Attachment A

STATEMENT OF WORK

Spacecraft Processing Operations Contract (SPOC)
for
National Aeronautics and Space Administration
Launch Services Program

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INTRODUCTION

NASA Launch Services Program (LSP) is responsible for NASA's acquisition and program management of commercial launch vehicles for NASA's science and robotic missions. LSP also provides processing facilities and support for these spacecraft, satellites, or payloads, herein referred to as spacecraft. The SPOC Contractor will provide facilities and services to facilitate and allow the spacecraft/launch vehicle organizations to conduct the processing and integration activities in preparation for mating the spacecraft with the launch vehicle at facilities near launch sites. The Contractor shall designate a facility located near either Kennedy Space Center (KSC)/Cape Canaveral Space Force Station (CCSFS) or Vandenberg Space Force Base (VSFB), or both. The Contractor may designate facilities at other launch site locations that have been approved by LSP. The launch site locations will now be herein referred to as the "launch site". This Statement of Work (SOW) defines the tasks required of the Contractor to provide processing facilities and services. An overview of the LSP personnel, processes and meetings are explained in the two documents:

- LSP-UG-332.01 Guide for NASA SC Processing at the Kennedy Space Center (KSC) and Cape Canaveral Space Force Station (CCSFS)
- LSP-UG-332.02 Guide for NASA Spacecraft Processing at Vandenberg Space Force Base.

1.0 SCOPE, OBJECTIVES, AND SPACECRAFT PROCESSING

1.1 Scope

The Contractor shall provide the following: advance planning, facilities, supplies, commodities, and services necessary for the Spacecraft Customers and Launch Service Contractors (LSC) to perform prelaunch processing and integration of the spacecraft and LSC hardware. This processing may include propellant loading, spin-balancing, launch vehicle integrated operations (upper stage mate, spacecraft adapter mate, spacecraft integration, or fairing installation), and encapsulation/transport of the completed spacecraft stacks to the launch pad.

1.2 Objectives

The Contractor shall perform advance planning necessary to furnish facilities, supplies, commodities, and services necessary for processing the spacecraft and providing for launch vehicle integration operations, when required. The Contractor must be able to provide the following primary capabilities: (1) facilities operated and maintained in accordance with safety, cleanliness, and security standards to protect the assets processed therein; (2) facilities and support to satisfy mission-specific requirements; (3) planning and documentation to optimize the spacecraft use of its facility; (4) commodities and services necessary to support spacecraft processing; and, (5) facilities and services to house support personnel.

1.3 Spacecraft Processing

The Contractor is responsible for providing all processing facility services necessary for the Spacecraft Customers to successfully prepare their flight hardware for launch. The Spacecraft Customers/LSC have prime responsibility for assembly, test, and servicing during the build-up and checkout of their respective hardware in the facility. The Contractor shall abide by all Spacecraft Customer's and LSC guidelines required to maintain the health and integrity of the hardware during processing operations in the processing facility. During the occupancy period, the Contractor shall provide necessary facility access, including access by international spacecraft customers, and support as required for spacecraft processing. The Spacecraft Customers will coordinate planned off-shift and 24-hour operations, but off-shift and 24-hour facility access and spacecraft operations may also be required in the event of anomalies or unplanned processing schedule changes. The Contractor shall not store another tenant's flight hardware or ground support equipment in a room occupied by a NASA spacecraft/ground support equipment (GSE). Shared areas (e.g., airlocks or general warehousing) are not included in the restriction, provided that shared areas are not obstructed by items stored by another facility tenant. In the event of a launch cancellation or postponement after spacecraft erection, the Contractor shall provide facilities and services for further processing, off-loading propellants, or deservicing the spacecraft for shipment back to the manufacturing plant or launch site. The Contractor shall provide support for packing and shipping GSE after the launch campaign is concluded.

1.4 Occupancy Period

The period of time for use of the Contractor's facilities shall be from the initial facility occupancy (IFO) date through the facility departure date. The occupancy period for each mission will be

provided with the Spacecraft Processing Operations Task (SPOT) and will be updated as required for each mission. To ensure readiness of the communications systems, the Contractor will permit LSP access to the facility for two weeks immediately prior to IFO; however, this time shall not be considered part of the Occupancy Period. During the occupancy period, the Contractor shall provide insight on activities of other facility tenants as they affect LSP's spacecraft processing schedules. LSP and the Contractor recognize that the nature of space flight activity is such that schedules must sometimes be changed, often for reasons beyond the control or reasonable predictive capability of LSP or the Contractor.

2.0 TECHNICAL REQUIREMENTS

The Contractor shall provide facility capabilities, support and services to meet the technical requirements for LSP spacecraft as defined in this section of the SOW and in Attachment A.1, Common LSSP.

The Contractor shall be responsible for providing, operating, and maintaining the facility, facility systems, and facility support equipment using industry's best practices. Use of Contractor's industry best practices will not supersede the maintenance and operational requirements set forth in the SPOT. The SPOT will include a *Launch Site Support Plan* (LSSP*)* for its respective spacecraft. In the event that there is a conflict between the SPOC and the SPOT, the SPOT shall prevail.

The Contractor shall comply with all Federal, State, and local laws applicable to fire, safety and occupational health as set forth in the Contractor's Facility Safety Manual, Attachment B, *Data Requirements List* (DRL 6).

2.1 Facility

The Contractor shall meet the minimum facility requirements stated in this SOW and the Common LSSP. Mission Specific processing and support space requirements shall be provided in the SPOT and represent LSP's estimated needs based on spacecraft size and support equipment. The Contractor shall accommodate each spacecraft and its respective launch vehicle integrated operations (upper stage, payload attach fitting, spacecraft integration, or fairing installation) in the processing facility without compromising the requirements listed for the spacecraft.

2.1.1 Spacecraft Processing Facility Requirements

The Contractor shall provide a cleanroom facility(s) to perform spacecraft processing. All facilities shall be capable of supporting non-hazardous operations.

For areas with seismic activity, the Contractor shall make provisions for the spacecraft to bolt down the support stand and associated hardware (if required). The spacecraft cleanroom areas shall have static dissipative flooring.

Prior to occupancy, access shall be provided for the Spacecraft Customers to become familiar with the facility capabilities for support of the spacecraft processing and integration activities.

The Contractor shall provide areas associated with the processing space such as air locks, control rooms, garment change rooms, office areas, conference rooms, and storage facilities.

2.1.2 Launch Vehicle Hardware Facility Requirements

Prior to occupancy, access shall be provided for the LSC to become familiar with the facility capabilities for support of the launch vehicle hardware processing and integration activities with the spacecraft. Following familiarization, the Contractor shall make provisions for the LSC to bolt down the launch vehicle hardware support stand and associated hardware (if required) and perform the mating function with the spacecraft.

2.1.3 Facility Environments

The Contractor shall provide data/information relative to the expected radio frequency (RF) and magnetic environment within the processing facility during the facility occupancy period and external to the processing facility during the Contractor-provided transportation of the spacecraft in accordance with Attachment B, *Data Requirements List* (DRL) 9, Facility Environment History. The Contractor shall work as a team with the Customer and Range to optimize the RF and magnetic environment for the specific spacecrafts.

The Contractor shall provide data/information relative to the capabilities and historical performance of the environmental control systems in the cleanroom facility(s) and the expected environment during processing. The Contractor shall provide data/information relative to the materials that will be present in the facility and their compatibility with the spacecraft systems and materials, as required in the mission SPOT.

2.2 Facility Systems

The Contractor shall meet the minimum facility system requirements stated in this SOW and the Common LSSP. Detailed requirements will be provided in the SPOT for each mission. The Contractor shall be responsible for providing back-up capability for all critical facility systems. Critical facility systems are those systems that, if they are to fail, will result in damage to the spacecraft, launch vehicle hardware, or GSE. This includes systems whose loss will result in out-of-specification conditions in the environment, as defined in the SPOT, and systems that can directly damage the hardware (e.g., power surges). The Contractor shall be responsible for submittal of the Certificate of Facility Readiness (COFR) prior to IFO in accordance with the (DRL 4).

The Contractor shall develop a preventive maintenance program and a long-range plan for all major maintenance, repair, and replacement projects. The Contractor shall keep a database which accounts for maintenance and repair efforts accomplished on their infrastructure and make available upon request by the Government. The database will, at a minimum, capture the description, date reported, date accomplished, and total cost of the maintenance and repair efforts. Following submittal of the COFR through post-launch facility departure, the Contractor shall report all non-routine maintenance and any major maintenance discrepancies, as well as all major repair efforts on critical systems that have the potential to impact the current mission. Where not specifically stated in the SPOT, interruptions in mission critical services should be no greater than one (1) hour in any 24-hour period during spacecraft occupancy of the facility requiring that

service. Facility system anomalies and conditions that fall outside of tolerance specified in the SPOT (excluding personnel safety issues, which are covered elsewhere) must be documented and reported to the appropriate LSP Launch Site Integration Manager (LSIM) for the spacecraft that is occupying that facility.

2.2.1 Mechanical Systems

The Contractor shall provide overhead traveling bridge cranes including those in the cleanroom and airlock that are designed, operated, and maintained in compliance with all applicable Occupational Safety and Health Administration (OSHA) (including Title 29 CFR 1910.179), American National Standard Institute (ANSI)/American Society of Mechanical Engineers (ASME), the Crane Manufacturers Association of America (CMAA 70) documents, and Contractor's Facility Safety Manual (DRL 6). For modifications to existing cranes and new construction, the compliance regulations cited above will apply to the design, as well as the operation and maintenance of these modifications and new cranes. Prior to each mission, the Contractor shall perform an Inspection, Operational Test, and Rated Load Test on the cranes to be used during the processing flow in accordance with AFSPCMAN 91-710 Vol. 6 Section 6, ASME B30.2 Chapter 2-2 Section 2-2.1.2, 2-2.1.3, 2-2.2.1, and 2-2.2.2. The Contractor shall submit the Inspection and Test results as part of the COFR (DRL 4). Cranes shall be equipped with drip protection.

The Contractor shall provide a Heating, Ventilating & Air Conditioning (HVAC) System to supply the following areas: airlock, cleanroom, control room, GSE storage room, break room, restrooms, conference room, office rooms, garment change room, and any other areas where flight hardware is processed. The HVAC system in the spacecraft processing cleanrooms shall comply with ISO-14644-1 class 8 cleanliness requirements while in an operational state. Stricter ISO 14644 cleanliness levels may be specified in the SPOT. The HVAC system shall comply with all American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) guidelines for design, operation, and maintenance practices. In addition, the Contractor shall provide backup HVAC capability to ensure the specified spacecraft environment is not violated.

The Contractor shall provide continuous monitoring of the temperature, humidity, and cleanliness levels in the airlock and cleanroom. The Contractor shall provide an environmental monitoring system that has the capability to monitor a clean work area as required in the ISO 14644-02. All monitoring systems shall have an alarm capability to provide notification to the Spacecraft Customers before an out of specification condition has been reached. The Contractor shall provide equipment to monitor non-volatile residue (NVR) and hydrocarbons in the clean work areas.

In accordance with the Contractor's Facility Safety Manual (DRL 6), once propellants are in the facility, the Contractor shall continuously monitor toxic vapor levels and provide toxic vapor checks every eight hours and prior to entry if the facility has been left unattended for eight hours. Monitoring shall be performed at American Conference of Governmental Industrial Hygienists (ACGIH) levels of 0.01 ppm for hydrazine.

Any facility fire suppression system shall not inadvertently activate and cause damage or do harm to the spacecraft or spacecraft ground/electrical service equipment.

2.2.2 Electrical Systems

The Contractor shall ensure that the electrical systems are designed, operated, and maintained in accordance with the National Electrical Code (NEC) and the National Fire Protection Association (NFPA). For facilities capable of performing propellant loading, the Contractor shall provide per NEC Class I, Division 2, Group C and D hazard proofing for both the cleanroom and airlock electrical power receptacles. The Contractor shall provide back-up power and the Contractor shall be responsible for switching to facility back-up power for the cleanroom and Spacecraft Customer's GSE, HVAC, Environmental Monitoring system, and emergency lighting loads during a facility power outage. Uninterruptable power, duration and loads, will be specified in the SPOT.

The Contractor shall provide a lightning protection and grounding system for the flight hardware and GSE processing areas. The Contractor shall provide a low-noise instrumentation ground.

2.2.3 Communications

The Contractor shall be responsible for providing, operating, and maintaining the necessary equipment to handle the flow of voice, video, timing, telemetry and networks, both internal and external to the processing facility, during spacecraft processing and launch. The Contractor shall make all necessary arrangements with the appropriate Government agencies for interfacing data that need to be transported to other Government facilities near the applicable launch complex. The Contractor shall establish a single Contractor/Government Communications demarcation point now referred to as communications demarcation point. The Contractor shall be responsible for all equipment up to the communications demarcation point. The Government will arrange for NASA Integrated Science Network (NISN) circuit assignments as needed, but the Contractor shall deliver the specified signals to the communications demarcation point. Certain operations will require redundancy in the voice and data systems to prevent single point failures from halting operations.

2.2.4 Voice Systems

The Contractor shall provide a voice system capable of transporting twenty-four (24) full duplex voice channels internally as well as extending channels to various external locations such as LSP Data Centers e.g., Building 836 or Building AE. The system shall be capable of concurrent operation of all stations, and each station shall be able to access multiple channels simultaneously. The Contractor shall provide the End Instrument stations and headsets at Customer locations within the processing facilities. The voice system shall have growth capability with respect to the number of stations available to Spacecraft Customers. Stations located in areas where hazardous materials may be used shall meet the requirements defined in industry best practices as set forth in the Contractor's Facility Safety Manual (DRL 6). The Contractor shall support voice communications verification checks prior to spacecraft arrival, the Mission Dress Rehearsal (MDR) and Launch Operations (L-1 day checks).

2.2.5 Television System

The Contractor shall provide a television system consisting of closed-circuit television cameras located in the cleanrooms and airlock areas and fitted with remote control pan, tilt, zoom, and focus to be controlled by the Spacecraft Customers in the control rooms. The system shall be capable of recording operations performed in the airlock and cleanrooms. The system shall be

capable of extending internally generated video to external locations such as LSP Data Centers as well as distributing internally various signals generated at external locations such as the space launch complex. The system shall be capable of accepting six video signals at the processing facility's communications demarcation point and distributing these signals within the processing facilities. The Contractor shall transport two full video signals between the processing facility and NASA LSP Data Centers. These signals shall have a minimum resolution of 450 lines, a maximum resolution of 1080 lines, and meet all National Television Standards Committee (NTSC) or Society of Motion Pictures and Television Engineers (SMPTE) published standards, respectively. The Contractor shall provide monitors at spacecraft, LSP and LSC locations within the processing facilities. Cameras located in areas where hazardous materials may be used shall meet requirements defined in industry best practices as set forth in the Contractor's Facility Safety Manual (DRL 6).

2.2.6 Timing System

The Contractor shall provide a timing system capable of accepting, distributing, and displaying Range generated timing signals. Timing signals include time of day (TOD), Greenwich Mean Time (GMT), Countdown displays, Global Positioning System (GPS) and Inter-Range Instrumentation Group (IRIG)-B. Displays located in areas where hazardous materials may be used shall meet the requirements defined in industry best practices as set forth in the Contractor's Facility Safety Manual (DRL 6).

2.2.7 Paging and Warning System

The Contractor shall provide a paging and warning system capable of paging personnel in all occupied areas of the facility. This paging and warning system shall be capable of alerting personnel inside and outside the facility in the event of a hazardous situation, as specified by industry best practices as set forth in the Contractor's Facility Safety Manual (DRL 6). The Contractor shall either provide Customer access to paging microphones in the control rooms and Customer Office Areas or shall provide paging support in these areas. Contractor shall provide either Customer access to control the warning system or shall provide support to the controlling system.

2.2.8 Data System

The Contractor shall be responsible for providing, operating, and maintaining the necessary equipment to distribute Wide Area Networks, spacecraft command, and telemetry data within the facility during spacecraft processing and launch. The Contractor shall make all necessary arrangements and coordinate with the appropriate Government agency for interfacing signals that are required at other Government facilities. The Contractor shall be responsible for all equipment up to the communications demarcation points in the processing facility. The Contractor shall provide a data system capable of routing Spacecraft Customer data from the cleanrooms to external locations such as NASA LSP Data Centers. The system shall be capable of accepting Electronic Industry Association (EIA) RS-422 data, in various bit rates, and fiber optic based signals, and extending them to the launch site/Government interface demarcation point for transmission to other centers via NISN, or to the launch complex area. The system shall have either the necessary redundancy to automatically re-establish any/all circuits in the event of a failure in system hardware/software or provide duplicate circuits per the SPOT requirements. The system shall be

able to support late requirements and have a minimum growth capability of 25 percent. The Contractor shall provide between four and eight single mode unequipped fibers terminated with ST connectors between the processing facility and the communications demarcations points. The Government will provide the extension of these fibers to other operational locations on the launch site. The Government will provide all necessary end equipment for these fibers. The Government will arrange for the NISN and/or commercial carrier long distance circuit assignments as required, but the Contractor shall provide the transport media to deliver the specified signals to the processing facility communications demarcation point. The SPOT will identify certain operations that will require redundancy in the data systems to prevent single failures from halting operations.

At Contractor designated facilities in the vicinity of launch sites other than KSC/CCSFS and VSFB, the Contractor shall be responsible for providing, operating, and maintaining the necessary equipment to distribute Wide Area Networks, spacecraft command, and telemetry data within the facility during spacecraft processing and launch. The system shall be capable of accepting spacecraft command and telemetry data, in various bit rates, and fiber optic-based signals, and extending between the processing area and the launch complex area. The Contractor shall be responsible for all equipment up to the communications demarcation points in the processing facility and launch complex. The Contractor shall make all necessary arrangements and coordinate with the appropriate Government agency or commercial providers for interfacing signals that are required at other Government facilities such as spacecraft mission operations center.

2.2.9 Fiber Optical Transport System

The Contractor shall be responsible for providing twenty (20) single mode optical fibers from the communications demarcation point to a KSC Fiber Optic Terminal or VSFB fiber demarcation point rack. The Government will make arrangements for extension of these fibers to LSP Data Centers and applicable launch complexes. The Contractor shall be responsible for all equipment up to the communications demarcation point in the processing facility.

2.2.10 Radio Frequency System

Facilities located near KSC Launch Sites shall provide a Radio Frequency (RF) system capable of transporting S- Band and X-band frequencies between its facility and Merritt Island Launch Facility (MIL)-71 located in the KSC Mission Operations Support Building (MOSB). The system shall be capable of supporting separate simultaneous transmit and receive signals. The Contractor shall provide end equipment, transport media between its facility and MOSB, obtain RF authorization, and obtain clearance from the appropriate Government agency before system use, as necessary. The Contractor shall purchase, own, operate and maintain the end equipment at both locations. The Contractor shall work with KSC contractors to report problems and troubleshoot the fiber optic transport system between its facility and MIL-71. The location of the end equipment at MIL-71 will be in Room 148 in the MOSB with a NASA-specified rack location. The RF over fiber system shall utilize the 5 fibers referenced in section 2.2.3.6.

Facilities located at other launch sites shall accommodate the Jet Propulsion Laboratory (JPL) Deep Space Network (DSN) trailer and supply the necessary fiber as specified in the SPOT.

2.2.11 Local Area Network System

The Contractor shall provide a Local Area Network (LAN) system that will be used for administrative data only. Spacecraft Customer's LAN access will be both wired and wireless. The Spacecraft Customers will provide their own workstation security. The Contractor will not be required to provide workstations or software for workstations. The Contractor shall provide all hardware and software (e.g., network switches/routers, network cable drops) necessary to establish and maintain connectivity between the facility systems and the appropriate launch site interface point and serve as an interface between the Spacecraft Customers and launch site for coordination, troubleshooting, and network management.

The Contractor shall provide a secure Wi-Fi infrastructure with wireless access in high bays, control rooms, office areas, and conference rooms. The system shall have a Wi-Fi security that has Wireless Protected Access (WPA/2) authentication and Wired Equivalent Privacy (WEP) key encryption. The Contractor shall conduct a site survey with LSP Mission Communications Engineer prior to each Spacecraft Customer arrival, demonstrating coverage in all appropriate areas. The Contractor shall provide Wi-Fi support during all scheduled operations and provide real-time support response to LSP and Spacecraft Customers.

2.2.12 Telephone System

The Contractor shall provide a standard multi-line commercial telephone system, with station-to-station intercom and local area and long distance dialing capability. The Contractor shall provide commercial telephone lines to support fax (facsimile) machines and analog modems. The Contractor will not be responsible for the payment of charges associated with the commercial services. The Contractor shall arrange with the commercial carrier or appropriate location agency for service and installation as well as provide assigned international access codes to track applicable charges. The Contractor shall submit an invoice for each mission's long distance telephone charges once they have been calculated upon mission facility departure. The Contractor shall provide fax machine or equivalent capability to the Customer. End Instruments located in areas where hazardous materials may be used shall meet the requirements defined in industry best practices as set forth in the Contractor's Facility Safety Manual (DRL 6). The exact telephone unit distribution will be detailed in the SPOT for each spacecraft.

2.2.13 Cellular Repeater System

The Contractor shall provide cellular voice and Long Term Evolution (LTE) data coverage inside Spacecraft Customer's office areas and control rooms. The system should include latest generation voice and data (LTE) coverage for the major carriers. The Contractor will obtain all RF authorization and clearances from the appropriate Government agency before system use.

2.3 Facility Support Services

The Contractor shall provide services in support of spacecraft processing, including arrangements for receipt of flight hardware and GSE. To the extent that the services identified and requested within this section are unavailable at the Contractor facility, the Contractor will arrange for support

from other sources. The Contractor shall provide the facility support services outlined below, and detailed in the A.1 Common LSSP.

2.3.1 Administrative Spaces and Support

The Contractor shall provide, at a minimum:

- Office areas with basic accommodations
- Break area with standard accommodations
- Conference room.

The Contractor shall coordinate in advance with the Spacecraft Customers for shipping and receiving of hardware and packages at the facility.

2.3.2 Janitorial Support

The Contractor shall provide janitorial support in all facility spaces provided for the Spacecraft Customer including office areas, control rooms, and cleanrooms.

2.3.3 Transportation Support

The Contractor shall be responsible for coordinating the arrival of the flight hardware and GSE, providing all handling equipment necessary to off-load and transport it into the processing facility, providing the offloading and transport operations procedures, and conducting the transportation route survey (DRL 5). This may involve arranging for the arrival site, security, and any material handling equipment needed at the point of arrival, including at the runway for flight hardware or GSE arrival by aircraft, as specified by the SPOT. When requested in the SPOT, the Contractor shall assist with the coordination of all necessary agencies, such as the United States Space Force (USSF); U.S. Immigration and Customs Enforcement (ICE), Customs and Border Protection (CBP); and the Department of Agriculture, for the spacecraft arrival by aircraft.

The Contractor shall provide trucks and GSE necessary to transport the spacecraft GSE between the Contractor's facility and the launch facility or other LSP facilities to be used by the spacecraft. This includes arranging for security escort support.

2.3.4 Cleanroom Garments and Supplies

The Contractor shall provide the processes, equipment, garments and supplies necessary to ensure that the personnel and equipment entering the cleanroom(s) meet the criteria to maintain the cleanroom(s) at the level required in the SPOT.

The Contractor shall provide non-static generating, cleanroom garments for spacecraft, LSP and LSC use during processing in the cleanroom(s). The Contractor shall provide laundering, once a week minimum, for all garments provided by the Contractor.

The Contractor shall outfit the garment change room with the equipment and supplies to clean small equipment and personnel accessories, distribute garments and supplies, and store the garments and supplies between use.

2.3.4.1 Propellant Loading Support Equipment and Services

If the Contractor's facility is capable of accommodating mono-propellant or bi-propellant fueling operations, the Contractor shall coordinate their support for the spacecraft fueling activities and provide accommodations for all of the propellant equipment to be used. The Spacecraft Customers will perform the fueling activity in the processing facility, unless requested of the Contractor via the SPOT.

The Contractor shall provide SCAPE (Self Contained Atmospheric Protective Ensemble) or equivalent protective suits or accommodate the use of protective suits. The Contractor shall supply the protective suits with breathing air and communications or accommodate the ability for an outside organization to supply them. The facility shall provide a suit-up area.

The Government or the Spacecraft Customers will purchase the propellants, provide for the transportation of the propellant to the launch site and provide storage at the launch site. The Contractor shall provide for the transport of the propellant from the launch site storage to the processing facility. The Contractor shall provide for the storage and handling of propellants at the processing facility. The Contractor shall be responsible for the integrity of the propellants from the time of receipt at their facility to the time of loading into the Spacecraft Customer's provided propellant cart.

2.3.5 Handling Equipment

The Contractor shall provide hardware handling equipment for loading, unloading, and transportation of the GSE and hardware, including cleanroom compatible equipment. All handling equipment shall meet requirements defined in industry best practices as set forth in the Contractor's Facility Safety Manual (DRL 6).

2.3.6 Fluids, Gases and Chemicals

The Contractor shall provide fluids, gases, and chemicals, such as isopropyl alcohol, de-ionized water and GN_2 as specified in the SPOT. The Contractor shall provide certification that all fluids and gases provided by the Contractor meet the required specifications in the SPOT.

2.3.7 Analysis/Sampling

The Contractor shall provide for the sampling and analysis of a variety of items. The request and specifications for the analysis will be provided in the SPOT. Specific parameters to be analyzed will be specified by LSP prior to taking the sample. The Contractor shall generate or provide the 3rd party report detailing the results of sample analysis.

2.3.8 Safety Equipment

The Contractor shall provide all of the necessary safety equipment and support to comply with the Contractor's Facility Safety Manual (DRL 6) associated with hazardous and nonhazardous operations. This support is to include, as an example, emergency life support apparatus (ELSA)/Emergency Only Respirator (EOR), showers, and eyewash stations when fuels will be in the facility.

2.3.9 Hazardous Waste

The Contractor shall dispose of all domestic, industrial, and hazardous waste generated at the processing facility, as required by local regulations and in compliance with the Contractor's Facility Safety Manual (DRL 6). The Contractor is responsible for minor spill containment and facility decontamination in the event of a hazardous mishap.

2.3.10 Security

The Contractor shall ensure the security of the spacecraft flight hardware and information. The Contractor shall control access to each of the assigned areas governed in the SPOT, including limiting access to authorized personnel. The Contractor shall ensure authorized personnel have full and free access to their assigned areas, including international spacecraft customers if required in the SPOT. When required in the SPOT, the Contractor shall provide the appropriately trained personnel and secured facilities to accommodate Communications Security (COMSEC) material.

2.4 Requirements Development and Implementation

2.4.1 Requirements Planning Approach

The SPOC will incorporate the Common Launch Site Support Plan i.e., Attachment A.1, Common LSSP. The Common LSSP identifies requirements that are general for all LSP Spacecraft processing operations. The SPOT will incorporate the Preliminary Spacecraft LSSP, which contains specific spacecraft processing requirements and flight hardware flow. Upon SPOT award, the Contractor shall assist the Spacecraft Customer in the development and tailoring of the flight hardware flow to the processing facility selected. This shall include, but is not limited to, optimizing the use of floor space and facility systems (e.g., cranes, high pressure gas) for operations such as fueling or encapsulation.

The Baseline Spacecraft LSSP incorporates the changes resulting from efforts to adapt the requirements to the selected facility, changes due to maturing spacecraft design and operational considerations, and the commitments received from the selected facility and other suppliers. LSP will provide the Baseline Spacecraft LSSP, containing the final requirements and hardware flow, to the Contractor as a modification to the awarded SPOT (see Guides to NASA spacecraft processing for further information). The Contractor shall provide a response on the final processing requirements and flight hardware flow that indicates understanding of the requirements and certifies that it will meet the specified requirements. Exceptions to meeting the requirements must be documented and provided to LSP. If there are any requirement changes following the publication of the Baseline Spacecraft LSSP, they will be incorporated via a LSSP Amendment Form (LAF) and provided to the Contractor for a response commensurate with this paragraph.

For each SPOT, LSP will submit safety documents to the Contractor including, but not limited to, the following: Spacecraft Customer and LSC released spacecraft processing procedures, spacecraft and launch vehicle safety documentation for hardware and operations being brought into the Contractor's facility, and Spacecraft Customer certifications required to operate facility equipment. The Contractor shall review and provide a written response to these procedures and safety documentation per the timelines specified by LSP and Range Safety. The Contractor shall inform LSP and the Spacecraft Customer of any processes that will violate any Contractor facility

rules, safety, environmental guidelines, or facility operational permits or licenses. The Contractor shall review and provide input to Spacecraft and Launch Vehicle procedures regarding facility capability, safety, and hazard mitigation.

The Contractor may be required to provide signature concurrence to comply with Spacecraft Customer operations plans and contingency procedures (e.g., Contamination Control Implementation Plan, Fuel Offload Plan).

2.4.2 Processing Methodology

The Spacecraft Customer/LSC have prime responsibility for assembly, test, and servicing during the build-up and checkout of their respective hardware in the facility.

As part of spacecraft processing, the Spacecraft Customers will perform hazardous operations. Typical hazardous operations include spacecraft propellant loading, spin balancing, ordnance installation and checkout, non-ionizing radiation sources (e.g., RF, laser, bright light), and fueled spacecraft handling. In accordance with SPOC Contract Section 2.21, *Licenses, Permits and Insurance for a Spacecraft Processing Facility*, the Contractor's facility shall be sited and otherwise approved for all operations. The Contractor shall work with and provide support to the Spacecraft Customers to help mitigate hazards associated with processing operations.

During processing operations, Contractor-trained Spacecraft Customers will have coordinated access to operate the following facility systems including, but not limited to, cranes, forklifts, fire protection system, and doors or the Contractor shall provide the resources to operate these systems. The Contractor shall be responsible for ensuring that all facility, facility systems, and facility services are available, when required, per the processing flows and any subsequent planning and scheduling meetings. The Contractor shall monitor mission operations at the facility to ensure compliance with facility rules, guidelines, and environmental management practices.

3.0 MANAGEMENT

The Contractor shall provide a team of personnel necessary to manage the requirements in the SPOC and the SPOT.

3.1 Management Approach and Processes

For Management Approach and Processes, the Contractor shall meet the requirements stated in the following paragraphs.

3.1.1 Facility Manifest

The Contractor shall maintain a facility manifest schedule and provide to LSP quarterly (DRL 10). The facility manifest shall include the known spacecraft processing commitments in the facility, whether tenants are commercial or government, including the initial facility occupancy and processing durations, the facility readiness schedule (cleaning time, stabilization time), and planned facility outages.

3.1.2 Customer Communications and Support

The Contractor shall establish lines of communication with LSP during both the planning and processing phases, which include teleconferences; discussions; and formal and informal requests for technical, status, and progress information on the processing facility. The Contractor shall ensure that the Spacecraft Customer's requirements are met in a timely manner such that on-going operations within the Contractor's facility are not impacted. The Contractor, to the best of its ability, shall support Government access to the spacecraft processing facility at the Government's request.

3.1.2.1 Spacecraft Planning Support

Before SPOT award, the Contractor may be invited/requested to support advanced planning working sessions such as Ground Operations Working Group (GOWG). When available, the Government may request tours of the facilities and the Contractor shall accommodate to the best of its ability.

Upon award of SPOT, the Contractor shall attend and present the status of its facilities and preparation for facility support to spacecraft processing at all GOWG meetings. At the first GOWG, after award of SPOT, the Contractor shall provide facility orientation presentations (DRL 3). The orientation briefing and hand-outs shall include, but not be limited to, information summarizing the Contractor's key personnel contacts, facility layout, operation methodology, status of the processing facility and its associated systems. The Contractor shall attend and present the status of its facilities at subsequent GOWG meetings, at the Ground Operations Review (GOR), and any additional meetings as identified in SPOT. If travel by the Contractor is required to support any meeting, it will be addressed as a modification to the SPOT.

The Contractor shall provide a Facility Handbook. This handbook shall have a complete description of the facility and facility systems capabilities (DRL 1).

Prior to Spacecraft arrival, the Contractor shall provide LSP, the Spacecraft Customer, and the LSC access to the facility for walkdowns, familiarization, measurements, and planning activities.

3.1.2.2 Spacecraft Processing Support

The Contractor shall support daily coordination meetings with LSP, the Spacecraft Customer, and the LSC during the facility occupancy period. The coordination meetings will status work-in-progress and services required for the current and following day's activities. LSP will provide detailed schedule and service requirements to the Contractor.

The Contractor shall provide insight to activities and situations with the potential to adversely affect spacecraft operations, safety, or schedules. Examples of potential sources of issues could be utility outages, facility maintenance activities, concurrent customer operations, and personnel availability. Spacecraft Customer's operations shall have priority over routine facility maintenance except in those cases where the safety of personnel or hardware would be compromised. Routine maintenance shall be scheduled to maximize the availability of facilities consistent with safety of operation, which shall be prioritized. Routine maintenance activities shall be included in manifest and scheduling products prepared in accordance with (DRL 10). Support

conflicts will be resolved with a spirit of cooperation among tenants, commensurate with respective launch dates.

3.1.2.3 Facility Orientation and Training

Spacecraft Customers will be trained by the Contractor to operate those facility systems and equipment needed to perform various processing tasks using contractor-provided equipment, including crane and forklift operations. The Contractor shall provide safety training required to assure that spacecraft, LSC, and LSP personnel are fully informed relative to facility hazards, alarm system operation, escape routes, fire suppression systems, etc. The Contractor shall maintain facility access control to assure personnel have received the necessary training before they are permitted unescorted access to the facility.

The Contractor shall notify and provide specific requirements to the Spacecraft Customer of all certifications (e.g., medical, safety) required to perform operations (e.g., fueling, crane) in the Contractor's facility. The Contractor shall be responsible for obtaining all required launch site crew certifications on behalf of the Spacecraft Customers.

The Contractor shall ensure that their team of personnel receives Spacecraft Customer dictated training as required in the SPOT. This training may include familiarization of the spacecraft or safety/sensitivity training on the spacecraft unique systems e.g., Cleanliness, Laser.

3.2 NASA Insight and Approval

The Contractor shall support technical coordination and interaction including, but not limited to: telephone discussions, formal and informal written correspondence, video conferences, meetings, and any other form of communication or sharing of information necessary to accomplish the cooperation required to provide LSP insight into the Contractor's facility. Working level relationships shall be encouraged between LSP and Contractor personnel to expedite insight and approval activities. The LSIM will be the Primary point of contact for technical guidance.

The Contractor shall acknowledge and be responsive to the inquiries, requests, technical coordination, and recommendations of NASA independent assessment teams, panels, or commissions within the scope of contract requirements.

3.2.1 Anomaly Investigations

The Contractor shall conduct an investigation, with participation by LSP, in the event of any mishap as defined by NPR 8621.1D (NASA Procedural Requirements for Mishaps and Close Call Reporting, Investigating, and Recordkeeping) and as required by the "Safety and Health" clause. The Contractor shall implement an Impound Plan (DRL 7) to ensure facility data is available to support a mishap investigation. The Contractor shall verbally and immediately notify the LSIM, Contracting Officer or COR of a Type A, B, or C mishap. The Contractor shall notify the LSP Safety Representative and Spacecraft Customer(s) Safety Representative, in addition to any jurisdictional authorities, of any accidents, mishaps, close calls, or other incidents.

Upon completion of the investigation, the Contractor shall submit a written report (DRL 2). For Type A, B, C, and D mishaps and close calls, as defined in NPR 8621.1D, reports shall be

generated per requirements in NPR 8621.1D. A copy of the report shall be forwarded to the COR within five days for Type A, B, and C mishaps and seven days for all others. Certain requirements of the "Safety and Health" clause also apply to non-LSP mission failures and anomalies.

3.2.2 DRL Documentation

The Contractor shall produce and make the appropriate distribution of all items on the DRL in Attachment B. As a contractual deliverable, changes to the DRL submissions shall be submitted for LSP approval. The Contractor shall develop and maintain a schedule for providing the deliverables specified in the DRL. The DRL defines the scope of documentation required; however, LSP will utilize the Contractor's existing documentation to the maximum extent possible.

3.3 Environmental Assessments

The Contractor shall be responsible for ensuring that its facilities have been evaluated as required under applicable federal, state, and local statutes and regulations.

3.4 Key Personnel and Staffing

The Contractor shall have key personnel that have the authority to commit, obligate, sign, authorize, and schedule activities at the processing facility. The Contractor shall identify a Safety Representative for each mission to resolve safety and health issues. All staffing of personnel necessary to operate and maintain the facility as necessary to support spacecraft processing during the occupancy period shall be the responsibility of the Contractor. The assigned personnel shall be identified at SPOT award.