

# Incorporating Lessons Learned/Best Practices into Emergency Management Training



Training  
Subcommittee

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**emi sig**  
EMERGENCY MANAGEMENT ISSUES  
SPECIAL INTEREST GROUP

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## Acronyms

Acronym	Definition
AAR	After Action Report
BP	Best Practice
CDC	Centers for Disease Control and Prevention
DHS	Department of Homeland Security
DHS LLIS	Department of Homeland Security Lessons Learned Information System
DOE	Department of Energy
DOE/NNSA	Department of Energy/National Nuclear Security Administration
EM	Emergency Management
EMI SIG	Emergency Management Issues Special Interest Group
EOC	Emergency Operations Center
ERO	Emergency Response Organization
FEMA	Federal Emergency Management Agency
HSS/HS-63	Office of Health, Safety, and Security (HSS) Office of Independent Oversight
IC	Incident Command
ICS	Incident Command System
ICP	Incident Command Post
ISM	Integrated Safety Management
LL	Lessons Learned
LL/BP	Lessons Learned/Best Practices
LLTG	Lessons Learned Task Group
NEI	Nuclear Energy Institute
OEI	Operating Experience Information
SELLS	Society for Effective Lessons Learned Sharing
STAR	Site Tracking, Analysis, and Reporting System
TS	Training Subcommittee
TWG	Training Working Group

# Incorporating Lessons Learned/Best Practices into Emergency Management Training

## Introduction

### Background

The function of the Emergency Management Issues Special Interest Group (EMI SIG) Training Working Group (TWG), which became the Training Subcommittee (TS) in January 2010, is to provide assistance to the Department of Energy (DOE) and the DOE Complex by:

- Studying issues that affect training and seeking a common approach for providing solutions to identified problems through a process that includes planning, research, and evaluation.
- Providing an infrastructure and forum that utilizes Websites, papers, and presentations to facilitate the sharing of training initiatives, information, findings, and good practices for consideration and implementation.
- Monitoring feedback to promote continuous improvement in emergency management training.

Each year the TS identifies specific objectives for focus. For 2007-2009, the objectives included: Objective #3 – Develop Recommendations for Incorporating Lessons Learned (LL) into Training.

This report documents the process used to gather information from the Department of Energy/National Nuclear Security Administration (DOE/NNSA) complex and others and provides examples on how to use Lessons Learned with a variety of training approaches.

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### Lessons Learned Task Group

The Lessons Learned Task Group (LLTG) was formed to address Objective #3. The LLTG's efforts to identify effective approaches to integrate and institutionalize Emergency Management (EM) Lessons Learned/Best Practices (LL/BP) are not intended to duplicate or replace existing DOE LL/BP systems or processes, but rather to:

- Identify specifically-focused existing processes for gathering, disseminating, and institutionalizing LL/BP.
- Make recommendations that will contribute to continuous improvement and enhance a site's EM planning and preparedness through existing training programs.

## Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued

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### DOE Guidance

The DOE/NNSA complex currently collects and disseminates LL/BP under the guidance of *DOE Order 210.2 DOE Corporate Operating Experience Program*. Specific requirements are detailed in the Order and roles and responsibilities are described to ensure compliance. One of these requirements is to “*Incorporate DOE and contractor lessons learned into operations, training, maintenance and work planning, work processes, and design and construction.*” (*DOE O 210.2, Attachment 2; 2f*)

In addition, *DOE Standard-7501-99 The DOE Corporate Lessons Learned Program* defines the expectations and framework for identifying, sharing, and using lessons learned. The standard broadens the concept of lessons learned to include all areas of DOE business as practiced by both DOE and contractor personnel at all levels of management and work performance. It supports identification and sharing of good practices as well as lessons learned.

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### Definitions of Lesson Learned and Best Practice

It is important to distinguish between what is and what is not a LL/BP. The following definitions identify criteria to evaluate LL/BP. *DOE Order 210.2* provides the following definitions:

**Lesson Learned.** A good work practice, innovative approach, or negative experience shared to promote positive information or prevent recurrence of negative events.

**Good Work Practice or Best Practice.** A positive example of work processes with potential to be the basis of significant operational improvements or cost savings.

The decision to communicate an experience as a lesson learned should be based on whether the information has importance to others. Sometimes this importance is obvious, such as information that can reduce costs or risks. At other times, it may be difficult to determine the value to others.

There are several categories of information that probably should not become lessons learned. These categories include information that is:

- Common knowledge (already known by the general population).
- Tied to experiences that are extremely low risk.
- Tied to one-time experiences (e.g., process, operations, etc. that will never be repeated).

(See [Appendix A – Lessons Learned Screening Tool](#))

A lesson learned written from locally-generated information generally should contain five basic elements:

1. A clear statement of the lesson.
2. A background summary of how the lesson was learned.
3. Benefits of using the lesson and suggestions on how the lesson may be used in the future.
4. Contact information for additional detail.
5. Key data fields to aid search ability.

(*DOE STD-7501-99*, Section 5.2.1, p.20)

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## Methodology

- Survey Process Steps** To accomplish this study, the LLTG completed the following steps:
1. Reviewed applicable DOE/NNSA Directives and Guidance that impact the EM LL/BP process.
  2. Formally requested data from DOE/NNSA sites, other federal government agencies, private industries, and states.
  3. Identified internal and external sources for EM-related LL/BP.
  4. Listed how sites are currently capturing, documenting, and disseminating LL/BP information.
  5. Listed how sites are analyzing and incorporating LL/BP information to improve EM planning and preparedness programs.
  6. Identified key EM training approaches that can be effective mechanisms to incorporate and institutionalize EM LL/BP.
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**Data Collection** The LLTG designed a survey instrument to gather information about what is currently done within organizations regarding LL/BP.

(See [Appendix B – Request for Survey Input](#))

Data were collected from 11 DOE/NNSA sites, government entities, private industry, and other external sources, including:

- Nuclear Energy Institute (NEI)
  - Department of Homeland Security (DHS)
  - Federal Emergency Management Agency (FEMA)
  - States of Kentucky and Ohio
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## **Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued**

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### **Data Analysis**

The participating DOE/NNSA sites and others provided information to the LLTG on current practices they use to:

- Identify or receive LL/BP
- Document LL/BP for analysis and consideration of applicability to the site EM program
- Disseminate EM LL/BP
- Integrate LL/BP into the EM program

Data were compared with industry best practices, DOE directives, and DOE guidance to identify common success factors and areas for improvement.

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## **Survey Results**

**Introduction** The following sections describe the DOE/NNSA EM LL/BP program processes, the use of site training programs to incorporate EM LL/BP within the DOE/NNSA site's comprehensive EM planning and preparedness system, and the mechanisms that enable improvements to become a permanent part of the EM organization.

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**Identification of Sources** Most of the sites that participated in the survey actively identify LL/BP from emergency exercises and drills and seek to improve on these lessons. However, few sites actively look beyond their own sites for applicable LL/BP. Although sites do utilize Corporate Operating Experience Programs, the information disseminated seldom bears a strong relationship to EM issues.

Anyone who knows about an experience, activity, event or good work practice that is of value to others can originate a lesson learned. In addition, there are many potential sources of EM lessons learned.

Survey respondents provided the following sources as examples:

- Emergency exercise and drill critiques and evaluations
- EM tabletop drill interface discussions
- Operating experience program reports
- Internal and external audits of EM conducted by DOE Office of Health, Safety, and Security (HSS) Office of Independent Oversight (HS-63)
- Department of Homeland Security Lessons Learned Information System (DHS LLIS)
- EMI SIG meetings, website, and conference calls
- FEMA
- DOE accident investigation reports
- NEI reports
- Incident reports
- State EM office contacts.

**Analysis and  
Documentation**

Frequently, personnel from various groups and departments at the sites screen LL/BP to identify those that pertain to their respective specific area(s). The responsibility to ensure that LL/BP are properly analyzed and documented is typically assigned to designated site LL/BP coordinators.

Additional benefits accrue to the site when EM can coordinate the oversight and review of LL/BP and ensure that all parts of the organization receive appropriate LL/BP. The EM training coordinator has a broad overview of the organization and can formally interface with all site groups and departments, not just the ones currently involved in screening LL/BP.

As specified in *DOE Order 151.1C Comprehensive Emergency Management System*, the integrated emergency management program is commensurate with the hazards and addresses these program elements:

- Program Administration
- Training and Drills
- Exercises
- Readiness Assurance
- Emergency Response Organization
- Offsite Response Interfaces
- Emergency Facilities and Equipment
- Categorization and Classification
- Notifications and Communications
- Consequence Assessment
- Protective Actions and Reentry
- Emergency Medical Support
- Emergency Public Information
- Termination and Recovery

EM LL/BP may have both primary and secondary relationships with one or more DOE/NNSA emergency management program elements. Analyzing the LL and linking it with the appropriate EM element(s) allows it to be disseminated to the right people and applied to the right program areas.

For example:

Site EM personnel familiar with recent drills and exercises would be interested in LL that would help them define and track important issues and/or trends.

## Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued

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It is also important to cross reference LL with all of the appropriate program elements and document the specific associations fully.

Examples of documentation of EM LL/BP cited by survey respondents include:

- Exercise/Drill After Action Reports (AARs) [BP EPI and Training](#)
- Exercise critique forms [BP Exercise Critique Form Allows for Extensive Participant Feedback](#) and [BP EPI and Training](#)
- Corrective Action Reports [BP Training and Drills, Written Exam](#) and [LL ERO Training Enhancements](#)
- EM LL information extracted from internal and external sources [LL Infrastructure Operations Emergency Management Lessons Learned Bulletin](#) and [BP EPI and Training](#)
- Operating Experience Reports [LL Radio Frequency Interference Triggers Nuclear Plant Shutdown](#)
- DHS LLIS database [BP EPI and Training](#)
- CDC workshops with stakeholder communities
- Fact sheets to share with other communities.

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### Dissemination

The importance of following DOE guidance to promulgate and disseminate EM LL/BP across the DOE/NNSA community for continued improvement cannot be stressed enough. Survey results indicate that, at this point in time, dissemination of EM LL/BP is done mostly within a site. In the absence of an established mechanism to disseminate and integrate EM LL/BP, sharing information between EM colleagues can be hit-or-miss.

Methods used by DOE/NNSA sites to disseminate information vary widely. Examples provided by survey respondents include:

- LLIS database information disseminated via newsletter and website links to managers and emergency response organization members
- Alerts [LL Emergency Exercises and Participant Drillsmanship Alert](#) and [LL Improper Usage of Emergency Terminology](#)
- Bulletins [LL Infrastructure Operations Emergency Management Lessons Learned Bulletin](#) and [BP Hanford Information Lessons Learned Sharing \(HILLS\) Web-Application](#)

## Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued

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- Monthly crisis managers' meetings [LL Common Understanding of Roles and Responsibilities](#)
- Exercise reports [LL Exercises and Lessons Learned Sharing](#) and [LL Improved Drill Props for Liquid Waste Training](#)
- Quality reports from senior managers to EM personnel
- Site Tracking, Analysis, and Reporting (STAR) systems
- Web-based LL/BP Information Sharing Systems [BP Hanford Information Lessons Learned Sharing \(HILLS\) Web-Application](#)
- Emergency Response Organization (ERO) requalification sessions, retraining, and supplemental training [BP EPI and Training](#), [LL ERO Training Enhancement](#), [BP ERO Annual Refresher Training](#), and [LL Radio Room Communications Procedure](#)
- Quarterly read/sign communiqué systems
- Operating Experience Information (OEI) [LL Radio Frequency Interference Triggers Nuclear Plant Shutdown](#)
- Tabletop drills
- Recruiting and training of field personnel as grassroots conduits to educate special interest groups about preparedness and response<sup>1</sup>
- Nuclear plant summaries of hostile action-based drills collected by a central organization and disseminated to nuclear utilities. [LL Exercises and Lessons Learned Sharing](#)
- Annual emergency planning improvement workshops sponsored by the CDC for states
- LL gathered and documented at CDC Stakeholder Workshops disseminated to participants

(See [Appendix C – Information Dissemination Methods](#))

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<sup>1</sup> REFERENCE: State of Kentucky Public Health Outreach and Information Network.  
Contact: [BarbaraJFox@ky.gov](mailto:BarbaraJFox@ky.gov)

**Integration -  
Site  
Management  
System**

The directive for DOE/NNSA sites to report and incorporate LL/BP is stated in *DOE O 210.2*. However, the Order does not state how this should be accomplished by each site. It is the site's responsibility to determine whether a LL/BP applies to its operation and how best to integrate it into the site's management system.

*DOE STD-7501-99* describes DOE expectations regarding an integrated Lessons Learned Program.

The Department has established Integrated Safety Management as a Department-wide approach for managing and performing work safely. .... It is expected that lessons learned will be identified, shared and used within each function, for inter-relationships among functions and within and among the three organizational levels of work planning and performance. ....

An effective lessons learned program is integrated throughout the management chain and across functional areas. (Section 3.3; p.11)

The site should "institutionalize" any LL/BP that is deemed to be an improvement to its EM and response preparedness program. This means ensuring that the LL is incorporated into both how the organization does business and/or how it regularly plans and operates its response preparedness programs.

Survey responses from many sites included the following examples of EM LL/BP institutionalization:

- Incorporate the LL information in response plans, policies, and procedures. [LL ERO Training Enhancements](#) and [LL Radio Room Communications Procedure](#)
- Upgrade site change management systems to address emergency planning or hazard management issues. [BP Exercise Critique Form Allow for Extensive Feedback](#)
- Add or change distribution of human resources.
- Add performance goals and measures to institute changes suggested by LL or BP. [BP Training and Drills, Written Exams](#)
- Redesign layout/operation of response facilities. [LL Radio Room Communications Procedure](#)
- Upgrade equipment used for communication and response activities. [LL Improved Drill Props for Liquid Waste Training](#)
- Use DOE oversight programs and evaluations to verify integration of specific LL/BP. [LL Improper Usage of Emergency Terminology](#)

**Integration -  
Training  
Organizations**

When LL/BP involve performance of site personnel and their interface with internal and/or external emergency response partners, EM training programs are often an effective way to integrate LL/BP into the organization's processes and culture.

Training departments generally have an assigned cadre of personnel to capture, analyze, track, and disseminate related LL/BP. This cadre is positioned to integrate LL/BP in training bulletins, classroom presentations, tabletop drills, e-mail updates, etc.

Training also represents a pivotal activity within overall site planning and preparedness, and thus is ideally positioned to ensure LL/BP are communicated throughout the organization, and reflected in needed changes and updates that go beyond training to include baseline procedures, checklists, and other job aids.

Lessons learned coordinators should work with their site training organizations to incorporate lessons learned information into training programs.

Survey respondents provided the following suggestions:

- Supplement Incident Command System (ICS) training modules with LL/BP examples. [BP EPI and Training](#), [LL Emergency Response Planning Must Consider Radiological Hazards](#), and [LL Common Understanding or Roles and Responsibilities](#)
  - Adjust documented training plans, methods, specific lessons, and test modules to address changes in qualification and performance of emergency respondents. [BP ERO Annual Refresher Training](#), [BP Training and Drill, Written Exam](#), [LL Emergency Response Planning Must Consider Radiological Hazards](#), [LL Improper Usage of Emergency Terminology](#), and [LL Radio Frequency Interference Triggers Nuclear Plant Shutdown](#)
  - Change drill/exercise scenarios and objectives to emphasize LL/BP issues. [LL Importance of Proper Master Scenario Events List \(MSEL\) Development for a Multi-Jurisdictional Response Exercise](#)
-

## **Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued**

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### **Benefits of Designated EM Training Coordinators**

Having an effective EM Training Coordinator as an advocate supports successful integration into site emergency plans and ongoing planning and response. EM training coordinators are generally in an excellent position to distribute LL/BP through the EM training program. They have assigned roles and responsibilities in this area; processes are already in place; and, they have the resources to update and/or train personnel with ERO responsibilities.

Designated EM training coordinators:

- can effectively integrate LL/BP into existing EM plans.
  - have a broad overview of the site.
  - can interface with all departments and not be limited to the specific department involved in screening a particular LL/BP.
  - have available resources to train ERO personnel.
  - have access to current trainee rosters and contact information of personnel.
  - have established procedures to track training compliance and due dates.
- 

### **Responsibilities of EM Training Coordinators**

A primary responsibility of EM training coordinators is to screen LL/BP to determine if training is an effective method for integration. Review of the LL/BP can be documented for those that directly impact or are of extreme importance to the EM program.

The screening process involves both analyzing and tracking the data. After analysis, training coordinators determine whether to integrate the data into EM training programs or to disseminate it throughout the site. Generally, EM training coordinators have a methodology to track training compliance and know of upcoming training dates and schedules.

Performing a periodic roll up and analysis of trends in emergency response performance may point to additional lessons to be learned about training effectiveness.

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**Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued**

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**Training Approaches**

Workers at all levels of the organization can potentially reduce risk, improve efficiency, and enhance the cost effectiveness of site operations by sharing and using lessons learned information. EM trainers may be the best equipped site personnel to identify and describe LL/BP and multiple program element linkage, and to ensure that LL/BP are subsequently addressed effectively through training program vehicles and lessons.

A number of training approaches can be used when training is determined to be an effective method for integration.

LL/BP associated with more than one EM program element may require more than one training approach or focus.

For example, an LL involving interface with the Incident Command Post (ICP) may need to be addressed in both Incident Command (IC) field training and Emergency Operations Center (EOC) staff training.

The following examples were provided by survey respondents.

Training Topic	Training Approach
ICS training for support personnel	Training module to address weaknesses in ICS operations and facility interfaces. <a href="#">LL Common Understanding of Roles and Responsibilities</a> and <a href="#">LL Emergency Response Planning Must Consider Radiological Hazards</a>
Formal exercise planning sessions	Involvement of less experienced personnel in the exercise planning process to provide practical interface with experienced exercise planners. <a href="#">LL Importance of Proper MSEL Development for a Multi-Jurisdictional Response Exercise</a>
ERO leadership training	Training module on decision-making under time constraints. <a href="#">LL ERO Training Enhancements</a> and <a href="#">BP Training and Drills, Written Exam</a>
ERO roles and responsibilities	Classroom or Web-based supplemental, requalification, and/or refresher training for ERO members. <a href="#">BP ERO Annual Refresher Training</a> and <a href="#">LL Common Understanding of Roles and Responsibilities</a>

**Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued**

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Training Topic	Training Approach
Procedural changes developed to correct problems	<ul style="list-style-type: none"> <li>• Classroom training <a href="#">BP ERO Annual Refresher Training</a> and <a href="#">LL Improper Usage of Emergency Terminology</a></li> <li>• Drills</li> <li>• Exercises <a href="#">LL Emergency Exercises Participant Drillsmanship Alert</a></li> <li>• Briefings and cross training <a href="#">LL Radio Room Communications Procedure</a></li> </ul>
Performance problems during emergency situations	<ul style="list-style-type: none"> <li>• Drills and exercises <a href="#">LL Improved Drill Props for Liquid Waste Training</a></li> <li>• Job Aids/checklists <a href="#">LL Radio Room Communication Procedures</a></li> </ul>
Misunderstanding of emergency response requirements	<ul style="list-style-type: none"> <li>• Required reading</li> <li>• Verification of understanding through testing</li> <li>• Group testing and exam banks <a href="#">BP Training and Drills, Written Exams</a></li> </ul>

(See [Appendix D – Lessons Learned/Best Practice Examples](#))

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## **Conclusion**

Lessons learned and/or best practices are an important asset to the continuous improvement of an organization's EM Program. EM Programs are encouraged to establish processes and procedures that will formally "institutionalize" lessons learned and/or best practices into their emergency response preparedness programs, plans, and operations.

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## **Appendix A**

### **Lessons Learned Screening Tool**

## Appendix A – Lessons Learned Screening Tool

### Society for Effective Lessons Learned Sharing (SELLS)

#### Screening Lessons Learned for Site Applicability

October 2003

This fact sheet is part of a collection developed by SELLS to support Department of Energy and National Nuclear Security Agency Lessons Learned programs.

#### Background

Throughout the Department of Energy (DOE), managers face the problem of dealing with too much information. At most DOE facilities, a Lesson Learned Coordinator helps reduce the information over load by reviewing information to find lessons learned to improve their site's safety and efficiency. This Fact Sheet shows a process to evaluate lessons learned information, developed through the DOE Society for Effective Lessons Learned Sharing (SELLS). It represents the work of a number of lessons learned practitioners from across the Department of Energy.

#### How to Use the Screening Guide

The questions below are used at the decision points in the attached flow chart. The screener needs a good knowledge of how their site operates: the processes, equipment, products, procedures, and safety management system in use. DOE Lessons Learned Coordinators usually have a side base of knowledge about their site and can answer most of the decision questions. In some cases, a screening team may be needed. In all cases, the whole flow chart should be finished to disposition any given lesson learned input. This chart is designed only for evaluating lesson learned information coming into a site. It is not intended to determine whether a lesson from a site has wider implications to the rest of the DOE.

#### Decision Point Questions

1. Does the lessons learned information reference work activities similar to those performed onsite?
2. Does the site have procedures in place to control the activities described in the lessons learned information?
3. Do the procedures address the hazards identified in the lesson learned information?
4. Can the safety, efficiency, or cost-effectiveness of site activities be enhanced through the integration of the lessons learned information into the activities, work planning process, or training?
5. Has the site experienced any adverse events as a result of these work activities?
6. Does the lessons learned information reference hazards found onsite? (e.g., industrial, environmental, or radiological)
7. Does the site have procedures in place to control the hazards described in the lessons learned information?
8. Can the site's hazard control be enhanced through integration of the lessons learned information into procedures, work activities, or training?
9. Has the site experienced any adverse events as a result of these hazards?
10. Does the lessons learned information pertain to equipment used on site?
11. Can the safety or efficiency of site equipment be enhanced through application of the lessons learned information to the equipment design or utilization?

## **Incorporating Lessons Learned/Best Practices into Emergency Management Training, continued**

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12. Have site personnel experienced any equipment malfunctions or accidents while using the equipment?
13. Does the lessons learned information reference a politically sensitive issue or event that does not directly pertain to site activities?
14. Could the lessons learned information impact the public's attitude toward site activities?

### **Contact Information**

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# **Appendix B**

## **Request for Survey Input**



EMI SIG Training Working Group  
Lessons Learned

EMI SIG Training Working Group  
Questionnaire on Lessons Learned

A key function of the Emergency Management Issues Special Interest Group (EMI SIG) is sharing information about emergency management programs and practices. Training programs play a critical role in the cycle of improving preparedness by promulgating and institutionalizing Lessons Learned emanating from exercises and drills. The Department of Energy National Nuclear Safety Agency, referred to as DOE/NNSA, shares Lessons Learned among the sites to further enhance the preparedness cycle. During the initial meeting of the EMI SIG Training Working Group (TWG) we discussed the need to identify methods to exchange and utilize emergency management Lessons Learned from DOE/NNSA site training programs. We agreed to poll TWG members about methods used to share and incorporate Lessons Learned from their respective programs and practices.

*“Lesson Learned” definition (Reference DOE STD 7501-99)*

Lesson Learned can be a *good work practice* or innovative approach that is captured and shared to promote repeat application; it may also be an *adverse work practice or experience* that is captured and shared to avoid recurrence. Use of lessons learned is a principal component of an organization whose culture is committed to continuous improvement.

Sharing Lessons Learned means getting accurate information to the right people in a timely manner and institutionalizing that information. To improve overall emergency preparedness, each site should always be searching for improvement methods to be integrated as new Lessons Learned.

The information you share through this questionnaire will be analyzed and used to document methodologies for incorporating Lessons Learned in training programs and, in turn, for utilizing our training programs to promulgate Lessons Learned. These methods will be a topic of discussion at the 2008 EMI SIG Meeting during a workshop to be conducted by the Training Working Group.

Appendix B – Request for Survey Input



EMI SIG Training Working Group  
Lessons Learned

Please review the following questions and submit answers to Bob Burger, Chairman, Training Working Group by October 30, 2007. Send by email to [rfburge@sandia.gov](mailto:rfburge@sandia.gov).

1. Do you have an active Lessons Learned program at your site?

2. If so, who is responsible for this program and how long have you had it?

3. Does the site Emergency Management Organization (ERO) participate in the Lessons Learned program?

4. Are there procedural ties between the Lessons Learned program and your Training Organization? If so, explain or attach an example.

5. How do you capture Lessons Learned from an exercise or drill?

- Are they part of the Evaluation Form or guidance given to Evaluators and/or Controllers for the exercise/drill?
- Where are they captured and documented? In a separate Lessons Learned Report? AAR? Other? If other, please explain and attach an example.



## EMI SIG Training Working Group Lessons Learned

6. How do you disseminate emergency management Lessons Learned information? Check those methods that apply.
- a. They are incorporated in annual re-training for your ERO?
  - b. Self-study modules are used to disseminate lessons learned?
  - c. Lessons Learned bulletins are distributed to the ERO?
  - d. Training modules are revised to incorporate Lessons Learned?
  - e. Other? Explain:
7. Check each Lessons Learned resource you have used in emergency management?
- DOE Safety Notices
  - ORPS Reports
  - Incident or accident investigation reports
  - Internal drills
  - Exercises
  - Event response reports
  - EMI SIG web site
  - Workshops or external training (e.g., EMI SIG, NFPA, FEMA, DOE, DHS)
  - Other Explain:
8. Does your site have a process for capturing success stories? For example, documented cases of Lessons Learned being implemented at your site? If so, describe briefly.



EMI SIG Training Working Group  
Lessons Learned

9. Has DOE/NNSA defined Lessons Learned expectations to emergency management or line management at your site? If so, describe how and what.

[Redacted text area consisting of four horizontal bars]

Thank you for completing this questionnaire. We welcome TWG members without site affiliation to add their experience-based comments as well.

Please add your name, email, and affiliation so we may follow-up if needed.

Name: [Redacted]  
Email address: [Redacted]  
DOE or NNSA Site: [Redacted]

**Return to:**

Bob Burger, Chairman, EMI SIG Training Working Group, [rburge@sandia.gov](mailto:rburge@sandia.gov).

## **Appendix C**

# **Information Dissemination Methods**

## Appendix C – Information Dissemination Methods

### Society for Effective Lessons Learned Sharing

#### Information Dissemination Methods

##### Introduction

Dissemination is one of the most important elements of a lessons learned program. Once lessons learned information is documented, it is of little benefit unless it is shared and used. Dissemination methods should be as efficient as possible to facilitate accessing and using the information. The greater the diversity of the user community, the greater the range of options required to effectively disseminate lessons learned information. For example, while electronic sharing via Internet may be preferred by a manager responsible for overall planning and implementation of a cleanup effort, the same method may have virtually no use for a field worker who does not use a computer. That worker may benefit much more from a periodic notice on a bulletin board or a conversation during a brown bag lunch.

The DOE Lessons Learned Program relies on several types of dissemination methods. It provides an Internet Site with links to individual site programs and other lessons learned sources, a List Server, a collection of fact sheets, and the opportunity for person to person sharing through periodic meetings. Primarily, the DOE Lessons Learned Program is an umbrella that provides efficient access to lessons learned information from sites, programs, laboratories, DOE contractors, subcontractors, and external organizations. The following summary provides examples of non-electronic and electronic dissemination methods that can be implemented to disseminate lessons learned information. Many of the non-electronic methods have already been implemented within DOE. Because many of these are site level techniques, this list does not include contact information for them. Most of the electronic methods included in the first table have been implemented as part of the Lessons Learned Program.

Method	Purpose	Contact
List Server	The DOE Lessons Learned List Server is limited to subscribers and is used to disseminate internal information across a broad spectrum of DOE personnel and facilities via the Internet and e-mail. Some DOE Sites also have developed list servers.	John Bickford Fluor Hanford, Inc. Email: <a href="mailto:John_C_Bickford@rl.gov">John_C_Bickford@rl.gov</a> Phone: 509 373 7664 Fax: 509 376 6112
DOE Lessons Learned Web Site	Provides a centralized location for accessing DOE Site Lessons Learned Programs, lessons learned information from other sources, and the central lessons learned database.	Same
Electronic Mail (e-mail)	Provides a means of sending online messages, text files, graphics files, and video to single or multiple recipients.	Same

## Appendix C – Information Dissemination Methods

Method	Purpose	Contact
Teleconference	A real time video demonstration that allow viewers to ask questions and make comments during the remote demonstration. May be used to share technical approaches to specific problems.	A real time video demonstration that allow viewers to ask questions and make comments during the remote demonstration. May be used to share technical approaches to specific problems.
Fax Machine	Use of fax machines to disseminate lessons learned information to personnel without computers.	

Non-Electronic Dissemination Methods	
Methods	Examples
Meetings	Staff meetings, onsite tool box meetings, safety meetings, and post-project appraisal meetings
Workshops	Information exchange workshops that target specific topics and types of workers
Cross-cutting Working Groups	Working groups to facilitate knowledge and information sharing across site, program, or functional boundaries
Employee Exchange	Temporary exchange targeted toward gaining experience in a specific area by working with experts or sites with notable experience (e.g., sites nearing completion of a specific type of project provide knowledge and experience that can be transferred through employee exchange
Lessons Learned Search Services	Search service that will identify, print, and fax lessons learned on a requested topic (to assist personnel who do not have access to computers).
Posted Information	Use of bulletin boards, toilet doors (Porcelain Press), or conference room walls to post lessons learned information in a public area.
Training	Inclusion of relevant lessons learned examples in all levels of employee training courses.
Direct Mail	Hard copy documentation of actual lessons learned sent via direct mail service.
Benchmarking Studies	Comparison of a specific process at an organizations (s) known for "best practices" in this area.
Publications	Newsletters, newspapers, local publications, bulletins, alerts, brochures, and fact sheets.
Lessons Learned Ambassadors/Experts	Subject matter experts may provide information and advice in specific topic areas. Subject matter experts may participate in occasional information sharing lessons and may be contacted for guidance.
Conferences	Staff participates in public and private section conferences, including the semiannual SELLS conference. Attendees share lessons learned from the conference upon return.

# **Appendix D**

## **Lessons Learned/Best Practice Examples**

**Appendix D– Lessons Learned/Best Practice Examples**

<b>EPI and Training</b>	
<b>Item</b>	<b>Description</b>
<b>EM Program Element</b>	Emergency Public Information
<b>Example Type</b>	<input type="checkbox"/> Lesson Learned <input checked="" type="checkbox"/> Best Practice
<b>Category</b>	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
<b>Submitted By</b>	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
<b>Summary Statement</b>	<p>Annual refresher training is provided for emergency spokespersons and technical briefers (contractor and DOE/NNSA personnel). New lessons learned segments are included by the instructor in each year’s training. Lessons learned are from site exercise experience/performance, industry EPI experience, and best practices gathered from annual EMI SIG EPI sessions.</p>
<b>Benefit</b>	<p>Topics covered in refresher training have included: Nuclear industry EPI issues and lessons learned experienced from hostile action exercises; impact of Social Media on emergency communications with the public and media; and performance issues involving interface with offsite agencies in JIC activations.</p>

Appendix D – Lessons Learned/Best Practice Examples

Exercise Critique Form Allows for Extensive Participant Feedback	
Item	Description
EM Program Element	Exercises
Example Type	<input type="checkbox"/> Lesson Learned <input checked="" type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input type="checkbox"/> Dissemination <input type="checkbox"/> Incorporation into Training <input checked="" type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	<p>The Emergency Planning and Preparedness Group utilizes an innovative exercise critique form. This form is split in two parts. The first section asks for recommendations and the action steps needed for improvements. The second section requests feedback on exercise design and conduct.</p>
Benefit	<p>Part 1 allows the exercise participant to inject his or her own knowledge and experience to offer a resolution to an identified issue. This section is sent to the EOC Section Chiefs or field elements.</p> <p>Part 2 allows for the exercise participant to suggest changes to future preparedness activities. This section is sent to the Exercise Program Group that will compile the assessment factor ratings from Part 2 and report these values in the associated After Action Report.</p>

Appendix D – Lessons Learned/Best Practice Examples

ERO Annual Refresher Training	
Item	Description
EM Program Element	Training and Drills
Example Type	<input type="checkbox"/> Lesson Learned <input checked="" type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input checked="" type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	<p>Annual ERO Refresher Training is divided into two different groups. Group I covers Concept of Operations for those that have not been formally refreshed in this area. The concept of operations presentation has been revised to incorporate changes.</p> <p>Group II covers lessons learned that have application to the Site.</p>
Benefit	<p>Those listed in Group I review the Concept of Operations and the Lessons Learned. Group II does only the Lessons Learned refresher. This reduces the amount of time needed for refresher training for part of the ERO.</p>

Appendix D – Lessons Learned/Best Practice Examples

Training and Drills, Written Exams	
Item	Description
<b>EM Program Element</b>	Training and Drills
<b>Example Type</b>	<input type="checkbox"/> Lesson Learned <input checked="" type="checkbox"/> Best Practice
<b>Category</b>	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
<b>Submitted By</b>	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
<b>Summary Statement</b>	<p>HS-63 noted that some training modules did not have final written examinations. The Training Coordinator went beyond this HS-63 observation to develop written examinations for each module. A comprehensive final written examination for key decision-making positions within the ERO was also developed.</p>
<b>Benefit</b>	<p>This comprehensive exam will be coupled with the final documented demonstration of initial proficiency to determine qualification for key decision-making positions. The plan is to also have all previously qualified personnel complete this examination as a "challenge" exam during upcoming refresher training. This training was also added to the training requirements matrix and the training program plan.</p>

Appendix D – Lessons Learned/Best Practice Examples

Hanford Information Lessons Learned Sharing (HILLS) Web Application	
Item	Description
EM Program Element	Program Administration
Example Type	<input type="checkbox"/> Lesson Learned <input checked="" type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	<p>This web site contains Hanford related operating experience articles including: Lessons Learned, Safety Bulletins, Recalls, and other types of information. The information can be used for preventing recurrence of events and sharing good work practices.</p>
Benefit	<p>General Software Description:</p> <ul style="list-style-type: none"> <li>• HILLS runs on the Hanford Local Area (Secure) Network</li> <li>• ASP Application with a MS-SQL Database backend</li> <li>• Database used to capture Meta Data for each Article</li> <li>• Interconnects Users Info to HLAN system</li> <li>• Outputs to E-mail System for Distribution</li> <li>• Searchable Adobe© PDF File Type used for Articles</li> <li>• Google© Application used for the Main Search</li> <li>• Secondary Searches through the Meta Data</li> <li>• Feedback System Connects to MS Excel©</li> <li>• ODBC Connection to MS Access©</li> </ul>

Appendix D – Lessons Learned/Best Practice Examples

Infrastructure Operations Emergency Management Lessons Learned Bulletin	
Item	Description
EM Program Element	Emergency Response Organization (EOC Cadre)
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	During an inventory of EOC controlled documents, a controlled copy of a procedure was found to be missing from a controlled copy procedure manual. Procedures are periodically found to be missing after the EOC has been activated for an exercise or an emergency. This normally occurs when an EOC cadre member needs to use a controlled copy procedure and removes it from the controlled copy procedure notebook.
Solution/Benefit	To prevent this situation from recurring, the controlled copy procedure needs to be copied and the original placed back in the procedure notebook. The copy needs to be identified as Information Use. Another option is to leave the controlled copy procedure in the procedure notebook while it is being used.  A Lessons Learned bulletin was sent to remind the EOC cadre members that controlled documents need to be maintained in accordance with plant procedures.

**Appendix D – Lessons Learned/Best Practice Examples**

<b>Emergency Exercises and Participant Drillsmanship Alert</b>	
<b>Item</b>	<b>Description</b>
<b>EM Program Element</b>	Exercises
<b>Example Type</b>	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
<b>Category</b>	<input checked="" type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
<b>Submitted By</b>	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
<b>Summary Statement</b>	The Incident Commander and other first responders did not demonstrate a sense of urgency associated with the emergency medical treatment of a simulated injured employee located within the immediate isolation zone. The sense of urgency demonstrated by the responders was directly influenced by the lack of appropriate information. Neither the visual clues provided by the simulated injured employee nor the verbal input from the event scene controller indicated that a time-urgent response was required. The Incident Commander also added to the perceived lack of urgency by taking very deliberate actions as a result of being observed/evaluated.
<b>Solution/Benefit</b>	Managers were sent this alert for the generic implications and instructed to share this information with employees and subcontractors who perform similar work: "Exercise participants should respond to the scenario as if it were an actual event - not to their perception of what criteria the evaluator is grading. Drillsmanship is defined as the responders verbalizing their thought process for evaluation purposes and reacting to simulations or event information as if it were an actual event. Proper drillsmanship has a direct impact on individual performance as well as the overall success of the activity."

Appendix D – Lessons Learned/Best Practice Examples

Radio Frequency Interference (RFI) Triggers Nuclear Plant Shutdown	
Item	Description
<b>EM Program Element</b>	Emergency Facilities and Equipment
<b>Example Type</b>	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
<b>Category</b>	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
<b>Submitted By</b>	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
<b>Summary Statement</b>	Signals from a worker's digital camera caused an emergency shutdown of the reactor at the Power Plant. When the camera was turned on too close to a control panel, RFI interfered with a boiler pump that provided water to four steam generators, causing the water levels to drop. This resulted in an emergency shutdown. With so many wireless electronic devices in use today, RFI is a concern that must be addressed particularly in areas where safety equipment may be affected.
<b>Solution/Benefit</b>	<p>If items such as digital cameras, cell phones, Blackberrys, and other wireless electronic devices are permitted in areas where safety systems are installed (e.g., control rooms), it is essential that adequate shielding be in place to suppress random emissions. Consideration should be given to banning wireless items in areas where critical safety equipment is installed, if possible.</p> <p>Operating Experience Information (OEI) provided by DOE was received, screened for applicability and disseminated through the company LL process. Applicable LLs are reviewed by the Training Coordinator for integration into the training process. Supplemental training is also provided as appropriate to capture LL to avoid recurrence of undesirable work practices and promote implementation of more effective methods of operation.</p>

**Appendix D – Lessons Learned/Best Practice Examples**

<b>Improper Usage of Emergency Terminology</b>	
<b>Item</b>	<b>Description</b>
<b>EM Program Element</b>	Notifications and Communications
<b>Example Type</b>	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
<b>Category</b>	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
<b>Submitted By</b>	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
<b>Summary Statement</b>	<p>Improper use of protective action terms can lead to confusion and ineffective implementation of protective actions. Usage of the term “Orderly Evacuation” by personnel, first responders, and in many of the facilities has led to confusion and ineffective implementation of protective actions. This term contradicts both the specific meaning and the intent of the protective action of evacuation as set forth in plans and procedures, DOE Orders and Guides, and the Codes of Federal Regulation.</p> <p>There are three authorized protective action measures in the DOE emergency management system. These measures are: Evacuation, Shelter-in-Place, and Take Cover. Evacuation is the movement of an at-risk population from an area of known danger or unacceptable risk to a safer location. “Evacuation” may be directed by the Plant Shift Superintendent or by an alarm system such as the Criticality Accident Alarm System (CAAS).</p> <p>The unauthorized instruction “Orderly Evacuation” came into usage with the intention of relocating a facility population during other than emergency condition. An “orderly evacuation” did not permit any evacuating individual to bypass any of the monitoring measures or</p>

**Appendix D – Lessons Learned/Best Practice Examples**

<b>Improper Usage of Emergency Terminology</b>	
<b>Item</b>	<b>Description</b>
	<p>administrative/physical controls at the facility.</p> <p>This has resulted in personnel improperly exiting a facility when what was required was a prompt, timely "Evacuation."</p>
<b>Solution/Benefit</b>	<ol style="list-style-type: none"> <li>1. "Orderly Evacuation" must be eliminated from the lexicon and all written procedures, documentation, and instructions. Organizations must review existing documents to ensure that there are no uses of the term "orderly evacuation" in lieu of or in conjunction with an emergency evacuation of any facility.</li> <li>2. Building Emergency Wardens must conduct remedial training for their personnel stressing the protective action of "Evacuation" and eliminating the use of "orderly evacuation."</li> <li>3. Where it is desired to move a population or portion thereof within or outside a facility under non-emergency conditions, the term "Relocation" will be used instead of "Orderly Evacuation."</li> </ol> <p>A Blue Alert Potential Event Condition was sent to Coordinators for appropriate distribution and determining uses for this lesson learned.</p>

Appendix D – Lessons Learned/Best Practice Examples

Exercises and Lessons Learned Sharing	
Item	Description
EM Program Element	Exercises
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input checked="" type="checkbox"/> Other: Nuclear Energy Institute (NEI)
Summary Statement	The Nuclear Energy Institute is the trade organization representing the nuclear utility industry in Washington, D.C. In 2007 they initiated an industry-wide program to share lessons learned between member utilities specifically about hostile action exercise response experience, including functional demonstrations and tabletop drills with offsite stakeholders.
Solution/Benefit	NEI designed a template used for updating and maintaining the lessons learned information submitted by nuclear plants following exercise experience. The template is based on guidelines drafted for conducting hostile action exercises and drills. As member utilities experience and capture lessons learned following exercises the information is submitted for all nuclear utilities to share and incorporate the lessons. The Guidelines are also revised and updated to integrate the experience and periodically re-distributed to the industry.

Appendix D – Lessons Learned/Best Practice Examples

Common Understanding of Roles and Responsibilities	
Item	Description
EM Program Element	Termination and Recovery
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	During an Operational Emergency, there was some uncertainty over when the control of reentry changed from the Incident Commander to the EOC Crisis Manager for recovery.
Solution/Benefit	<p>The transition from emergency to recovery was clarified and formalized for reentry operations. This involved meetings and discussions on transition and the decision to incorporate a formal turnover point between the Incident Commander and the Crisis Manager when both agree that emergency actions are no longer necessary.</p> <p>The Recovery Procedure was revised and incorporated into the appropriate checklists to make this clear and to define a formal, documented turnover point. Incident Commanders and Crisis Managers were briefed and changes were discussed at the regularly scheduled monthly Crisis Managers' Meeting. These changes were also included in refresher training on the procedures/checklists.</p>

Appendix D – Lessons Learned/Best Practice Examples

Importance of Proper Master Scenario Events List (MSEL) Development for a Multi-Jurisdictional Response Exercise	
Item	Description
EM Program Element	Exercises
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input checked="" type="checkbox"/> Other External
Summary Statement	<p>Some federal agencies and local exercise planners do not fully understand the exercise planning process, and/or could not make the commitment for their entity's response. The experience level of exercise planners differs from site to site and within other agencies/locals. The exercise MSEL should have detailed descriptions that tie into the exercise objectives and include identified times that are developed from best practices. In addition, there is too much simulation versus real response actions. The insufficient MSEL:</p> <ul style="list-style-type: none"> <li>• impeded response across many units.</li> <li>• withheld commitments from other agency managers.</li> <li>• lessened enthusiasm.</li> <li>• necessitated too many simulations that did not adequately test mastery of procedures.</li> </ul>
Solution/Benefit	More senior level exercise planners should include less seasoned planners in multi-agency, offsite exercise planning sessions to cross train and enhance capabilities in exercise planning.

Appendix D – Lessons Learned/Best Practice Examples

Improved Drill Props for Liquid Waste Training	
Item	Description
EM Program Element	Training and Drills
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	<p>Organizations that simulate an emergency event should consider using drill props that most resemble the actual equipment used. In addition, the location of the props may have an impact on the exercise response.</p> <p>Drill Scenario: Material leaking from a 55-gallon drum was identified in the drill scenario as oxalic acid. Clean water was used to simulate the chemical. The drill event simulated the puncture of the drum by a fork lift. The contents of the drum began to spill onto the pavement and splashed a nearby operator. The operator then proceeded to the nearest safety shower and began a simulated 15-minute flush/wash-down. The operator noticed the spill from the punctured drum advancing down the pavement in his direction. The operator abandoned the safety shower and proceeded uphill of the spill path. The operator located another safety shower. As the operator exited the scene, he noted that the simulated oxalic acid was mixing with the water from the first safety shower thus increasing the size of the spill.</p>

**Appendix D – Lessons Learned/Best Practice Examples**

<b>Improved Drill Props for Liquid Waste Training</b>	
<b>Item</b>	<b>Description</b>
<b>Benefit/Solution</b>	<p>This exercise demonstrated the uncertainty in determining the grade of the land. The safety shower for this unloading area was set up at what appeared to be level to, or above grade, of this unloading area. It is recommended that when setting up a safety shower for an area, you conduct a water flow test or have the area surveyed to determine runoff direction.</p> <p>The safety shower for this unloading area was moved. Grade level determinations were conducted for other unloading areas.</p> <p>The lesson learned for this event was communicated through the written drill report for this exercise and shared with applicable personnel for consideration in future.</p>

Appendix D – Lessons Learned/Best Practice Examples

ERO Training Enhancement	
Item	Description
EM Program Element	Training and Drills
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	An assessment of the EM Program revealed an opportunity for improvement in the ERO training process for Medical Support Directors. While personnel assigned to the function were provided training, there was no established Job Code with recognized qualifications for the position. This could have resulted in inconsistency in the execution of duties.
Benefit/Solution	A potential issue report was entered in the corrective action system to transmit the information to the responsible director. The information was disseminated and corrective action assignments were made by the responsible manager.  A Job Code for Medical Support Director was developed with the ERO qualification training requirements.

**Appendix D – Lessons Learned/Best Practice Examples**

<b>Radio Room Communications Procedures</b>	
<b>Item</b>	<b>Description</b>
<b>EM Program Element</b>	Notifications and Communications
<b>Example Type</b>	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
<b>Category</b>	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input checked="" type="checkbox"/> Dissemination <input checked="" type="checkbox"/> Incorporation into Training <input type="checkbox"/> Continuous Improvement
<b>Submitted By</b>	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
<b>Summary Statement</b>	Radio Room checklists, procedures, and training were not available for basic activities and basic positions (e.g., radio console operator, logger). During an exercise, radio room participants who were less familiar with the positions took the most conservative actions. This resulted in inaccurate documentation and information sharing. In addition, overly conservative protective actions stopped work unnecessarily.
<b>Benefit/Solution</b>	Procedures and checklists were written for the positions. On the-job training, briefings, and cross training were conducted.

Appendix D – Lessons Learned/Best Practice Examples

Emergency Response Planning Must Consider Radiological Hazards	
Item	Description
EM Program Element	Readiness Assurance
Example Type	<input checked="" type="checkbox"/> Lesson Learned <input type="checkbox"/> Best Practice
Category	<input type="checkbox"/> Identification <input type="checkbox"/> Documentation <input type="checkbox"/> Dissemination <input type="checkbox"/> Incorporation into Training <input checked="" type="checkbox"/> Continuous Improvement
Submitted By	<input checked="" type="checkbox"/> DOE/NNSA Site <input type="checkbox"/> Federal Agency <input type="checkbox"/> State <input type="checkbox"/> Other
Summary Statement	<p>Emergency preparedness assessments performed at radiological facilities identified radiological planning weaknesses that could negatively impact response to a facility radiological emergency. These weaknesses were related to management of emergency equipment, emergency response kits, required surveillances, personnel training, and accuracy of building emergency plans.</p> <p>Involvement of multiple organizations (e.g., Emergency Preparedness, Operations, Radiological Control, and Environment, Safety, and Health) in the management of the EM Program was considered a major factor in the inconsistencies identified - including overlapping and unclear roles and responsibilities.</p>

## Appendix D – Lessons Learned/Best Practice Examples

<b>Emergency Response Planning Must Consider Radiological Hazards</b>	
<b>Item</b>	<b>Description</b>
<b>Benefit/Solution</b>	<p>To ensure adequate preparation and readiness to implement the Incident Command System during an emergency, facilities with radiological hazards must include radiological planning in selection, inventory, and surveillance of emergency equipment; development of procedures; and, facility emergency response organization training.</p> <p>The roles and responsibilities of multiple organizations with overlapping roles must be clearly defined. Where one facility relies on another facility or group for emergency equipment/resource needs, Memoranda of Understanding should be developed to ensure that all involved organizations clearly communicate and understand those relationships.</p>

# **Appendix E**

## **Additional Resources**

## Appendix E –Additional Resources

Other sources for emergency management lessons learned include:

- DOE Office of HSS <http://www.hss.energy.gov/IndepOversight>
- Department of Homeland Security – LLIS Database  
<https://www.llis.gov/newsletter>
- Nuclear Energy Institute – Hostile Action EP Drills (Nuclear Regulatory Commission)  
<http://www.nrc.gov/about-nrc/emerg-preparedness/respond-to-emerg/hostile-action.html>
- Centers for Disease Control and Prevention  
Type “Lessons Learned” in the Search box at the top of the web page for Articles and Information about Lessons Learned on file  
<http://www.cdc.gov>
- Transportation Community Awareness and Emergency Response (TRANSCAER)  
TRANSCAER is a voluntary national outreach effort sponsored by chemical manufacturing and transportation industries.  
<http://www.transcaer.com/>
- National Fire Protection Association  
Type “Lessons Learned” in the Search box at the top of the web page for Articles and Information about Lessons Learned on file  
<http://www.nfpa.org>