



Turnover Environmental Condition Assessment
(TECA)
for
Mobile Launch Platform 3 (MLP 3)

[REDACTED]

[REDACTED]

Prepared by

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Summary

This Turnover Environmental Condition Assessment (TECA) was prepared by United Space Alliance to provide information relevant to environmental management activities and assist in NASA turnover planning. The following facility has been included:

<i>Building Number</i>	<i>Building Name</i>
MLP 3	Mobile Launch Platform 3

USA conducted walk downs, researched USA records and interviewed knowledgeable persons and there were no noteworthy conditions identified in the original Planning Environmental Conditional Assessment (PECA) for MLP 3 nor are any identified with this TECA.

NOTE: USA will continue to have processes in MLP 3 beyond the official turnover date. An updated TECA will be submitted when USA no longer maintains the hydraulics system, ground power and structural integrity.

Recognized Environmental Conditions:

- No recognized environmental conditions were identified in MLP 3.

Environmental Management Activities:

- SPCC location K6-05466MLP3-1 is located in Compartment 2B. This 104 gallon hydraulic fluid tank supplied hydraulic fluid to one of the Shuttle's Solid Rocket Boosters (SRB). It is SN S72-0841-01-004.
- SPCC location K6-0546MLP3-2 is located in Compartment 16B. This 104 gallon hydraulic fluid tank supplied hydraulic fluid to the Shuttle. It is SN S72-0841-01-010.
- SPCC location K6-0546MLP3-3 is located in Compartment 43B. This 104 gallon hydraulic fluid tank supplied hydraulic fluid to the Shuttle. It is SN S72-0841-01-006.

NOTE: USA will continue Spill Prevention Control and Countermeasures (SPCC) inspections under Ground Ops Capabilities (GOC).

Other Concerns:

- An asbestos survey, performed in May 1997 indicated friable asbestos in MLP 3. Lead and polychlorinated biphenyl (PCB) contaminated paints are also known to be present. Information regarding the location and quantity of known asbestos as well as contaminated paints will be provided to any occupant of this facility through the Medical Environmental Support Contractor (MESC) Environmental Health office.
- Residual hydraulic fluid remains in equipment and ancillary hydraulic lines.

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Mobile Launch Platform 3

Description:

Built in 1967, the MLPs were designed for the Apollo/Saturn program and modified in the 1970's to support the Shuttle. There are three levels constructed of steel. There is a Tail Service Mast (TSM) on either side of the Main Engine exhaust vent. These 31-foot masts contain the feed lines through which liquid hydrogen (LH₂) and liquid oxygen (LOX) were loaded into the shuttle's external fuel tank, as well as electrical hookups and flares which eliminated free hydrogen present prior to main engine ignition. At launch, the umbilical was pulled away from the orbiter and retracted into the TSM, where protective hoods rotated closed to shield them from the exhaust flames. Each TSM assembly is 15 feet (4.6 meters) long, 9 feet (2.7 meters) wide, and rises 31 feet (9.4 meters) above the Platform deck. Other umbilical's carried helium and nitrogen, as well as ground electrical power and communications links. MLP-3, in total, weighs approximately 9.25 million pounds (4.2 Mkg) and measures 160 feet by 135 feet (49 meters by 41 meters), and is 25 feet (7.6 meters) high (Figure 1).



Figure 1. MLP 3 returning from Launch Pad 39A to the VAB (NASA Archive)

Eight attach posts, four on the aft skirt of each SRB, supported and held the Space Shuttle on the Mobile Launcher Platform. These posts fit on counterpart posts located in the Platform's two solid rocket booster support wells. The space vehicle disconnected from the Platform by explosive nuts. Sound suppression water was transmitted into the exhaust vents of the MLP (Figure 2).

The main body of the Platform provides three openings - two for the exhaust of the solid rocket boosters and one for the main engines exhaust. The MLP has two inner levels containing electrical, test and propellant-loading equipment (Figure 3).

The launch vehicle was assembled in the Vehicle Assembly Building (VAB) on an empty MLP. After the SRB Aft Skirts were affixed to the platform by means of attach posts, the remaining vehicle components were stacked. The Crawler-Transporter then carried the combined platform and vehicle to the launch site, and placed them there together. Once the launch was completed, the Crawler Transporter retrieved the empty MLP from the pad to be readied for its next use.

Structural: Each MLP is of welded steel construction. The steel is coated with Ameron (Product #D-21-9) inorganic zinc primer and GE (Product #4304) topcoat.

Utilities: Utilities include telephone, electrical power, lighting, domestic sewer transmission lines, domestic waste tank, potable water, fire alarm, Firex water, Halon fire extinguishment system, oxygen monitoring system, breathing air, heating, ventilation, air conditioning, and battery back-up power.

MLP 3 end-state is presumed to be “Mothballed” and will transfer to NASA GP Ground Operations Capability (GOC). Initial walk downs of the structure were November 30, 2010, January 9, 2012 and the final walk down of the structure was accomplished on May 8, 2012.

Recognized Environmental Condition:

- No Recognized Environmental Conditions were identified.

Observations:

- The Halon tanks have been removed from the alarm system and fire suppression system. All fire alarm control panels (FACP) with battery cabinet, manual pull stations (MPS), heat activated detectors (HAD), smoke detectors mounted on the ceilings and air conditioning ducts and strobe lights with integrated audible alarm horns are still in place.
- The Hazardous Gas Warning System has two oil filled vacuum pumps associated with a mass spectrometer located in Compartment 7A. This system also has compressed gas cylinders containing inert gases in 7A and 43A. The payloads purge system is in Compartment 34A.
- The following chemicals were identified in systems aboard MLP 3:
 - Compressed gases: Helium, Nitrogen, shop air, breathing air
 - Chemicals
 - Hydraulic fluid
 - Petroleum gear lubrication oil
 - Petroleum grease
 - Silicone vacuum oil
 - Lead-acid batteries

- Domestic wastewater
- All flex hoses in the TSM have been removed and placed in storage.
- There is compact fluorescent lighting throughout MLP 3.
- MLP 3 has a total of 88 Ni-Cad batteries located in 7A and 21A.
- The following systems/equipment can be found in the numbered compartment of the MLPs:
 - 8B - empty cabinets, a dry type transformer, chilled water supply lines, a stainless steel sink which is hooked up to potable water but not used (see Figure 4) and oxygen analyzer supervisor panel and oxygen analyzer integration unit panel (see Figure 5).
 - 7B - sound suppressions lines (see Figure 6), one hand- held fire extinguisher (see Figure 7) and chilled water HVAC units (see Figure 8).
 - 10B - sound suppression lines, HVAC lines, power panels and communications.
 - 9B - ELSA box (see Figure 9), the empty cage that formally housed a Satellite Accumulation Area (SAA) when at the Launch Pads (see Figure 10), heater power switching panels (see Figure 11) and a dry type transformer.
 - 48B is an instrumentation room.
 - 36AB has sound suppression and power lines.
 - 37AB - power supply for the Solid Rocket Booster (SRB) winches (see Figure 12).
 - 38AB - power supply for Space Shuttle Main Engine (SSME) winches (see Figure 13).
 - 37A - Four SRB winches are in this compartment (see Figure 14).
 - 47AB - water lines for the sound suppression system.
 - 15B – Fire suppression hose (see Figure 15), Integrated Network Control System (INCS) panel (see Figure 16), ELSA box and a dry type transformer.
 - 16B - oxygen analyzer monitoring unit (see Figure 17), chilled water lines, SRB hydraulic pumper with 104 gallon hydraulic oil tank , S/N S72-0841-01-010, (see Figure 18), SSME winches, two hand-held fire extinguishers, an alarm distribution panel (see Figure 19) and the empty 100 gallon contingency tank (see Figure 20). The hydraulic pumper is tagged with “Inactive – Verify Certification Before Reuse” and dated 10/31/2011. The hydraulic oil remains and the SPCC inspections will continue under GOC.

- 40AB - water valve control panel for the sound suppression system (see Figure 21).
- 41B - compressed air tank, potable water system and Firex (see Figure 22).
- 44B - INCS panels, oxygen analyzer, an alarm distribution panel, sound suppression water pipes and Firex (see Figure 23). The SSME heater panel and the GN2 panel for the LOX system have been removed.
- 43B - Orbiter hydraulic pumper with 104 gallon hydraulic oil tank, S/N S72-0841-01-006, (see Figure 24).). The hydraulic oil remains and the SPCC inspections will continue under GOC.
- 42B - sound suppression and ventilation lines.
- 45AB - fire suppression pipes (see Figure 25).
- 34B - two oxygen analyzer monitoring units, two ELSA boxes, and Firex lines. The helium panel and LH2 panel have been removed.
- 33B - SRB Aft Skirt Purge panel (see Figure 26), alarm distribution panel and an oxygen analyzer monitoring unit. The Orbiter Helium Anti/Ice panel has been removed (see Figure 27).
- 35AB, 32AB, 39AB and 42AB all contain sound suppression lines.
- 2B - two SSME winches, hand held fire extinguisher, ELSA box, oxygen analyzer monitoring unit, SRB hydraulic pumper unit, S/N S72-0841-01-004, (see Figure 28), Orbiter/SRB Control Panel and ventilation lines. The hydraulic oil remains and the SPCC inspections will continue under GOC.
- 30AB - sound suppression and ventilation pipes. There is also an area where paint was sampled (see Figure 29). Paint sampling areas were noted throughout the MLP.
- 31B - ELSA box.
- 1B - hand held fire extinguisher, oxygen analyzer monitoring unit, alarm distribution panel and the main facilities helium and nitrogen interface to the MLP (see Figure 30).
- 2A- two ELSA boxes, Fire alarm sensor panel, oxygen analyzer monitoring unit, hand held fire extinguisher and orbiter ECS system lines and filters (see Figure 31). This compartment stored the aft orbiter platform which has been removed and stored in the VAB (see Figure 32).
- 34A - a GN2 panel for Hubble support and a GN2 SRB TVC servicing panel.

- 33A- INCS control panels and the ECS system particle counter (see Figure 33).
- 31A - two SRB winches.
- 1A - a dry type transformer, hand held fire extinguisher and ECS lines.
- 9A - a hand held fire extinguisher, halon fire suppression system control panel and battery rack control and monitor panel. The batteries associated with this rack are in secondary containment tubs. Paint sampling was performed on one steel beam in this compartment.
- 21A- two dry type transformers, main power supply control panel (see Figure 34), ni-cad batteries and a hand held fire extinguisher. The Halon fire suppression system tank previously located in this room was removed.
- 8A - portable eyewash station, stainless steel double sink, chilled water supply (see Figure 35) and two dry-type transformers. The Halon fire suppression system tanks previously located in this room were removed.
- 7A - a helium tank, hand held fire extinguisher, power supply for orbiter and SRB (see Figure 36) with a battery back-up (see Figure 37), hazardous gas warning system, hydrogen umbilical mass spectrometer (HUMS) (see Figure 38), and a transformer. The Halon fire suppression system tanks were removed.
- 10A - a hand held fire extinguisher, water valve control panel and a launch power systems interface panel. The Halon fire suppression system tanks previously located in this room were removed
- 7A - two ELSA boxes and ni-cad batteries.
- 20A - empty.
- 48A - tool room.
- 18A-bathroom with two sinks, two toilets, two urinals and one drain (water supply turned off).
- 15A - sound-proof work room.
- 19A – a transformer.
- 16A- a hand held fire extinguisher, an empty heat exchanger for the Freon system, two low voltage panels, two ELSA boxes, fire suppression water pipes, and a fire hose. The fire suppression water pipe had a paint sample taken.

- 44A-a hand held fire extinguisher, phone, GN2 control panel, Firex lines, sound suppression system lines, and two helium tanks. The hydrogen system control panel and the SSME GN2 heater controller were removed.
- 43A - Freon R-124 system which is currently empty, (see Figure 40) with a tank for over-pressurization (see Figure 41), HVAC system lines, GN2 panel, and tanks helium, nitrogen, shop air and breathing air for the hazardous gas warning systems.
- 41A - two SRB winches.

USA Processes:

- USA will continue to maintain systems on the MLPs that support flight under the GOC contract. These include hydraulics, ground power and structural integrity.
 - The MLPs have multiple petroleum-containing lubrication and compressed gas systems.
 - The ground cooling system utilizes Freon R124 It includes a heat exchanger, catch tank for over-pressurization) and an emergency vent. This system was drained and purged with GN2 after each launch.
 - The hydraulic pumping systems existed to supply the Space Shuttle's SRBs and Orbiter with hydraulics. The three 104 gallon capacity reservoirs are located in Compartments 2B, 43B, and 16B. There is secondary containment "coffins" surrounding each pumper. Stainless steel piping supplies hydraulic fluid to Zero-Level.
 - In compartment 16B there is a 100-gallon capacity, single-walled contingency tank to collect excess hydraulic fluid in case of over-pressurization. The tank is labeled as empty.
 - Engine Platform Winches contain approximately 5 gallons of 90 weight gear oil. Eight winches are located on the SRB Platform (Compartments 37A, 41A, 31A). Four winches are located on the SSME Platform (Compartments 2B and 16B)
 - Five shock absorbers containing silicone oil (approximately 2 quarts each) are located on the platforms.
 - Platform jack screws and personnel access doors use petroleum grease.
 - Battery back-up systems in secondary containment are located in power supply racks in Compartments 7A and 9A.

Spills information:

- 03/01/07 MLP-3 Surface of MLP-3/1 gal hydraulic fluid
- 05/03/08 MLP-3 MLP deck "0" level at Pad A/1 gal diesel fuel
- 07/23/09 MLP-3 Ground Coolant System/429 lbs R-124

- 01/15/10 MLP-3 Compartment 2B/approx. 100 gal potable water

USA Waste Management information:

- All hazardous wastes produced by USA operations have been removed and the Satellite Accumulation Area (SAA) in Room 9B was formally closed on October 27, 2011. This mixed crib operated only while the MLP was on the Pad with a Shuttle. Small quantities of solvents were issued from this area to support orbiter operations as needed. The chemicals were removed from this area and the site would remain inactive at all other times.

USA Reusable Textile Wiper Program information:

- The reusable textile wiper site staged in MLP 3, located in Room 9B, was closed with the closure of the SAA site on October 27, 2011.

Additional Figures:



Figure 2. Sound Suppression Test Pad 39A (NASA Archive)

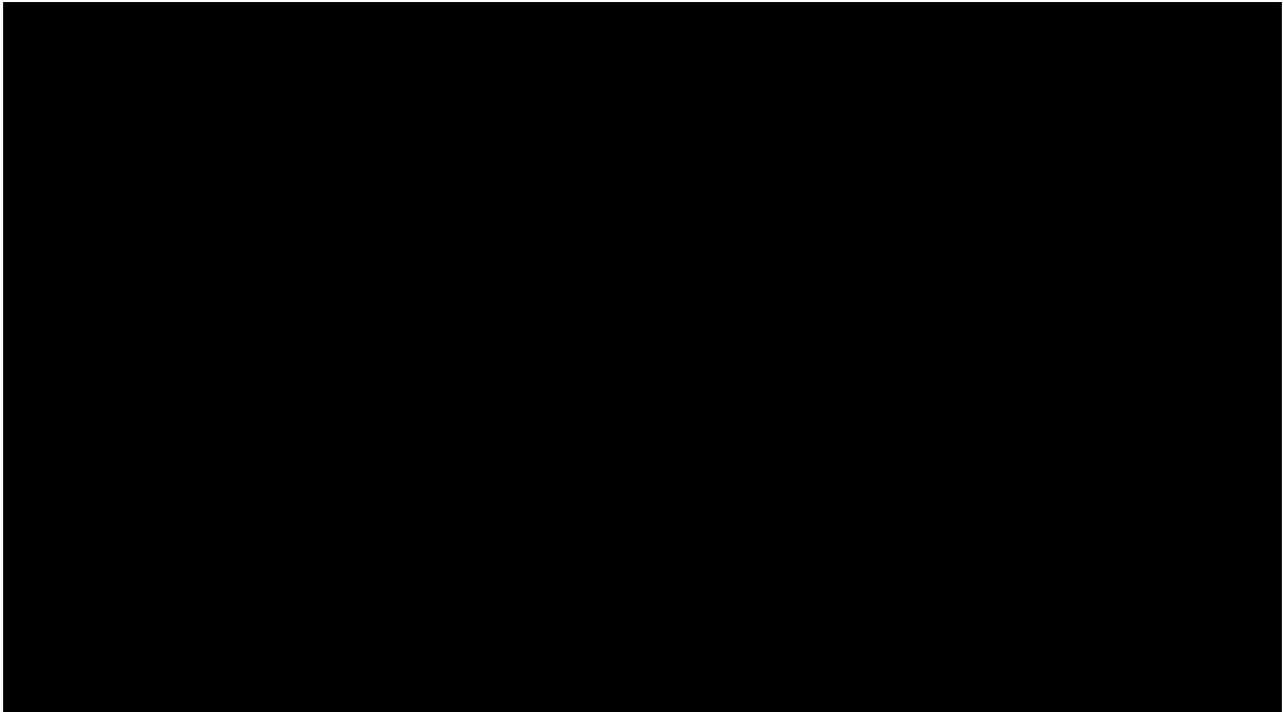


Figure 3. MLP Floor Plan



Figure 4. 8B - Dry type transformer and stainless steel sink



Figure 5. 8B - Oxygen analyzer panels



Figure 6. 7B - Sound suppression



Figure 7. 7B - Hand-held fire extinguisher



Figure 8. 7B - HVAC unit



Figure 9. 9B - ELSA box



Figure 10. 9B - Empty caged area that formally housed a Satellite Accumulation Area



Figure 11.9B - Heater power switching unit



Figure 12.37AB - Power supply for SRB winches



Figure 13. 38AB - SSME power supply

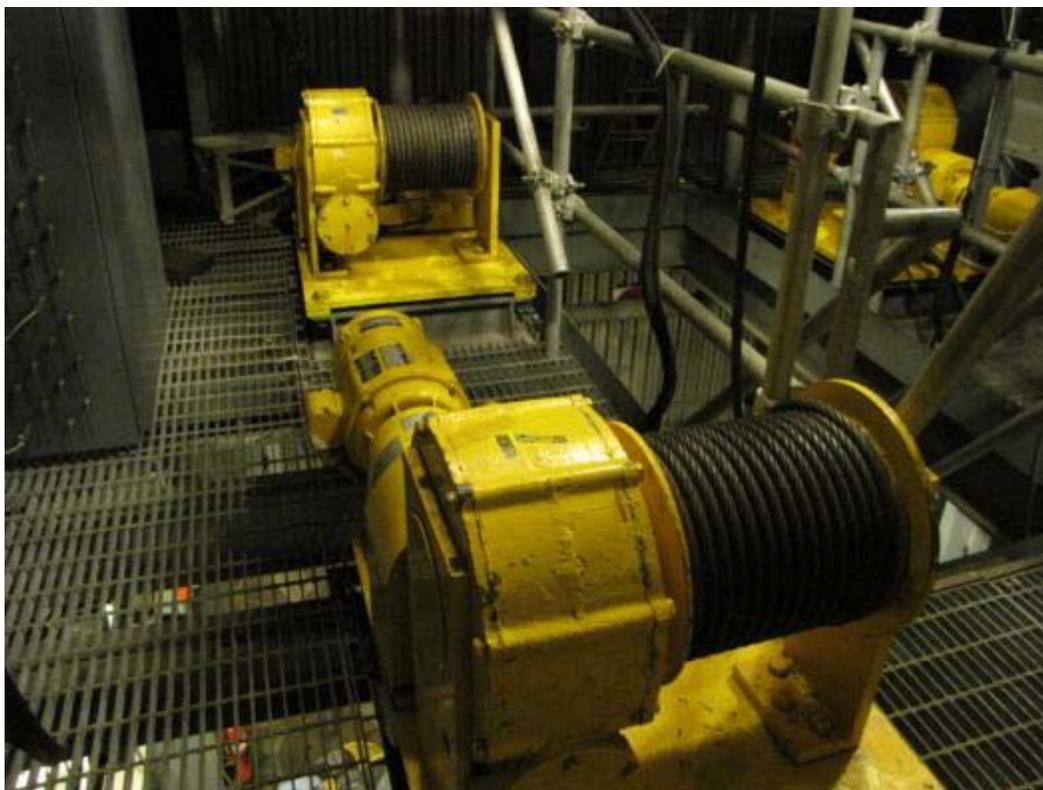


Figure 14. 37A - SRB winches



Figure 15. 15B - Fire suppression hose



Figure 16. 15B - INCS



Figure 17. 16B - Oxygen analyzer monitoring unit



Figure 18. 16B - Hydraulic pumper



Figure 19. 16B - Alarm distribution panel



Figure 20. 16B - Empty 100 gallon contingency tank



Figure 21. 40AB - Water valve control panel



Figure 22. 41B - Compressed air tank, potable water system and fire suppression



Figure 23. 44B - Oxygen analyzer panel, INCS, sound suppression and Firex



Figure 24. 43B - Hydraulic pumper



Figure 25. 45AB - Fire suppression lines



Figure 26. 33B - SRB aft skirt purge panel



Figure 27. 33B – The Orbiter Helium Anti/Ice Panel has been removed



Figure 28. 2B - Hydraulic pumper



Figure 29. 30AB - Example of paint sampling site



Figure 30. 1B - Main facilities helium and nitrogen interface to MLP



Figure 31. 2A - ECS system lines for orbiter



Figure 32. 2A - Storage area formally used for aft orbiter platform



Figure 33. 33A - ECS system particle counter



Figure 34. 21A - Main power supply control panel



Figure 35. 8A - Halon, portable eyewash station, stainless steel sink and chilled water supply



Figure 36. 7A - power supply



Figure 37. 7A - Battery backup



Figure 38. 7A - HUMS



Figure 39. 44A - Helium tanks



Figure 40. 43A - Freon 124 system



Figure 41. 43A - Freon R124 Tank for Over-Pressurization

Findings and Conclusions

Environmental Concerns:

Based on the information gathered and on observations made during this investigation, the TECA has revealed no on-site or off-site environmental conditions associated with the subject property.

Conclusions:

A TECA following the general outline of a Phase I Environmental Site Assessment in conformance with the scope of work and ASTM Practice E 1527-05 was performed on the subject property.

Recommendations:

Based on the results of the TECA of the subject property, no further investigation is recommended at this time.

Appendix A – Interviews

USA conducted interviews with individuals who have knowledge of the facility and adjacent or surrounding areas.

[REDACTED]

Chemicals present in systems are: hydraulic oil, compressed gases (GN2, GHe, and shop air), gel-cel batteries. The Halon tanks for the dry chemical Firex system have been removed. Freon is drained after launch and the system is purge with GN2.

In the initial interview, [REDACTED] identified some painting operations that are performed by other United Space Alliance organizations. Details of these painting operations are noted in the interviews with these organizations.

[REDACTED]

[REDACTED] was contacted via e-mail on January 24, 2012 and confirmed there had been no modifications of the protective systems consisting of fire detection, fire suppression and smoke detection. The walk down conducted on May 8, 2012 showed all Halon tanks removed.