

Downgrading Nuclear Facilities to Radiological Facilities-16428

Jesse Farr*, Jeff Jarry**, and Leroy Duran***

*Weston Solutions Inc., jofarr@sandia.gov

**Sandia National Laboratories, jfjarry@sandia.gov

***Sandia National Laboratories, lgduran@sandia.gov

ABSTRACT

Based on reduced radiological inventories, SNL downgraded 4 SNL Hazard Category 3 nuclear facilities to less-than-Hazard-Category 3 radiological facilities. SNL's Waste Management and Pollution Prevention Department managed the Hazard Category 3 nuclear facilities and implemented the downgrade. This paper examines the multiple steps of the downgrade process. The examination provides useful information to other facilities contemplating or anticipating a similar transition.

INTRODUCTION

SNL evaluates hazards, controls, and potential risks associated with facilities, operations, and activities using Primary Hazard Screenings (PHSs). Potential hazard severity is used to classify facilities as nuclear, including Hazard Category 3 (HC-3) facilities, and industrial, which includes less-than-HC-3 radiological facilities. Facilities classified as HC-3 nuclear facilities have a potential higher hazard severity than less-than-HC-3 radiological facilities. SNL's HC-3 nuclear facilities therefore require more extensive safety basis documentation (e.g., Documented Safety Analyses, Technical Safety Requirements, supplements, etc.) and are authorized for operation by DOE/NNSA. SNL's less-than-HC-3 radiological facilities require less safety basis documentation (e.g., Hazard Analysis) and are authorized for operation by SNL's Safety Basis Department.

The SNL Waste Management and Pollution Prevention Department (WMPPD) recently downgraded 4 HC-3 nuclear facilities to less-than-HC-3 radiological facilities after radiological inventories were reduced. The downgrade process consisted of the following steps:

- Program Review and Gap Analysis
- Database Modifications and Verification
- Inventory Checks
- Authorization Document Transitions
- Technical Work Document Modifications
- Training

- Readiness Assessment
- Notification

DISCUSSION

Each of the steps associated with the downgrade of the HC-3 nuclear facilities to less-than-HC3 radiological facilities are addressed in this section.

Program Review

After the opportunity to downgrade the bunkers was presented in January of 2014, the WMPPD initiated meetings to identify the optimal implementation process, steps that would be required, personnel and support groups that would be involved, and anticipated timeframes for the various activities.

At the time of the downgrade, SNL's WMPPD operated multiple HC-3 nuclear facilities and less-than-HC-3 radiological facilities. So a mature program for the operation of less-than-HC-3 radiological facilities was already in place. Transitioning the HC-3 facilities to the existing less-than-HC-3 radiological facilities program was identified as the most logical downgrade process. An ensuing gap analysis identified a number of changes and revisions that would need to be made to the existing less-than-HC-3 radiological facility program to incorporate the facilities.

The downgrade process and resulting milestones, schedule, assumptions, and risks were documented in the *Transition Plan for Deactivation of Hazard Category 3 Nuclear Operations: Manzano Nuclear Facilities and Onsite Transportation of Hazard Category 3 Radioactive Materials*. The document was completed and approved by SNL's upper level management in late January. The assumptions and risks listed for the downgrade included the continued need and approval for the downgrade, timely availability of impacted personnel and support groups, and adequate funding.

Database

An initial step of implementing the downgrade was to modify an in-house tracking database called RadTrack to confirm the less-than-HC-3 radiological quantities. At the time of the downgrade, RadTrack was the database used to monitor radiological quantities at the various facilities. Distinct versions of the database that calculated radiological quantities based on whether the facility was a HC-3 nuclear facility or less-than-HC-3 radiological facility were used. While the HC-3 nuclear facility version of RadTrack was still being used, a modified test version was developed to correctly calculate the new less-than-HC-3 quantities for the 4 facilities being transitioned. This database transition process was described in *RadTrack and*

Waste Characterization Team (WCT) Software Update Plan for the Hazard Category Threshold Values and Nuclear Facilities Downgrade. The document identified the anticipated modifications to RadTrack's data tables, screens, and reports.

The modified version of RadTrack was then tested and verified. The process was described in *RadTrack and Waste Characterization Team (WCT) Software Revisions for Hazard Category Threshold Values and Nuclear Facilities Downgrade Testing Plan.* The document specified the tests for the data table changes, screen changes, and report changes.

The modified version of the database was developed, tested, and verified in mid-February.

Inventory Checks

After the new less-than-HC 3 radiological facility version of RadTrack was modified, tested, and verified, new reports were generated for the 4 HC-3 nuclear facilities. The reports confirmed the contents were less-than-HC-3 radiological quantities. Printouts of the new reports that listed each container were then compared to physical inventories during walk-downs of the facilities to confirm accuracy.

Authorization Documents

A new draft PHS was then developed in mid-February that identified operations and activities for the existing WMPPD less-than-HC-3 radiological facilities and the 4 transitioning facilities. The PHS confirmed the combined facilities would remain less-than-HC-3 radiological facilities. A new draft HA for the combined facilities was also developed. The draft version of these documents was reviewed by SNL's approval organizations to confirm the designation and resolve any potential issues ahead of time. The existing nuclear facility safety basis documents (e.g., Documented Safety Analyses, Technical Safety Requirements, supplements, etc.) were also prepared for inactivation and archiving.

Technical Work Documents

Commensurate with the database modifications and PHS development, all of the WMPPD technical work documents (TWDs) were reviewed to identify updates required to transition the 4 facilities to less-than-HC-3 radiological facility operations. This review revealed that 11 TWDs specific to HC-3 nuclear facility operations would need to be archived. These TWDs addressed specific HC-3 nuclear facility requirements related to training, inventory control, formality of operations, quality assurance, etc. Since general operation TWDs were in place that addressed these requirements for less-than-HC-3 radiological facilities, these TWDs would no longer be needed. The review also established that 28 TWDs and 12 forms that addressed general operations and less-than-HC-3 radiological facility

requirements would need to be modified. Most of the TWDs required modification to remove the following language:

- Activities and requirements related to HC-3 nuclear facilities and operations.
- HC-3 nuclear facility position descriptions, signature requirements, and notification requirements.
- References to HC-3 nuclear facility TWDs that were being archived.

Most of the general operation TWDs also required the scope be modified to add the 4 facilities being transitioned. The method selected to implement these minor modifications on an accelerated basis was a global deviation for the TWDs. The global deviation allowed a large number of TWDs to be changed by listing the impacted TWDs and specifying all the universal changes on one form. The deviation was reviewed by subject matter experts and approved by the authors of the impacted TWDs.

Extensive changes were required for 2 TWDs, one addressing emergency response and one addressing facility maintenance. Unique emergency response criteria (e.g., evacuation routes, personnel roles and responsibilities) needed to be incorporated into the general operations emergency response TWD. And extensive changes to the existing facility maintenance TWD for the 4 facilities was necessary to remove unique HC-3 nuclear facility criteria. New revisions were therefore developed.

The TWD modifications necessary to transition the HC-3 nuclear facilities to less-than-HC-3 radiological facilities (i.e., global deviation and 2 TWD revisions) were completed by mid-February and were ready for implementation. The modifications would become effective when signed by management.

Training

A training class was provided to all WMPPD personnel in mid-February that specified operational and procedural changes that would result from the transition. During the training, the following draft and pending items were provided and discussed:

- Data tables, screen shots, and reports from RadTrack changes.
- Less-than-HC-3 PHS and HA for consolidated facilities and operations.
- Global TWD deviation.
- Emergency response TWD revision.
- Facility maintenance TWD revision.
- Form changes.

Examples and exercises that demonstrated impacts were presented. The anticipated timeline for implementation was identified. And the attendees signed Authorized User's Lists (AULs) for the TWD revisions.

Assessment

When the WMPPD declared readiness for the transfer of the 4 HC-3 nuclear facilities to less-than-HC-3 radiological facility status, a Readiness Assessment Team directed by SNL's Safety Basis Department evaluated the readiness to operate. The team issued the *Readiness Assessment for Expanded Operations* on March 4, which stated the WMPPD was ready to safely and compliantly expand operations to include the 4 facilities as less-than-HC-3 radiological facilities. The team stated that the modified RadTrack, draft PHS, procedures and forms, and emergency plan were ready to support operations. The team also stated the training provided to WMPPD personnel adequately addressed operations and emergency response.

Effective Date and Notification

Once the Readiness Assessment Team declared readiness to transfer of the 4 HC-3 nuclear facilities to less-than-HC-3 radiological facility status, all that remained was the actual transfer and notification to impacted personnel and organizations. The date selected for transfer was March 26. On that date, the following activities were conducted:

- The WMPPD Manager signed the revised PHS and HA that identified the change.
- The global deviation, 2 TWD revisions, and 12 form changes were made effective.
- Authors directed the 11 HC-3 nuclear facility TWDs be archived.
- The modified version of the database (RadTrack) was made effective and put into use.
- Impacted SNL organizations were notified of the program modifications and effective date through the distribution of a SNL upper level management memorandum.

A confirmation email was then provided to all WMPPD staff. The email notification stated the scope of the downgrade and listed all the actions that were effective on that date.

CONCLUSIONS

SNL's WMPPD successfully completed the downgrade of 4 HC-3 nuclear facilities to less-than-HC-3 radiological facilities in less than 2 months. The process was simplified by transferring operational requirements for the facilities to an existing less-than-HC-3 radiological facility program. The downgrade was implemented through database changes, TWD modifications, authorization documentation updates, and training. The downgrade significantly reduced the amount of required

safety basis documentation and transferred approval authority from DOE/NNSA to SNL's Safety Basis Department.

REFERENCES

- *Transition Plan for Deactivation of Hazard Category 3 Nuclear Operations: Manzano Nuclear Facilities and Onsite Transportation of Hazard Category 3 Radioactive Materials*, Sandia National Laboratories/Albuquerque NM, January 30, 2014
- *RadTrack and Waste Characterization Team (WCT) Software Update Plan for the Hazard Category Threshold Values and Nuclear Facilities Downgrade*, Sandia National Laboratories/Albuquerque NM, February 11, 2014
- *RadTrack and Waste Characterization Team (WCT) Software Revisions for Hazard Category Threshold Values and Nuclear Facilities Downgrade Testing Plan*, Sandia National Laboratories/Albuquerque NM, February 11, 2014
- *Readiness Assessment for Expanded Operations*, Sandia National Laboratories/Albuquerque NM, March 4, 2014