



Y-12 Improvements

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January 18, 2023

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A Brief History of the Problem

- The Y-12 Nevada National Security Site (NNSS) Waste Certification Program (WCP) was established in 2003 in order to dispose of dismantled weapon components.
- One dismantlement effort was planned, with support from Waste Certification characterization subject matter experts (SMEs), in 2007.
- It was understood that an agreed-upon dismantlement approach would be utilized, which would result in a specific subcomponent's removal and return to the facility that manufactured the subcomponent.
- The characterization basis was documented in a due diligence to an existing NNSS profile in September, 2008, and specifies that the subcomponent of concern would be removed.
- The manufacturer informed Y-12 that they no longer desired the subcomponent in 2009.
- Y-12 Process Engineering evaluated a different dismantlement approach that would not require removal of the subcomponent and this approach was utilized.

A Brief History of the Problem – Cont.

- The change was not communicated to the Waste Certification SMEs that characterized the components.
- Ten shipments of components to the NNSSS began in January, 2013 and continued through December, 2018.
- The National Nuclear Security Agency (NNSA) Laboratory Design Agency (DA) was interested in receiving specific components from Y-12 and initiated communication with a Y-12 Weapon Product Engineer (WPE).
- On June 27, 2019, a representative from the DA emailed the WPE stating they could receive components on the condition that the certain subcomponents were de-energized & removed.
- The Y-12 WPE read the email on July 02, 2019 and reported this information to the Y-12 NNSSS Primary Technical Contact (PTC).
- Internal notifications were made the same day.

A Brief History of the Problem – Cont.

- Y-12 issued an unclassified “Night Note” to NNSA headquarters authorities mid-morning on July 03, 2019. The term “explosive” was used.
- Simultaneously, the Y-12 Waste Certification Official made notification to NNSS.
- At 1300 hrs (EST), representatives from Y-12, NNSS, and NNSA HQ held a conference call and an initial determination was made that the subcomponent had hazardous constituents.
 - This initial determination required notification to the State of Nevada.
 - Consolidated Nuclear Security (CNS) documented a thermodynamic analysis of the subcomponent, which stated there were no hazardous constituents. EPA Region 9 did not accept the revised characterization, and a settlement was issued.
- Y-12 voluntarily suspended all shipments to NNSS on July 03, 2019.
- NNSS notified Y-12 on July 11, 2019 of formal suspension of the WCP.
- **This discovery resulted in a litany of subsequent actions that affected generators across the entire DOE complex.**

How Did This Happen?

- The direct cause was a failure to re-characterize Weapon-Related Material (WRM) following a process change resulted in non-compliant shipments.
- The Dismantlement Process Engineer (retired at the time of discovery) confirmed that the process change not only resulted in lowering the cut line, but also removed the steps to de-energize the component.
- The root cause was a failure to adequately flow down weapon dismantlement and disposition requirements into implementing procedures for WRM disposition.
- Y/WR-005, Y-12 National Security Complex Weapons Returns Materials Disposition Plan (U), Rev. 3, November 4, 2003, defined a three-phase planning approach to WRM dismantlement and disposition that involved global planning, material characterization, and program-specific planning.
- The failure to formalize requirements into process and procedures resulted in knowledge gaps and weaknesses in the disposal of weapon components.

Recovery Strategy

- Developed two separate corrective action plans – one to address waste shipments and one to address shipments of Weapon Material and Weapon-Related Material (WM/WRM).
- The Department of Energy sent an Enterprise Assessment team to Y-12 for a two week review in January, 2020.
- The NNSR Radioactive Waste Acceptance Panel (RWAP) conducted an assist visit in January, 2020.
- A Nuclear Security Enterprise (NSE) multi-site panel conducted a peer review in February, 2020.
- Sixty-three action items were identified at the conclusion of the afore mentioned reviews.

Paper, People, Processes

- Ten existing procedures were revised, seven new procedures were developed.
- The Y-12 Waste Management Manual was revised to be the overarching command media for disposal of WM/WRM, in addition to waste.
- Training was conducted for affected stakeholders.
- Two separate, independent assessments were conducted to ascertain readiness prior to RWAP assessments of the waste and WM/WRM elements of the Y-12 Waste Certification Program's suspension.
- Real-Time Radiography has been successfully deployed.
- Waste Management's Non-Destructive Assay facility is nearing completion of a modernization campaign after 30 years of operations.

Summary

- Diligently monitor for process drift.
- Never attempt to speak about classified topics in an unclassified environment.
- Never provide an answer before understanding all of the facts – no matter the pressure.
- The waste portion of Y-12s WCP was unsuspended after 615 days.
- The WM/WRM portion of Y-12s WCP was unsuspended after 1212 days.
- During normal operations, Y-12 has an inventory of ~1,500 packages. The NNSS shipment issue has created today's backlog of ~6,000 packages. Representatives from Energy Solutions have recently provided initial, efficient transportation and disposal options to minimize this risk to the Y-12 mission.