

**Independent Oversight Review of the
Independent Integrated Safety
Management/Integrated Work Management
Assessment of Research and Development and
Programmatic Work at the
Los Alamos National Laboratory**



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**Office of Safety and Emergency Management Evaluations
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Acronyms

ADPSM	Associate Directorate of Plutonium Science and Manufacturing
CRAD	Criteria, Review, and Approach Document
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S, Department of Energy
DOP	Detailed Operating Procedure
FLM	First Line Manager
HSS	Office of Health, Safety and Security
ISM	Integrated Safety Management
IWM	Integrated Work Management
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
NNSA	National Nuclear Security Administration
PIC	Person In Charge
R&D	Research and Development
TA	Technical Area

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1.0 PURPOSE

The purpose of this Independent Oversight review by the Office of Health, Safety and Security's (HSS) Office of Safety and Emergency Management Evaluations (Independent Oversight) was (through shadowing¹) to determine the depth, breath, and rigor of the Los Alamos National Laboratory (LANL) independent integrated safety management/integrated work management (ISM/IWM) assessment activities at the LANL Plutonium Facility at Technical Area (TA)-55 conducted July 18 through August 19, 2011, and to maintain HSS's operational awareness of the status of IWM implementation. HSS delayed issuance of this report, which was developed and approved in accordance with DOE Order 227.1, *Independent Oversight Program*, to allow evaluation and incorporation of the independent ISM/IWM assessment final results.

These oversight activities were conducted in accordance with the HSS *Office of Safety and Emergency Management Evaluations Protocol for Small Team Oversight Activities*, dated May 2011, and with LASO Work Instruction 00 04, Revision 3, *Assessment Shadowing Activity Reporting*, dated January 2009.

2.0 BACKGROUND

On January 20, 2010, the DOE Los Alamos Site Office (LASO) issued a letter to LANL expressing concerns about worker safety associated with integrated work control in programmatic and research operations. The Defense Nuclear Facilities Safety Board (DNFSB) made similar observations in an earlier staff review of work planning and control practices at LANL. In response to these LASO and DNFSB concerns, LANL initiated a number of continuous improvement activities through mid-fiscal year 2011. LANL committed to conduct an independent ISM/IWM assessment, focusing on work planning and control, to assess the status of its improvement activities and implementation of work planning and control at the activity level; this assessment was to be completed in the fall of 2011. The National Nuclear Security Administration (NNSA) criteria, review, and approach documents (CRADs) were to form the basis for this assessment. The LANL independent ISM/IWM assessment team consisted of both LANL and non-LANL experts, as well as individuals from other DOE contractors. Personnel from HSS Independent Oversight, the NNSA Office of Safety (NA-171), LASO, and the DNFSB staff shadowed the assessment. Two staff members from HSS Independent Oversight participated with LASO in their shadowing oversight of the LANL ISM/IWM assessment.

3.0 SCOPE

The scope of the LANL independent ISM/IWM assessment included selected LANL directorates and focused on moderate hazard research and development (R&D) and programmatic work. The scope also included a comprehensive review and summary of three previous assessments, as well as a review of actions associated with the Moderate Hazard R&D Safety Improvements Project Execution Plan. The

¹ Shadowing is a specific type of oversight activity where HSS personnel observe a site office and/or contractor assessment and document HSS's evaluation of that assessment.

HSS Independent Oversight shadowing of the LANL independent ISM/IWM assessment focused on the site's compliance with LANL procedure P300, *Integrated Work Management*, and included document reviews; attendance at all required assessment team training courses and in-briefings; observations of multiple assessment team staff interviews; field observations of multiple work activities, including a critique; and attendance at daily assessment team meetings.

The HSS Independent Oversight review team's field observations were limited to work activities, staff interviews, and document reviews at the LANL Plutonium Facility at TA-55 in order to provide an independent perspective on ISM/IWM at TA-55 and input to LASO's oversight of the assessment. The HSS review was conducted utilizing the approved LASO/LANL ISM/IWM assessment plan and CRADs that were tailored for LANL and based on the NNSA *Activity-Level Work Planning and Control Process Attributes and Best Practices Guidance*, dated January 2006. The LANL Independent ISM/IWM Assessment Plan also included a sampling plan of work activities to observe, as well as a "CRAD Tool" that included appropriate criteria and lines of inquiry tailored to key LANL individual position descriptions with specific roles and responsibilities for implementation of P300.

4.0 RESULTS

Overall, the LANL independent assessment process provided an adequate mechanism to assess and report the status of ISM/IWM at TA-55, and the LASO shadow process accurately oversaw and reported on the assessment. The LANL report, *Independent Integrated Safety Management/Integrated Work Management Assessment of Research and Development (R&D) and Programmatic Work*, dated September 26, 2011, accurately captured the observations of the LANL assessment sub-teams and appropriately reflected the status of ISM/IWM at TA-55. Specifically, the LANL assessment graded ISM/IWM implementation within the Associate Directorate of Plutonium Science and Manufacturing (ADPSM), the organization responsible for operations at TA-55, as "Partially Effective." The LANL assessment found that the TA-55 work control processes met the intent of P300 but identified weaknesses in the Detailed Operating Procedure (DOP) peer review process and documentation of hazard analyses, validation, and pre- and post-job briefings associated with DOPs. The assessment also found issues with implementation of conduct of operations in the areas of awareness of proper operation of the equipment in the area, ensuring that equipment operates within the required specifications, proper level of detail within a procedure to cover all required operations/activities, and failure to strictly follow the procedure as written. These individual issues were accurately captured in the report and reflected in the report findings. At TA-55, ADPSM fully met 315 of 432 assessment criteria, indicating 78% implementation (the assessment gave half credit for partially meeting criteria), and the deficiencies at TA-55 constituted 20 of the 65 findings in the report. The LANL assessment report concluded that, "While the Conduct of Operations at TA-55 needs to be strengthened, the review of documents and activities by the team demonstrated that the hazards were identified and controls were in place."

A number of the identified conduct-of-operations deficiencies were initially noted by the Independent Oversight review team and/or the DNFSB staff members, who were also observing the work, not by the LANL assessment team members. In the two LANL assessment sub-teams observing work at TA-55, only one team member had any significant prior nuclear operations experience. These observations were provided to the LANL assessment sub-teams and subsequently communicated to LASO facility representatives assigned to TA-55. In addition, LANL addressed the lack of team experience in the Lessons Learned section of the LANL ISM/IWM assessment report. Examples of observed conduct-of-operations deficiencies include:

- During a lathe operation, workers kept their hands in the glovebox and within inches of the rotating equipment, contrary to a requirement for workers to completely withdraw their hands

from the glovebox workstation. It is important to note that a judgment call to not follow this requirement was made and accepted by the worker, the person in charge (PIC), and the first line manager (FLM) without discussion of the established controls to protect the worker from rotating equipment.

- The workers and PICs for several jobs knew that the gloveboxes needed to stay at a lower pressure than the room, but they did not know any glovebox-specific values and did not know where to find these values. The activity-specific procedures required the workers to verify appropriate glovebox pressures but did not state the specific parameters.
- During a walkthrough of a hydroxide precipitation operation, the use of a vacuum trap and the work steps to correct an overflow condition were not specified in any work procedure. Subsequent discussions with the PIC revealed that overfills have occurred and that correcting an overflow condition is a complex and involved process. In addition, the procedure did not reflect current operating practices for checking the operation of the vacuum pump during the initial steps of the operation.
- During a walkaround, a posting was noted that identified potential electrical safety concerns with several electrical plugs in a glovebox but did not provide enough information about the location of the plugs or whether they were locked or tagged out. None of the operators in the room were familiar with the condition and/or status of the plugs or controls in place. This situation was subsequently brought to the attention of the Facility Operations Director, who found that the plugs were corroded (due to the environment in the glovebox), placed the plugs out of service, and convened a critique.
- Procedure MFG-WI-0034 is designed as a “use every time” procedure requiring verbatim compliance. The observers noted that workers sometimes repeated steps in the procedure, although the procedure did not address repeating work steps. In addition, workers skipped a step in the procedure that required data entry onto a datasheet. The data was subsequently recorded after the situation was brought to the attention of the PIC. Also, workers used a logbook to record important information regarding equipment operation, but the work procedure did not discuss the use of the logbook.
- Procedure PMT2-DOP-PMP-007, R3.1, *Plutonium Electrowinning*, contains an attachment titled *Electrowinning Run Data Sheets*, which is designated as “use every time” on both the procedure approval cover sheet and the attachment itself. During electrowinning operations, workers used an unapproved run sheet for data collection that had been significantly revised by the first line supervisor and differed from the approved “use every time” attachment in the procedure. It is important to note that these changes were made by the first line supervisor and accepted by the workers and the technical subject matter expert without revising the procedure as required.
- Numerous postings throughout TA-55 had been approved by management and posted over a year ago; operators stated that many were no longer applicable. These postings have all the characteristics of operator aids, and P315, *Conduct of Operations Manual*, is explicit in its requirements for keeping operator aid postings up to date and reviewing operator aids quarterly for accuracy and continuing need.
- P315, *Conduct of Operations Manual*, has a requirement that verbatim compliance is required for all "use every time" procedures. However, it contains no such statement for Reference procedures and thus does not meet the intent of the DOE Order 422.1, *Conduct of Operations*.

The LANL independent ISM/IWM assessment report was accurate in reporting deficiencies in conduct of operations at TA-55, the report's findings accurately reflected the specific deficiencies, and the report provided the overall conclusion that conduct of operations at TA-55 needs to be strengthened. In addition, TA-55 has yet to declare that the old conduct-of-operations order (DOE Order 5480.19) is fully implemented and has applied to LASO for a delay in implementing the latest conduct-of-operations order (DOE Order 422.1). Furthermore, LASO had also reported deficiencies in conduct of operations at TA-55 in previous oversight activities. On September 16, 2011, the LASO Manager sent a memorandum to the Director of LANL requesting LANL to implement immediate and longer-term, sustainable actions to improve the quality of nuclear safety and operations.

5.0 CONCLUSIONS

Overall, the LANL independent assessment process provided an adequate mechanism to assess and report on the status of ISM/IWM at TA-55, and the LASO shadowing process accurately oversaw and reported on the assessment. The LANL independent assessment report accurately captured the observations of the LANL assessment sub-teams (including HSS and DNSFB staff) and appropriately reflected the status of ISM/IWM at TA-55. HSS's participation with LASO in evaluating the LANL independent assessment facilitated an efficient method by which HSS Independent Oversight could independently observe the effectiveness of LANL and LASO processes, maintain operational awareness, and gain a detailed understanding of specific issues at TA-55.

6.0 ITEMS FOR FOLLOW-UP

Because of weaknesses in LANL's implementation of conduct of operations at TA-55, HSS Independent Oversight will monitor improvement actions developed in response to the identified TA-55 conduct of operations deficiencies through the HSS site lead program and follow-on HSS Independent Oversight review activities.

Appendix A Supplemental Information

Dates of Review

Onsite Data Collection: July 18 – August 19, 2011

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