Comm	Network	Provide Virtual Private Network connectivity to LMA and JPL in the PPF, spacecraft control rooms, office support areas, and trailers during spacecraft processing and pad operations.	MSP'01-Orbiter		2766 5301	557188 Y
370		Comm	Network	Provide connectivity between the PON and the Project areas and trailer's LAN during spacecraft processing and pad operations.	MSP'01-Orbiter		2766 5301	556488 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
380		Comm	Network	Provide 10baseT connectivity with RJ45 connectors LMA/JPL UNIX Collaborative Server to the PON during spacecraft processing and pad operations. Subject to change pending decision from Project.	MSP'01-Orbiter		2766 5301	556482 Y
410		Comm	Network	Provide 24 hour administrative network support during mission critical activities.	MSP'01-Orbiter		2800	556486 Y
420		Comm	Network	Provide 24 hour communication engineering and technician support during mission critical activities.	MSP'01-Orbiter		2766 5301	556401 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
421		Comm	Voice	<p>PAO (Comm)</p> <p>Provide following PAO support:</p> <p>Bi-directional 56k full bandwidth 56 digital voice circuit between Hangar AE PAO Console and KSC Press Site for PAO release audio and return release audio from KSC Press Site and Hangar AE.</p> <p>Landline analog back up for all the above.</p> <p>Full duplex voice nets to Hangar AE include:</p> <p>PAO CO ORD</p> <p>USA CO ORD</p> <p>USA CO ORD back up</p> <p>(KSC Press Site to Hangar AE)</p> <p>Monitor only voice nets on the AE PAO Console include:</p> <p>CX17-1</p> <p>CX17-2</p> <p>NASA MGMT</p> <p>Mission Audio</p> <p>Mission MGMT</p> <p>Anomaly 1</p> <p>Range Ops</p> <p>NASA Engineering</p> <p>Met Net</p> <p>S/C-1</p> <p>Full duplex voice nets on the AE PAO Console include:</p> <p>PAO-CO-ORD</p>	MSP-01-Orbiter		2805	<p>556405</p> <p>556406</p> <p>Y</p>

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
422		Comm	Video	PAO (Comm) Provide the following PAO video support: Air Force Weather NTSC uncompressed video to the KSC Press Site Patrick IGOR NTSC video uncompressed to KSC Press Site Cocoa Beach DOAMS NTSC video uncompressed to KSC Press Site Three NTSC uncompressed video lines PAO video feeds from Hangar AE to KSC Press PAO release NTSC uncompressed video from KSC Press Site to KSC, Hangar AE, and the Eastern Range	MSP'01-Orbiter	2805	2805	556447 556448 556449 556450 Y
430		Comm	Video	Provide color CCTV coverage of spacecraft in HPF routed to HPF spacecraft control room, JPL Project Manager's office, Spin Control area (SAEF-2 room 103), and the HPF conference room during spacecraft processing.	MSP'01-Orbiter		2805	556490 Y
440		Comm	Video	Provide color CCTV coverage of standard SLC-17 video routed to HPF spacecraft control room, JPL Project Manager's office and the HPF conference room during pad operations.	MSP'01-Orbiter		2805	556481 556482 Y
450		Comm	Video	Provide color CCTV coverage of SLC-17 Levels 9B and 9C routed to HPF spacecraft control room, JPL Project Manager's office and the HPF conference room during pad operations.	MSP'01-Orbiter		2805	556483 Y
460		Comm	Video	Provide color CCTV coverage of spacecraft EGSE located in SLC-17 Blockhouse routed to HPF spacecraft control room during pad operations. Provide pan/tilt and zoom control via telephone request.	MSP'01-Orbiter		2805	556484 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
470		Comm	Video	Provide three existing color TV monitors in HPF spacecraft control room, one existing color TV monitor in the JPL Project Manager's office, one additional color TV monitors in the Spin Control area (SAEF-2 room 103), and one existing color TV monitor in the HPF conference room during spacecraft processing and pad operations.	MSP'01-Orbiter		2805	556500 Y
480		Comm	Video	Provide color video coverage of HPF highbay, HPF spacecraft control room and SLC-17 routed to the KSC internet homepage during spacecraft processing and pad operations. Video source to be controlled by call-up panel in HPF control room.	MSP'01-Orbiter		2805	556496 Y
490		Comm	Video	Provide JPL PAO web camera link from KSC to JPL. KSC to provide selectable Mars Orbiter spacecraft video to Mars Orbiter project terminated with male S-type video connectors during S/C processing and pad operations plus 24 hours post launch. Provide one 15-inch color video monitor located with Mars'01 video computer (provided by project).	MSP'01-Orbiter		2805	556501 556496 Y
491		Comm	Video	Provide routing of launch vehicle on-board camera video from Range to Hangar AE and HPF Control Room	MSP'01-Orbiter			557534 557535 Y
500		Comm	Video	Provide three copies of VHS and Beta-max videotape of launch and processing activities.	PAO		2805	556470 Y
560		Comm	Video	Provide photographer to perform mobile video support during Mars Orbiter processing.	MSP'01-Orbiter		2805	556497 Y
570		Comm	Video	Provide video recording of hazardous operations.	MSP'01-Orbiter		2805	556467 Y
580		Comm	Timing	Provide GMT and the Hangar AE Countdown Clock Display to HPF spacecraft control room during rehearsals ORTs, and launch operations.	MSP'01-Orbiter		2810 2830	556522 556523 Y
581	HPF AL	Space	Work Area	Sq. Footage: 450 square feet	MSP'01-Orbiter	PREF	5600	556612 Y



REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
582	HPF CR	Space	Work Area	Specs: Approximately 10-ft x 10-ft of suitable mounting surface for customer-provided spin table.	MSP'01-Orbiter	PREF		556472 Y
590	HPF CR	Admin	Phones	# of Lines / # of Phones / # of Modems: Two lines / Two (explosion-proof) phones	MSP'01-Orbiter	PREF	2780	556472 Y
600	HPF CR	Extra	Furniture	Item: Four 4' x 2' x 6' wire racks (for storing work-in-progress)	MSP'01-Orbiter	PREF POSTF HPF	5301	556421 Y
610	HPF CR	Extra	Furniture	Item: Three storage cabinets, with at least one lockable	MSP'01-Orbiter	PREF POSTF HPF	5301	556420 Y
620	HPF CR	Equip (facility)	Cold storage (refrigerator)	Temp. Range / Min. capacity size / Duration: 1-7 deg C (35-45 deg F) / 30-in x 20-in x 12-in (75-cm x 50-cm x 30-cm) / Approx. three months (flight Ni-H batteries). Note: Exterior display required for monitoring. Alarm capability preferred, but not required. * Current SAEF-2 refrigerator can handle batteries themselves, but cannot accommodate the additional battery storage containers.	MSP'01-Orbiter	PREF POSTF	5307	556518 Y*
640	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Deionized water / four 55-gal (208-liter) drums / BOC-4430191, Rev L	MSP'01-Orbiter	HPF	5310	556592 Y
650	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Isopropyl alcohol / one 55-gal drum (208-liter) for fuel cart cleaning / TT-1-735, Grade A	MSP'01-Orbiter	HPF	5310	556588 Y
660	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Isopropyl alcohol / four (19-liter) containers with six plastic squeeze bottles / TT-1-735, Grade A	MSP'01-Orbiter	HPF	5310	556588 Y
670	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Liquid Nitrogen / five 160-liter dewars at 25 psig / MIL-PRF-27401D, Type II Grade B (Note: For cold-trap operations during propellant loading.)	LMA-PROP	HPF	5310	556592 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
671	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Liquid Nitrogen / six 160-liter dewars at 25 psig / MIL-PRF-17401D, Type II Grade B (Note: For GRS bench-top cooler stand alone operations.)	MSP'01 - GRS	HPF		557548 Y
680	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Breathing air / one tube bank trailer connected to HPF CR supply panel / SE-S-0073 Table 6.3-29 (Note: To support 2 X 2 SCAPE crew for 32 hours (64 hours total.)	LMA-PROP	HPF	5310	556591 Y
690	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Breathing air / air-pack bottles for SCAPE ingress & egress / SE-S-0073 Table 6.3-29 (Note: To support 2 x 2 SCAPE crew.)	LMA-PROP	HPF	5310	556596 Y
700	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Facility GN <sub>2</sub> / 10,000 scf at 750-psig (minimum) / MIL-PRF-27401D, Type 1, Grade B with 10-micron filter	LMA-PROP	HPF	5310	556596 Y
701	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Facility GN <sub>2</sub> / Approx. 500 scf at 250-psig (Minimum) to 3,000 psig (maximum) / MIL-PRF-27401D, Type 1, Grade B. (Note: Requires 3/8-in AN flex hose connection to spin table. Regulator supplied by spacecraft customer.)	MSP'01-Orbiter	HPF	5310	556596 Y
702	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: GN <sub>2</sub> / Two standard K-bottles (w/two-bottle rack) / MIL-PRF-27401D, Type 1, Grade B. (Note: Required as backup supply for spin balance table operation. Regulator supplied by spacecraft customer.)	MSP'01-Orbiter	HPF	5310	557550 Y
703	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Facility GN <sub>2</sub> / Approx. 1,000 scf at 250-psig (minimum) / MIL-PRF-27401D, Type 1, Grade B. (Note: Regulator supplied by GRS team.)	MSP'01 - GRS	HPF	5310	557550 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
710	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Gaseous Helium / twelve K-bottles at 6000 psig / MIL-PRF-27407B, type 1, Grade A (Note: Regulator will be supplied by spacecraft customer.)	LMA-PROP	HPF	5310	556595 Y
720	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: GN <sub>2</sub> / 60 K-bottles / MIL-PRF-27401D, Type 1, Grade B (Note: Regulator will be supplied by spacecraft customer.)	LMA-PROP	HPF	5310	556593 Y
730	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: High purity grade N <sub>2</sub> H <sub>4</sub> / 272 kg (600 lbs min.) in 120-gal (454 liter) DOT4BW container (with full container backup available within 24 hours, in case of sample failure) / MIL-PRF-26536E, HPH Grade	LMA-PROP	HPF	5310	556587 Y
740	HPF CR	Equip (Fluids)	Commodity	Item / Amount / Spec: Low Iron N <sub>2</sub> O <sub>4</sub> / 150 kg (330 lbs.) in 55-gal (208 liter) DOT4BW container (with full container backup available within 24 hours, in case of sample failure) / MIL-STD-MIL-P-26539E	LMA-PROP	HPF	5310	556588 Y
750	HPF CR	Equip (Fluids)	SCAPE suits	# / Duration: Ten PHE (SCAPE) suits / Approx. one week for propellant loading operations	LMA-PROP	HPF	5302	556458 Y
760	HPF CR	Equip (Fluids)	Aspirators	# / Duration: One fuel aspirator / Approx. one week for fuel loading operations (Note: OJT informal training requested prior to operation.)	LMA-PROP	HPF	5302	556459 Y
770	HPF CR	Equip (Fluids)	Scrubbers	# / Type / Location / Duration: One / Fuel scrubber / SAEF-2 / Approx. one week for propellant loading operations	LMA-PROP	HPF	5302	556460 Y
780	HPF CR	Equip (Fluids)	Scrubbers	# / Type / Location / Duration: One / Oxidizer scrubber / SAEF-2 / Approx. one week for propellant loading operations	LMA-PROP	HPF	5302	556461 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
790	HPF CR	Equip (Lab)	Lab Equipment	# / Item / Spec / Duration: One / Propellant cylinder scale (and associated electronics and readout) for 55-gal (208 liter) 4BW oxidizer (N <sub>2</sub> O <sub>4</sub> ) cylinder / Accuracy of +/-0.1% of full scale / Approx. two weeks	LMA-PROP	HPF	6000	557446 Y
795	HPF CR	Equip (Lab)	Lab Equipment	# / Item / Spec / Duration: One / Propellant cylinder scale (and associated electronics and readout) for 55-gal (208 liter) 4BW fuel (N <sub>2</sub> H <sub>4</sub> ) cylinder / Accuracy of +/-0.1% of full scale / Approx. two weeks	LMA-PROP	HPF	6000	556616 Y
800	HPF CR	Equip (Facility)	Mop & sop kits	# / Duration: Three (Hydrazine) / Approx. three months	LMA-PROP	HPF	5600	556519 Y
810	HPF CR	Equip (Facility)	ELSA Packs	# / Duration: Five boxes of five ELSAs / Approx. three months	MSP'01-Orbiter LMA-PROP	HPF	5302	556462 Y
820	HPF CR	Equip (Facility)	POL Lockers	# / Duration: Two total in HPF / Approx. three months *Will provide, but only one locker	MSP'01-Orbiter LMA-PROP	HPF	5307	556520 Y*
821	HPF CR	Stock	Plastic / Tape	# / Description: 1) One roll / Plastic, Series 24, 02405 made by T&F Division of CHR Industries (or equiv) 2) Four rolls / Ultra Tape 2149 made by Ultratape Industries (or equiv) Note: Required for spacecraft propellant loading preparations. Therefore all materials must be hypergolic-compatible, ESD-compatible, and non-flammable.	LMA-PROP	HPF		Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
822	HPF CR	Power	Electrical Outlets	# / Spec / Connector: Location is in the HPF high bay (clean room) area. 1) One circuit / 120V, 1-phase, 30A / Crouse Hinds [fueling cart] 2) One circuit / 480V, 3-phase, 60A / AR-642 Avkrite [EGSE] 3) One circuit / 480V, 3-phase, 60A / AR-642 Avkrite [GRS Power Distribution Unit] 4) One circuit / 208V, 3-phase, 30A / Hubbell 231A [battery cooling cart]	MSP'01-Orbiter / MSP'01 - GRS	HPF	5305	557193 Y
823	HPF CR	Power	Electrical Outlets	# / Spec / Connector: Location is for the HPF spin table control area (SAEF-2 room 103). These outlets may be located in the high bay area and routed into the control area via extension cables running through facility conduits. 1) One circuit / 208V, 3-phase Y, 30A / Hubbell 2810 4-pole, 5-wire [spin table control console] 2) Two circuits / 120V, 20A / Standard [spin control console computer]	MSP'01-Orbiter	HPF		557545 Y
824	HPF CR	Power	Phase Check	Description / Location: Verify proper phasing for all 3-phase electrical outlets / HPF CR	MSP'01-Orbiter	HPF		557544 Y
824B	HPF CR	Power	UPS	# / Capacity / Items to Cover / Min shut-down duration: Facility UPS / 25 kVA / C&T Rack, ITPE, BPTS, test consoles / 30 minutes	MSP'01-Orbiter	HPF		557193 Y
825	MISC	RO	Badging	# To be Escorted / # Unescorted Three / 45	MARS-01-Orbiter	PREF POSTF	5303	556508 Y
830	HPF CR	Service	Monitor (NVR)	Spec / Reports: ASTM E1234 [NVR plate handling & installation] and ASTM E1235 [gravimetric measurement] / Weekly reports	MSP'01-Orbiter	PREF	5303	556563 556609 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
840	HPF CR	Service	Monitor (particulate)	Spec / Reports? / Alarm? / Action: Class 100,000 of Fed. Std. 209 (Light scattering method of 0.5 and 5 micron particles) / Report with hourly data, when requested / Out of spec condition / Notify MARS'01-Orbiter POC	MSP'01-Orbiter	PREF	5308	556558 556559 556560 Y
850	HPF CR	Service	Sample Analysis	Item / Spec: Gaseous Helium / MIL-PRF-27407B, Type 1, Grade A (Best effort for sample results to 1 ppm hydrocarbons and sample purity results for LMA specification MP72115, Appendix 6, Tables II and III particulate spec.)	LMA-PROP	PREF	5410	556608 Y
860	HPF CR	Service	Sample Analysis	Item / Spec: Facility GN <sub>2</sub> (750 psig) / MIL-PRF-27401D Grade C (Best effort for sample results to 1 ppm hydrocarbons and sample purity results for LMA specification MP72115, Appendix 6, Tables II and III particulate spec.)	LMA-PROP	PREF	5410	556607 Y
870	HPF CR	Service	Sample Analysis	Item / Spec: High purity grade N <sub>2</sub> H <sub>4</sub> / Sample Specs defined in LMA MP50405, rev 23, dated Jan. 30, 1997. Samples must pass a V-9 particulate distribution as defined in the referenced document.	LMA-PROP	PREF	5410	556606 Y
880	HPF CR	Service	Sample Analysis	Item / Spec: High purity grade N <sub>2</sub> O <sub>4</sub> / Sample Specs defined in LMA MP50405, rev 23, dated Jan. 30, 1997. Samples must pass a V-9 particulate distribution as defined in the referenced document.	LMA-PROP	PREF	5410	556606 Y
881	HPF CR	Service	Equipment Installation	Activity / Duration: Install four floor inserts into the SAEF-2 floor using a customer-provided drill templet, to support securing the LMA spin table (uses four ½-in x 13 All Thread mounting bolts) / four shifts	MSP'01-Orbiter	PREF HPF		557542 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
882	HPF CR	Service	Proofload	Activity / Duration: Perform rated load test of installed LMA spin-table mounting holes to 1,728 lbs each / One shift Note: Customer will provide attachment hardware for spin-table (1/2-in x 13 All Thread).	MSP'01-Orbiter	PREF HPF		557542 Y
883	HPF CR	Service	Chilled Water System	Item / Rate / Duration: Provide a closed-loop chilled water capability to supply $\leq 45$ -deg F water to the GRS bench-top cooler. Interface is a std garden-hose connection. / In excess of 3 gal per minute / Use through first month of HPF processing.	MSP'01 Orbiter – GRS	PREF HPF		557552 Y
890	HPF CR	Service	Technicians	# / Activity / Duration: Facility HVAC tech / Shutdown HVAC fresh air make-up in the event of wild fire or controlled burn within five miles upwind of HPF.	MSP'01-Orbiter	PREF HPF	5300	556553 N
891	HPF CR	Service	Technicians	# / Activity / Duration: Two / Provide two ball-valve operators for all HPF operations requiring water deluge protection (fueling, fueled spacecraft lifts and spins)	MSP'-1-Orbiter	PREF HPF	5300	55719 Y
900	HPF CR	Service	Toxic Vapor Checks	Description / Location: Provide TVC prior to opening facility housing N <sub>2</sub> H <sub>4</sub> , every four hours (with sensitivity level of 0.01 ppm Hydrazine) while personnel occupy the facility, and after fueled spacecraft moves / HPF	MSP'01-Orbiter	HPF	5300	55654 Y
1000	HPF CR	Stock	Garments (cleanroom)	# / Size / Type: 60 sets per week / 100K Class CWA static-proof, full polyester bunny-suits with boots and head covers (full face/eye and shower caps).	MSP'01-Orbiter	PREF	5302	55645 Y
1010	HPF AL	Stock	Wipes	# / Spec: Four bundles (packages of 100) of lint-free rags for cleaning	MSP'01-Orbiter LMA-PROP	PREF	5300	55655 Y
1015	MISC	Admin	FEDEX / UPS Accounts	Account / Estimated Usage Rate: Account to be setup by Lockheed Martin / daily	MSP'01-Orbiter	PREF	5306	55642 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
1016	MISC	Space	Storage Space	Sq. Footage: 900 square feet	MSP'01-Orbiter	PREF POSTL	5600	556611 Y
1017	MISC	Environ	Monitor (Weather)	Item to Report / Frequency: Yes / daily	MSP-01-Orbiter	PREF PAD	3220	556532 Y
1018	MISC	Equip (Facility)	Hydraset	Size / Duration / Reason: 5,000 pounds / 3 months / Backup only	MSP'01-Orbiter	PREF	5341	556602 Y
1019	MISC	Equip (Trans- port)	Forklift	# / Size / Location / Duration: One / 15,000 pounds, standard tines / HPF / 3 months, as schedule One / 30,000 pounds, 10 foot tines / SLF & HPF / two days in Jan 01 (spacecraft arrival)	MSP'01-Orbiter	TRANS	5341	556599 556600 Y
1020	MISC	Equip (Trans- port)	Light Banks	# / Size / Duration / Reason: One shift / SLF / Expect night landing for spacecraft arrival	MSP-01-Orbiter	TRANS	5305	556512 Y
1021	MISC	Equip (Trans- port)	Packaging	Amount / Description / Use: 20 containers / Packing support / Program return to Denver	MSP'01-Orbiter	TRANS	5306	556514 Y
1022	MISC	Equip (Trans- port)	Pallet Jack	Capacity / Duration: 5,000 pounds / 3 months	MSP'01-Orbiter	TRANS	5341	556600 Y
1023	MISC	Equip (Trans- port)	Tractor / Trailer	# / Size / Spec / Location: One / 60 foot / flatbeds / Transport MGSE from SLF to HPF	MSP'01-Orbiter	TRANS	5341	556599 Y
1030	MISC	PA	Tapes (video)	# / Format / Activity / Location: Up to 15 tapes / VHS / Various HPF and Pad activities	MSP'01-Orbiter	PREF POSTL PAD	3100	556499 556477 Y
1040	MISC	Security	Traffic Escort	From / To / Duration / Occasion: 1. SLF SAEF-2 / Half-shift / spacecraft arrival 2. SAEF-2 / SLC-17 / Half-shift / spacecraft & Delta 3 <sup>rd</sup> stage transport to pad. Oversized load: Approx 32-ft (9.75 m) H x 12-ft (3.65 m) W x 40-ft (12 m) L	MSP'01-Orbiter Boeing	TRANS	5303	556503 Y



REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
1050	MISC	Service	Battery Disposal	# / Size / Battery Type / Location: Contingency support only	MSP'01-Orbiter LMA-PROP	PREF	5307	556556 Y
1060	MISC	Service	Battery Lab	# / Size / Battery Type / Service Request: Contingency support only	MSP'01-Orbiter LMA-PROP	PREF	5307	556556 Y
1080	MISC	Service	Calibration	Item / Spec / Due: Contingency support only	MSP'01-Orbiter LMA-PROP	PREF	6010	556617 Y
1085	MISC	Service	Cleaning/Bagging	Item / Size / Location: Contingency support only	MSP'01-Orbiter	PREF	5370	556603 Y
1090	MISC	Service	Decontamination	Item / Spec: Propellant cart / Propellant South / MIL-P-1246, Level 25A	LMA-PROP	PREF	5370	556604 Y
1100	MISC	Service	Machine Shop	Item / Spec: 10 hours support (contingency)	MSP'01-Orbiter	PREF	5300	556552 Y
1110	MISC	Service	Ordnance Storage	Item / Checkout? / Destruction? / Duration / Use / Location:	MSP'01-Orbiter	PREF	5307	557195 Y
1120	MISC	Service	Photos (Engineering)	# / Size / Format / Activity / Location: Up to 200 photos / Two copies of color or black-and-white contact sheets and duplicate negatives / closeout photos	MSP'01-Orbiter	PREF	3100	556530 556531 Y
1130	MISC	Service	Precision Cleaning	Item / Cleaning Spec / Location: Contingency support only	MSP'01-Orbiter	PREF	5370	556603 Y
1140	MISC	Service	Proof Loading	Item / Spec: Contingency support only	MSP'01-Orbiter	PREF	6000	556615 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
1150	MISC	Training	Aerialift (Manlift)	# to Train / Course #: Four/ 1. QG 232 KSC Forklift Safety 2. XG 749 MDA OJT Forklift Training 3. QG 271 MDA (Fall Protection for Payloads Customers) Note: Class A Heavy Equipment Physical required	MSP'01-Orbiter	PREF	3450	556542 Y
1160	MISC	Training	Crane / Door	# to Train / Course #: Twelve / 1. QG 340 KSC (Crain training, classroom) 2. OJT XG 772 MDA Note: Crane II Certification Class A Physical required	MSP'01-Orbiter	PREF	3450	556537 Y
1170	MISC	Training	Facility Access	# to Train / Course #: 45 / 1. QG07CKSC (ELSA Training, classroom) 2. QG109 (General Safety Processing) 3. QF28XKSC (SAEF-2 Familiarization) 4. QG205KSC (How Clean Is Clean Enough?)	MSP'01-Orbiter	PREF	3450	556540 556538 556539 556536 Y
1180	MISC	Training	PHE/SCAPE Training	# to Train / Course#: Six (LMA) / 1. QG501KSC (PHE SCAPE Operator Certification) 2. QG570KSC (Minor Hypergol Spill cleanup) Note: Class A Physical w/treadmill required	MSP'01-Orbiter	PREF	3450	556541 Y
1190	MISC	Training	SLC-17 Facility Access (including ELSA)	# to Train / Course #: 40 / 1. QG07CKSC (ELSA Training, classroom) 2. QG100CAS (CCAS Safety Familiarization) 3. QG117CAS (SLC-17 Walkdown) 4. QF17PCAS (SLC-17 Familiarization)	MSP'01-Orbiter	PAD/PREF POSTF	3450	556540 556541 556542 556543 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
1191	MISC	Training	Medical Cert	# to Cert / Reason: Eight Class A physicals with treadmill (stress test) / Req'd for SCAPE, heavy equipment, and crane operations.	MSP'01-Orbiter / LMA-PROP	PAD/PREF POSTF	3500	556547 Y
1192	MISC	Training	OIS / TOPS	# to Cert / Reason: Approx. 30 personnel / Req'd for use of OIS and TOPS voice communications.	MSP'01-Orbiter	PAD/PREF POSTF	3450	556543 Y
1200	OF-FICE	Admin	Conference Room	Max Capacity / Amenities: 30 people / Teleconferencing capabilities, single projection screen (approx. 48-in x 64-in), one large white board, and one overhead viewgraph projector	MSP'01-Orbiter	PREF POSTF	5600	556426 Y
1210	OF-FICE	Admin	Copiers	# / Estimated # of Copies: One standard and one high capacity with collator / Approx. 20 reams of paper per week	MSP'01-Orbiter	PREF	5301	556422 Y
1220	OF-FICE	Admin	Mailcode	Mailcode / Mailstop Location: MSP'01 / Office area (M7-1061)	MSP'01-Orbiter	PREF POSTF	1020	556424 Y
1230	OF-FICE	Admin	Offices	# / Type: 40 / Cubicle workstations Five / Project management offices	MSP'01-Orbiter	PREF POSTF	5600	556423 Y
1240	OF-FICE	Admin	Phones	# of Lines / # of Phones: 45 lines / 45 phones (one per desk)	MSP'01-Orbiter	PREF POSTF	2780	Y
1260	OF-FICE	Security	Locks	Type of Coverage: Key-locked with keys issued for private offices. Combination lock box for general office area access. Electronic security when requested.	MSP'01-Orbiter	PREF POSTF	5303	556509 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
1270	OTH-ER	Service	Haz Waste Disposal	Item / Amount / Location: 1. Hydrazine / HPF CR 2. Oxidizer / HPF CR 3. Isopropyl alcohol / HPF CR 4. (Trace) Hydrazine contaminated rinse water / HPF CR 5. (Trace) oxidizer contaminated rinse water / HPF CR 6. Adhesives / HPF CR Note: Detailed information to be included in PWQs	MSP'01-Orbiter LMA-PROP	PREF	5307	556515 556516 Y
1271	PAD	Power	Electrical Outlets	# Circuits / Spec / Connector: Whiteroom: 1) One / 110 Vac / Std [GN2 Purge cart] 2) One / 208 Vac, 3-phase, 30A / Hubbell 231A [Battery cooling cart] 3) One / 110 Vac / Std [Battery Charge/Discharge Assembly (BCDA) suitcase] 4) Two / 110 Vac / Std [Misc., small, portable, test equipment items] Blockhouse: 1) One / 250 Vac, 1-phase, 30A, NEMA L6-30P 2) Two / 110 Vac, 30A / Std twist lock [PDAC rack] 3) One / 110 Vac, 15A / Std [Sensaphone]	MSP'01-Orbiter	PAD	MISSION SPEC	557546 557547 Y
1320	PAD	Extra	Auxiliary A/C	Temp. Range / Duration: Supply as close as reasonable to 52.2 F (+/- 10-deg F) / Approx. three weeks (Note: Requires adapter off 6-in line from GPS air conditioning system into PAF.)	MSP'01-Orbiter	PAD	MISSION SPEC	556562 Y
1321	PAD	Service	Camera Pass	# Needed: One	MSP'01-Orbiter	PAD		557548 Y

REQ. NO.	LOC.	CAT.	ITEM	REQUIREMENT DESCRIPTION	RECIPIENT	REQUIRED FOR	COMMIT SOURCE	Y/N
1330	PAD	Furniture	Tables	# / Size: One / 30-in x 60-in (Note: Required for battery charging suitcase.)	MSP'01-Orbiter	PAD		556614 Y



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