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Corporate Functional Management Evaluation of the LLNL Radiation Safety Organization

L. S. Sygitowicz

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Corporate Assess, Improve, and Modernize Evaluation of the
LLNL Radiation Safety Organization

Site Visit
1/14/2008 to 1/18/2008

Leonard S. Sygitowicz, CHP

Advanced Mixed Waste Treatment Project
Bechtel BWXT Idaho
Environment, Safety, Security and Health Manager

Wk 208-557-6320
Cell 208-520-7224
E-mail sygils@amwtp.inl.gov

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Executive Summary

A Corporate Assess, Improve, and Modernize review was conducted at Lawrence Livermore National Laboratory (LLNL) to evaluate the LLNL Radiation Safety Program and recommend actions to address the conditions identified in the Internal Assessment conducted July 23-25, 2007. This review confirms the findings of the Internal Assessment of the Institutional Radiation Safety Program (RSP) including the noted deficiencies and vulnerabilities to be valid.

The actions recommended are a result of interviews with about 35 individuals representing senior management through the technician level. The deficiencies identified in the LLNL Internal Assessment of the Institutional Radiation Safety Program were discussed with Radiation Safety personnel team leads, customers of Radiation Safety Program, DOE Livermore site office, and senior ES&H management.

- There are significant issues with the RSP. LLNL RSP is not an integrated, cohesive, consistently implemented program with a single authority that has the clear roll and responsibility and authority to assure radiological operations at LLNL are conducted in a safe and compliant manner.
- There is no institutional commitment to address the deficiencies that are identified in the internal assessment. Some of these deficiencies have been previously identified and corrective actions have not been taken or are ineffective in addressing the issues.
- Serious funding and staffing issues have prevented addressing previously identified issues in the Radiation Calibration Laboratory, Internal Dosimetry, Bioassay Laboratory, and the Whole Body Counter. There is a lack of technical basis documentation for the Radiation Calibration Laboratory and an inadequate QA plan that does not specify standards of work.
- The Radiation Safety Program lack rigor and consistency across all supported programs. The implementation of DOE Standard 1098-99 Radiological Control can be used as a tool to establish this consistency across LLNL. The establishment of a site wide ALARA Committee and administrative control levels would focus attention on improved processes.

Currently LLNL issues dosimeters to a large number of employees and visitors that do not enter areas requiring dosimetry. This includes 25,000 visitor TLDs per year. Dosimeters should be issued to only those personnel who enter areas where dosimetry is required

Reviewer:

Leonard S. Sygitowicz, CHP

Purpose and Scope: To work with current Radiation Safety Section (RSS) Manager to identify and prioritize issues identified during multiple assessments conducted on the RSS processes. Also, to provide opinion as to the validity of issues and make recommendations regarding corrective actions.

Names/Organizations of Persons Contacted or Interviewed:

Dick Nugent/ Manager, Hazards Control Department

Kathy Shingleton/Section Leader, Radiation Safety Section

Tim Smith/Health Physicist, Field Operations

Bill Carl/Team Lead, Radiation Calibration Laboratory

Rick Thacker/Health Physicist, Field Operations

Todd Sudsmo/Health Physicist, Field Operations Team Lead

Jim Mecozzi/Team Leader, ES&H Team 1

Dave Prokosch/Team Leader, ES&H Team 3

Chuck Salsbury/ Health Physicist, DOE Livermore Site Office

Greg Jones/Health Physicist, ES&H Team 1

Warren TenBrook/Health Physicist, ES&H Team 3

Allen Macenski/Director, Environment, Safety, Health and Quality

Frank Russo/Principle Associate Director, Operations and Business

Reggie Gaylord/Associate Division Leader, Radiochemistry/Chemistry, Materials, Earth & Life Sciences

Doug Marden/Assurance Manager, Chemistry, Materials, Earth & Life Sciences

Bev DeOcampo/Team Leader, ES&H Team 1

Quang Le/Health Physicist, ES&H Team 1

Pedro Cabrera/ES&H Tech, Team 3

Peter Kirsten/ES&H Tech, Team 1

Miguel Castro/ES&H Tech, Team 2

Patrick Epperson/Deputy Division Leader, Radioactive and Hazardous Waste Management

Jerry Hopkins/Tech Supervisor, ES&H Team 4

DeWayne Rayford/Tech Supervisor, ES&H Team 1

Tracey Simpson/Team Leader, ES&H Team 2

Michele Sundsmo/Deputy Section Leader, Radiation Safety Section

Mike Merritt/Deputy Associate Director, Nuclear Operations

Jerry Paulson/Associate Director, Nuclear Operations

David Hickman/Team Lead, WCB/Spectroscopy Lab

Jack Topper/Team Lead, Personnel Dosimetry Lab

Steve McConnell/Division Leader, ES&H Teams Division

Mark Martinez/Deputy Principal Associate Director, Nuclear Materials Technology Program

Carolyn Wong/Team Lead, Radiation Measurements Lab/Bioassay Lab

Annmarie Wood-Zika/Team Lead, Internal Dosimetry

Documents reviewed:

- Internal Assessment of the LLNL Institutional Radiation Safety Program conducted July 23-25, 2007
- AIM Team Report, Nuclear Operation Directorate, LLNL
- Lawrence Livermore National Laboratory Radiation Protections Program (RPP) UCRL-MI-222689
- NNSA for Cause Appraisal of the Lawrence Livermore National Laboratory Radiation Protection Program, January 18-28, 2005
- DOE Standard Radiological Control DOE-STD-1098-988
- ESH Manual Volume 2
 - Document 20.1 Occupational Radiation Protection
 - Document 20.2 LLNL Radiological Safety Program for Radioactive Material
 - Document 20.3 LLNL Radiological Safety Program for Radiation Generating Devices
 - Document 20.4 LLNL Occupational Radiation Protection ALARA Program
 - Document 20.6 Exposure to Radiation in an Emergency
- Impact of Implementation of 13.2M Budget on HCD, December 4, 2007
- LLNL's Radiation Protection Program (RPP) Internal Audit Results, 2002-2004
- Radiation Safety Program Peer Review, June 2, 2004
- RSS's Budget Augmentation Request for FY06
- LLNL's Radiation Protection Program: Problems, Progress and Priorities, December 12, 2006
- Hazards Control Department Radiation Safety Section memo: Costs and Benefits of Various Dosimeter Issuance Policies of 29, Dec, 2007

Corporate Functional Management Evaluation Radiation Safety Program –
Out Brief Meeting 1/18/08

Name	Organization	Phone #
Jim Merrigan	ESH&Q	4-6983
Allen Macenski	ESH&Q	2-3343
Michelle Sundomo	ESH&Q	4-2318
Kathy Shingleton	HCD/RSS	2-5172
Dick Nugent	HCD	3-7640

Review Results:

My review confirms that the findings of the Internal Assessment of the LLNL Institutional Radiation Safety Program (RSP) conducted July 23-25, 2007, including the noted deficiencies and vulnerabilities, to be valid.

Actions Recommended:

Recommendation #1-

1. Reinforce Senior Management commitment to the Radiation Safety Program.
 - a. Establish clear roles and responsibilities for the site Radiological Control Manager (RCM).
 - b. Make appropriate organizational changes to implement one Radiological Safety Program with clear roles and responsibilities.
 - c. Establish communication and access to Senior Management on a routine basis for the Radiological Control Manager.

The lack of an integrated, cohesive, consistently implemented Radiation Protection Program with an assigned, visible, and recognized Radiological Control Manager has led to an inconsistently applied Radiation Safety Program across LLNL. The organization of the Hazards Control Department separates the Radiation Safety section from those responsible for implementing the Radiation Safety Program. Clear lines of authority are not understood by the customers of the Radiation Safety Program as reported in the Internal Assessment of the LLNL Institutional Radiation Safety Program July 23-25, 2007 and the AIM Team report on the Nuclear Operations Directorate of January 11, 2008.

Recommendation # 2-

2. Establish a project team to address the open deficiencies.
 - a. Establish a plan, set priorities, set schedules.
 - b. Complete all identified actions within one year.
 - c. Address Inter Assessment deficiencies as identified in the July 23-25, 2007 (deficiencies 1.1, 2.1, 2.2, 2.3, 5.2, 6.1).
 - i. 1.1 – There are insufficient resources to both (1) manage risks associated with the conduct of current radiological operations and (2) accomplish needed improvements in the RSP. Laboratory management has apparently decided to direct resources to support of current radiological operations rather than improve the program and address previously identified program deficiencies. With only one exception, all observations/findings have been identified during previous assessments. LLNL SEP (Safety and Environmental Protection Directorate) management has previously been informed of the identified deficiencies, but has not taken the necessary action to resolve/eliminate the problems.
 - ii. 2.1 – There are no Technical Basis Documents (TBDs) for the RCL (Radiation Calibration Laboratory). For example, portable radiation detection instruments are on a calibration schedule that is beyond ANSI (American National Standards Institution) guidance (12 months) and accepted industry practice (6 months). However, there is no TBD to support this decision.

- iii. 2.2 – The RCL QA (Quality Assurance) Plan is inadequate, e.g. the current plan does not specify standards for work.
- iv. 2.3 – Assigned resources are not adequate for the workload at the RCL. The RCL must continue to support the Laboratory's needs for calibrating instruments, support a significant project for the purchase and installation of Canberra iCAMs (intelligent continuous air monitoring) in Building 332 (the Plutonium Facility, a DOE-STD-1027-92 Hazard Category 2 nuclear facility), update procedures and the QA Plan, develop TBDs, clean up Room 183 B&C cells in a timely fashion, and dispose of legacy sources.
- v. 5.2 – There is no evidence of a standard laboratory-wide program for radiological recordkeeping. Also, there is apparently no centralized document storage area for applied health physics records. Retrieval of historical radiological records is difficult.
- vi. 6.1 – The radiological surveys performed by the Materials Management Section for off-site transportation of radioactive material do not appear to be consistently documented as required by HP-FO-001 under provisions of the MOU. The RSP needs to provide periodic training and sufficient oversight of the Materials Management Section to ensure HP-FO-001 is effectively implemented. Since RSS (Radiation Safety Section) is the responsible organization for 10 CFR 835 compliance, this is a radiation safety vulnerability over which RSS has no control.
- d. Deficiencies 4.1, 5.1, and 7.1 can be addressed on a site-wide basis.
 - i. 4.1 - There is no formal, standardized document development and control system to ensure consistent technical and programmatic review of RSP procedures and Technical basis documents. For example, HP-FO-004 appears to have been developed with significant input from ES&H Teams. However, documentation of their input is lacking, as is documentation of review and input on other HP-FO (Health Physics – Field Operations) procedures. Furthermore, there is no evidence that any training was conducted to ensure ES&H Teams could properly implement the field procedures.
 - ii. 5.1 – In two specific areas, ES&H Team health physicists are not allowed unfettered access to facilities and activities for which they have radiation protection responsibility. The affected areas were the Radioactive & Hazardous Waste Management (RHWM) facility (ES&H Team 1) and for general health physics support provided by ES&H Team 4. These health physicists are required to request access from the facility operators before they can enter the facility. This practice puts the Laboratory in a position of significant liability should a radiation-related event occur. This practice is of enough concern that it should be investigated to see if other LLNL safety programs are similarly affected.

- iii. 7.1 – (General) Protection and storage of combined external dosimetry, internal dosimetry, and whole body count hardcopy personnel dosimetry information is deficient. Recent records (since 1985) are stored in a dedicated area with fire-suppression, but are not in fire-proof containers. The data are not under secure access control during working hours, nor is there a designated individual with primary responsibility for managing these data. (The records room is locked during non-working hours). The current staff is fully-burdened and cannot reasonably take on the additional task of records management.
LLNL has evaluated the assessment results and determined that the deficiencies cited above constitute evidence of programmatic weaknesses satisfying the criteria in the “DOE Enforcement Process Overview” for reporting to the DOE Noncompliance Tracking System (NTS). LLNL has further determined that despite the assessment team finding no 10 CFR 835 noncompliance issues, the deficiencies identified in this assessment constitute Quality Assurance (i.e., 10 CFR 830, Subpart A) noncompliance similar to noncompliances identified in previous assessments (and which were cited in the February 23, 2006, enforcement action received by LLNL) and which therefore further warrant the current assessment results being reported to the NTS.

The lack of an institutional commitment to address these deficiencies in a timely manner results in serious weaknesses in the Radiation Safety Program continuing to exist. The majority of these deficiencies have been identified and not addressed back to 2005.

Recommendation # 3-

- 3. Re-establish funding and staffing to keep commitments made as a result of the MOVER event and subsequent NNSA for Cause Review, including commitments made in the PAAA enforcement action.
 - a. Recent budget actions could result in the Radiation Calibration Laboratory, Internal Dosimetry, Bioassay Laboratory, and the Whole Body Counter being unable to provide services in accordance with commitments previously made.
 - b. Establish a minimum level of service with Programs to assure radiological control resources.

The recent budget reduction in the Radiation Calibration Laboratory, Internal Dosimetry, Bioassay Laboratory, and the whole body counter reduces resources below a level to remain compliant. The corrective actions taken as a result of the MOVER Event and subsequent NNSA for Cause Review establish a commitment to maintain support for instrument replacement and technical basis improvement. The recent budget reduction results in support below the committed level.

Recommendation # 4

4. Implement Standard 1098-99 standard establishing a site-wide Radiological Control Manual.
 - a. Use a tool to establish consistency and rigor to the Radiological Control Program.
 - b. Implement site-wide ALARA Committee.
 - c. Set site-specific administrative control levels.

The implementation of Standard 1098-99 establishing a site-wide Radiological Control Manual is a contract expectation. The implementation of this standard would establish a consistent site-wide Radiation Safety Program with clear roles and responsibilities, authority, and accountability. The Programmatic weaknesses that are identified in this report will be addressed if this standard is implemented in a timely manner. LLNL is one the only organizations that hasn't previously embraced this standard. The field organizations interviewed indicated that the rigor and process that standard requires is needed to improve the existing program.

Recommendation # 5-

5. Limit issuing dosimeters to only those employees and visitors that enter radiological controlled areas.

The present policy of issuing dosimeters to all LLNL staff and all visitors that will be on site for more than 2 weeks or who plan to enter facilities with radiologically controlled areas needs to be revised. Only a small fraction of the personnel issued dosimeters actually enter areas where dosimetry is required. More than 25,000 visitor dosimeters are issued annually, most of which are not used to enter radiation areas. LLNL total dosimeters processed are about 47,000 annually. As reported in a memo, dated 29 Dec 2007, from the Radiation Safety Section Leader to the Director of ESH&Q if dosimeter issue was restricted to Rad workers and very limited visitors this could reduced to about 14,000. Although the memo identifies risk associated with limiting dosimeter issue to only Rad workers and very limited visitors most other DOE installations have reduced dosimetry issue to only those required. Substantial cost savings can be realized.