Department of Energy
Washington, DC 20585

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MEMORANDUM FOR TODD A. SHRADER
MANAGER
CARLSBAD FIELD OFFICE

FROM: THOMAS R. STAKER
DIRECTOR
OFFICE OF ENVIRONMENT, SAFETY AND HEALTH ASSESSMENTS
OFFICE OF ENTERPRISE ASSESSMENTS

SUBJECT: *Office of Enterprise Assessments Operational Analysis of Safety Trends at the Waste Isolation Pilot Plant, May 2014 – May 2015*

Since the two events occurring at the Waste Isolation Pilot Plant (WIPP) in February 2014, the Department of Energy (DOE) independent Office of Enterprise Assessments (EA) has placed significant attention on the recovery and improvement activities including performance of numerous operational awareness visits and reviews. Recently, EA analyzed the consolidated set of data collected along with operational events to ascertain trends in safety performance.

EA's analysis identified concerns with conduct of operations, maintenance, the contractor assurance system, and use of overtime that can be leading indicators of another potential safety incident. While the Carlsbad Field Office and Nuclear Waste Partnership, LLC are implementing steps to improve these areas, EA's analysis indicates that schedule pressure was an underlying causal factor for these concerns. A change in the recovery schedule will ease near-term schedule pressure. The attached summary provides the results of EA's analysis and a recommendation with regard to the remaining safety issues. EA will continue to monitor safety performance at WIPP and will inform you of any identified issues or concerns.

If you have any questions, please contact me at (301) 903-5392, or your staff may contact William Miller, Director, Office of Nuclear Safety and Environmental Assessments, at (301) 903-5635, or Jeff Snook, Site Lead for WIPP at (301) 903-9825.

Attachment *Office of Enterprise Assessments Operational Analysis of Safety Trends at the Waste Isolation Pilot Plant, May 2014 – May 2015*

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Office of Enterprise Assessments Operational Analysis of Safety Trends at the Waste Isolation Pilot Plant, May 2014 – May 2015

Activity Description/Purpose

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an analysis of past operations at the Waste Isolation Pilot Plant (WIPP) to ascertain trends in safety.

Overview

The EA analysis considered operational events and reviews conducted during May 2014 through May 2015 and identified a significant negative trend in the performance of work and operations activities. During this period, strong and unrealistic schedule pressures on the workforce contributed to poor safety performance and incidents during that time are indicators of the potential for a future serious safety incident. EA analyzed the performance of major maintenance tasks, the implementation of safety program elements, and WIPP Occurrence Reporting and Processing System (ORPS) reports. Nuclear Waste Partnership, LLC (NWP) and the Carlsbad Field Office (CBFO) have implemented some corrective actions to improve the safety posture since the February 2014 accidents. A contract direction letter issued from CBFO to NWP on July 28, 2015 (CBFO letter 15-2331) is a good first step in relieving the schedule pressure.

Schedule Pressure

NWP's current recovery schedule is primarily a critical path schedule with no schedule contingency. This approach has promoted a focus on schedule sometimes over other key mission considerations, including safety, when unexpected delays occurred. Even though NWP, CBFO and Environmental Management (EM) managers have emphasized that safety was the priority, workers have stated in a recent worker safety report that they felt pressure to maintain WIPP's recovery schedule. These conditions could be a precursor to poor safety performance.

CBFO and EM recently announced that the target date of March 2016 for reopening of WIPP cannot be met and the schedule will be extended, although a new schedule has not yet been established. CBFO and EM have also initiated steps to address the schedule pressure concerns by directing NWP to provide a revised recovery schedule that will result in an extended date for commencement of operations.

Work Performance Weaknesses

NWP and CBFO have identified several weaknesses in the ability to implement the Evaluations of the Safety of the Situation (ESS) to establish the nuclear safety envelope and to conduct work safely. For example, NWP performed a filter change-out on March 26, 2015, and over a one-month period had to evaluate and address five ESS violations. Despite lessons learned from this evolution, during the pre-job briefing on May 15, 2015, for the next set of filter change-outs, CBFO pointed out to NWP an ESS control that would have been violated if work had commenced, and thus prevented another ESS violation.

NWP performed an extent-of-condition review and found that some ESS requirements were improperly included in working procedures. NWP currently has eight ESSs. When NWP

began to have multiple ESSs, the NWP safety analysis lead for the documented safety analysis process recommended consolidating them for ease of management and incorporation into procedures. NWP management decided against consolidation because it would redirect resources from maintaining the schedule. This is a direct example of where the previous emphasis on schedule (the decision not to consolidate the ESSs) took precedence over improving safety (writing the ESS requirements into the implementing procedures) and later became a precursor to poor safety performance (two filter change-outs with ESS issues).

Another example is ESS 09, which requires approvals from a safety engineer on a proposed plan to move liquid fueled vehicles that do not meet the safety inspection criteria for operations. This requirement was not incorporated into implementing procedure MWO90534, and its omission could have led to a safety incident.

Contractor Assurance System

The NWP Contractor Assurance System (CAS) as currently structured and implemented is not fully effective. NWP performs few internal assessments, relying instead on outside independent reviews. NWP has not scheduled any self-assessments of CAS effectiveness, and trending and analysis of metrics is limited. Most WIPP issues and specific corrective actions are being tracked as part of the recovery schedule but have not been loaded, analyzed, tracked, and closed within the processes governed by the issues management system. For example, the accident investigation corrective actions were only tracked in the recovery schedule, not in the issues management system. In many cases, individuals developed corrective actions and injected them into the recovery schedule without the benefit of the issues management system processes. Bypassing these processes leads to an inability to effectively identify, analyze, and track issues; predict trends; take appropriate and effective corrective and preventive actions; and verify closure. NWP has a growing list of issues, and although NWP management is aware of the problems with the CAS, NWP does not currently have the resources available to effectively address this backlog.

Safety Performance Weaknesses

Several conditions indicate that worker and management attention to safety needs improvement. One example, documented in an ORPS report (EM-CBFO-NWP-WIPP-2015-0004), was that when workers could not close a ventilation damper to prepare for a filter change-out evolution, the cognizant engineer they contacted directed them to bypass the step, resulting in a procedure noncompliance. This conduct of operations issue was not caught by the workers and was wrongly recommended by the cognizant engineer. Furthermore, noncompliance with this procedure could have resulted in a serious safety incident.

The following examples also directly impacted personnel safety and show continued weaknesses in training, conduct of operations, and safety culture:

- Waste oil was left in the underground for an extended time, despite a renewed emphasis on combustible loading reduction.
- Fire water lines were inadequately protected against freezing.
- Inadequate preparation for hot work, a subsequent small fire in the underground, and non-reporting of the fire by both the workers and their supervisor could have led to a serious fire incident.

- An operator improperly left a trainee alone to operate the waste hoist. The trainee then improperly operated the waste hoist, which tripped the safety (Lilly) relay and shut down the waste hoist for hours.
- The cognizant engineer violated/bypassed two safety postings and removed a safety guard to reset the hoist controller safety relay for which there was no procedure.
- Workers removed a grating to an underground tank and did not post a barricade or boundary, causing a fall hazard.

Conduct of operations and maintenance safety performance present other concerns. NWP has a backlog of hundreds of preventive maintenance items. A shutdown facilitated recovery from this backlog, among other things. Furthermore, NWP has no formal process for tracking to ensure that scheduled preventive maintenance tasks are performed on schedule, and some equipment may be used without completed preventive maintenance. For example, while preparing to perform bolting operations in a contaminated area, NWP discovered that a bolter had missed its 100-hour preventive maintenance requirement.

CBFO has also identified serious issues in conduct of operations, job hazards analysis, and safety basis. Examples include the failure to implement filter change-out ESS requirements noted above, and using a handwritten, important modification to a procedure instead of properly incorporating it through the procedure revision process.

As another example, CBFO discovered that a maintenance operations instruction manual referenced in the documented safety analysis had been cancelled, thereby possibly violating the unreviewed safety question process.

While these issues were discovered and corrected, they could have led to further violations in ESS, documented safety analysis, or procedures. Although CBFO deserves plaudits for its substantially improved oversight due to increased staffing, field presence, operational awareness, and documentation and tracking of substantial issues, these shortcomings call into question NWP's ability to safely perform work and NWP's own safety oversight.

Overtime

Last, NWP has used extensive overtime to execute the recovery schedule but currently does not track individuals' use of overtime. Thus, personnel may be working past the point of safety (e.g., an exhausted person could make a poor decision that could negatively impact the safety of a coworker), and NWP would not know in advance that the use of extended work hours was a precursor because this condition is not being tracked.

Conclusions

The issues discussed above could be leading indicators of a potentially serious incident in the future. Many more issues involving conduct of operations, maintenance, and inadequate work controls also raise concerns about the possibility of a serious incident. CBFO and NWP management are aware of these concerns and are taking steps to address each one individually. However, NWP and CBFO have larger issues to address, with broader overarching corrective actions.

Recommendations

1. Senior contractor and Federal line management should refocus and sustain efforts to improve the conduct of operations, contractor assurance, and safety culture at the site to reduce the potential for a serious incident at WIPP.

2. NWP, in conjunction with EM and CBFO, should continue to establish a fully activity-based, resource-loaded recovery schedule for WIPP that fully reflects the complex set of activities and corrective actions necessary for safe restart. Effective communications with employees will be essential as the new schedule is established.

3. CBFO and NWP should continue to closely monitor safety performance and, if needed, take additional actions to address any identified negative trends.