



# Lujan Neutron Scattering Center Flight Path Disposition Project

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# Agenda

- Scope
- Milestones, Monthly summaries
- Planning
- Challenges
  - Programmatic Deadlines
  - PHAROS D&D “PAUSE WORK” Cut Electrical conduit containing conductor
  - Low Level Waste Removal
- Successes
  - FP-9 (SPEAR) D&D
  - Repurposing of Equipment
  - FP-16 (PHAROS) D&D
  - FP-15 (PCS) D&D
  - Legacy Data Cable Removal
  - Chem Lab: Chemical Disposition

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# Scope

- The scope of the Lujan Limited Flight Path Disposition Project (LLFPD) is presently confined to the decommissioning and demolition (D&D) of the LANSCE - Lujan Center flight paths (Figure 1) and supporting infrastructure that were previously supported by DOE Basic Energy Sciences (BES) and Biological and Environmental Research (BER) programs.
- D&D focus areas associated with Lujan Flight Paths
  - PHAROS (line 16)
  - PCS (line 15)
  - SPEAR (line 9)
  - BES/BER supported infrastructure located at buildings 15 (Chem Lab) 622 within the Lujan Center complex
  - Safe disposition of Legacy materials located in the Lujan “Boneyard” Area

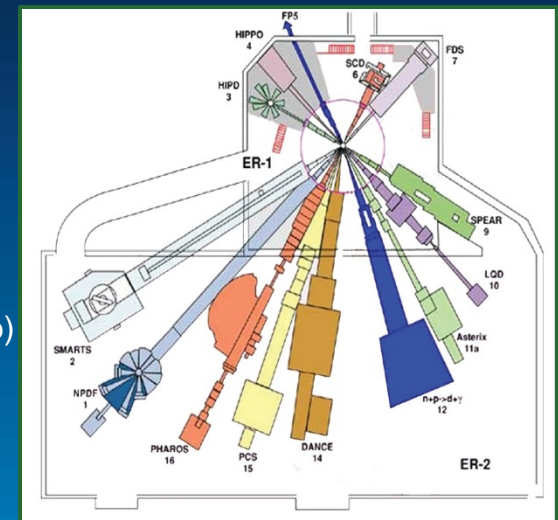


Figure 1

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# Milestones, Monthly Summaries

Lujan	Lujan Center Dnd	01-Oct-15 A	28-Sep-16
Lujan.1	PHAROS (Flight Path 16) - ER-2 Scope	01-Oct-15 A	31-Jan-17
Lujan.1.1	PHAROS Activities	01-Oct-15 A	31-Jan-17
L.1000	Begin Flight Path 16 Disassembly and Disposition		
L.1025	MCF-C&S Work Planning and IWDs Complete	01-Oct-15 A	
L.1035	Vacuum Vessel Cut Up and Removed from ER-2 to Waste Staging Area		14-Oct-16*
L.1045	PHAROS Equipment Cabinets in ER-2 Cleaned Out and Dispositioned		23-Dec-16
L.1060	All Waste from Flight Path 16 are disassembly Shipped to Waste Disposal Site		23-Dec-16 31-Jan-17
Lujan.2	SPEAR (Flight Path 9)	01-Oct-15 A	28-Sep-18
Lujan.2.1	SPEAR Activities	01-Oct-15 A	28-Sep-18
L.11070	Begin Flight Path 9 Disassembly and Disposition	01-Oct-15 A	
L.1107	SPEAR Detector and Salvageable Equipment Removed from Flight Path		31-May-17
L.1840	Work Planning and IWDs Complete		31-Oct-17
L.1102	EPACS Equipment Disabled and Removed		22-Dec-17
L.1850	Electrical Air Gap Removal Complete		22-Dec-17
L.1127	Flight Path Disassembly Complete		30-Apr-18
L.1135	SPEAR Detector and All Other Salvageable Equipment Dispositioned		29-Aug-18
L.1145	All Waste from Flight Path 9 are Disassembled and Shipped to Waste Disposal Site		28-Sep-18
Lujan.3	PCS (Flight Path 15) - ER-2 Scope	01-Oct-15 A	29-Sep-17
Lujan.3.1	PCS Activities	01-Oct-15 A	29-Sep-17
L.1150	Begin Flight Path 15 Disassembly and Disposition	01-Oct-15 A	
L.1198	Electrical Panels and Beam Dump Removed from PCS		30-Sep-16
L.1180	PCS Detector and Data Acquisition System Shipped to ORNL		31-Oct-16
L.1195	EPACS Equipment Disabled and Removed		15-Nov-16
L.1870	Work Planning and IWDs for PCS Work Completed		30-Nov-16
L.1900	Electrical Air Gap Complete		31-Jan-17
L.1220	Flight Path Disassembly Complete		31-May-17
L.1250	All Waste from Flight Path 15 are disassembly Shipped to Waste Disposal Site		29-Sep-17
Lujan.4	BONEYARD	01-Oct-15 A	31-Jan-17
Lujan.4.1	BONEYARD Activities	01-Oct-15 A	31-Jan-17
L.1320	Begin Clear Out of Transportainers and Lay Down Area in the Boneyard	01-Oct-15 A	
L.1403	Detectors and Equipment Ready for Pre-shipment Survey		31-Oct-16*
L.1405	Detectors and Equipment from IPNS shipped to ORNL		30-Nov-16
L.1415	All Boneyard Waste to shipped to Disposal Site		31-Jan-17
Lujan.5	Building 622	01-Oct-15 A	28-Sep-18
Lujan.5.1	Building 622 Activities	01-Oct-15 A	28-Sep-18
L.1490	Begin Clear Out of BES Legacy Equipment and Waste	01-Oct-15 A	
L.1506	Legacy and IPNS Salvaged Electronics in Room 118 and Electronic Lab Dispositioned		31-Jan-17
L.1502	Contents of Spear, Pharos, and PCS Data Rooms Cleared out and Dispositioned		31-Aug-17
L.1530	Contents of X-ray Lab and Spear Space in Room 118 Cleared Out and Dispositioned		31-Aug-16*
L.1534	Legacy Data Cables Under Raised Floor and in Trenches Removed		29-Sep-18
Lujan.6	Building 16	01-Oct-15 A	30-Jun-17
Lujan.6.1	Building 16 Activities	01-Oct-15 A	30-Jun-17
L.1660	Begin Removal Legacy BES Samples, Chemicals, and Salvage Equipment	01-Oct-15 A	
L.1695	Disposal of Remaining Chemicals Complete		31-Oct-16
L.1920	Disposal of Legacy Samples Complete		31-Oct-16
L.1685	Disposition of Equipment to be Salvaged or Transferred to ORNL Complete		30-Jun-17
Lujan.7	Lujan Dnd Management	31-Mar-17	31-Jul-17
L.1930	Preparation of ER-1 Work Scope Options Estimate Development Complete		31-Mar-17*
L.1940	ER-1 Work Scope Option Decision Complete		30-Jun-17*
L.1950	Conduct FY18 Planning Meeting		31-Jul-17*

## Lujan Neutron Scattering Center - Limited Flight Path Disposition Project

April 2017 Monthly Progress Report (Call: April 8<sup>th</sup>, 2017 - 8:00 EST)

### Accomplishments

WNS 2.1. Research - Helium Transporter to be used to move the wax filled portion of the vacuum vessel out of ER2 has been received at LANL. It is at the 1A-60 warehouse and arrangements for transport to 1A-33 are being made. Helium representatives are to be onsite to provide training the week of April 23. Vacuum vessel move is planned for the week of April 24. Actual weight and dimensions were measured for overland transport permitting and TOS approval (Figure 1). Dimensions are inches (in/feet/meters).

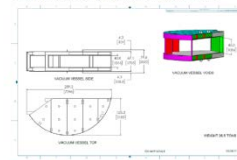


Figure 1. Actual weight and dimensions of wax filled portion of the PHAROS vacuum vessel.

WNS 1.2. SPEAR - SPEAR was turned over to Construction Management significantly ahead of schedule. The SPEAR electrical demolition back to the flight path jacks was completed. Flight path jacks, transformer and transformer lead to be removed back into trench later this month. Cass was disassembled and removed for disposal up to the 100 gals threshold (Figure 2). Removal of Cass demo and ductwork removal planned for 2018 maintenance outage. Core air conditioning system demo is in progress. Waste has been surveyed and staged for disposal.

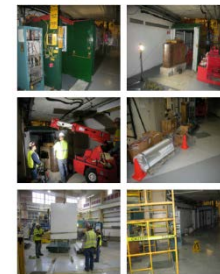


Figure 2. SPEAR core demolition.

WNS 1.4. Boneyard - A crate was built to ship PHAROS oscillating radial collectors along with the 120A and 500 detectors from ORNL. The collectors and detectors were packed in foam for shipment to LMG (Figure 3).



Figure 3. Radial collectors in bottom of ORNL and 500A detectors in top of crate.

WNS 1.5. Building 622 - X-ray lab O&M work planning was begun. Industrial hygiene collected smear samples for lead and beryllium safety. Samples are out for analysis. The existing smoke alarm batteries are checked with lead and the machine has beryllium components (Figure 4). Computer hardware and removable magnetic media disposal program was made.

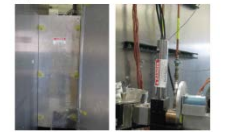


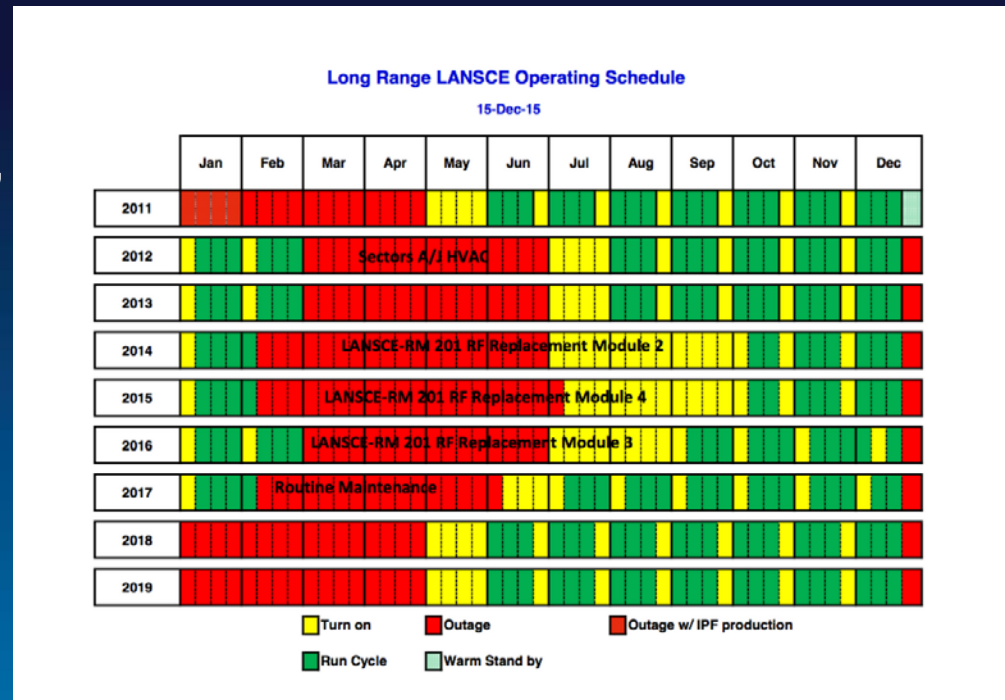
Figure 4. Beryllium containing a new equipment.

SPO-SC project management subject matter expert provides routine support to project for communications and reporting to BES (Project miles stones, work packages and monthly summaries

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# Challenges: Programmatic Deadlines

LANSCCE is a user facility with well-defined periods for beam delivery and maintenance activities, the LANSCCE operations and maintenance schedule is an underpinning factor for the basis of the D&D schedule

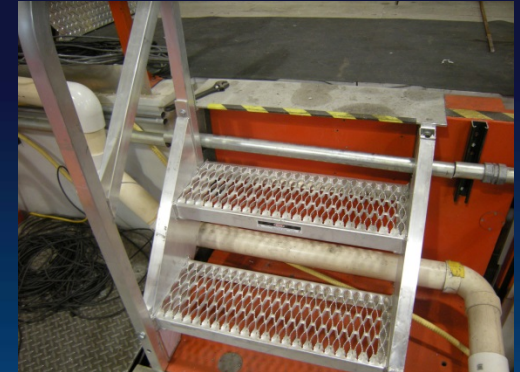


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# Challenges

## PHAROS D&D Project

- Management “Pause Work”
- What happened?
  - During PHAROS D&D project discovery of electrical conduit containing wires was cut (de energized 480V) contrary to work requirements



### Lessons Learned

- \*Communication is key
  - Cold and dark necessary prior to any work
  - 3-factor verification of cold and dark (Facilities, P-27 ESO, Independent verification of cold and dark
  - Mark conduit for removal (green paint) AND to remain (red tape)
  - Verification of each conduit prior to cutting by worker and “buddy”
- Have a questioning attitude – key during D&D operations
- Bring in required expertise for IWD review
  - Construction Management
    - \*skill of craft (heavy equipment operations, Torch cutting, facility electrical DEMO)

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# Challenges: Low Level Waste Removal

- **CAUSE:** LLW waste items on manifest with weight discrepancies  
**CORRECTIVE ACTIONS:**
  - Recommend sending scales in for calibration
  - Review vendor recommendations to achieve <10% variation
  - Perform an effectiveness evaluation to achieve consistency
  - Contact the TSDF to obtain validation of weights



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# Challenges: Low Level Waste Removal

- **CAUSE:** LLW waste items not captured on the shipping manifest  
**CORRECTIVE ACTION:**
  - Stage the blocks in a designated area as a set before loading on the Flat Bed to optimize the inventory process
  - Develop a check list that contains all the pertinent information for the shipment and includes an independent verification for the number of items
  - Take photographs of the loaded flat bed for inclusion into WCATS
  - Evaluate effectiveness with a monthly MOV



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# Challenges: Low Level Waste Removal *cont.*

- **CAUSE:** Water accumulation inside LLW roll off waste container  
**CORRECTIVE ACTIONS:**
  - Perform a container verification for seals and cracks, and enter results in check list.
  - Add absorbent to all waste containers per Navarro instruction.
  - When loading hold the waste container at around 45 degrees, and verify no water drains out and enter results in check list.
  - Document actions in WCATS.
  - Develop a comprehensive check list that addresses this and other weight verification actions.

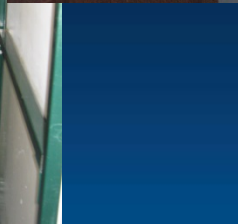
## TA-53-DI-0100, Rev.0 Desktop Instructions for Waste Management Coordinators (WMC) in the field

*This document identifies scope, controls, and general procedural steps for performing specific waste management activities within the TA-53 area of operation.*



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# Successes: FP-9 (SPEAR) D&D



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# Successes: Repurposing of Equipment



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# Successes: FP-16 (PHAROS) D&D



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# Successes: FP-15 (PCS) D&D



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# Successes: Legacy Data Cable Removal



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# Successes: Chem Lab: Chemical Disposition



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# Successes: Safe disposition of Legacy materials located in the Lujan “Boneyard” Area



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- **Chemical disposition**
  - >90% complete
  - 4000 chemicals when started
  - ~500 shipped to SNS
  - ~100 waiting to ship
  - Various Chem lab instrumentation repurposed at LANL sites and SNS
- Flight Path shielding blocks, vacuum vessel cut outs and Vacuum vessel equal 314,171 lbs. shipped off thus far
- Two trailers totaling in weight 38,490lbs waiting to be shipped off
- Roll-offs totaling 156,110lbs
- Additional shielding blocks in staging area totaling 125,700lbs waiting to be loaded and shipped

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- Repurposed the following:
  - PHAROS FERMI Chopper (SNS)
  - CHRISTINA spectrometer and chopper (SNS)
  - PHAROS Radial Collimators (SNS)
  - Qens Detectors (SNS)
  - Sputtering Spectrometer (New Mexico State University)
  - PHAROS: 47 detectors assemblies /392 He<sup>3</sup> tubes (\$7.2 million replacement cost)
  - SNS
  - SCD: detector and DAQ racks
  - 7T and 11T magnet (SNS)
  - Repurposed ~60,000lbs of HD and borated polyethylene
  - Repurposed ~125,000lbs of concrete and steel shielding blocks for future spectrometer construction

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# What's left?

- D&D portion inside Experimental Room 1 (ER-1)
  - FP-9 shielding package
  - FP-15 shielding package
  - FP-16 shielding package
- Mercury Shutters
- X-Ray Lab DEMO
  - Hazards Beryllium, Lead, Electrical

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