SUBJECT:	Lessons Learned Program	NUMBER:	3903
RESPONSIBILITY:	Quality Assurance Manager	REVISION:	001.00
APPROVED BY:	Head, Office of Quality and Best Practices	EFFECTIVE:	02/22/10

Contractor Assurance

3903

Lessons Learned Program

Office of Quality and Best Practices
Fermi National Accelerator Laboratory
Batavia, IL

February 01, 2010

Approved By: _____
John Robert Grant
Head, Office of Quality and Best Practices
Fermi Research Alliance, LLC

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1.0 Introduction

This document describes the system for lessons learned and the requirements to ensure the system and processes are operating effectively and efficiently. It is designed to assist in identifying opportunities for improvement and providing the means and requirements for identifying deficiencies and reporting them to responsible line management. Additionally, it establishes processes for effectively implementing action plans and sharing lessons learned across the laboratory and DOE complex.

The generation of lessons learned (LL) is an integral component of the laboratory's management systems. The Lessons Learned Program (LLP) seeks continual improvement in all activities and adheres to the dictums of both the Environmental, Safety, and Health (ES&H) and the Quality Assurance Policies (Director's Policies nos. 3.000 and 10.000). All levels of management participate in and look for opportunities to generate LLs that improve productivity, quality, and

safety. Divisions/Sections/Centers take an active role at all levels to seek improvements and communicate their findings through this Lessons Learned Program.

In addition, Fermilab personnel gain knowledge from internal work experiences at the lab and the experiences of others through lessons generated at other laboratories. On occasion, information provided by other government and private organizations is reviewed in order to incorporate those lessons in our procedures and processes.

DOE Order 226.1A also requires that Fermilab flows down its assurance requirements to subcontractors, to the extent necessary to ensure contractors' compliance with the requirements and the safe performance of work. A fully implemented LLP is integral in meeting this requirement.

2.0 Purpose

The purpose of this procedure is to establish the responsibilities and actions required to implement the Fermilab Lessons Learned Program. This program promotes:

- Safe, effective operations of Fermilab facilities
- Process improvement
- Recurrence of desirable outcomes
- Prevention of the recurrence of undesirable outcomes

These outcomes are achieved by applying the applicable lessons learned and best practices from experiences at Fermilab and other facilities within the Department of Energy (DOE) complex.

3.0 Scope

All products, services, processes, management systems, and projects at Fermilab are within the scope of this document.

- Program requirements are in sections 4.0 through 6.0.
- Procedure requirements are in sections 7.0 through 11.0.

4.0 Applicability

This procedure applies to all Fermilab employees, subcontractors, and users.

5.0 Responsibilities

5.1. The Fermilab Director

- Approves the LLP as part of Director's Policy No. 39.000, Assurance Program.
- Holds senior staff accountable for implementation of and compliance with this document.
- Appoints the Office of Quality and Best Practices (OQBP) as the management system owner for Fermilab's Lessons Learned Program.

5.2. The Office of Quality and Best Practices

- Manages the Fermilab Lessons Learned Program as the senior Fermilab official responsible for the development, implementation, assessment, and improvement of the Lessons Learned Program.
- Coordinates all substantive changes to the LLP. Advises and assists the laboratory director in providing continuity, completeness, and appropriate standardization in the overall program.
- Provides support to other management, management system coordinators, and assurance representatives.
- Determines when entry into the DOE Lessons Learned database is appropriate.
- Provides periodic status reports to the Fermilab Assurance Council, the laboratory director, responsible managers, and others as appropriate.
- Provides feedback through the DOE field element to the issuing authority for DOE Corporate Operating Experience documents when specific implementation of lessons learned and a formal response is required.
- Appoints the Lessons Learned Administrator (LLA).
- Ensures systems provide access to lessons learned.

5.3. Heads of Divisions/Sections/Centers or Management System Owners (MSO) and Project Managers

- Ensure compliance with this document for their areas of responsibility, including flow down of requirements and awareness to suppliers and subcontractors providing goods and services.

NOTE – The LLP awareness and subcontractor requirements are part of the Fermilab Environment Safety & Health Manual (FESHM), Chapter 2060.

- Provide the necessary resources to implement this document.
- Ensure individuals within their Division/Section/Center are trained in the LLP as identified during the individual training needs assessment (ITNA) process.
    - See Section 9.0 for training requirements.
- Appoint the Lessons Learned Coordinator (LLC); only one LLC is needed per management system or project.
- Appoint the Assurance Representative to support the LLCs.

NOTE - If an area supplies LLC for the management system, an assurance representative (AR) from this functional area is not necessary. Example would be ES&H or CD provides the LLC for ES&H or Cyber-security systems respectively. The D/S/Cs shall provide the ARs.

5.4. Line Management (All Levels)

- Ensures that decision-making is founded on the best professional and industrial practices currently available.

- Ensures lessons learned from within their organization are actively solicited, reviewed, communicated, and utilized.
- Works with engineers and other subject matter experts to document learning.

5.5. Lessons Learned Coordinator (LLC)

- Screens lessons learned to identify operating experiences relevant to their area.
- Disseminates lessons learned within a specific Division/Section/Center, management system, or project to personnel for review, analysis, implementation of actions, and routine use.
- Acts as an LLP point of contact for a specific Division/Section/Center, management system, or project.
- Coordinates with the OQBP to determine the suitability of internally generated lessons learned for distribution to the DOE LL database.

5.6. Lessons Learned Administrator (LLA)

- Screens lessons learned to identify potentially relevant operating-experiences.
- Disseminates external lessons learned to Divisions/Sections/Centers, management systems, or project systems personnel for review, analysis, implementation of actions, and routine use.
- Assists the head of the OQBP in implementing and maintaining the Lessons Learned Program.
- Maintains the LL Master Tracking Database.

5.7. Assurance Representative (AR)

- Develops lessons learned documents with originator and submits them to the LLCs to share within the laboratory.
- Acts as lessons learned representatives for specific functional subsections of a Division/Section/Center, management system or project.
- Works with the supervisors, engineering, or other subject matter experts to analyze and document learning.

5.8. All Employees, Subcontractors and Users

- Plan and execute their work based on best available practices.
- Receive training in the LLP as part of completing their ITNA.
- Learn from internal and external experiences in order to prevent adverse operating incidents and to expand the sharing of good work practices.
- Participate actively by making suggestions for improvement and documenting issues or learning with their immediate management.

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6.0   Requirements

6.1.   Program Infrastructure and Management

The Fermilab Lessons Learned Program includes three basic processes or parts.

- The first is a development process that includes identification, documentation, validation, and dissemination of a lesson learned.
- The second is a utilization and incorporation process that includes identification of applicable lessons learned, identification of actions that will be taken as a result of the lesson learned, and follow-up to ensure that the identified actions were taken.
- The third is the processes to measure operational performance improvement and program effectiveness.

Vertical integration is facilitated by the downward flow of information regarding expectations for management system and program implementation. Vertical integration begins with management and continues down through the organization lines to the individual worker:

- The MSO is at the top of the vertical pathway in the management system.
- The LLC is the focal point for horizontal and vertical integration.
- The AR coordinates the horizontal integration within the management system and acts as the focal point within their respective functional areas.

Horizontal integration provides equality and compatibility to avoid conflicting requirements among organizations and technical disciplines, standardization, efficiency, and assurance of similar levels of compliance. For example, coordination meetings and committee meetings not only provide a mechanism for passing information up and down the chain of responsibility but also provide opportunities for program comparisons across and within the organization.

Performance areas that cross functional lines, management systems, or program lines (such as occupational injuries, radiation exposure, absenteeism or occurrence reports) are evaluated by the affected organization and the appropriate system or program experts.

6.2.   Management Commitment

6.2.1.   Management demonstrates commitment by developing and communicating lessons learned at local levels, sharing them with the rest of the DOE, and by demonstrating that lessons learned, both locally and by outside organizations with relevant work experiences, are factored into local management systems and contain mechanisms for improving work performance.

6.2.2.   Managers at all levels are expected to tailor lessons learned programs to their particular work and hazards.

6.2.3.   Management shall review status, metrics, and resource needs for all lessons learned during periodic management reviews and other appropriate meetings.

6.3. Individual Commitment

6.3.1. Employees, supervisors, and department and group heads shall express commitment to the LLP by notifying management of potential lessons to be shared with internal and external organization and by using the information gathered from experiences, activities, processes and practices.

6.4. External Lessons Learned Initiation Requirements

6.4.1. A lesson learned is entered into the DOE Lessons Learned database after being reviewed by OQBP to ensure it meets the following criteria:

- The lesson shall provide significant, new information.
- The experience has direct relevance to other facilities, sites, or programs.
- The information has the potential to be the basis for significant improvements or cost savings.

6.5. Establishment of Local Processes and Procedures

6.5.1. Local processes and procedures shall be established consistent with this document. However, local mechanisms may be tailored through agreement with the head of OQBP. The end result must be to ensure the ability for OQBP to link the local programs together and facilitate sharing of lessons with all DOE and contractor organizations, other government agencies, industry and the public.

6.6. Criteria for the Development of Lessons Learned

6.6.1. Lessons learned shall be developed, at a minimum, after any of the following occurrences.

6.6.1.1. A Type A or Type B accident investigation.

6.6.1.2. A significant category 1 or recurring event. (See FESHM 3020 and reference 6.2).

6.6.1.3. A significant category 2, 3 or 4 occurrence.

6.6.1.4. A specific operating experience derived from other operating events including:

- General emergencies
- Site area emergencies or alerts
- NTS injury or illness reported in CAIRS
- Assessment findings (independent or self), when a finding:
  - o provides significant new information; or
  - o has direct relevance to other facilities, sites or programs; or
  - o the information has potential to be the basis for significant improvements or cost savings.

6.6.1.5. A project's Critical Decision step reaches completion, as defined by DOE O 413.3A

6.6.1.6. A complex corrective action plan is completed.

6.6.1.7. The best practices found during an activity would pass the criteria in Section 6.4 of this program document.

6.7. Technical Review

6.7.1. The LLC shall coordinate technical reviews and is responsible for ensuring the results are documented and records are maintained.

6.7.2. Appropriate subject matter experts, selected based on the content of specific lessons learned documents, shall review and validate the lessons learned document for accuracy and applicability to the site. Line Managers and the LLC may also participate in the review.

7.0 Procedure Overview

See Appendix 1 for a diagrammatic view of the lessons learned process.

NOTE - Sections 7.0 through 11.0 provide the procedural requirements for physical implementation.

7.1. Receipt and Initial Documentation

7.1.1. Each lessons learned is sent to the LLA

7.1.1.1. If the lesson learned is internally generated, the originator completes Lessons Learned Form. (See Appendices 2 and 3.)

RECOMMENDATION – The originator should contact the LLC to review the potential submittal prior to completing the form and/or to obtain assistance in completing the form.

7.1.1.2. Pressing "Save" on the form to the data entry screen submits the form to LLA. This is done automatically through the lessons learned form.

NOTE – The completed lessons learned form should be reviewed for the inclusion of the proper attributes and completeness prior to submittal, selecting "Save". See Appendix 6 for other considerations.

7.1.1.3. If externally generated, DOE systems send information or the LLA screens and downloads data from the web site.

7.1.1.4. Lessons received from other source by employees must be sent to the LLA for processing.

7.1.2. LLA records form receipt in LL Master Tracking Database and begins the screening process.

7.2. Obtaining Lessons Learned and Screening

7.2.1. Sources for lessons learned areas

NOTE – Sources below are listed only for potential use. Only lessons learned from the DOE database and those submitted within the Fermilab system are required to be screened for application at Fermilab.

7.2.1.1. Sources of lessons learned for *improvement* include, but are not limited to, the following:

- Price Anderson Amendments Act (PAAA) issues
- Stop Work Orders
- Corrective Action Plans (reports)
- Management evaluations
- Items identified by functional group personnel
- ORPS reports
- CAIRS reports
- NTS reports
- Independent assessments, self-assessments, audits, and appraisals
- Safety meetings
- Training evaluations
- Non-conformance reports
- Safety bulletins
- Operational Readiness Reviews
- Project planning and evaluation results

7.2.1.2. Sources of lessons learned for *noteworthy practices*, include those mentioned in section 7.2.2.1, but especially the following:

- Management evaluations
- Self-assessments
- Items identified by functional group personnel

7.2.2. Initial Screen for Applicability

7.2.2.1. The LLA receives and screens candidate lessons learned information from external source documents to determine the applicability to Fermilab. Screening is based on the guidelines in Appendix 4.

External sources include:
- OSHA Fatal Facts
- Accident/Incident Reports
- US DOE Operating Experience Summaries

- DOE Lessons Learned Database
- Government-Industry Data Exchange Program (GIDEP)

7.2.2.2. The LLC also screens candidate information from internal functional groups and sends those recommended for external use to the LLA.

7.2.2.2.1. If a lessons learned is rejected, a reason must be provided to the LLA.

7.2.2.3. The LLA records all applicable lessons learned in the LL Master Tracking Database and routes them to the functional areas that potentially may use the lesson..

7.2.2.3.1. If a rejection notice is returned by the LLC, the notice will be recorded in the database.

7.2.2.3.2. If the LL was internally generated, the LLA shall send the reason for rejection to the originator.

7.2.3. Lessons Learned Review Within Functional Area(s)

7.2.3.1. The LLC reviews lessons learned submittals received from the LLA. If the following conditions are met:

- the documents satisfy the screening guidelines,
- the functional area's procedures, processes, and/or systems do not have equivalent or better controls, or
- the level of control need to be reviewed versus the information in the lesson;

the LLC disseminates the lessons learned to subject matter experts, managers, and designated management system and functional area personnel as necessary.

7.3. Dissemination

7.3.1. Response to the LLA is due within 10 working days:

7.3.1.1. If the LLC determines that an LL item is not applicable to his/her functional area, the LLC sends a response with reason for rejection to the LLA.

7.3.1.2. The LLC suggests areas in which the LL may be applicable, if known.

7.3.1.3. If the LLC determines that a lessons learned item is applicable to his/her functional area, the LLC develops and internally distributes a notification. The following instructions shall accompany the notification:

- Perform an applicability evaluation of the item to determine corrective actions.
- Disseminate within their area of responsibility for the development of needed corrective actions or changes.
- Report the results of the evaluation to the LLA and upper management if significant.
- Send status of the screening review and recommendation for applicable areas to the LLA within 10 working days of receipt of the LLA.

7.4. Implementation Plans

7.4.1. For externally generated LLs, the LLC ensures the implementation plan is sent to the LLA within 10 working days after receipt of the notice.

7.4.2. The LLC ensures the implementation actions comply with requirements for lesson learned. Requirements to be considered are as follows:

7.4.2.1. The area's procedures for LLs that apply only to the functional area.

7.4.2.2. Lab-wide requirements if the LL is externally generated or applicable.

7.4.3. For internally generated LLs, the LLC also ensures priority, category, and if required, hazard information is completed and entered into the lessons learned form. See Appendix 5 and Table 1.

7.5. Review for Approval

7.5.1. The functional area LLC shall review the implementation plan for adequacy, suitability, and potential effectiveness.

7.5.1.1. Once the implementation action plan for externally generated LLCs are reviewed and approved by the LLC, they are sent to the OQBP with a request for approval.

7.5.2. The OQBP reviews each response for the following:

- Determination of applicability to functional organizations.

  NOTE - Applicability to others may be decided solely by OQBP or from a recommendation by the functional area LLC, SME, and/or MSO.

- Adequate justification for non-applicability from any functional organizations.
- Adequate action plans with expected completion dates.

7.5.2.1. If OQBP does not concur with the selection of other applicable organizations or determines the information provided is insufficient, the OQBP shall re-consider and attempt to find a resolution to the issues by discussing with the LLC and, if necessary, the MSO.

7.5.2.1.1. If the issues cannot be resolved, the dissenting opinion process within the Fermilab Integrated Contractor Assurance Program (FICAP) will be used.

7.6. Verification and Validation of Implementation

7.6.1. The functional area verifies that implementation actions are complete and working properly.

7.6.1.1. For all externally generated lessons learned, a notification is sent to the LLA with a request for validation once Section 7.5.1 is complete.

7.6.2. OQBP shall perform a validation assessment or surveillance on all action plans for external lessons learned.

7.6.2.1. Verification and validation shall meet the requirements found in the Fermilab Assessment Manual.

7.7. Tracking

7.7.1. The LLA logs all lessons learned transactional information into the LL Master Tracking Database.

7.7.2. The LLA shall send notifications containing status and actions necessary to the appropriate LLC(s),

7.7.3. The LLA shall track any notifications deemed to require follow-up actions. These notifications shall include a decision for applicability or reason for rejection, results of reviews, concurrence for actions plans, and completion dates for actions.

7.7.4. Tracking will begin by the LLA upon transmittal of the notification to the LLCs. It continues until the item is closed-out.

7.7.5. The item will remain open until the LLA receives notification that all corrective actions are completed and verified.

7.8. External Communication

7.8.1. All external communications about lessons learned must be directed to OQBP.

7.8.2. OQBP shall notify any Fermilab area which is deemed appropriate per the review

7.8.3. OQBP shall enter lessons learned information into the DOE Lessons Learned database, if deemed applicable to others in the DOE complex.

7.8.4. OQBP shall post all externally shared lessons learned on the Fermilab Quality website: http://www.fnal.gov/directorate/OQBP/index.htm.

8.0 Monitoring and Performance Evaluation

8.1. Assessment

8.1.1. Individual plans and systems are assessed using the following systems and metrics:

8.1.1.1. An annual survey conducted by OQBP.

8.1.1.2. The Assessment Program administered by OQBP.

8.1.1.2.1. Formal audits are subject to Integrated Quality Assurance (IQA) and FICAP requirements. Other assessments will be determined based upon independent and management system program requirements.

8.1.1.3. Data monitoring and analysis as described in Section 8.2.

8.1.1.4. Performance and effectiveness metrics as described in Section 8.3.

8.1.1.5. Results shall be shared with management and become part of the Fermilab Management Review.

8.2. Improvement Monitoring

8.2.1. Improvement based on lessons learned shall be monitored and assessed based on the following:

8.2.1.1. System usage by volume and function

8.2.1.2. Number of plans submitted which are rejected

8.2.1.3. Annual survey on issues and ways to improve the system

8.3. Metrics

The following metrics shall be met or corrective action plans developed, documented, monitored and closed per Fermilab Corrective and Preventive Action Procedure, 1004:

8.3.1. Performance

- LLC reviews and responds within 10 working days (or) 14 calendar days of notice.
- A plan is developed by the LLC for all items within 20 working days (or 28 calendar days) of opening
- The goal for percentage of plans on schedule is equal to 95 percent.

8.3.2. Effectiveness

- Percentage of plans verified effective at initial check for closure.
- The goal is equal to 95 percent and with a target equal to 100 percent.

8.3.3. Metrics

- Metrics are established by OQBP, tracked and reported for the functional area by the LLC to OQBP and monitored by OQBP.

9.0 Training

9.1. Levels of Training – Awareness and System Usage.

9.1.1. All new employees will undergo awareness training during their initial orientation.

9.1.2. Visitors/users will receive notification of awareness training requirements in information provided by User's Office.

9.1.3. Assurance representatives (ARs) and other identified by their organizations will undergo system usage training conducted by the LLCs.

9.1.3.1. Coordinators are required to attend a system usage course before being designated a coordinator.

9.1.3.2. Department heads, group leads and supervisors shall also attend. It is strongly recommended that division and section heads also attend.

9.2. System Usage and Program Training

9.2.1. System usage and program training will address the following functions of the Lesson Learned Program:

9.2.1.1. Background documents and drivers

9.2.1.2. Lessons learned process

9.2.1.3. Roles and Responsibilities

9.2.1.4. Program requirements

9.2.1.5. Developing a lesson learned

9.2.1.6. Identifying a lesson learned experience

9.2.1.7. Determining what is not a lesson learned

9.2.1.8. Preparing a lesson learned document

9.2.1.9. Security issues and use of vendor names

9.2.1.10. Reviewing and validating a lesson learned document (Subject matter experts).

9.2.1.11. Disseminating lessons learned

9.2.1.12. Utilizing and incorporating lessons learned into projects and activities

9.2.1.13. How to address lessons learned that require immediate attention.

9.2.1.14. Incorporating lessons learned into ongoing training

9.2.1.15. Determining and implementing action plans

9.2.1.16. The monitoring process

9.2.1.17. The metrics process

10.0 Records

10.1. Lessons Learned Records Maintenance

10.1.1. The LL Master Tracking Database is maintained in accordance with the Fermilab Records Management Handbook.

10.1.2. OQBP maintains records of all external LLs, including their implementation plans and closure documentation.

10.1.3. Functional areas maintain records of all internal LLs, including their implementation plans and closure documents.

10.1.4. A summary containing the total numbers of applicable LLs, major categories for LL rejection, total number of plans due, plans submitted on time, corrective actions taken for plans not on time, and the total plans closed are maintained and forwarded to OQBP for the mid and end of year reviews by the LLCs.

11.0 Document Management

11.1. Lessons Learned Program Review Cycle

11.1.1. Operating Documents – Procedures, Forms, etc.

11.1.1.1. This document and all associated documents within OQBP control are reviewed for accuracy and relevance every three years.

11.1.1.2. Functional areas are responsible for defining review requirements within their areas.

11.2. Revision Review

11.2.1. The Office of Quality and Best Practices and the reviewers (see Section 11.5) examines all revisions other than minor editorial changes.

11.2.2. If a review results in changes, the OQBP resubmits the document to the laboratory for review and approval. Any changes are identified and explained, and the OQBP will certify that the revised document continues to satisfy requirements.

11.3. Document Owner

11.3.1. Head of the Office of Quality and Best Practices

11.4. Document Approvals

11.4.1. Head of the Office of Quality and Best Practices

11.5. Reviewers

11.5.1. Major Change/Revision

11.5.1.1. Management System Owners

11.5.1.2. Lessons Learned Coordinators

11.5.1.3. Project Managers

11.5.1.4. Chief Operations Officer

11.5.1.5. Head of OQBP

11.5.2. Minor Revision

11.5.2.1. Head of OQBP

- A notice is sent to the parties listed in the Major Change/Revision subsection, Section 11.5.1.

12.0 Policy and Program Documents

12.1. Directors Policy No. 3, Environmental, Safety and Health

12.2. Directors Policy No. 10, Quality Assurance

12.3. Directors Policy No. 39, Assurance Program

12.4. 3901 Fermilab Integrated Contractor Assurance Program (FICAP) Chapter 7, Lessons Learned

12.5. Fermilab Environment Safety & Health Manual (FESHM) Chapter 3020, Significant and Reportable Occurrences

12.6. Fermilab Environment Safety & Health Manual (FESHM) Chapter 2060, Work Planning and Hazards Analysis

12.7. 3902 Fermilab Assessment Manual

12.8. 1002 Graded Approach Procedure

12.9. 1004 Fermilab Corrective and Preventive Action Procedure

13.0 Definitions

Actions: Specific activities taken as a result of a lesson learned. Actions may include:
- Corrective actions: actions taken as a result of the analysis of an actual experience;
- Preventive actions: actions taken to prevent a negative situation from occurring; or
- Improvement actions: actions taken to improve the efficiency of operations based on a good work practice or an innovative approach).

Adequacy: The degree of being able to meet a need satisfactorily or of sufficiency for a particular purpose.

Assurance Representative (AR): An assurance representative is usually a manager or specialist supporting portions of the framework for processes and procedures used to ensure that an organization can fulfill the requirements in the management system. This person's perspective focuses on division/section/center implementation. Assurance representative role is identified for each management system.
For instance, the ES&H management system has senior safety officers within each division/section/center. These positions report direct-line to the Division/Section/Center manager and dotted-line to the ES&H director.

Causal Analysis: A review of an activity to determine the root cause, to identify less than adequate contributing systemic factors, and to prevent further concerns.

Complex Problem: Situations where the cause is unknown or that take considerable resources - usually a cross-functional team of people, time and money - to understand and quantify the significance and impact or consequence. Thresholds for risk management vary and are determined by individual area and need. However, for this document, the Graded Approach Procedure activity selection criteria will be used as the minimum.

DOE Corporate Lessons Learned Program: The collection of DOE and contractor organizational Lessons Learned Programs for sharing information to improve performance.

Effectiveness: The degree to which a product or service meets customer requirements and expectations or is worth doing in the first place. (Are we doing the right things?)

External Versus Internal (within this document): External refers to outside the D/S/C, management system/major process functional boundary or project. Internal is within its management structure or thus, considered "local' to its sphere of influence and control.

Functional Area: Grouping of activities or processes on the basis of their need in accomplishing one or more tasks.

Good Work Practice: A positive lesson or action that has the potential to be the basis of significant improvements or cost savings.

Lesson Learned (LL): A "good work practice" or innovative approach that is captured and shared to promote repeat application. A lesson learned may also be an adverse work practice or experience that is captured and shared to avoid recurrence.

Major Change/Revision: Change to outcome and/or process.

Major or Significant Processes: Major processes govern the operation of a management system, constitute a core business function and/or value stream, or support core processes. The three types of processes are as follows:

Management processes are the processes that govern the operation of a management system. Typical management processes include Corporate Governance and Strategic Management.
- A **process** is a structured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization in contrast to a product's focus on what is produced. A process has a structure for action; that is, a beginning, end, and clearly identified inputs and outputs.
- A **system** is a combination of processes and their interactions.

Operational processes are processes that constitute the core business functions and create a value stream. Typical operational processes are Purchasing, Manufacturing, Facilities, and Marketing.
- **Core** is the basic or most important parts.
- A **value stream** is all the actions, both value added and non-value added, that are required to bring a product or service to a successful output.
- **Core business** function is a key activity or cluster of activities which must be performed in an exemplary manner to ensure a firm's continued "main" or "essential" activities because it adds primary value to an output.

Core support processes are the processes that must be performed in an exemplary manner to ensure the operational processes are successful. Examples include accounting, recruitment, and IT-support.

Management Systems Owner (MSO): A management system is the framework of processes and procedures used to ensure that an organization can fulfill all tasks required to achieve its objectives. For example, an environmental management system enables organizations to improve their environmental performance through a process of continuous improvement. Thus, an example of a management system owner at Fermilab is the ES&H Director.

Minor Change/Revision: No substantive change; e.g. a minor editorial change.

Organization: The site, plant, facility, function, or location at which the lessons learned program is implemented.

Subject Matter Expert (SME): An individual qualified and experienced in performing a particular task. A Subject Matter Expert may also be an individual who, by education, training, and/or experience is a recognized expert on a particular subject, topic, or system.

Suitability: The degree something has the properties that are right for a specific purpose.

14.0 References

DOE O 226.1A, *Implementation of Department of Energy Oversight Policy,* Attachment 1, dated 7-31-07

DOE-STD-7501-99, *The DOE Corporate Lessons Learned Program*, dated December 99

DOE O 470.2B, *Independent Oversight and Performance Assurance Program*, Attachment 2, dated 10-31-02

DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, dated 08-13-03

DOE O231.1A Chg. 1, *Environment, Safety and Health Reporting*, dated 06-03-04

DOE G231.1-1, *Occurrence Reporting and Performance Analysis Guide*, dated 08-20-03

DOE G231.1-2, *Occurrence Reporting Causal Analysis Guide*, dated 08-20-03

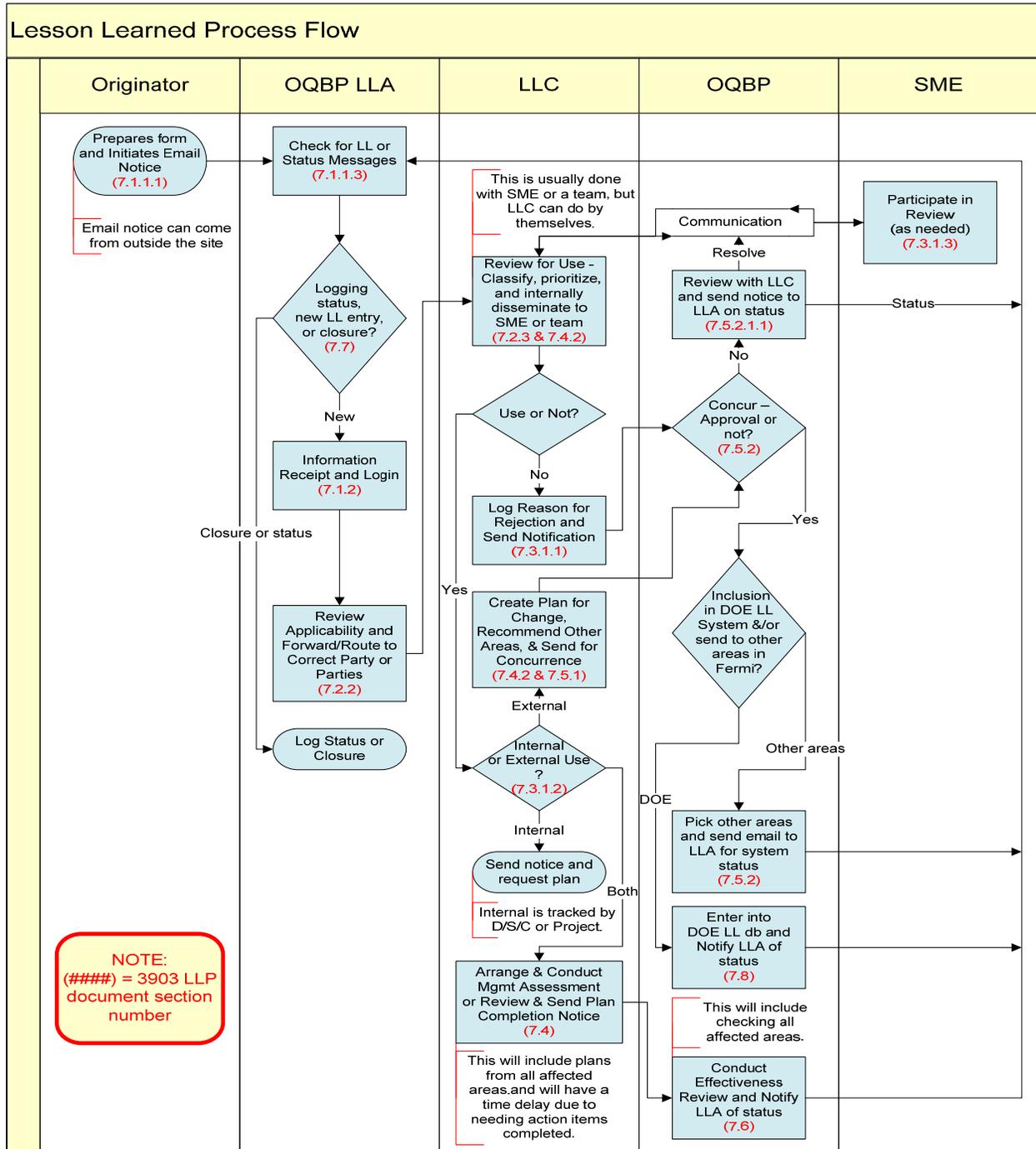DOE O 210.2, *DOE Corporate Operating Experience Program*, dated 06-12-06

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Table of Revisions

Author	Description	Revision	Date
Ed Vokoun	Draft – Merging ES&H document.	000.00 A3	10/19/09
Ed Vokoun	Draft – Change/edit procedure process flow per OQBP input.	000.00 A4	10/30/09
Ed Vokoun	Draft – Update per initial review ES&H and OQBP comments.	000.00 A5	11/09/09
Mari Nichols-Haining	Draft – Change/Edit, technical review	000.00 A6	11/30/09
Ed Vokoun	Draft – Promoting to rev000 B: review for approval	000.00 B	11/30/09
Mari Nichols-Haining	Draft- Change/Edit, technical review	000.00B	12/10/09
Ed Vokoun	Draft – Minor text edits in process flowchart	000.00 B1	12/15/09
Ed Vokoun	Draft – Promoting to Technical Edit and including minor changes from Fermilab review.	000.00 D	01/22/10
Mari Nichols-Haining	Draft-Technical Edit	000.00 D1	01/24/10
Ed Vokoun	Draft – Promoting to active revision and including minor changes from technical edit and final review.	0001.00	02/01/10

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Appendix 1: Flow Diagram- Lessons Learned Process

Fermilab

Appendix 2: Lessons Learned Form Field Descriptions

Title.	Title of the lesson learned
Date	Date the lesson learned was issued
Identifier	Leave Blank. The identifier is generated by the database design when the lesson is entered into the system.
Lessons Learned Statement	Statement that summarizes the lesson(s) that was learned from the activity.
Discussion of Activities	Brief description of the facts that resulted in the initiation of the lesson learned.
Analysis	Results of any analysis that was performed, if available
Recommended Actions	A brief description of management-approved actions that were taken, or will be taken, in association with the lesson learned.
Estimated Savings/Cost Avoidance	An estimate of the cost savings from the application of a good work practice or the costs avoided by prevention of a similar event if the lesson learned is implemented.
Estimated Savings/Cost Avoidance Justification	An analysis and explanation of the cost savings or cost avoidance estimated to be achieved through the application of good work practices or the prevention of a reoccurring lesson learned event.
Priority Descriptor	A descriptive code that assigns a level of significance to the lesson. Options include Red/Urgent, Yellow/Caution, Blue/Information, Green/Good Work Practice (generated by the database design)
Work/Function(s)	The work or function(s) to which the lesson applies. Enter all that apply. See listing.
User-Defined Category	Space for organizations to include internal-use categories. The drop down menu for categories: a. Safeguards and Security – Emergency Management b. ES&H c. Cyber Security d. Quality e. Project Management f. Finance g. Corporate Governance & Planning h. S/CI
Definitions continued on next page.	(Intentionally left blank)

Lessons Learned Form Field Descriptions (cont.)

Risk(s)	Selection for types of risk: a. Reputational b. Schedule c. Cost d. Security e. Environment f. Safety g. Health h. Legal i. Contract Management
Hazard(s) [Drop down Risk(s) submenu]	Hazards this lesson applies to those that were present in the original situation if environmental, safety or health risk are selected. See listing
ISM Core Function(s)	ISM core functions to which this lesson applies. See listing
Originator	Name of the originating individual and organization; can be a subcontractor. Note – If originating from DOE Lessons Learned db or another organization, show this in this field.
Contact	Name and phone number of individual to contact for additional information
Authorized Derivative Classifier Not Applicable	Name of individual who determined that the lesson learned does not contain classified information. (Not required for lessons submitted by unclassified facilities.
Name of Reviewing Official Not Applicable	Name of Reviewing Official who determined that the lesson learned did not contain Unclassified Controlled Nuclear Information (UCNI). (Not required for facilities which have no UCNI
Keywords	Word(s) used to convey related concepts or topics stated in the lesson.
References	References such as DOE Orders, Programs (e.g., Standards/Requirements Identification Document program), Standards, Occurrence Report numbers, etc.

Appendix 3: Lessons Learned Form

Title	
Identifier	
Originator	
Date	
Contact	
Authorized Derivative Classifier	Not Applicable
Reviewing Official	Not Applicable
Statement of the Lesson Learned from Operating Experience	
Discussion of Activities	
Analysis (may be incorporated into the discussion)	
Recommended Actions	
Estimated Savings/Cost Avoidance ($s)	
Estimated Savings/Cost Avoidance Justification	
Priority Descriptor	
Work/Functions	
User-Defined Category	
Risks (with list of Hazards hidden until ES&H selected)	
ISM Core Functions	
Keywords	
References	

Appendix 4: Screening Criteria

- Does Fermilab perform work affecting facilities that utilize the same equipment (safety, production, monitoring, etc.) described in the document being screened?

- Does Fermilab perform work affecting facilities that employ the same designs described in the document being screened?

- Does Fermilab utilize an administrative or management control system similar to that described in the document being screened?

- Does Fermilab perform work affecting facilities that use, store, or produce the same or similar chemicals/products described in the document being screened?

- Are the same activities or operations described in the document being performed by Fermilab?

- Does Fermilab implement the same regulations/codes/standards described in the document being screened?

- Is there the opportunity for a similar problem or situation to affect Fermilab work?

Appendix 5: Categories of Lessons Learned from Operating Experience

These bin categories are intended to help lesson authors assign specific searchable subjects to their lessons so users can find information focused on their needs. The three sets of bins (Work/Function, Hazard, and ISM Core Function) provide several avenues for zeroing in on applicable lessons. Some of these bins are narrow (Hoisting and Rigging, Mechanical Injury) and some are broader conceptual areas (Authorization Basis, Energy Conservation, and Environmental Release).

Lessons Learned Hazards

Confined Space
Electrical/NEC
Elevated Work/Falling Objects
Environmental Release
Ergonomics/Lifting
Excavation and Trenching
Fire/Smoke/NFPA
Firearms and Explosives
Lasers
Natural Phenomena
Other
Personal Injury/Exposure Airborne Materials
     Ambient Temperature Extremes
     Asbestos
     Beryllium
     Hazardous Material (General)
     Infectious Agents
     Mechanical Injury (Striking/Crushing)
     Noise
Other
Personal Injury/Exposure
     Radiation/Contamination
     Slips and Tripping
     Toxic Material
Plants/Animals/Insects
Power Tools
Pressurized Systems
Radiological Release
Suspect/Counterfeit or Defective Items
Traffic
Weather Related

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Not Identified

ISM Core Functions
Define Work
Analyze Hazards and Risks
Develop/Implement Controls
Perform Work
Feedback and Improvement

Work/Function
Alternate Fuels
Authorization Basis
Business and Support Services
Chemical Management
Conduct of Operations
      General
      Configuration Management
      Lockout/Tagout
      Procedure Development
      Procedure Adherence
      Work Planning
      Work Control

Construction
Contract Administration
Decontamination and Decommissioning
Demolition
Driving
Emergency Management
Energy Conservation
Engineering and Design
Nuclear
Non-Nuclear
Environmental Protection
      General
      Environmental Sampling
      Releases
      RCRA Management
Underground Storage Tanks
      NEPA Management
      TSCA Management
Environmental Restoration
Excavation
Excess Property and Equipment

Management
Fire Protection
Hoisting and Rigging
Human Factors
Human Resources
Information Technology
Inspection and Testing
Laboratory Experimentation
Maintenance
       Electrical
       Facility
       HVAC
       Instrumentation and Control
       Mechanical
Other
Power Distribution and Utilities
       Roads and Grounds
       Structural
       Safety Systems
       Heavy Equipment
       Vehicle
Machining and Fabrication
Management
Material
       Handling
       Storage
Occupational Safety and Health
       General
Personnel Protective Equipment
Operations
       Facility
       Heavy Equipment
Other
Packaging and Transportation
Procurement
Protective Force Related
Quality
Radiation Protection
Research and Development
Safeguards and Security
Safety Design
Training and Qualifications
Waste Management
Waste Remediation

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Welding, Burning, Hot work
Well Drilling
Not Identified

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Table 1- Priority Descriptors

GENERAL SUBJECT AREA

RED/URGENT   A lesson from an actual event with significant adverse outcome

YELLOW/CAUTION   A lesson from an event or condition with potentially adverse outcome

BLUE/INFORMATION   A fact or discovery of benefit to others

GREEN/GOOD WORK PRACTICE   A success story; a practice that results in a positive outcome

General Subject Area	Red/Urgent	Yellow/Caution	Blue/Information	Green/Good Work Practice
Public Safety	Event related to site operation that has affected public safety and health or threatened public safety and health	Potential event related to site operation which may have affected public safety and health	Information to protect public safety and health including, but not limited to, cumulative findings from trending	Action, activity, or practice which improves public safety and health
Worker Safety	Fatality, near fatality, serious injury, or permanent/ total disability	Conditions which resulted in •injury •temporary/partial •disability or significant loss of work time or, •productivity	Information to protect worker health and safety including, but not limited to, cumulative findings from trending	Action, activity, or practice which promotes: safe work practices or healthful work practices

Row - intentionally left blank				
Environmental Protection	Unconfined hazardous release beyond the site boundary. Significant unconfined on-site hazardous release requiring cleanup.	Condition which may have resulted in an uncontrolled release to the environment or a moderate on-site hazardous release	Information to protect the environment including: • Measurable, but minor, hazardous releases or cumulative findings from trending	Action, activity, or practice which: prevents on or off-site environmental degradation or will limit or reduce on or off-site releases to the environment
Compliance	Violations of Federal or State law with significant penalties	Violations of Federal or State law with minor penalties. Significant non-compliance with the technical requirements of DOE Orders or regulations	Information which may improve compliance performance	Action, activity, or practice which improves the compliance performance of the site
Management / Admin-istration	Significant management violations including fraud, abuse, and discrimination	Identified actions reflecting failure to operate within DOE management imperatives	Information which may improve DOE management performance	Action, activity, or practice which improves DOE management performance

Row - intentionally left blank				
Investment and Investment Protection	Significant loss or damage of major equipment, property or facility	Potential for major equipment, property or facility to become— •lost or damaged •degraded •unreliable	Information which may improve— •value •efficiency •cost	Action, activity, or practice which improves— •specifications •reliability •efficiency •credibility
Public Interest	On-site event that is perceived by the public to— •have an effect on public safety and health or •threaten public safety and health	A potential site operations event which may have affected the public, excluding safety and health, had the event occurred	Information beneficial to public relations	Action, activity, or practice that promotes benefits to the public

Appendix 6: Attributes of a Good Lessons Learned

Writing a Good Lessons Learned Statement

This is more important than people think. Some organizations perform their screening for relevance and significance using only the Lessons Learned Statement, so if it is not well written, others may miss the opportunity to implement a useful lesson.

Recommended structure for a Lessons Learned Statement- three sentences

- Sentence #1
    - Starting with an action verb
    - State what actions need to be taken

- Sentence #2
    - State what the general problem is that the actions address

- Sentence #3
    - State what consequences you experienced or avoided

Example of a Good Lessons Learned

"Perform pre-operational checks on rental lift equipment to ensure that safety-related controls are operational. Rental equipment has often been found to have multiple non-operational controls. This has resulted in at least one near miss at [facility], in which a lift boom tipped over; partially due to control system failures"

Example of a Weak Lessons Learned

"You should always follow procedures, because if you don't you will run into problems."

"Don't open an energized electrical cabinet"

"Always [*do the right thing*]"

"Never [*do the wrong thing*]"

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Attributes-to-Strive-For	New, significant, clearly stated lesson, fields filled in, Accurate and Credible Information, Enough Detail Determine Relevance, Actionable, Easily Shared

☐ Contains new information related to adverse experience and how to prevent them or related to best practices and how to apply them

☐ Contains a strong Lessons Learned Statement that communicates to readers what to do and why it is important using language that they can easily understand and relate to

☐ Is associated with preventing a significant adverse consequence or enabling a significant improvement in performance

☐ Is focused on a single lesson or a collection of related lessons to facilitate clarity of communications

☐ Contains information that has been validated to be accurate and communicated by a credible source

☐ Includes a brief discussion of the background information and any actions that were taken to help the reader understand the context surrounding the experience and whether it is relevant to them

☐ Includes actions that are recommended for others to prevent a similar occurrence for the situation as described in the lesson or one that is closely related

☐ Identifies schedule delays, labor, or other costs or consequences that were experienced or avoided so that the reader can assess the potential value to them

☐ Include source and reference information to enable readers to follow up if they need to do so

☐ Include categorization information and the key words that may help others find the lesson when searching. Includes clearly stated facts

☐ Identifies relationships to compliance requirements or processes, if applicable

☐ Is timely related to operations and activities across the DOE

☐ Is in an electronic format that is accessible and printable using typical; desktops

Attributes-to-Avoid	Opinions, Irrelevant Details, Only Communicating Event or Experience Detais, Too Many Incomplete Fields, Restrictions on Sharing

☐ Includes judgments or opinions not supported by analyses

☐ Includes irrelevant details or a lengthy listing of chronology or procedure details where a general description would be adequate to provide sufficient background for the reader to understand and apply the lesson

☐ Includes a discussion of the event in the Lessons Learned Statement

☐ Includes blank or only partially completed fields that may cause the reader to question the credibility of the information

☐ Communicates only what happened without communicating a lesson learned and how work can be done differently in the future

☐ Includes restrictions on sharing that make it difficult to use the learning across the DOE

☐ Includes jargon or acronyms that are not common across the DOE or that may be difficult for the reader to understand