



Turnover Environmental Condition Assessment

(TECA)

for

MLP 2

[REDACTED]

[REDACTED]

Prepared by

[REDACTED]

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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 2	Mobile Launch Platform 2

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 2 nor are any identified with this TECA.

#### **Recognized Environmental Conditions:**

- No recognized environmental conditions were identified in MLP 2.

#### **Environmental Management Activities:**

- There are no Environmental Management activities in MLP2.

#### **Other Concerns:**

- Asbestos-Containing Building Materials (ACBM), lead paint and PCB-contaminated paints are known to be present in MLP 2. An Asbestos Containing Material (ACM) survey performed in May 1997 indicated friable ACM has been identified in MLP 2. Lead and PCB contaminated paints are indicated through interviews of key personnel. Information regarding the location and quantity of known ACBM as well as contaminated paints will be provided to any occupant of this facility through the MESC Environmental Health office.
- Residual hydraulic fluid remains in equipment and ancillary hydraulic lines.
- Two lead acid batteries supporting the fire alarm system managed by the ISC Contract remain in a battery box in Compartment 9A.
- 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).
- Personnel access doors use petroleum grease.

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## Mobile Launch Platform 2

### 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, with 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 (LH<sub>2</sub>) 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 Masts, 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. Each MLP, 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 2 at Launch Pad (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. Each 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.

MLP 2 final end state is "Abandon." Initial walk down of the structure was November 30, 2010 and the final walk down of the structure was accomplished on July 30, 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. The fire alarm control panels (FACP) with two lead acid batteries in compartment 9A are still in place. Manual pull stations (MPS), heat activated detectors (HAD), smoke detectors mounted on the ceilings and air conditioning ducts are still in place.
- All hand held fire extinguishers and the AED have been removed from MLP 2.
- There is compact fluorescent lighting throughout MLP 2.
- Emergency warning beacons are in the process of being removed by ISC contract personnel. Emergency exit lights remain.
- All ELSA boxes have been removed from MLP 2.
- Integrated Network Control Systems (INCS) have been removed.
- All compressed gas tanks and systems have been removed. Two empty helium tanks remain in compartment 44A.
- The oxygen monitoring units has been removed.
- The following can be found in the numbered compartments of MLP 2:
  - 8B - a dry type transformer (see Figure 4), chilled water supply lines, a stainless steel sink which was hooked up to potable water but not used and oxygen analyzer supervisor panel and oxygen analyzer integration unit panel (see Figure 5).

- 7B - sound suppressions lines and chilled water lines (see Figure 6), the hand- held fire extinguisher was removed on August 14, 2012 (see Figure 7), chilled water HVAC unit and an area of paint sampling for lead (see Figure 8).
- 10B - sound suppression lines, HVAC lines, power panels and communications have been removed (Figure 15 background).
- 9B - empty cage that formally housed a Satellite Accumulation Area (SAA) when at the Launch Pads (see Figure 9), two dry type transformers (see Figure 10) and heater power switching panels (see Figure 11).
- 48B is an instrumentation room.
- 36AB has sound suppression and power panels.
- 37AB - power supply panel for the Solid Rocket Booster (SRB) winches (see Figure 12).
- 38AB - power panel for Space Shuttle Main Engine (SSME) winches.
- 37A - four SRB winches are in this compartment (see Figure 13) and four hold down posts.
- 47AB - water lines for the sound suppression system.
- 15B - fire suppression hose (see Figure 14), Integrated Network Control System (INCS) panel has been removed (see Figure 15) and a dry type transformer.
- 16B - chilled water lines, the drained SRB hydraulic pumper with 104 gallon hydraulic oil tank , S/N S72-0841-01-007, (see Figure 16) and SSME winch. The hydraulic pumper is labeled “Empty/Permanently Closed” and dated 4/2012 (see Figure 17). The 100 gallon contingency tank is labeled “Empty” (see Figure 18).
- 40AB - water valve control panel for the sound suppression system.
- 41B - potable water system pipes and Firex lines.
- 44B - sound suppression water pipes and Firex lines. The SSME heater panel and the GN2 panel for the lox system have been disconnected. The PSIG purge and actuation pneumatics panel is disconnected.
- 43B - Orbiter hydraulic pumper with 104 gallon hydraulic oil tank, S/N S72-0841-01-017 (see Figure 19). The hydraulic pumper is labeled with “Empty/ Permanently Closed” and dated 4/2012 (see Figure 20).
- 42B - sound suppression and ventilation lines.

- 45AB - fire suppression pipes.
- 34B – INCS panel will remain. The helium panel and LH2 panel have been removed.
- 33B - SRB Aft Skirt Purge panels have been removed (see Figure 21), alarm distribution panel removed (see Figure 22).and the Orbiter Helium Anti/Ice panel has been disconnected.
- 35AB, 32AB, 39AB and 42AB all contain sound suppression lines.
- 2B - two SSME winches, SRB hydraulic pumper unit, S/N S72-0841-01-018, (see Figure 23), Orbiter/SRB Control Panel and ventilation lines. The hydraulic pumper is labeled with “Empty/Permanently Closed” and dated 4/2012 (see Figure 24).
- 30AB - sound suppression and ventilation pipes.
- 31B - empty.
- 1B - sound suppression lines and the main facilities helium and nitrogen interface to the MLP (see Figure 25). The oxygen analyzer monitoring unit has been removed.
- 17A – fire hose.
- 2A- fire alarm sensor panel and oxygen analyzer monitoring unit removed. The hand held fire extinguisher was removed on August 14, 2012 (see Figure 26). HVAC carbon and HEPA filters and a fire hose. This compartment stored the aft orbiter platform which has been removed and stored in the VAB (see Figure 27).
- 34A - a GN2 panel for Hubble support and a GN2 SRB TVC servicing panel.
- 33A- INCS removed (see Figure 28) and the ECS system particle counter.
- 31A - two SRB winches and two hold down posts.
- 1A - a dry type transformer and ECS lines.
- 9A - halon fire suppression system control panel and battery rack control and monitor panel (see Figure 29). The two batteries associated with this rack are lead acid (see Figure 30). Two 400 hertz generators have been removed (see Figure 31).
- 21A- two dry type transformers, power panels (see Figure 32) and a current transducer (see Figure 33). The Halon fire suppression system tanks previously located in this room have been removed (see Figure 34).

- 8A - stainless steel double sink, chilled water supply and two dry-type transformers (see Figure 35). The Halon fire suppression system tanks previously located in this room were removed.
- 7A - the hand held fire extinguisher was removed on August 14, 2012, power supply for orbiter and SRB with a ni-cad battery back-up removed (see Figure 36), hazardous gas warning system, hydrogen umbilical mass spectrometer (HUMS) has been removed (see Figure 37), compressed gas tanks removed (see Figure 38) and a dry type transformer. The Halon fire suppression system tanks were removed see (Figure 39).
- 10A - chilled water supply system, water valve control panel and a launch power systems interface panel. The Halon fire suppression system tanks were removed.
- 20A - empty.
- 18A - bathroom with two sinks, two toilets, two urinals and one drain (water supply turned off).
- 15A - sound-proof work room with one dry type transformer (see Figure 40), a HVAC unit (see Figure 41) and power panels.
- 19A – a dry type transformer.
- 16A- empty heat exchanger for the Freon system, two low voltage panels, fire suppression water pipes, and a fire hose.
- 44A- phone, GN2 control panel, Firex lines, sound suppression system lines, and two empty helium tanks. The hydrogen system control panel and the SSME GN2 heater controller are labeled as disconnected (see Figure 42).
- 43A – empty Freon R-124 system (see Figure 43) with a tank for over-pressurization is deactivated, HVAC system lines, GN2 panel removed, INCS panel removed, hazardous warning panels removed, and all tanks of helium, nitrogen, shop air and breathing air for the hazardous gas warning systems removed.
- 41A - two SRB winches and two hold down posts.

**USA Processes:**

- USA has no personnel, property or processes at MLP 2.

**Spills information:**

- 10/31/00 MLP-2 or 3 in Compartment 43B/ < 1 gal hydraulic fluid
- 01/03/03 MLP-2 Fire System/3800 lbs Halon-1301 fire suppression media

- 01/08/07 MLP-2 SRB hydraulic system right side drain from "0" level hydraulic interface pit onto VAB HB-1 floor. Estimated quantity about 40 gallons of hydraulic fluid

**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 2, located in Room 9B, was closed with the closure of the SAA site on October 27, 2011.

**USA Spill Prevention Controls and Countermeasures Program (SPCC) information:**

- The hydraulic pumping systems existed to supply the Space Shuttle's SRBs and Orbiter with hydraulics. The three 104 gallon capacity reservoirs, which were SPCC sites, are located in Compartments 2B (K6-0546MLP2-1), 16B (K6-0546MLP2-2), and 43B (K6-0546MLP203). There is secondary containment "coffins" surrounding each pumper. Stainless steel piping supplied hydraulic fluid to Zero-Level. These hydraulic pumpers units have been drained of hydraulic fluid, labeled "Permanently Closed and Empty" (4/2012) and removed from the KSC SPCC Site Specific Plan.

**Additional Figures:**



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

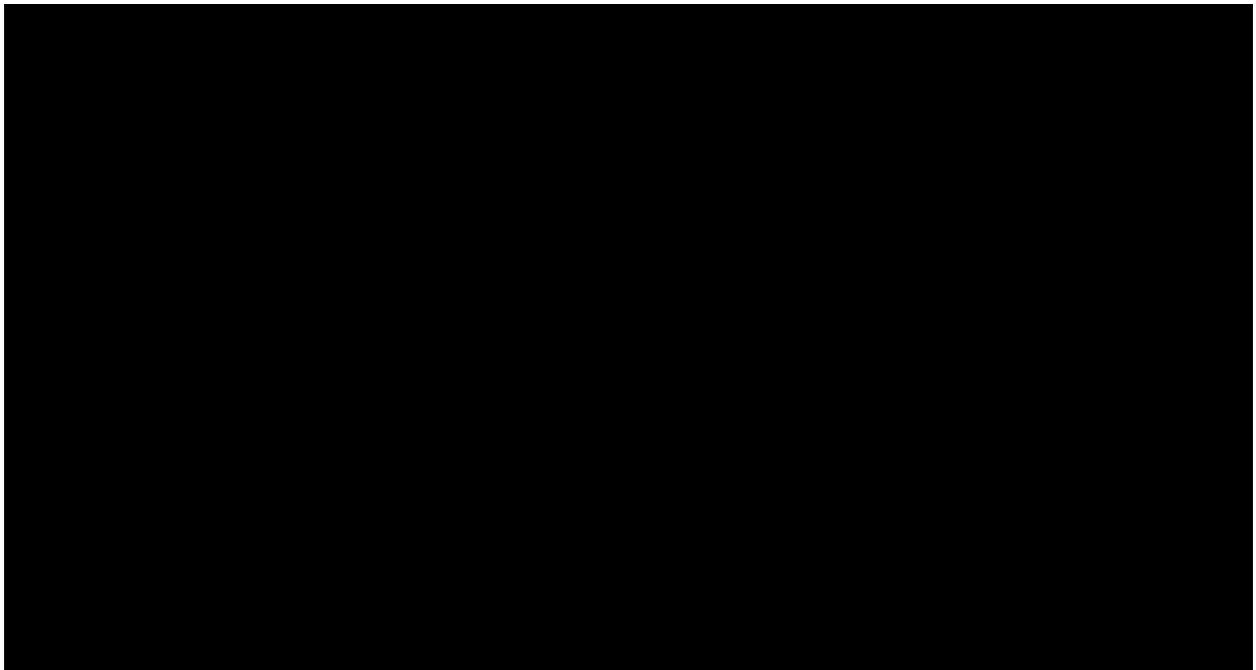


Figure 3. MLP Floor Plan



Figure 4. 8B - Dry type transformer



Figure 5. 8B - Oxygen analyzer panels



Figure 6. 7B - Sound suppression



Figure 7. 7B - hand held fire extinguisher was removed August 14, 2012.



Figure 8. 7B – Lead paint sampling area



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



Figure 10. 9B – Dry type transformer



Figure 11. 9B - Heater power switching panels



Figure 12. 37AB – Power supply panel

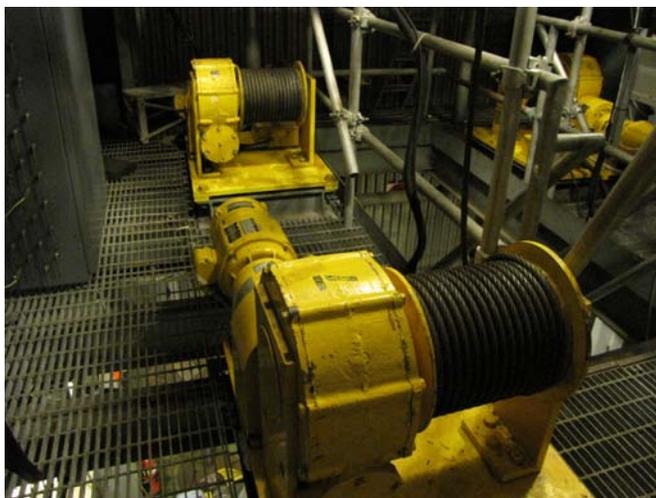


Figure 13. 37A - SRB winches



Figure 14. 15B - Fire hose



Figure 15. 15B – INCS panels removed (foreground) and communications removed from 10B (background)



Figure 16. 16B – SRB hydraulic pumper unit



Figure 17. 16B – Hydraulic tank on pumper labeled “permanently closed/empty”



Figure 18. 16B – 100 gallon contingency tank



Figure 19. 43B – Orbiter hydraulic pumper unit



Figure 20. 43B – Hydraulic tank on pumper labeled “permanently closed/empty”



Figure 21. 33B - SRB Aft Skirt Purge panels have been removed



Figure 22. 33B – Fire alarm distribution panels removed



Figure 23. 2B – SRB hydraulic pumper unit



Figure 24. 2B - Hydraulic tank on pumper labeled “Empty/Permanently Closed”



Figure 25. 1B - Main facilities helium and nitrogen interface to the MLP



Figure 26. 2A – Oxygen monitoring unit removed, hand held fire extinguisher and beacons removed. The hand held fire extinguisher was removed August 14, 2012.



Figure 27. 2A – Storage area previously used for aft orbiter platform



Figure 28. 33A – INCS removed



Figure 29. 9A – Halon fire suppression system control panel, battery rack control and monitor panel, battery box. The hand held fire extinguisher was removed August 14, 2012.



Figure 30. 9A – two lead acid batteries



Figure 31. 9A – Two 400 hertz generators removed



Figure 32. 21A – Dry type transformer and power panels



Figure 33. 21A – current transducer



Figure 34. 21A – Halon fire suppression tanks removed



Figure 35. 8A – Dry type transformer



Figure 36. 7A – INCS removed



Figure 37. 7A – HUMS removed



Figure 38. 7A – Compressed gas tanks removed



Figure 39. 7A – Halon tanks removed



Figure 40. 15A - Dry type transformer



Figure 41. 15A – HVAC unit



Figure 42. 44A – Hydrogen system control panel and SSME GN2 heater controller panel disconnected



Figure 43. 43A – Empty Freon 124 system

## **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.

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