Emergency Management Principles and Practices for Health Care Systems

Unit 4:
Emergency Management Instruction, System Evaluation, and Organizational Learning for Healthcare Systems

Emergency Management Principles and Practices for Healthcare Systems

This educational curriculum was developed by The Institute for Crisis, Disaster and Risk Management (ICDRM) at The George Washington University (GWU) under contract to the Veterans Health Administration (VHA).

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Table of Contents

Module 4.4 Organizational Learning: Incorporating Improvement into the Emergency Management Program

Unit 4.

Emergency Management Instruction, System Evaluation, and Organizational Learning for Healthcare Systems

Unit Summary

This unit addresses the critical activities of education, training, exercise, system evaluation, and system improvement based upon "organizational learning" rather than the "personnel learning" that occurs in standard "lessons learned" activities. This unit presents effective processes for education, training, evaluation, and improvement of the healthcare system emergency management (EM) program and its component plans. A distinction is made between the different purposes of education, training, drills, and exercises. Efficient methods for conducting "hot washes," more formal after-action reports, and other evaluation methods are presented, along with methods for processing and incorporating identified improvements into the emergency operations plan (EOP).

Module 4.1

Introduction and Overview

Lesson 4.1.1 Instruction, System Evaluation, and Organizational Learning: An Overview

Lesson Objectives

- ○ *Describe the primary purpose of education, training, and drills and their role in system implementation, maintenance, and organizational learning.*
- ○ *Describe the multiple types of exercises and their primary purpose.*
- ○ *Explain the purpose and general methods used to assess EM program and EOP effectiveness through an EM programmatic evaluation.*
- ○ *Explain the general methods used to evaluate EOP efficiency and effectiveness through the after-action report process.*
- ○ *Explain the organizational learning purpose and process.*

Introduction

Effective implementation and management of an Emergency Management (EM) program requires careful attention to instructing participants, exercising plans, evaluating system performance, and identifying and implementing appropriate change. These critical activities are presented in this unit. This lesson provides a summary of the detailed material presented in the remaining lessons in Unit 4.

All healthcare system personnel should understand the importance and appropriate application of instructional strategies and techniques that contribute to their personal development and development as a team member in support of the EM program. Additionally, healthcare system personnel should understand the purpose, methods, and application of system and plan evaluation. Evaluation as described in this unit is not directed toward individuals, but is focused on the overarching goal of continually improving the EM program and its supporting plans. Contributing to program improvement is a shared responsibility and requires the active participation of all healthcare system personnel. Inherent in this participation is an understanding of the purpose and importance of the instructional and evaluation processes.

General

The activities of education, training, and training drills are collectively referred to as **instruction**. Exercise, on the other hand, provides a

method for **evaluating** emergency response and recovery systems and identifying improvement needs.

Response and recovery competencies are required to maintain systems operations during emergencies and disasters.

- Competencies and capabilities in the healthcare system: Within a healthcare system, individual and collective competencies and capabilities form the foundation for healthcare system operation during normal conditions. Specific competencies are also required to maintain system operations during times of emergencies and disasters. Instruction, which is primarily associated with the preparedness phase of Comprehensive Emergency Management (CEM), is manifested during response and recovery operations. If these competencies are carefully developed during preparedness activities, they form a valuable, consistent basis for developing instructional modules.

- An overview of training, education, drills, exercises, and EOP evaluation as applied to the healthcare system: The lessons contained within this unit provide an overview of training, education, drills, exercises, and EOP evaluation as applied to the healthcare system. The final section of the unit conveys an understanding of "organizational learning," a method for implementing lasting change. The various terms associated with instruction, evaluation, and organizational learning are precisely defined to clarify their purpose, relation to each other, and their application in emergency management. These definitions are highlighted in the "Terminology alert!" boxes throughout the unit lessons.

Education and Training

Education focuses on knowledge and training focuses on skills.

- The distinction between training and education: Education and training are terms that are often confused and used interchangeably. The distinction between the two is a function of the instructional intent, with education focusing on the acquisition of knowledge and training focusing on the development and retention of specific and demonstrable skills. The knowledge and skills support the individual, team, and organizational competencies presented in the EOP-designated jobs and job groups for emergency response and recovery. Job and position competencies are generally explained through knowledge and skill-supporting competencies, which can be directly translated into learning objectives for the education and training courses. In actual practice, the line between education and training may blur, with some level of education included in training and some level of training in educational activities.

- <u>Drills</u>: Drills are an extension of training and allow for individual and team practice of a combination or series of skills. As such, they are the culmination of the instructional process building upon individual and team education and training activities. Careful evaluation of drills provides a means of assessing individual and team capabilities to perform emergency response and recovery responsibilities as defined in the competency statements applicable to all employees (competencies common to all healthcare system employees), specific job groups (e.g., facility leaders and healthcare providers), and emergency response and recovery operations specific tasks (e.g., mobilizing a healthcare facility unit and decontaminating personnel). Additionally, the evaluation of drills provides a means of validating and adjusting policies, procedures, communication, decision making, and organizational structure supporting emergency response and recovery operations. For clarity, drills with evaluation as the primary objective are termed "evaluative drills" to distinguish them from "training drills."

Drills allow for individual and team practice of skills.

Exercises

- <u>The distinction between drills and exercises</u>: Although the term "exercise" is commonly used interchangeably with the term drill, exercises are in fact different in purpose and structure. Drills are primarily to provide skills training, while exercises are developed and conducted for the primary purpose of evaluating the structure and processes of the EOP. Accordingly, exercise objectives are established to reflect this purpose of system and plan evaluation.

Exercises provide a means of evaluating the EOP and recovery plan.

- <u>Scenarios as the basis of drills and exercises</u>: Like drills, exercises are based upon a set scenario. However, drill scenarios are established to prompt the performance of a specific sequence of individual and team skills, while exercise scenarios are more extensive to include multiple personnel, teams, and even organizations that must coordinate and work together in emergency response and recovery operations.

- <u>Exercises build on a foundation of instruction and the existing system</u>: It is essential to recognize that exercises build upon prior instructional activities and the existing system structure, description, policies, procedures, and resources. Some level of instruction and the refinement of skills (training) are a by-product, not the primary intent, of exercise. **The primary value of exercises is system evaluation. Individuals and teams participating in the exercise should therefore already have the instructional foundation to accomplish their specific emergency operations functions in**

Exercises build upon prior instructional activities and the system structure.

order to maximize the value of the experience. Similarly, evaluation of the EOP through an exercise can only be accomplished if the plans and system are clearly described and communicated, with exercise participants trained to a defined standard. These evaluative activities provide the means of developing, reinforcing, and validating individual, team, and organizational competencies and capabilities.

- Categories of exercises: There are three primary categories of exercises reflecting the complexity and presentation of the scenario, the level of participation by individuals and teams, and the range of functional areas involved. These categories are:

  Different types of exercises allow for increasing levels of complexity and involvement.

  ○ Tabletop: This is a scenario-based discussion of elements of the EOP, which allows individuals and teams to evaluate their emergency operations roles and responsibilities in a relatively low stress environment though extensive simulation and injection of guidance and coaching by exercise facilitators. Within this category of exercises, tabletops progress from simple to complex, involving increasing levels of scenario complexity and role-playing requirements by participants and decreasing levels of guidance and coaching by exercise facilitators.

  ○ Functional: This is a scenario-based execution of specific tasks and/or complex activity within a functional area of the EOP. A functional exercise is designed and developed to increase the level of complexity and stress above that included in a tabletop. Although there is still some level of simulation, particularly in the area of interaction with other functions and "outside" personnel and organizations, realism within the function is increased and time becomes a constraint for activities and decision making.

  ○ Full-Scale: This is a scenario-based extension of a functional exercise to include multiple, if not all, functions and activities of the EOP. A single scenario is exercised across multiple functions and may be extended to interaction and coordination with other organizations. Simulation is minimized and exercise objectives may involve the actual mobilization of personnel and resources. Depending on the complexity of the scenario, a full-scale exercise may extend over a prolonged period of time and has the potential provide a robust evaluation of the EOP.

  The category selected for a specific evaluation will depend upon the maturity of the EM program and the EOP, and other factors such as the results of previous evaluations, the turnover of personnel, changing organizational requirements, and new technologies. The

scenario and scope of an exercise are then designed and developed to meet the exercise objectives.

EM Program Evaluation

- The EM program supports the organizational mission and strategic objectives: Evaluation of the EM program must be accomplished within the context of the organization's mission and the strategic objectives supporting that mission. Within a healthcare organization these objectives include evaluation of:

  - Continuity planning:

    - The simulated hazard impact creates little disruption to ongoing medical and business operations.

    - Demonstrated protection of personnel (patients and their families/visitors, staff and their families) and property.

  - Medical surge to meet incident requirements:

    - Demonstrating capacity to effectively manage the quantity of patient care needs.

    - Demonstrating capability to meet the types of patient care needs.

- The four component EM program plans: Supporting the strategic objectives, the four component EM program plans (mitigation, preparedness, response or EOP, and recovery) are included in the comprehensive EM program evaluation.

- The reasons for program evaluation: Given this context, why is it necessary to evaluate the EM program in a comprehensive and systematic manner? This question can be answered by identifying the two primary reasons for program evaluation:

  - Accountability: To determine if program activities and resource use contribute to the effective and efficient accomplishment of the organizational and program objectives.

  - Improvement or Enhancement: To determine the need for and means to accomplish and monitor organizational change that improves or enhances the ability to accomplish organizational and program objectives.

The EM program evaluations should include examinations of continuity planning (resiliency) and maintenance of medical surge capacity and capability.

Performance metrics define desired levels of performance.

- Performance metrics: To accomplish comprehensive program level evaluation, the design, development, and implementation of the evaluation methodology and process must be accomplished as a building block of the program itself and not as an after thought. Additionally the evaluation methodology and process must also be subject to evaluation for the purpose of accountability and improvement. To this end, performance metrics (criteria) defining the desired level of performance must be specified and evaluation measures and methods selected to allow comparison of the measures against the metrics. The determination of appropriate metrics and the accompanying selection of measures and methods for comprehensive program evaluation is no easy task, but cannot be minimized or neglected due to the importance of the EM program and its support of the organization's mission.

- Evaluation of the EOP and recovery plan: In addition to program level evaluation, systematic performance-based (operational) evaluation of the EOP and recovery plans is accomplished through the examination of:

  ○ Actual incidents (emergencies and disasters)

  ○ Exercises (tabletop, functional, and full-scale) as described earlier in this lesson

  ○ Evaluative drills (drills conducted specifically for the purpose of evaluating personnel, policies, procedures, equipment, etc.)

  ○ Proxy events (actual experiences falling short of actual emergencies and/or disasters or planned exercises that provide insight into the adequacy of response and recovery operations).

Performance-based evaluation of the EOP is accomplished through the AAR process.

- The purpose of the AAR: Generally, the evaluation of operational incidents, actual or scripted, occurs after the conclusion of the incident or at logical break points. The term chosen to identify this post incident evaluation is the "After Action Report (AAR) process." The AAR process serves several important purposes:

  ○ Documentation of exercise and response activities

  ○ Identification of operational successes and deficiencies during response and recovery

  ○ Analysis of evaluation findings to determine the effectiveness and efficiency of the EOP and/or recovery plans

- ○ Definition of a plan of action for implementing needed improvements.

- The AAR process: Similar to program evaluation, the AAR process is based upon objectives and requires specific performance-based metrics, measures, and a defined methodology. In general the actual AAR process encompasses the following sequence of activities:

  - ○ Collection of objective, authoritative, and relevant data and observations

  - ○ Synthesis of collected data and observations into useful information

  - ○ Development of a report that provides a description of the incident, exercise, evaluative drill or proxy event in a narrative form, and then describes objective issues arising, both positive and negative, with actionable recommendations aimed at improving the EOP and/or recovery plans.

- Evaluation summary: The process and results of EM program evaluation and performance-based Emergency Operations Plan (EOP) and recovery plan evaluation support the concept of organizational learning, which is described in the next section. Each type of evaluation provides the ideas and supporting information necessary to identify, consider, and implement the changes necessary to adapt the EM program and the supporting plans to internal and external environment changes and to continuously improve the EM program and supporting plans in the context of the healthcare organization's mission and strategic objectives.

Evaluation of the EM program and the EOP supports organizational learning.

Organizational Learning

- Organizational learning and the "learning organization": Organizational learning is intended to establish permanent improvement in the organization itself.   This goes far beyond individual learning associated with education, training, drills, and the experience gained in exercises.   It includes precisely defined systems-based processes that identify and assess all sources of data and information for the purpose of implementing organizational and system level changes necessary to adapt and improve performance. For organizational learning to occur, an organization has to be committed to implementing necessary change.   The most widely used term used to describe this organizational characteristic is the

A "learning organization" is committed to continuous improvement based upon evaluation.
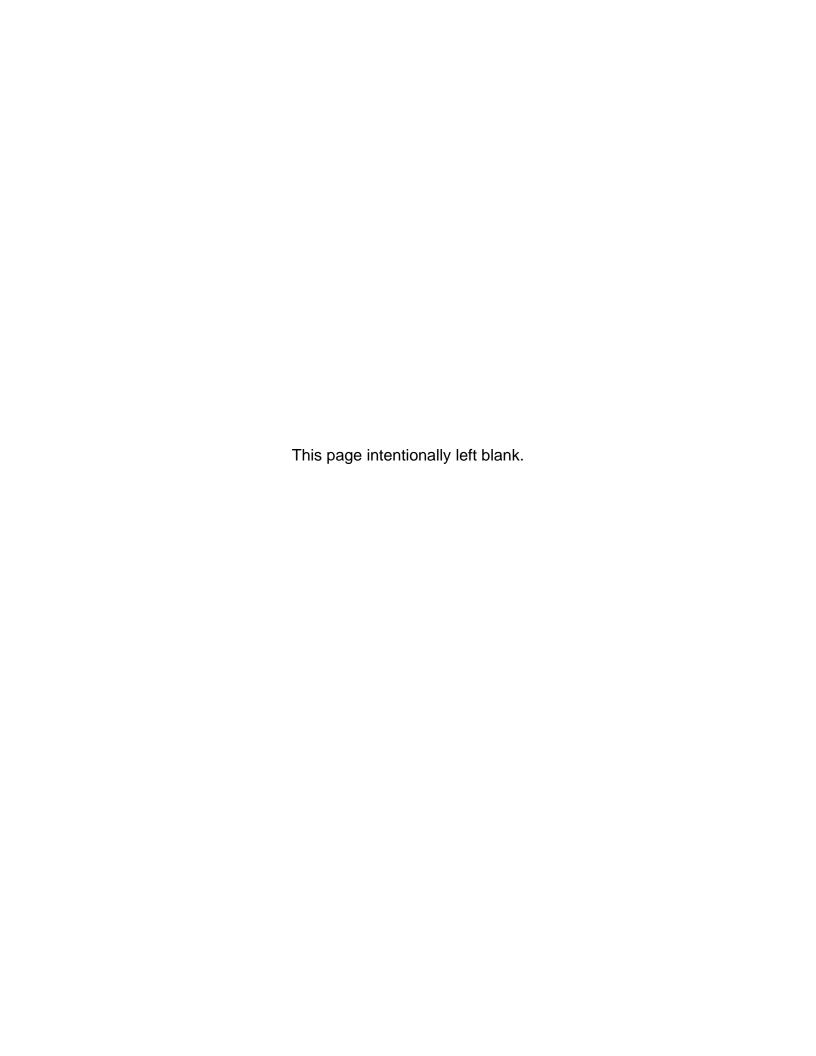
"learning organization." A learning organization conducts continuous evaluation of its experience and transforms that experience into lasting improvements in performance. For this to occur, all the organization's systems must promote and reward the participation of all members of the organization in the process of identifying and implementing change that results in improvement. The improvements are incorporated through changes to:

○ Organizational and program-specific objectives.

○ Structure and processes of the program and/or component plans (including the EOP).

○ Policies and procedures for the organization and how it relates to emergency management.

○ Personnel qualifications (including job group and task specific competencies).

○ Facilities for emergency response.

○ Equipment.

○ Supplies.

The EM Program Manager is responsible for organizational learning within the EM program.

- Role of the emergency program manager: Within the EM program, responsibility for the organizational learning process is held by the emergency program manager. In consultation with the EM committee and healthcare system and facility leadership, the emergency program manager defines and administers the process for soliciting, analyzing, processing, tracking, and acting on potential organizational changes.

- The organizational learning cycle: Once change is implemented, monitoring the results of the organizational learning process falls back upon the emergency management competencies of individuals and teams developed through education, training, and drills and the results of program and operational performance-based evaluation as described earlier in this lesson. This cycle of continual improvement focuses on the organization's goals of continuity of healthcare services and maintenance of adequate surge capacity and capability, which is ultimately dependent on the EM program and all phases of Comprehensive Emergency Management. When requested or directed, it is important for appropriate healthcare system personnel to participate in this organizational learning process so that improvements are fully implemented across the organization.

Module 4.2

Education, Training, Drills, and Exercises

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Lesson 4.2.1 Establishing and Maintaining the Healthcare Emergency Operations Plan: Education, Training, Drills, and Exercises

Lesson objectives

- *Explain the importance of consistent and precise terminology in the context of Emergency Management for Healthcare Systems.*
- *Describe the relationship between education, training, drills, and exercises in EOP preparedness.*
- *List approaches for designing and conducting emergency response education, training, drills, and exercises.*
- *Define the term "competency" and describe the use of competencies in emergency management.*
- *Explain emergency response and recovery competencies and their proficiency levels, as applied to the healthcare system EOP function.*
- *Define the Instructional Systems Development (ISD) process and its application to emergency management education, training, and drills.*

Terminology and Concepts in the Context of Emergency Management for Healthcare Systems

Across the spectrum of emergency management, terminology has become progressively less precise as more disciplines have entered the field. These include homeland security, risk management, military personnel, public health, and others.

Imprecise terminology hinders the successful implementation and maintenance of the EOP.

- For example, personnel primarily involved in the homeland security field have introduced new terms and descriptions for long-standing incident and emergency management terminology and concepts. Many of these appear to have been drawn from the U.S. military, intelligence, and other related fields.

- This phenomenon is best viewed as "industry application" of emergency management concepts (see preface to this text): in this instance, a "homeland security application" that has interpreted long-standing concepts of incident and emergency management, program management, instructional design, and theory related to systems, evaluation, and organizations. This variance is most evident in the subjects covered in this unit.

- For the purpose of this text, the authors adhere to precise terminology and long-validated concepts within the context of emergency management, systems theory, instructional design, and exercise. The text demonstrates the inter-relationship of management concepts across this seemingly disparate subject matter. Accordingly, **specific**

terminology and their definitions are provided in this text to clarify these terms and concepts in the context of emergency management for healthcare systems. Other industry applications, plus some of the more abstract but enlightening "academic" definitions and concepts found in the management literature, are acknowledged.

Education, Training, Drills, and Exercises and their Emergency Management Inter-relationships

To be successful, the emergency program manager must clearly recognize the similarities and differences between **education, training, drills, and exercises**, and how they relate to each other, how they are managed, and how they are used to attain optimal performance during incident response and recovery. Within the EM program, these terms and their related concepts are used to organize the many preparedness activities involved in emergency system implementation, maintenance, evaluation, and improvement.

Education is the conveyance of knowledge.

- Education: Education (see terminology textbox) is instructional activity that primarily provides **knowledge,** rather than skills or abilities. It may be an essential part of implementing the knowledge component of any competency (see Unit 1). Emergency management educational activities impart knowledge relative to emergency management, including but not limited to incident response and recovery. This text is an example of education applicable to all four phases of Comprehensive Emergency Management: mitigation, preparedness, response, and recovery.

> **Terminology alert!**
>
> *Education***:** Education is instruction, structured to achieve specific competency-based objectives, that imparts primarily **knowledge.** This may be general knowledge or it may be job specific, but it extends to "higher order" knowledge (for example, understanding the "big picture" or working under stress) not specifically included in one's job description but of great value during emergency management activities. Educational material should be competency-based and specify a level of proficiency that relates to the relevant competencies ("awareness, operations, or expert").

Training provides skills and, in some instances, abilities.

- Training: Training (see terminology textbox) is instructional activity designed to provide individuals or groups of individuals with **skills**

and, therefore, is another essential part of EOP implementation. Similar to education, training can be generalized or more job specific.

> **Terminology alert!**
>
> ***Training***: Training is instruction that imparts and/or maintains the **skills** (and some **abilities,** such as strength and endurance) necessary for individuals and teams to perform their assigned system responsibilities. Training objectives should be competency-based and specify a level of proficiency that relates to the relevant competencies ("awareness, operations, or expert"). As much as possible, training should address skills function under the conditions likely when the skill must be conducted.

- Importance of terminology: As applied to the EM Program, categorizing instructional content and activities as either training or education is important to promote precision (see Text box 4.2.1.1 below):

  - Precision: This precision is critical to optimal EM program management, since the instructional content and activities are developed, structured, and delivered for the purpose of preparing each individual and operating unit (i.e., hospital functional area) with the competencies (knowledge, skills, and abilities) to accomplish their roles and responsibilities within the EM program. In educational instruction, primarily knowledge competencies are presented. In training instruction, competencies with skills and/or abilities are covered. The level of proficiency[1] of each competency that a successful student can perform should be delineated.

  - Education range: Education can vary from basic orientation material to very complex instructional activity that provides a basis for expert-level proficiencies.

  - Training range: Training can range from the provision of awareness level skills or general abilities, such as physical endurance, to very specific instructional activity that imparts mastery of complex job skills.

Distinguishing between primarily educational and training activities allows for the development of concise and accurate objectives for each instructional activity.

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[1] Barbera, J.A.; Macintyre, A.G.; Shaw, G.; Seefried, V.; Westerman, L.; DeCosmos, S. *VHA-EMA Emergency Response and Recovery Competencies: Competency Survey, Analysis, and Report* (June 2005). Available at www.gwu.edu/~icdrm/, last accessed January 22, 2006.

Many academic distinctions have been provided between education and training. The definitions utilized in this text are based upon practical considerations for what the activity is designed to achieve.

Textbox 4.2.1.1

Defining and Differentiating "Training" and "Education"

Academic and professional literature sources present a range of definitions for education and training and for the association between these terms. For example, sources such as Nadler's *Handbook of Human Resource Development*[2] presents training as imparting the competencies required for a person or team's current job responsibilities, and education as providing personal and professional development for transition to a new job. Other authoritative sources take the term education to a level beyond specific job requirements to include the development of understanding and the promotion of personal growth.[3]

This emergency management text takes a more practical view of the difference between education and training: they are differentiated by **the preponderance** of knowledge versus skills acquisition. Education and training are essentially ends of a continuum that directly relates to competencies: education primarily teaches knowledge competencies, training is primarily skills; one may even argue that "awareness level training" (see below for explanation) is "education" and not training, since operational skills are not imparted. In practice, neither training nor education is found totally independent of the other, but the preponderance of the learning objectives should indicate one or the other category of instructional activity.

Drills form a third type of instructional activity that imparts a series or combination of skills.

Drills: Drills (see terminology textbox) are the next logical extension of instruction to impart emergency response and recovery competencies. As with individual training and education, drills are designed, developed, and conducted to achieve observable, competency-based objectives at the individual and team level.

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[2] Nadler Leonard (1984). *The Handbook of Human Resource Development* (Glossary). New York, New York. John Wiley and Sons.
[3] *American Heritage College Dictionary* (1997). Boston, Massachusetts. Houghton Mifflin.

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Terminology alert!

Drill: A training application that develops a combination or series of skills.

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○ <u>Drills as an extension of education and training</u>: Drills should not be used as a starting point for instruction. Instead, they build upon individual and team training and educational activities to impart the skill and abilities to accomplish complex process and procedures. They also may extend the educational and training experience into the realm of simulated emergency conditions. In healthcare system emergency management, for example, a decontamination drill trains personnel to conduct a series of individual skills: mobilizing the patient decontamination (DECON) unit, donning personal protective equipment, demonstrating patient reception, making decisions about length of DECON and decontamination technique, demobilizing the DECON unit, and returning to readiness. Similarly, a mobilization drill for a healthcare system command post teaches personnel to set up the facilities under urgent incident circumstances, while beginning incident management operations.

○ <u>Drill versus exercise</u>: "Drills" are distinguished from "exercises." While the terms are commonly interchanged, this distinction is presented in exercise guidance such as HSEEP[4] and serves an important purpose. Drills are primarily instructional, while exercise is primarily for evaluation (see exercise definition below). While both are commonly conducted using a scenario, the drill scenario merely prompts the performance of a series of skills, as opposed to "exercises" (defined in the terminology textbox below) that are much more scenario-driven activities.

○ <u>Instructional versus evaluative drills</u>: While the primary purpose of drills is to **train to and practice a series of skills (i.e., "instructional")**, some drills are conducted primarily to **validate individual and team capabilities**, policies, procedures, communication, and decision making within a component of the EM program and EOP. These therefore have a more formal evaluation component (see Lesson 4.3.3). Because their primary purpose may be to evaluate functional capabilities or capacities, in

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[4] *Homeland Security Exercise and Evaluation Program. Volume III: Exercise Program Management and Planning Process* (July 2004). Chapter 4: 48-49. Washington, D.C.

Exercises are an evaluation tool. The appropriate instructional activities should be conducted <u>before</u> the exercise. Otherwise, the results of the exercise are suspect.

this text they are distinguished from instructional drills by qualifying them as "evaluative." Evaluative drills are addressed further under "exercises" in this text.

- <u>Collective terminology</u>: Despite the differences between education, training, and drills, many emergency management organizations refer to all three as "training" to avoid confusion during detailed discussion of preparedness activities. This text uses "**instruction**" and "**instructional activity**" to collectively describe these three instructional categories.

- <u>Exercise</u>: Exercise (see terminology textbox) is a planned activity that is developed and conducted to evaluate whether the system, or specific functions or elements of the system, can achieve specific emergency response or recovery objectives without having to experience an actual emergency or disaster. It therefore also indirectly evaluates the achievement of preparedness objectives.

> **Terminology alert!**
>
> ***Exercise***: A scripted, scenario-based activity designed to **evaluate** the system's capabilities and capacity to achieve overall and individual functional objectives and to demonstrate the competencies for relevant response and recovery positions. The purpose of exercise evaluation is to determine an objective, valid indication of future system performance under similar conditions and to identify potential system improvements.

  - ○ <u>Evaluation as the objective</u>: Like instructional activity, exercises are designed, developed, and conducted to achieve specific, attainable objectives. **Exercises are primarily an evaluation activity, and the objectives should reflect this.**

  - ○ <u>Relationship of exercise to system development</u>: Exercises should never be considered a starting point in system development (see Textbox 4.2.1.2), but as a method to evaluate the performance of an established system and/or its component sub-systems, processes, procedures, and competencies.

  - ○ <u>Relationship of exercise to instructional activities</u>: While some practice and instructional activity occurs in all exercises, this should not be the primary reason to conduct exercises (see scenario-based training as an alternative activity). By assessing

competencies, exercises indirectly assess instructional activities for the relevant individuals and teams.

Textbox 4.2.1.2

Exercise as a Primary Training or Plan Development Tool

Even though common practice, it is an inappropriate and ineffective practice to use exercises as initial or early **individual and team training experience**. It can actually be detrimental to conduct an exercise with personnel who have not received the necessary instructional foundation to accomplish their job functions, resulting in unsafe conditions or very discouraging outcomes. Within an exercise, a small percentage of participants may be primarily being trained (particularly expert-level training). These personnel must be carefully monitored by experienced proctors.

Similarly, it is not appropriate to conduct an exercise as a means of defining the emergency response and recovery organization and guidelines. The system being evaluated must already have been adequately defined **with objectively described system, processes, procedures, positions, equipment, and supplies.** It is only under this setting that the exercise performance can be compared to the designed system function. Conducting an exercise to develop system design requirements is inefficient and potentially misleading:
- It risks the incorporation of exercise artifact (defined and discussed in Lesson 4.2.3) into the system design.
- Exercises cannot be considered an objective system evaluation with predictive value for future performance if personnel haven't been adequately trained for their roles.

Conducting exercises on an incomplete System Description/ Concept of Operations has little true value and can lead to complications.

○ <u>Exercise categories</u>: Exercises are generally categorized as listed below, according to their specific goals and objectives and their respective level of "play."[5] A more complete description of exercise types is presented in Lesson 4.2.4:

▪ *Tabletop:* A scenario-based discussion that permits evaluation of the EOP and/or Recovery Plan, or elements thereof, through oral interaction and application of plan guidance. This is accomplished using minimal or no physical activity, hence the

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[5] Adapted from Sikich G. *Emergency Management Planning Handbook* (1996). Washington, D.C. McGraw Hill.

descriptor "tabletop." It is used to have individuals and teams describe their roles and responsibilities through a presented scenario and to evaluate the performance of these roles and responsibilities in a relatively low stress environment. Through the use of simulation techniques, emphasis is placed on collaboration and cooperation, decision making, and team building in the context of a specified scenario. This format allows a significant amount of comment and coaching from the facilitator/s.

Different types of exercises permit evaluation of specific components or the entire EOP.

- **Functional:** The scenario-based execution of specific tasks and/or more complex activity within a functional area of the EOP. This is typically conducted under increased levels of stress and genuine constraints that provide increased realism, and so is less reliant upon orally presented simulation. It commonly includes using the actual communication modes that would be employed during an actual incident. Collaboration and cooperation and interactive decision making are more focused within the exercised function and accomplished in real-time. Interaction with other functions and "outside" personnel is simulated, commonly through the play of exercise controllers. An example for healthcare systems might be the exercise of a decontamination unit. Sometimes these narrow exercises are referred to as "drills," but if the primary purpose is evaluation rather than training, the term should be qualified as an "evaluative drill." This avoids confusion with a "training drill," which has a different purpose and construct.

- **Full-scale:** A scenario-based extension of a functional exercise to include all or a combination of functions and complex activities of the EOP. It is typically conducted under high levels of stress and very real-time constraints of an actual incident. Interaction across all functions by the players decreases the artificial (oral) injects by controllers and makes the overall scenario much more realistic. Because of this, the full-scale exercise is a more comprehensive evaluation/validation of the EOP and its policies and procedures in the context of emergency conditions.

- In summary: Education, training, drill, and exercise activities must be based upon observable objectives specific to the purpose of each independent activity and follow a sequential order of complexity and purpose. Further, the overall program that develops and conducts these activities should do so using strategic planning that assures that all facets of emergency response and recovery are covered in a

balanced fashion, and that preparedness, evaluation, and improvement are comprehensive.

The Central Role of "Competencies" in Guiding Instructional and Evaluative Activities

Competencies (see terminology textbox) and their importance to emergency management are presented extensively in Unit 2.

> **Terminology alert!**
>
> ***Competency***: A specific knowledge element, skill, and/or ability that is objective and measurable (i.e., demonstrable) on the job. It is required for effective performance within the context of a job's responsibilities, which achieves the objectives of the organization.

Competencies provide the necessary knowledge, skills, and abilities that instructional activities provide and that evaluative activities measure.

- <u>Competencies and their use in emergency management.</u> <u>Competencies in summary</u>: Simply put, competencies are an objective description of the knowledge, skills, and abilities an individual must perform in a position or a functional role so that their actions contribute to organizational success.

    ○ <u>Competencies as a common denominator</u>: Competencies, if properly constructed, become a "common denominator" that ties together the EOP, instruction, evaluation, and organizational learning. Competencies provide clear guidance for instructional design (see Lesson 4.2.2), clear metrics to measure performance against during exercise evaluation (see Lesson 4.2.3), and an effective method for implementing change in performance that can directly re-shape instructional courses. Use of competencies, therefore, can simplify administrative tasks within EM program management and promote more consistency and efficiency across the EOP and Recovery Plan elements.

    ○ <u>Competencies and position qualifications</u>: Competencies are important in describing a job or position qualifications because they consistently align the objectives (i.e., desired outputs) of individual and team jobs/responsibilities with the overall goals and objectives of the organization. In this manner, the organizational mission and objectives are achieved through effective individual and team performance.

The VHA Emergency Response and Recovery competencies are grouped into primary and supporting competencies. The primary competencies can serve as valuable metrics during real or proxy events. The supporting competencies can directly translate into objectives and metrics for instructional activities (phase 2 of the ISD process).

- Since emergency management in healthcare systems is not the primary organizational mission, emergency response and recovery competencies are the most effective tool for assuring that the knowledge, skill, and abilities for response and recovery are clearly defined and understandable.

- If a response and recovery system has been well described and delineated, then competencies and their associated proficiency levels are valuable tools for system implementation and evaluation. For example, well- described competencies can translate to specific learning objectives for specific instructional activities.

- To be fully described and yet easily understood, a competency may best be written as a "primary" competency with "supporting" competencies that describe the knowledge, skills, and abilities needed to demonstrate the performance of the primary competency within the job context. See Textbox 4.2.1.3 below for an example.

Textbox 4.2.1.3

**Primary and Supporting Competencies:
An Example**

A core All Employee competency (AEC)[6] is presented to illustrate a competency structure that is useful for ISD purposes.

Primary (Core) Competency

AEC -1: Utilize general Incident Command System (ICS)/Incident Management System (IMS) principles during incident response and recovery.

Required mastery of this primary competency is at the Operations level.

Supporting Competencies

Knowledge

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[6] Barbera, J.A.; Macintyre, A.G.; Shaw, G.L.; Seefried, V.; Westerman, L.; DeCosmo, S. *VHA-EMA Emergency Response and Recovery Competencies: Competency Survey, Analysis, and Report,* available at www.gwu.edu/~icdrm, accessed January 26, 2005.

AEC-1.1: Describe ICS/IMS as an emergency response and recovery operating system and its application to VHA healthcare facility incident response and recovery, management structure, concept of operations, and planning cycle.

AEC-1.2: Describe your potential role(s) and responsibilities within the healthcare facility response and recovery in terms of ICS/IMS principles.

AEC-1.3: Describe the ICS/IMS – delineated expectations of individual responders in relation to the healthcare facility response and recovery to include: attendance at briefings, reporting requirements, and the use of role-related documents, such as Job Action Sheets.

Skills

AEC-1.4: Demonstrate an operations level of proficiency in ICS/IMS principles by utilizing appropriate forms, attending indicated meetings, and adhering to appropriate reporting requirements.

A Systems-based Approach to Instructional and Exercise Activities

As with all other aspects of EM programs, the development and conduct of instructional activities and exercises should be accomplished in a consistent, systems-based manner. As described in the systems approach to Emergency Management presented in Unit 1, common elements and templates are used to promote consistency, effectiveness, and efficiency across instructional and evaluative activities.

- Maintaining common elements in instruction, evaluation, and improvement: Instructional activity, exercise, and system improvements are commonly not tightly coordinated within most emergency management programs. A primary reason for this is that it has been difficult to directly relate the three activities using common elements. As noted above, the use of competencies in these program activities and the use of consistent processes and templates to develop and conduct the activities will provide a coordination mechanism.

ISD is consistent with a systems approach and provides structured methods for the development, conduct, and evaluation of instructional and evaluative activities.

- <u>Instructional Systems Development (ISD) process</u>:[7] ISD presents an organized template strategy that incorporates organizational objectives, competencies, and other critical design considerations into the instructional development process. It is addressed in great detail in Lesson 4.2.2.

  ○ <u>ISD effectiveness</u>: ISD is currently the most widely accepted strategic template related to professional instructional activity. Also referred to by DoD and others as a "Systems Approach to Training" (SAT),[8] extensive experience with ISD across many professional disciplines has demonstrated its effectiveness.

  ○ <u>ISD phases</u>: ISD is a multi-phase, iterative process for the development and conduct of instructional activities. The defined phases are: Analysis, Design, Development, Implementation, and Evaluation. The foundation of the ISD process, the analysis phase, prompts the generation of competencies if they are absent (or confirms them if they have been already developed). The follow-on phases of design, development, implementation, and evaluation are competency-based.

  ○ <u>ISD & exercise</u>: The principles of ISD may **also** be applied effectively to exercise planning, development, execution, assessment, and revisions to future exercises and for the overall exercise program. This is addressed in Lesson 4.2.3.

  ○ <u>ISD & evaluation</u>: While ISD incorporates an assessment component, this evaluation is focused upon the **instructional activities and exercises themselves** and can be considered a component of preparedness planning evaluation. The evaluation of the exercised EOP and its elements in relationship to response and recovery effectiveness is addressed extensively within the system evaluation discussion in Lesson 4.2.4.

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[7] ISD is also referred to as "Instructional System Design" but the use of the term "Development" generally refers to a more comprehensive process.
8 U.S. Marine Corps Combat Development Command. *Systems Approach to Training (SAT) Manual*. (2004). Quantico, Virginia.

Lesson 4.2.2 Developing and Conducting Education, Training, and Drills

Lesson objectives

- *Describe the characteristics of the Instructional Systems Development (ISD) process that make it an effective strategy for EOP implementation and maintenance.*
- *List the different steps (phases) and considerations for the development of education, training, and drills using the ISD process.*
- *Explain the importance of evaluation in the ISD process and describe the different types or "levels" of evaluation.*
- *Describe considerations in developing strategic planning for an EM program instructional activities to accomplish preparedness.*
- *Explain the application and incorporation of competencies and competency proficiency levels to education, training, and drills.*
- *Describe the different types of instructional categories and how they relate to competencies.*

Introduction

Education, training, and drills are inter-related concepts that assist with the implementation and maintenance of any system. This lesson focuses on designing, developing, and conducting each type of instructional activity and then discusses the strategic planning necessary for an overall instructional program.

Developing and Conducting Education, Training, and Drills

- The implementation and maintenance of a functional EOP requires an effective instructional program and quality instruction. This supports organizational, facility, and community-level missions, goals, and objectives. Every employee plays a role in emergency response and recovery operations and should receive the commensurate level of instruction, practice, and feedback to meet that assigned role.

- Before assuming that the etiology for an identified performance deficiency is a training issue, an in-depth performance analysis should be undertaken. This should determine whether training is actually the problem, and, therefore, whether instructional change is the most effective solution (see Textbox 4.2.2.1).

- Instructional System Development (ISD), as discussed in the preceding lesson, is the systems approach most widely used in developing instructional material and is presented here.

Adequate instructional activities are essential to EOP implementation and maintenance. They should receive the commensurate level of attention.
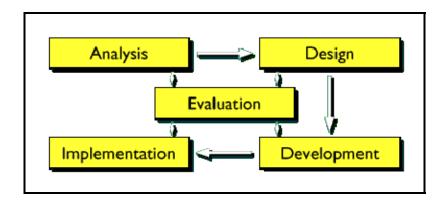
The ISD Process for a Systems Approach to Training, Education, and Drills

- <u>Professionalism</u>: Although it may appear that training, education, and drills are relatively simple to develop, conduct, and evaluate, these activities should be undertaken in a focused and careful manner:

  ○ Extensive effort and experience is required to develop and conduct **quality** instructional activity.

  ○ As emphasized throughout this text, instructional activities must be addressed in a systematic manner for an emergency management program to be optimally effective:

    ▪ The multiple instructional courses should be coordinated according to a strategic plan that addresses consistency and comprehensive coverage of emergency response and recovery competencies.

    ▪ Instructional activities must be based upon the system that will be used for that organization. This precludes, in most instances, the use of "off the shelf" or generic instructional activities from many vendors.

    ▪ Adult education and other valid educational principles should be applied across all of these activities.

    ▪ Evaluation of each activity should be conducted consistently.

- <u>Consistency</u>: As discussed in the preceding lesson, ISD is a widely used systems approach to instruction that promotes consistency through an organized, step-wise incorporation of the appropriate considerations.

- <u>Extensively accepted</u>: ISD as a process was developed at Florida State University in the mid-1970s, under the sponsorship of the Department of Defense, for the purpose of providing effective and efficient job specific training and education to service members. Over the past 30 years, ISD has been widely adapted throughout the

military services, the private sector, all levels of government, and the not-for-profit sector.[9]

- ISD as a stand-alone program: ISD was originally constructed on the premise that it was a central, defining template for any organization developing systems material. In other words, ISD assumes that other components of a program (e.g. carefully described system description, competency development, hazard vulnerability analysis) do not exist for the organization to any satisfactory degree prior to the initiation of the ISD process (i.e., development of instructional material). ISD therefore appears to exist in isolation from the other programmatic functions, some of which occur before instructional activities in this text. For example, ISD depicts the development of competencies during its "Analysis" phase, whereas good EM programs develop these prior to creating instructional materials. In the presentation of ISD below, these variances are noted and program products (such as the competencies) are inserted into the appropriate step of ISD.

- The phases of ISD: The following diagram (Exhibit 4.2.2.1) depicts the phases of the ISD process and the inter-relationships of the ISD phases. The "evaluation" focus throughout the ISD phases is emphasized by its central location and connection to each phase. ISD is not a linear set of steps, but an iterative process that is responsive to changing conditions and new information. A brief description of each phase follows the ISD diagram.

    Exhibit 4.2.2.1. The phases of the Instructional Systems Development (ISD) model.

    ○ **Analysis:** The systems approach to instructional design begins with a sound analysis. The objectives of the instructional activity

The central role of evaluation in the ISD process applies to assessment of the instructional activity itself, not the overall EOP.

Analysis, the first phase of the ISD process, examines the context and the constraints for the instructional activity before delineating objectives.

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9 University of North Carolina School of Education Website. *Instructional Systems Development – About*, available at: http://www.soe.unc.edu/ISD/About/about.html, accessed July 22, 2005.

can then be established and the performance requirements of the individuals and group receiving instruction can be delineated.

▪ <u>Analyze the organization</u>: Before addressing the objectives and job-specific requirements for the instruction, the analysis focuses on the organization: its mission, structure, size and complexity, management and decision-making methods, the characteristics of the workforce, and the products and services it provides under all conditions. Additionally, analysis of constraints placed upon the organization should include an assessment of the availability of resources (funding, time, and personnel); the commitment of leadership, communication channels, union/labor rules; as well as other organizational factors that have the potential to influence the development and conduct of instructional activity.[10] In an effective EM program, much of this will be clearly delineated before embarking upon ISD for instructional development.

▪ <u>Analyze the issues the instruction will address</u>: The organizational and constraint analysis (above) establishes the context for the instructional program. Analysis next focuses on the individuals and teams to determine:

  ❑ A definition of the issue or problem to be resolved by the instruction (e.g., the gap between current capabilities and desired job-related performance, the maintenance of particular education or skills, or others).

  ❑ A description of causes and solutions to the defined problem/s: **It is important to determine that the deficiency is an education or training gap, rather than another issue such as a system design flaw, a motivational challenge, or other problem** (see Textbox 4.2.2.2 below).

  ❑ A "job/task analysis" to identify exactly what individuals and teams must be able to do, and to the designated level of proficiency, to meet the **requirements** of the job. In most instances, the identification and validation of individual and group competencies (and their indicated levels of proficiency) serve as the "job/task analysis." Well-described position descriptions and position qualifications (using

The job/task analysis (a part of ISD phase one) is obviated in well-run EM programs if competencies, position descriptions, and position qualifications have already been described.

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[10] University of North Carolina School of Education Website. I*nstructional Systems Development - About.* http://www.soe.unc.edu/ISD/Modules/Analysis/analysis.html, accessed July 22, 2005.

competencies) within the EOP obviate the need for a job/task analysis. See Textbox 4.2.1.3 for an example competency.

Textbox 4.2.2.2

Performance Analysis and Training

In many instances, training is accepted as the default solution to individual and team-level performance gaps or deficiencies. Careful examination, however, may demonstrate that the actual issue is a design flaw, poor motivation in performers, or some other factor. This should be accomplished through a **performance analysis** (see HPT example below).

Training may in fact be the correct solution, particularly when new policies, procedures, or equipment are introduced, or when an individual or team is assigned new or additional responsibilities.

Motivation may be a controlling factor, particularly when rigid training is provided under mandate from an authoritative outside source, such as the Occupational Safety and Health Administration (OSHA), and participants do not see the relevance to their performance.

Training without adequate analysis and validation may be misguided, a wasteful use of limited resources, and may not resolve the targeted performance problem (see HPT sidebar).

Human Performance Technology (HPT): An Example Approach to Performance Analysis

Human Performance Technology[11] (HPT) is a systematic approach embraced by myriad organizations, notably the Department of Defense and the U.S. Coast Guard, to promote and support effective and efficient individual and team level performance within the context of the overall organizational goals and missions and the many relevant sub-systems. The goal of HPT is to properly identify and define performance problems/gaps and to select and apply the appropriate intervention(s) (training and non-training) that develop and maintain the desired level of performance. Training may be, and often is, the appropriate solution; however, HPT recognizes that there are other influences on performance including:

A common tendency is to assume performance deficiencies are a direct result of inadequate instructional activities. The use of tools such as HPT can help to identify other critical problems (such as motivational issues) that can impact performance. Emergency Program Managers are urged to consider these other factors when evaluating performance.

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[11] U.S. Coast Guard. *Standard Operating Procedures (SOP) for the Coast Guard's Training System*. Volume 2–Analysis (2004). Coast Guard Headquarters. Washington, D.C.

- Personnel selection
- Personal capabilities
- Personal motivation
- Organizational motivation (incentives and rewards)
- Organizational guidance (unclear goals, objectives, policies, procedures)
- Lack of appropriate equipment, supplies, etc.
- Lack of support by leaders and/or co-workers.

HPT as a process mirrors and supports the ISD process and is based on sound organizational, constraint, and performance analyses. If personal, organizational, resource, or environmental obstacles stand in the way of individual and team performance, those obstacles must be identified and removed if training is to effectively achieve response objectives. In fact, addressing these obstacles may obviate the need for additional training. Alternatively stated, if you ask a person if they could do something "if their life depended upon it" (i.e., extreme motivation applied), and the answer is "yes," the problem is probably not training-based and training will not resolve the performance issue. Instead, other obstacles to adequate performance (motivation, cumbersome process design, interpersonal conflict, etc.) must be identified and corrected.

- Identifying mandates: In some cases, the analysis process in ISD is significantly affected by mandates that delineate legal and/or regulatory compliance and accreditation standards. These standards may need to be incorporated into the instruction and so may be treated in a similar manner to competencies For example:

  - The Occupational Safety and Health Administration (OSHA) standards as set forth in the Occupational Safety and Health Act[12] establish instructional requirements for all employees regularly working with a defined level and type of hazardous materials.

  - The Joint Commission on Accreditation of Healthcare Organizations (JCAHO)[13] establishes healthcare facility standards, including ones related to performance during emergency situations. These convey specific instructional

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[12] U.S. Department of Labor, Office of Compliance Assistance Policy, information available at: http://www.dol.gov/compliance/laws/comp-osha.htm, accessed May 15, 2006.

[13] Joint Commission on Accreditation of Healthcare Organizations Website: http://www.jcaho.org/, accessed April 27, 2006.

and exercise requirements for healthcare workers.

- ▪ <u>Analyzing mandates</u>: Mandated training requirements constitute an important component of analysis, since how they are most efficiently and effectively met may vary across organizations and individual facilities. Examples include:

  - ❑ Many regulations require a specific number of "training" hours for staff members. The training opportunities should be carefully evaluated to optimize cost-effectiveness. For example, HAZWOPER delineates specific time requirements for the instruction provided to staff preparing to wear PPE during the response to hazardous materials incidents.[14] For healthcare system preparedness, the time spent providing education and training as well as the time spent "drilling" the EOP decontamination function may be included as PPE "training hours," as long as direct supervision by competent instructors is provided over the PPE-equipped personnel.

  - ❑ "Refresher training" mandated by some regulatory standards (such as the U.S. Occupation Safety and Health Administration) may also be met in part through "demonstration of competencies" rather than only by a specific amount of training time.[15]

- ▪ <u>Incorporating mandates</u>: Mandated factors must be accounted for in the remaining steps of ISD (beyond analysis) to ensure that they are translated into learning objectives and that the instructional activities meet the mandates while fully supporting the EM program.

- ○ ***Design***: Planning the instructional activity occurs during the design phase of ISD.

  - ▪ <u>Learning objectives</u>: Using the results of the ISD analysis phase, instructional requirements and outcomes are translated into goals and learning objectives (see terminology textbox) upon which instruction is designed.

Design, the second ISD phase, includes the development of objectives of the instructional activity.

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[14] U.S. Department of Labor, Regulations (Standards - 29 CFR) *Hazardous Waste Operations and Emergency Response. - 1910.120.* Information available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765, accessed November 7, 2005.

[15] OSHA/DoL. *Training Curriculum Guidelines - (Non-mandatory) - 1910.120 App E*, available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9770, accessed May22, 2006.

- Writing learning objectives: These should be developed directly from the competencies and mandates captured during analysis and should be cross-walked with them to be sure all are incorporated. See "Writing SMART Objectives" in Textbox 2.1.2.1.

Terminology alert!

Learning objective: A precise statement describing what the student is to be capable of demonstrating, under the specified conditions, upon successful completion of the instruction. In competency-based instruction, learning objectives should clearly and concisely describe the relevant competencies a student should be capable of performing after successful completion of the instructional experience.

- Selecting instructional methods: The ISD design phase then addresses the matching of instructional methods to the intended audience and the selection of instructional media, materials, and methods of evaluation. An essential component of this instructional design is incorporating characteristics of adult learners (see Textbox 4.2.2.2).

Design also includes the selection of the methods, materials, and media for the instructional activity.

Textbox 4.2.2.2

Adult Learning

Academic literature examining adult learning generally supports the position that adults should be taught differently than children and adolescents and that their instructional activities should not be passive. [16] The following characteristics of adult learners should be carefully considered in all phases of the ISD process:[17]

- Adults prefer self-direction.
- Adults have experience that should be used and built upon.
- Adults' readiness to learn depends upon their needs.
- Adults' orientation to learning is life- or problem- centered.
- Adults often learn best in small groups.

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[16] *Systems Approach to Training (SAT) Manual.* Section 6000. U.S. Marine Corps Combat Development Command. (2004). Quantico, Virginia.
[17] *Systems Approach to Training (SAT) Manual.* Section 6200 (2004). U.S. Marine Corps Combat Development Command. Quantico, Virginia.

▪ Adults need a supporting and challenging environment.

An in-depth description of these characteristics is beyond the intent and scope of this document. Professional instructional developers should have an appreciation of these characteristics and properly include them in the ISD process.

○ **Development** – The development phase of ISD translates design into actual instructional strategies and materials for instructors and students. Evaluation methods, tools, and standards are further defined. Again, the characteristics of adult learners must be incorporated into the instructional development phase.

   ▪ Instructional development: Specifically, instruction should:

      ❑ Set the context for learning by relating the specific instruction to higher order goals and objectives.

      ❑ Be broken up into logical and manageable segments to facilitate acquisition and mastery of the knowledge and skills and verification that this has occurred.

      ❑ Allow for practice of newly acquired knowledge elements and skills.[18]

○ **Implementation:** The implementation phase of ISD focuses on the details of instructional conduct and includes its actual delivery. Effective and efficient instruction requires a management plan, scheduling, logistical support, and continual monitoring. Regardless of the quality of the analysis, design, and development phases, inadequate implementation can doom the instructional program to failure.

   ▪ Instructor selection: Particular attention should be paid to the qualifications and selection of instructors to deliver instructional material and facilitate the learning process. Beyond possessing subject matter expertise, instructors should understand and apply the principles of adult learning practices and exhibit effective communication skills. Additionally they

Development, the third ISD phase, provides the actual materials and strategies for the instructional activity. This necessarily includes the evaluation methods to be used to assess the effectiveness of the instructional activity.

Implementation, the fourth phase of ISD, focuses on preparation and conduct of the instructional activity.

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[18] Adapted from: *Systems Approach to Training (SAT) Manual*. Section 6400. U.S. Marine Corps Combat Development Command. (2004). Quantico, Virginia.

should possess the skills needed to[19]:

❑ Effectively communicate complex topics in easy-to-understand language.

❑ Assist/facilitate trainees as they work through real-life scenarios while integrating many diverse perspectives into decision-making processes and emergency response and recovery planning and operations.

❑ Motivate trainees from different professional disciplines to work together during emergency response and recovery operations.

○ ***Evaluation***: The term evaluation in ISD applies to both the assessment of the conduct of the instructional activity as well as the outcome of the instruction as it relates to program requirements. The ISD recommendation for assessing the instructional activities includes both Formative and Summative Evaluation (see extensive discussion of these two evaluation categories in System Evaluation, Lesson 4.3.1) and is delineated by four "levels."

■ Formative evaluation in ISD answers the question: "Does the **instructional activity itself** meet the goals and objectives established during the analysis phase in an efficient and effective manner?" This evaluation is generally not highly structured but requires monitoring during each phase of the ISD process to ensure that each successive phase properly reflects the output and intent of the proceeding phases. The intent of this questioning is to recognize areas that are suboptimal and so incorporate improvements.

■ Summative evaluation in ISD answers two questions:

❑ "Do the **instructional outcomes** meet the goals and objectives established during the instructional analysis phase?"

❑ "Are the goals and objectives established during the instructional analysis phase correct and sufficient to meet EM program and EOP requirements?"

Evaluation is conducted throughout the four ISD phases. It applies to assessment of the conduct and content, as well as the outcomes of the instructional activity.

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[19] Adapted from: *Medical Surge Capacity and Capability*. The CNA Corporation. Chapter 8. Implementation, Training, and system Evaluation (2004), available at: http://www.hhs.gov/ophep/mscc_handbook.html, accessed April 14, 2006.

- ISD evaluation may be highly structured and include one or more of the following levels of investigation (see Textbox 4.2.2.3 for full discussion of these levels):[20]

    1. <u>Reaction</u>: Student and instructor satisfaction with the learning experience

    2. <u>Learning</u>: Student mastery of learning objectives

    3. <u>Behavior</u>: Translation of the instructional experience to the job

    4. <u>Results</u>: Match of instruction to organizational goals and objectives.

Textbox 4.2.2.3

<u>The Kirkpatrick Method for Evaluating Training Programs</u>[21]

"Training program evaluation is commonly undertaken in order to determine the effectiveness of training and areas in need of improvement. The "Kirkpatrick method" is promulgated as representing the ISD evaluative approach. The four Kirkpatrick levels represent a sequential method of assessing the desirability of training program outcomes. The delineation of knowledge sets, skills, and attitudes will produce desired behaviors in trainees accomplished through a participatory process that includes management.

Level 1: Reaction measures trainee's satisfaction with the training program. Since negative reactions to training initiatives can derail programs and reduce the motivation to learn, it is important to gauge participant reactions and make programmatic adjustments as necessary. Reaction sheets measuring trainee feedback are the instruments of choice for quantifying reactions. Written comments and suggestions are gathered at each session to ensure a high response rate. Reactions are gauged against set standards, action is taken to correct inadequacies, and changes are communicated.

Level 2: Learning measures the extent to which attitudes change, skills increase, and/or knowledge improves due to the training

The Kirkpatrick Method provides a standardized evaluation method for ISD.

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[20] Kirkpatrick's Levels of Training Evaluation. Kirkpatrick, Donald. *Evaluating Training Programs.* San Francisco, California. Berrett-Koehler. (1994).
[21] Kirkpatrick, D. L. (2000). Evaluating Training Programs: The Four Levels. *The ASTD Handbook of Training Design and Delivery.* Piskurisch, G.; Beckshi, P.; and Hall, B. New York, McGraw-Hill**:** pp. 133-147.

program. Written exams and performance tests are commonly conducted at the conclusion of training to assess learning. Additionally, written pre-tests are commonly administered to allow an accountability measure of the learning achieved by the instructional activity (through comparison of pre- and post-training test results). Program adjustments are made as indicated by evaluation results.

Level 3: Behavior assesses whether or not the training results in positively changed job performance and a transfer of the training concepts to the trainee. Assessing positive change in Levels 3 & 4 is much more complex than in Levels 1 & 2. This demands a high degree of organizational commitment to the stated goals and required outcomes of the training program. In order for changes in behavior on the job to occur, certain conditions must be met. Trainees must have a desire to change and must know what to do and how to do it. If the training program has identified the proper objectives and content, and has achieved high trainee satisfaction levels, these conditions should be met. These behavioral change enablers are directly related to the training program itself.

The next conditions, though, are contingent upon factors in the workplace that trainers cannot readily influence. Behavioral change is dependent on the right work climate and on rewards. Management attitudes can discourage or prevent change, or encourage and require change. These factors that are present in the trainee's work climate are internal to the organization and are often difficult for a trainer to assess. Involving management in training program development and needs assessments can influence the creation of a positive work climate that promotes change. Rewards are internal to the organization and can be intrinsic (praise, satisfaction) or extrinsic (promotion, money). Both types of rewards support changes in employee job behaviors.

Level 4: Results are the final training program outcomes that translate into "increased readiness, improved ability to deliver quality health services, cost control, reduced severity of critical incidents, better responses, etc." The results should be those objectives that prompted the initiation of the training program and they prove that trainees can apply what they learned in the workplace. Evaluating results means that adequate time is allowed for the expected achievements to take hold. Evaluating results is challenging, but an assessment of conditions before the training program is started offers a baseline for comparison later on that can help training professionals clearly delineate ways in which the training program has achieved the desired results." [Exercise may be the most effective way to accomplish Level 4 evaluation of "results" – author

added.]

- ■ <u>ISD evaluation in EM programs</u>: In EM programs, ISD evaluation of each specific instructional activity is commonly focused upon the initial two evaluation levels. Methods therefore include:

  - ❑ <u>Reaction</u>: assessed through surveys and interviews

  - ❑ <u>Learning</u>: the quality as well as degree of learning is assessed through classroom tests and observations of skill performance, drills, and exercises.

- ■ <u>Individual and system performance evaluation</u>: The complete measure of the effectiveness of instruction, however, resides in the third and fourth levels, which focus on the transfer of the instruction to competent job performance and the impact of the instruction on organizational goals and objectives.

  - ❑ Levels 3 and 4 of evaluation extend in time beyond the actual period of instruction and require ongoing monitoring of the workplace and environment.

  - ❑ In the case of EM program and EOP supporting competencies, Level 3 (Behavior) and Level 4 (Results) evaluations are normally accomplished during response and as a component of the After Action Report process for actual emergencies, proxy events, and exercises. Ideally, exercises conducted in a controlled, closely monitored and documented environment provide the means and data for assessing the outcomes of individual and team instruction. These findings can then guide curriculum revision as indicated.

- ■ Evaluation of Levels 3 and 4 can be very complex. As noted at the end of the textbox, evaluation at Levels 3 and 4 may be effectively accomplished through the EM programmatic evaluation process presented in Lesson 4.3.2, and in performance-based evaluation of exercises, proxy events, and actual response, presented in Lesson 4.3.3.

- • <u>In summary</u>, the ISD process provides a reliable framework for systematic instructional analysis, design, development, implementation, and evaluation. It has been an accepted standard for

Comprehensive evaluation of instructional activities must include Kirkpatrick Levels 3 and 4. This necessitates evaluation activities that occur in a continued manner after the instructional activity was conducted (e.g., exercises, proxy events, real responses).

over 30 years and has been widely embraced by the public, private, and not-for-profit sectors.

Healthcare-Specific EM Program: Planning Considerations for Instructional Activities

The following issues are important instructional considerations for healthcare system emergency managers:

Instructional activities cannot be designed in isolation. They must take into account strategies for EOP implementation and the stage of implementation.

- The instructional program for the EM program should address strategic planning:

  ○ Balancing the focus and level of training: Instructional activities should incorporate strategic planning so that the education, training, and drills are designed and developed as a balanced program, with progressively focused and challenging stages. The strategic planning assures that the instructional program covers all necessary knowledge, skills, and abilities at the appropriate levels of proficiency. It also assures that all priority hazards for the organization have been addressed in the instructional activities.

  ○ Defining types of instruction, including refreshers: The instructional program should define the specific types of instruction it provides. This includes not just initial instruction but also planning and administering recurring/refresher training. Strategic planning assures not just that the courses are occurring, but that they are being revised as indicated to incorporate changes in the EOP (see Lesson 4.4.2) or to address improvements identified through the ISD process.

- Levels of proficiency applied to Education, Training, and Drills:

  ○ Designation of "instructional levels": Per the discussion of competencies in Unit 1, specified "levels" are used to designate the proficiency necessary in each competency required by a personnel position. Since all instruction should be competency-based (see Textbox 4.2.2.4 for discussion), the same "level" designators and definitions apply to instruction that is designed to provide proficiency in specified competencies. Education and training sessions should all be designated as one of the following:

    ▪ Awareness level instruction

    ▪ Operational level instruction

- ▪ Expert level instruction.

Textbox 4.2.2.4

Competencies and ISD

As presented in the ISD process description, competencies can be a product of the analysis phase (if not accomplished when developing position qualifications during the system development). Competencies form the basis for the instructional design, development, implementation, and evaluation during any instructional activity.

- If properly identified and written, competencies (qualified by their required level of proficiency) are translatable into learning objectives.

- All instructional learning objectives should be competency-based and specify a level of proficiency that relates to the relevant competencies ("awareness, operations, or expert").

- Since the mastery of competencies generally occurs over a period of time and requires practice and evaluation (usually through evaluative drills and exercises), primary competencies are decomposed into supporting competencies for the purpose of instructional activities and strategies. Each supporting competency provides a critical component of the primary competency, representing a specific knowledge element, skill, or ability that can be translated, during the ISD process, to a learning objective for instructional design.

In this competency example provided in Textbox 4.2.1.3, the **primary competency** can be demonstrated and properly evaluated primarily in ISD (Level 2 and 3 evaluations) during actual response and recovery operations or during an appropriate exercise or proxy event. The **supporting knowledge competencies**, however, can be addressed and evaluated (Level 2 evaluations) through a range of instructional assessment strategies, including individual and group classroom sessions, reading materials, computer-based instruction, coaching, etc. The supporting skill competency can best be demonstrated and evaluated through supervised/evaluated drills that focus on each skill (utilizing forms, attending meetings, adhering to reporting requirements) or combinations of skills.

The proficiency level of the competencies covered in the instruction can be used to categorize the level of the instructional activity.

○ Assigning the appropriate level designation: The predominant proficiency level of the competency(s) that the instructional activity covers should be used to qualify that activity (see Textbox 4.2.2.4). This proficiency designator should always be used when titling the activity (and in presenting the objectives) to convey the performance expectation at the completion of the instruction. An example is "awareness training on the management of chemically contaminated casualties" provided to all personnel after the decontamination system and related procedures have been developed. This is differentiated from the "operational level training on the management of chemically contaminated casualties" that is provided to the decontamination team.

○ Evaluating "outside" training: **When soliciting training proposals from outside training vendors, the desired proficiency levels for instructional activities should be carefully defined in the solicitation.** Proposed vendor products should be evaluated to assure the indicated level of instruction is indeed provided. If the instruction is billed as "operational level" instruction, it should mean the graduates of the training are operationally proficient on the systems that the healthcare organization uses for the activity, not just what the vendor uses during training. In this manner, vendors can be held accountable to achieve the expected level of performance in successfully trained participants.

• Expert-level instruction considerations:

Instructional activities that are designed to impart an expert level of proficiency can be harder to develop and implement. Students must already possess operational proficiencies and, ideally, have response and recovery experience.

○ Definition: Expert-level proficiency (see terminology textbox in Lesson 1.1.3) infers that the individual already has the ability to perform at the operational level and, **in addition**, **can use expert judgment to make decisions beyond the clearly defined decision guidelines for a specific competency or position responsibility** (see "expert judgment" in Lesson 4.3.2). For example, the ability to modify patient triage guidelines during response to a very unusual hazard agent (such as hydrofluoric acid) may be considered an expert level of proficiency in patient care.

○ Operational-level proficiency as a baseline: Students should ideally already be experienced in operational-level emergency response and recovery.

○ Complexity of expert-level instruction: Expert-level instruction is generally more complex and effort-intensive than lower proficiency courses. This is sometimes accomplished using scenario-based

discussion, where participants develop expert judgment by working through complex decision making with an expert mentor. Expert-level instruction may also be accomplished through mentoring during activities requiring expert judgment. For example, during exercises, mentoring and "coaching" of specific personnel during exercise play may provide this instruction, but the mentor must assure that this "training" does not compromise the overall evaluative purpose of the exercise.

- Instruction-related certification, qualifications, and record keeping:

  ○ Certification indicates qualifications: Position qualifications are discussed in Lesson 2.1.1, and most are directly related to competencies. Some of these qualifications are related to specific education and/or training, and these are commonly documented through a **certification** process.

  ○ Range of formality: Certifications may be very formal and prescriptive, with some mandated by local, State, Federal regulations or professional disciplines. Others may be less formal and primarily a method for emergency program managers to track the maintenance of competencies by system personnel.

  ○ Demonstration of performance qualifications: Certification of successful education and/or training generally requires a distinct evaluation of the student within or after the instructional session. The student should successfully demonstrate the indicated mastery (i.e., level of proficiency) of the curriculum's learning objectives. These evaluations should be largely performance-based, in contrast to traditional methods limited to primarily a written test. For example, appropriately filling out a relevant ICS form provides more predictive value of performance than answering one or two questions about the form on a post-test.

  ○ Certification and learning objectives: Since the learning objectives in the instructional curriculum are derived from underlying competencies, "certification" is assumed to indicate that an individual possesses the competencies upon which the specific instruction was developed. As noted in the preceding section on instructional design, the certification should indicate a level of proficiency designated for each competency. This emphasizes the importance of attending to detail when developing learning objectives from the pertinent competencies.

  ○ Certification interval: Most certifications are for a designated time interval, after which the certified individual may "re-certify." This is

'Certification' documents successful completion of an instructional activity and is important in verifying personnel qualifications. They do not necessarily provide evidence of 'behavior' change or 'results' as described by Kirkpatrick.

Certifications can also help with overall instructional strategy (tracking of personnel instruction, maintenance of personnel instruction, etc.).

usually accomplished by demonstrating, through evaluation, that the individual has maintained the indicated knowledge, skills, and abilities.

○ Strategic planning and certification: When conducting strategic planning for EM program instruction, the required and expected certifications, their duration, their recertification methods, and the emergency response and recovery positions needing certification should all be considered. Number and timing of instructional courses, recruitment of participants, and tracking of active certifications should all be incorporated into the strategic plan at this time.

○ Maintaining certification records: Record keeping of each instructional activity and the "trained" individuals (sorted by the certification interval) should be functionally oriented. This assists with efficient development and evaluation of the strategic instructional plan (see Lesson 4.3.2) and in developing any follow-on instructional activity. Record keeping must also meet the legal requirements of applicable laws, regulations, and the organization's legal risk managers.

• Categories commonly used in describing instruction: Descriptive categories may present a relationship between the instructional objectives of courses in the category and the organization's instructional strategic planning. In other words, having instructional categories can be helpful in shaping the instructional strategic planning that must be done during EM program preparedness (see Lesson 1.5.1).

○ Designation of categories: All instructional initiatives should be cataloged in a manner consistent with the defined strategic approach (progression in skills proficiency, maintenance of competencies, appropriate balance across EOP functions and elements, etc.) incorporated into the instructional strategic plan. In addition to the competency-related instructional levels described earlier, instructional categories may be designated as:

■ General orientation to the hospital EOP: These should be designed and provided to every new employee and hospital staff member as a component of his or her employment orientation (hospital orientation for temporary employees and for resident physicians, and so on, rotating through a facility). A small laminated pocket card, often referred to as a job aid, may be helpful for providing a reminder of key concepts and actions to be taken should the EOP be activated. The knowledge

Instructional activities should support a progression of knowledge and skills obtainment. The use of "categories" can aid this instructional strategy.

elements (to an operational level of proficiency) of the All Employee competencies can be addressed during these general orientation sessions. This would, therefore, be a type of **education.**

- <u>Instruction for job groups, or specific EOP functions</u>: Personnel within the organization may be grouped according to common competencies for the purpose of designing and conducting training and education. Major job groups defined earlier in this text (Lesson 1.1.3) include Facility Leaders, Patient Care Providers, and Emergency Program Managers, Clinical Support Personnel, and Non-clinical Support Personnel. More focused instruction may be provided to narrower target audiences (i.e., specific functions such as Finance/Administration or to more specific groups such as personnel filling security position). The knowledge, skills, and abilities taught should cover the designated levels of proficiency of primary competencies and, as much as possible, the supporting competencies as well. The appropriate section(s) of the EOP along with the position-specific operational checklist (also called Job Action Sheet) may serve as valuable training aids to support this instruction. Certification based upon post-course evaluation can be used to track "competent" personnel.

- <u>In-service and other refresher instruction</u>: This is designed to maintain the requisite knowledge, skills, and abilities. Evaluation after completion of these activities provides an opportunity to certify that these components of competencies are being adequately maintained (i.e., "re-certification").

- <u>Skills training</u>**:** This includes supervised and unsupervised practice, and allows trainees to learn, master, and maintain targeted skills under actual or simulated conditions. This is accomplished in a relatively non-threatening environment supported by guidance and feedback to assist in the mastery process. An example might be training on the use of two-way radios for response.

- <u>Knowledge-focused instruction</u>: This reading, computer-based, or classroom presentation supports skills attainment but, by itself, is primarily an educational activity and is generally not sufficient to attain operational proficiency for the actual skill.

- <u>Full-spectrum instruction</u>: This is an approach that incorporates education modules, skills training, and follow-on drills into a single training curriculum that can effectively provide specific

Full-spectrum instruction includes the impartation of knowledge (education) and skills (training), with drills to complete the skills training. Both evaluation <u>of the students</u> and evaluation of the instructional activity are important.

instruction for very complex competencies. Full-spectrum instruction combines both education and training as defined in this text, and presents each appropriately. Performance-based evaluation of participants who successfully complete the instructional phase of this training provides a basis for validating individual and team capabilities, as well as assessment of components of the EM program and EOP. Examples of this type of instructional activity include:

❑ The ACLS course (see Textbox 4.2.2.5) is a well-known example that provides both knowledge and skills in a balanced format. In addition, students practice series of skills through "drills." Evaluation is accomplished through a multiple-choice test and performance in a scenario-driven skill session. This type of evaluation is common for nationally distributed instructional courses with large student-to-instructor ratios.

❑ The Medical Team Training Course from the FEMA Urban Search & Rescue Response System is a successful emergency response course also based upon this model.[22] Individual and team performance is evaluated during a 4-hour follow-on exercise at the conclusion of the course.

❑ A hospital emergency response example is operational-level training for the hospital decontamination team. This commonly includes education (presentations on chemical hazards, principles behind personal protection, and other information), skills training, (donning and doffing personal protective equipment [PPE], proper washing of incapacitated victims, and others), and drills (scripted scenarios) where the learned skills and knowledge (such as recognizing an incident, mobilizing the DECON team and area, receiving and decontaminating victims) are practiced and demonstrated. These may be categorized as instructional if the drill is primarily for training purposes. Alternatively, it may be an "evaluative" drill if the primary purpose is to assess individual and/or team performance in the drill scenario.

This type of training is consistent with optimal adult education principles and tends to be more palatable for healthcare system personnel than the more common lecture/slide series training,

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[22] *The US&R Medical Team Training Course* (also called Medical Specialist Course by FEMA) has an outline and modules available at http://www.fema.gov/usr/medmanual.shtm, accessed December 9, 2005.

which essentially provides one-way flow of information.

Textbox 4.2.2.5

Instructional Course Integrating Education, Training, and Drills

Integrated instruction is widely used in clinical courses teaching complex medical knowledge, skills, and abilities. Perhaps one of the longest and best recognized of these examples is the American Heart Association's "Advanced Cardiac Life Support© (ACLS)" course.[23] The format template from this widely taught curriculum has been applied in many "Life Support" courses taught by other disciplines.

Its format includes:
- Lectures providing the medical knowledge to manage cardiopulmonary emergencies
- Skill stations teaching life-support skills, such as airway intubation
- The drill station "Megacode," which provides an evaluative drill where knowledge, skills, and ability conveyed earlier in the course must be applied to successfully manage the scenario-prompted patient assessment and appropriate interventions, which is presented under simulated stress of an actual emergency.

Successful completion of the course is determined by a written post-test and by the performance evaluation from the Megacode experience.

○ "Train-the-trainer" instruction: This type of instruction faces the same difficulties described earlier in the "expert-level instruction." Successful strategies for training instructors include carefully selecting participants, providing a series of expert-level instruction sessions, and maximizing response experience through exercises and actual incidents. The new "trainers" then teach the material with proctors providing formative evaluations (see Lesson 4.2.1). This is an important issue for the emergency program manager, and is a critical factor to developing a full-spectrum "in-house" instructional program.

"Train the trainer" is an important type of instructional activity that promotes maintenance of the EOP. This type of instruction can be difficult to adequately conduct and success is, in part, contingent upon selection of appropriate "students."

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[23] *Advanced Cardiac Life Support Course*; a description is available from the American Heart Association at http://www.americanheart.org/presenter.jhtml?identifier=3011972, accessed December 1, 2005.

- Non-traditional instructional methods: Some considerations that enhance any specific instructional activities include:

  ○ Scenarios: Scripted scenarios may be used, as in tabletop exercises, but with props that promote realism (model "disaster towns," slide presentations, video injects, etc.).

  ○ Training caches: Instructional designers should consider the acquisition and maintenance of separate (but similar) response supplies for instructional activities. The use of this "training cache" for instruction will promote familiarization with the specific equipment and supplies without impacting true operational readiness.

  ○ Simulations: With very little effort, instructional designers can add characteristics to instructional activities that prompt realistic "play" during training and drills. Examples include the use of simulants (e.g., safe alternatives that simulate the physical presence of hazardous contaminants), time pressure, noise, aggravated "patients," and other prompts. These can also be employed during exercises.

  ○ Maximizing instructional opportunities: Emergency Managers may find that instruction provided in unconventional settings may be useful. For example, instructional material related to the EOP can be provided through "regular" channels and activities of the organization. Examples include: writing a column in the organization's newsletters, adding emergency response training material into training for everyday practices, and staffing an emergency response training booth at employee fairs to distribute informational pamphlets and recruit responders.

  ○ Branding the EM program effort: Emergency program managers may consider activities that create and maintain interest/motivation in the EM program. For example, publicizing EM program activities and positive outcomes may be an effective method to provide recognition for involved personnel. Bringing in known outside authorities (senior EMS or fire official, the local emergency manager or political leader, and others) as exercise observers or to speak at meetings and "recognize" the organization's emergency preparedness efforts may promote interest and understanding. Finally, simple but captivating slogans can be used to reflect activities, as long as they are professional and EM/ICS consistent.

- In-house versus vendor-supplied ("outside") instruction:

  ○ Achieving operational proficiency: Operational-level instruction implies that the personnel are "operationally proficient" **on their own response and recovery systems** ("demonstrable on the job" means on "their" job). This can be difficult for outside vendors to accomplish with **their** equipment, facilities, and lack of understanding of the organization's EOP.

  ○ Benefits of in-house instruction: While difficult to initially develop, in-house instruction may, in the end, be much less expensive and more efficient. Examples of benefits include:

    ▪ Since the instructional activity is conducted by the organization's personnel, it will incorporate the inherent characteristics of the organization's architecture, politics, traditions, and other important factors (both for response and during preparedness).

    ▪ As the instructional activity is "owned" by the organization, methods in scheduling instruction and maintaining competencies may be configured to maximize participation while limiting the expense of overtime compensation and additional staffing.

    ▪ An in-house "training cache" is owned by the organization and therefore likely to be consistent with equipment (brand, type, how it is stored) to be used during actual response. **There is little value in providing instructional activities that use vendor supplied equipment, if that equipment is unavailable to the organization during actual response**. Unfortunately, this is currently a common phenomenon in government-provided training initiatives.

    ▪ Developing and maintaining in-house instructional programs promotes the development of "resident experts" – personnel within the organization who develop an expert level of proficiency across a wide range of EM program and response/recovery competencies. This provides immense value during all EM program activities and may be especially valuable during emergency response.

  ○ Managing vendor-provided "in-service" instruction: When an organization is purchasing specific products, the vendor's instructional material and training sessions for the equipment or

Though significant effort is required to develop "in-house" instruction, it has many advantages over vendor-supplied instruction.

supplies are commonly presented as "in-service" training. Vendor-supplied in-services may be valuable instructional opportunities, but generally are not equivalent to stand-alone, operational-level instruction. An adequate instructional activity would include healthcare system orientation (taught by hospital personnel) as to the pertinent EOP context where the products will be used, where it is stored, and the strengths/limitations of the product in relation to emergency response and recovery operations. This information is not likely to be provided by vendors (especially limitations of the equipment) and so should be presented by appropriate in-house personnel.

"In-house" instructional activity is promoted by many regulatory agencies.

○ <u>Regulations and in-house instruction</u>: Regulatory agencies allow and even encourage hospitals to design, develop, and implement in-house instructional activities. In the recent past, regulatory agencies and accreditation bodies have taken a more proactive stance in assisting hospitals with this guidance (see examples in Textbox 4.2.2.6).

Textbox 4.2.2.6

Guidance by Regulators: Example

▪ The Occupational Safety and Health Administration (OSHA) guidance for hospitals, for example, is provided through a widely available informational booklet:
- OSHA 3152. "Hospitals and Community Emergency Response - What You Need to Know," 1997. Emergency Response Safety Series, U.S. Department of Labor Occupational Safety and Health Administration. Available at: http://www.osha-slc.gov/. OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances. Available at: http://www.osha.gov/dts/osta/bestpractices/html/hospital_firstreceivers.html. This publication was the focus document in a joint OSHA/JCAHO seminar held in Washington D.C. in October 2005.

○ <u>Cost-effectiveness of in-house instruction</u>: The initial instructional analysis, design, and development are effort-intensive and may require internal and/or outside expert consultation. This effort, however, results in tailored, more effective instruction that is specific to the healthcare facility and it's EOP. Availability is under healthcare system control, and the follow-on instructional sessions are much less expensive to conduct. This approach, therefore,

may be the most cost-effective method for developing, evaluating, and maintaining the knowledge and technical skill levels of hospital personnel working individually or in teams.

○ <u>Templates and instruction</u>: Adherence to the ISD process from analysis to implementation and evaluation will promote the development of an effective and efficient training program. This can maximize the potential for successful training that meets personal, organizational, community, and system-wide goals and objectives.

A Template Summary of the ISD Approach

For each new or "under revision" instructional activity:

- Analyze

  ○ Review relevant personnel assignments to EOP positions of responsibility and/or authority.

  ○ Review the EOP (including annexes, appendices, service plans, and job aids) to identify job groups, individual jobs, and related competencies that need to be covered.

  ○ Review the HVA to identify priorities across hazards, and risk elements common to multiple hazards, that should be addressed by the proposed instruction.

  ○ Review evaluations from prior relevant instruction, relevant exercise, and incident-related After Action Reports. Include other system evaluations, together with relevant organizational recommendations for improvement.

  ○ Review regulatory requirements (e.g., JCAHO, OSHA) impacting training content, length, and frequency.

  ○ Review constraints (budgetary and others).

  ○ Review inter-organizational agreements and requirements.

  ○ Establish realistic and achievable overall education and training objectives for the activity that supports the results of the above reviews and best contributes to the continuous improvement of the EM program and EOP.

A template of the ISD process applied to the healthcare facility EM program is provided for the reader's consideration.

- Design

  ○ Determine the boundary conditions for conducting the instructional activity (based upon availability of resources and personnel, willingness and availability of other organizations to participate, regulatory guidance, amount of time to prepare, and other conditions identified in the preceding phase).

  ○ Finalize the instructional objectives as constrained by the boundary conditions.

  ○ Select an instructional scenario (as appropriate) that is consistent with the results and final prioritization in the Hazard Vulnerability Analysis (HVA).

  ○ Select the most appropriate type of instructional method to achieve the learning objectives.

  ○ Project the expected initiation date for instruction to commence, given the factors considered above.

  ○ Determine the instructional setting, acceptable length of instructional sessions, and timing to minimize impact on organizational staffing but still achieve the instructional learning objectives. See Textbox 4.2.2.7 for design strategy recommendations.

Textbox 4.2.2.7

Addressing Efficiency in Instructional Design

The instructional activity should, when feasible, include all personnel positions within a specific function (i.e., teach the competencies required for all positions within that function). This will enhance time efficiency and participation by all personnel will promote team-building. To accomplish this, the curriculum strategy can be to address the competencies common to all of the function's positions in a general session, and then use breakout sessions to teach the remaining, very position-specific competencies.

- Develop

  ○ Establish the evaluation requirements and guidelines for evaluating the instructional activity.

- ○ Develop guidelines for education and training evaluation.

- ○ Identify, select, and prepare personnel who will conduct and evaluate the instructional activity (e.g., Instructional director, instructors, and staff).

- ○ Arrange for and prepare any actor/simulator victims if required to meet instructional objectives (see the section on exercise actor/victims in Lesson 4.2.3).

- ○ Determine and arrange for instructional location and logistics.

- ○ Develop the instructional script and prompts as indicated.

- ○ Develop all relevant instructional materials.

- ○ Conduct a safety-focused review of the "developed" instructional activity.

- Implement

  - ○ Develop the instructional management plan, including assignment of specific responsibilities and timelines.

  - ○ Distribute the instructional management plan as indicated.

  - ○ Check for potential scheduling conflicts well before the instructional dates to identify and resolve problems.

  - ○ Check all logistical arrangements sufficiently before the instructional session dates to resolve problems.

  - ○ Remind participating personnel to review their EOP responsibilities and accomplish any pre-requisites prior to attending the instructional activity.

  - ○ For instructional activities that can create realistic concerns for patients and proximate non-participants, make provisions to reassure these groups (see the section on patient reassurance during exercises in Lesson 4.2.3).

  - ○ Initiate the activity consistent with instructional objectives.

  - ○ Continually monitor the instruction for safety issues and be prepared to terminate the activity for safety violations (see the section on exercise safety in Lesson 4.2.3).

- Evaluate

  ○ Conduct and manage the Reaction and Learning evaluation activities (see textbox 4.2.2.3 earlier in this lesson) and other evaluation indicated for this instructional activity.

Lesson 4.2.3 Developing and Conducting Exercises

Lesson objectives

- *Explain the purpose of an Exercise Program.*
- *Describe considerations in planning and developing exercises, including the key characteristics of exercises.*
- *List the general considerations that differentiate exercise types.*
- *Describe the specific steps in planning, developing, and conducting effective tabletop exercises.*
- *Describe the specific steps in planning, developing, and conducting effective functional and full-scale exercises.*
- *List the exercise considerations specific to healthcare systems (tabletop, functional, full-scale).*

Introduction

Exercises serve as a means to **evaluate and continuously improve** the overall EOP system and/or specific aspects of the EOP. Each exercise should therefore be carefully designed, developed, implemented, and evaluated to assure optimal benefit.

- Focus areas for exercise evaluation: Almost all aspects of the EOP, including recovery planning, can be assessed through properly conducted exercise activity. Common areas are listed in Textbox 4.2.3.1. These include the EOP structure, sections, functions, process and procedures, preparedness and proficiency of individual staff positions, and functional elements, as well as adequacy and function of equipment and supplies.

Textbox 4.2.3.1

EOP Components Commonly Evaluated Through Exercises

- Organizational structure
- Individual functions
- Processes and procedures
- Adequacy of overall and functional preparedness activities as guided by the EOP
- Effectiveness of individual positions
- Effectiveness of functional elements
- Adequacy and function of supplies and equipment

Exercise is primarily an evaluation tool. It also supports education and training (e.g., by providing additional familiarization with the EOP) but should not be conducted without adequate preceding instructional activity.

- Exercise considerations: Clearly understanding the primary and secondary purposes of exercise activity is important:

  ○ Exercise and performance evaluation: The **primary** purpose of exercise is to accomplish "performance-based evaluation" (see Module 4.3) of emergency response and recovery, or simply put, to answer the question "Did ___ perform as expected?"

  ○ Exercise and "practice": **Secondarily**, exercises may be viewed as activities that provide practice (e.g., training) opportunities for participants. While skills and knowledge acquisition always occurs during a well-planned and executed exercise, the healthcare system exercise should **not** be viewed as primarily an instructional tool. This purpose is better served through a competency-based instructional (i.e., training and education) program - see scenario-based training in Lesson 4.2.2.

  ○ Pairing exercise with training: Training and exercise can, however, be paired experiences. For example, operational-level training can be provided, and then be followed by an exercise to evaluate the system performance post-training. This can be an effective method for accomplishing instruction and assuring it is effective (see "Full-spectrum functional instruction" in Lesson 4.2.2). This approach shouldn't, however, "cheat" by training directly to the exercise, since the evaluation will provide only dangerous over-confidence rather than a true test of system preparedness.

  ○ Exercise as partnership facilitation: Exercises, if well-planned and executed, are also an important method for imparting understanding of, and respect for, the healthcare system's emergency response capabilities to outside agencies that interface with the healthcare system during all phases of emergency management.

- The exercise **program**: A structured exercise **program, achieved through strategic preparedness planning,** is essential to providing overall strategy consistent with EM program objectives. The strategic plan should establish an ongoing cycle of individual and team competency-based training before exercises. It establishes exercises to evaluate this instructional preparedness while "exercising" the EOP. An evaluation process identifies areas of concerns that are addressed during continuous program improvement. The exercise program (described later in this lesson) fits within this overall strategy.

- The use of ISD in the exercise program: The ISD process presented for instructional activity may also be applicable to exercise. It provides

guidance to analyze (set exercise objectives), design, develop, implement (conduct), and evaluate EM program areas described above. The ISD provides guidance that is consistent with and perhaps more expansive than that presented through common authoritative bodies. For example:

○ FEMA: FEMA's exercise guidance provides bullets that generally conform to the ISD process (see Textbox 4.2.3.2 below). The first three bullets in the textbox ("Identify" – "Confirm" – "Clarify" are incorporated into the "analysis" phase of ISD). The other guidance bullets are also clearly covered in the ISD process.

Textbox 4.2.3.2

FEMA: An effective exercise program will:[24]

- Identify EOP strengths and weaknesses
- Confirm resource requirements
- Clarify the appropriateness of team and individual responsibilities
- Reinforce individual and team competencies
- Demonstrate the areas that need additional coordination
- Identify and strengthen intra- and inter-organizational relationships
- Comply with recommended and required exercise program standards
- Provide a means of applying the exercise evaluation results for the continuous improvement of the EOP and EM program through an inclusive After Action Report and system improvement process.

Exercise guidance provided by many sources (such as FEMA) mirrors the application of the ISD process (see textbox 4.2.3.2).

○ JCAHO: Within the healthcare community, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has disseminated the most widely accepted exercise standards for healthcare organizations within the United States. These standards have recently been upgraded and are presented in Textbox 4.2.3.3. A review of the JCAHO standards reveals that they are also generally consistent with the ISD process. An organized, programmatic approach to exercises that is supported by the ISD process will meet or exceed the JCAHO standards related to exercises.

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[24] Adapted from: *Guide to Emergency Management Exercises.* Federal Emergency Management Agency Emergency Management Institute. Emmitsburg, Maryland. 1997.

Textbox 4.2.3.3
Joint Commission:
Environment of Care and Hospital Exercises

The Joint Commission on Accreditation Healthcare Organizations has recognized the importance of exercising emergency plans, and its 2006 standards related to exercise have greatly expanded over past guidance: [25, 26]

The standards address:
- Stressing the hospital EM system with the exercise
- Using plausible scenarios based upon the HVA
- Thorough and objective performance evaluation, with multiple accompanying requirements
- Communicating evaluation findings throughout the organization
- Regular exercises or actual response (twice/year) - Tabletop exercises don't count, except they may satisfy a communitywide exercise requirement; One annual exercise each year must include influx of actual or simulated patients
- Exercise evaluation covering notification, internal and external communication, and a range of patient care activities, including tracking.
- Improvements to be made based upon exercise findings, and these are evaluated in future exercises

Exercise Planning and Development

The ISD systems approach to training (see Lesson 4.3.2) may be applied, with minimal adaptation, to exercise planning and implementation. This approach is recommended, both for simplicity and for promoting consistency with instructional activities. The ISD application to exercises is presented here.

- Goals and Objectives: During the analysis phase, the **exercise goal(s)** (mission) and **objectives** are determined and delineated. Defining these objectives is essential to focus the exercise on specific

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[25] Joint Commission Resources. Emergency Management Drills: Revised Standards Encourages Organizations to Improve the Quality of Emergency Exercises, in *EC News: The Official Joint Commission Environment of Care® News Source* (March 2006), Volume 9, Issue 3; Oakbrook Terrace, Illinois.
[26] © Joint Commission Resources: *CAMH: 2006 Comprehensive Accreditation Manual for Hospitals*. Oakbridge Terrace, Illinois: Joint Commission on Accreditation of Healthcare Organizations, 2006, EC-4.20.

EOP areas that the emergency program managers have chosen to emphasize and "exercise." For example, key exercise objectives may include: "evaluation of the healthcare system command post function," "demonstrating effective use of the portable communications equipment," and "evaluation of the new procedures for interfacing with the city's Emergency Medical Services."

- Strategy: The exercise is planned, developed, and conducted primarily to evaluate the EOP and its processes, procedures, and other system components and qualities. It is **not** accomplished primarily to evaluate any specific individual's performance.

    ○ System focus: The exercise objectives should be similarly restricted to "exercising" and evaluating the EOP and its components, and should not focus upon the evaluation of specific individuals or the everyday clinical skills and knowledge of staff. It should be emphasized (during both exercise planning and in pre-exercise communications to the hospital personnel) that the exercise **assumes** the clinical competency of hospital staff and is **not** intended to test the individual medical/nursing knowledge of clinicians and other providers. Rather, exercise is intended to evaluate the system's ability to adequately address the event as well as the response-generated demands during emergency response and recovery.

    ○ Individual focus: If individual performance within specific positions will be a focus of evaluation, this should be prominently noted in the exercise objectives. This may be important in assessing clinical activities related to emergency response and should be clearly publicized as **performance within the context of the EOP**. Examples where this may be important include:

        ▪ The pace of patient triage

        ▪ The adequacy of decontaminating (removing) a simulated chemical

        ▪ The effectiveness of providing life-saving interventions during patient decontamination

        ▪ The surge capacity to register and process lab specimens from a large number of victims

        ▪ The surge capability to set-up and administer very unusual and cumbersome pharmaceuticals and vaccines.

Exercises are primarily focused on system, or system component, evaluation, not assessment of individual participants. When evaluation will be conducted for individual activities (see text for examples), participants should be notified that this is within a "systems" context (e.g., adequacy of the system design, adequacy of training etc.,) and not for personal "grading."

See the exercise design template at the end of this lesson for further application of the ISD process during exercise-related activities.

Exercise Characteristics

EM programs should strongly consider using ICS to develop and conduct the exercise and the After Action Report process.

- Managing the exercise: **The exercise should be managed using ICS**. This includes establishing an organizational structure (using ICS principles) for developing and conducting the exercise. The exercise evaluation process should also use ICS for information processing, analysis, and lead to continued use of ICS for managing the After Action Report process (see Lesson 4.3.3).

- Exercise Scenario: All exercises are scenario driven, with a scenario that prompts decisions, actions, and outcomes (actual or verbalized) that address the exercise objectives.

The choice of the exercise scenario should be directly relevant to the exercise objectives. In addition, the scenario should be realistic and allow accomplishment of the exercise objectives.

  ○ Realistic and moderate impact: The **scenario should be realistic and of only moderate severity** such that if personnel reasonably achieve the level of performance delineated in the EOP, they are successful in achieving their exercise objectives. An "Armageddon–style," overwhelming scenario can be demoralizing and provides little benefit to personnel or to program managers. Conversely, a low volume or carefully choreographed scenario that is "scripted for success" provides a false sense of capability, and the feel-good effects can be more than offset by accompanying complacency.

  ○ The HVA for guidance: The preferred starting point for planning exercises should be the Hazard Vulnerability Analysis (HVA) process (see Lessons 1.3.1 and 1.3.2). The HVA provides guidance for developing exercise goals and objectives that in turn drive the scenario selection and development. During this process the most credible hazards are identified, along with their potential impacts. Taken together, these factors should provide the context for developing the circumstances and injects for a realistic and challenging scenario. Subject matter experts should be consulted as indicated to assure that the exercise details and timeline are realistic both for the hazard impact, for the anticipated response actions, and for the ongoing injects to the scenario.

Standardized terminology has been described in several publications for the range of exercise roles.

- Exercise terminology and operational concepts: Over the past decade, emergency response and recovery exercises have developed a relatively standard set of nomenclature for the job titles and associated roles and responsibilities in conducting the exercise

(participants, evaluators, safety personnel, etc.). Relatively comprehensive references are available,[27] and only the key terms and concepts are presented here:

○ Exercise Director (also referred to as the "Lead Exercise Planner" or "Exercise Planning Team Leader"): this individual is charged with the responsibility for and authority to properly plan an exercise. If ICS is used as recommended in developing and conducting the exercise, the Exercise Director is in effect the Exercise Incident Commander for these activities.

○ Exercise Planning Team: This is the group that is: "responsible for designing, developing, conducting, and evaluating all aspects of an exercise. The planning team determines exercise design objectives, tailors the scenario to jurisdictional needs, and develops documents used in exercise evaluation, control, and simulation."[28] The Exercise Planning Team performs its responsibilities under the leadership of the Exercise Director. The team should be selected to be representative of the various functions, activities, jurisdictions, and organizations participating in and/or impacted by the exercise. A leader of the Exercise Planning Team (below the Exercise Director) serves as the Planning Section Chief for the ICS structure conducting the exercise. The concepts of action planning should be used to manage exercise activities as the exercise is conducted.

○ Master Exercise Controller[29]: The individual charged with the responsibility for ensuring that the exercise is conducted according to the exercise plan, objectives, scenario, and the Master Sequence of Events List (MSEL). Generally, the Exercise Controller will be selected from the Exercise Planning Team due to her/his familiarity with the exercise planning process. In the case of a tabletop exercise or a functional exercise limited to one location, the Master Controller may be the sole exercise controller. In an ICS structure developed to conduct the exercise, the Exercise Controller would be the Operations Section Chief. In this example, the Exercise Operations Section could have three branches: Control Branch; Player Branch; and Evaluator Branch. Specific responsibilities of the Master Exercise Controller during an exercise include:

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[27] *Homeland Security Exercise and Evaluation Program.* Volume I: Overview and Doctrine. Chapter 4. Exercise Program Management and Planning Process. p. 25. Washington, D.C. http://www.ojp.usdoj.gov/odp/docs/HSEEPv1.pdf, accessed December 1, 2005.

[28] Ibid, p. 25.

[29] Adapted from *Guide to Emergency Management Exercises*. Federal Emergency Management Agency Emergency Management Institute. Emmitsburg, Maryland. 1997.

- Monitoring the sequence of events to ensure the exercise is proceeding as planned

- Maintaining order and professionalism by all involved

- Acting as a simulator for unanticipated events and/or resource requirements

- Managing message flow (adding or discarding) to speed or slow the exercise pace[30]

- Monitoring actions and decisions to make sure that they are consistent with the exercise plan

- Monitoring activities for safety issues (if a safety controller for smaller exercises has not been designated).

○ Controller[31]/control staff: Individuals assigned to exercise locations as required to accomplish the responsibilities of the Master Exercise Controller (Exercise Operations Section Chief) under his/her direction. They provide the scenario injects (MSELS) and facilitate "player" (see below for definition of these terms) information and actions as indicated by the type of exercise and the exercise plan. In a large or complex exercise, the controllers should be organized using standard incident command structure and process.

○ Safety controller: Controller/s designated to perform the safety function during the exercise.

○ Evaluator: Personnel assigned to make objective observations, using supplied exercise evaluation guidance that will provide a uniform basis for system evaluation from the exercise experience (see Lesson 4.3.3).

○ Player: Healthcare system personnel who are participating in the exercise in the roles they would take during an actual emergency.

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[30] Any major deviations from the exercise plan should be cleared by the Master Exercise Controller. This simple "rule" can prevent freelancing by personnel involved with conducting the exercise and prevent significant confusion.

[31] *Homeland Security Exercise and Evaluation Program.* Volume I: Overview and Doctrine. Chapter 4. Exercise Program Management and Planning Process, Washington, D.C. http://www.ojp.usdoj.gov/odp/docs/HSEEPv1.pdf, accessed December 1, 2005.

- ○ <u>Actor</u>: Individual simulating a victim, victim family, media, perpetrator, or other person within the exercise scenario to prompt realistic action/reaction from the exercise players.

- ○ <u>Simulators</u>: Simulators create (through a Simulator Cell) an artificial reality through the delivery of pre-scripted and spontaneous messages to exercise players. In this role they portray the role of the entire external environment and as such should be familiar with the agencies/entities/individuals they are representing in the context of the exercise. Specific responsibilities of the simulator include:

  - Simulating all actions taken by the outside agencies/entities/individuals

  - Sending pre-scripted messages representing the outside agencies/entities/individuals according to the MSEL

  - Responding to unanticipated actions by players with spontaneous messages

  - Informing the controller of simulation problems and progress of the exercise.

- ○ <u>Exercise Observers</u>: "Outsiders" invited to observe all or selected portions of the exercise. Observers do not participate in exercise play or in exercise control functions: it is important to specifically brief them on this, since many observers are VIPs and prone to inject themselves into exercise play or controller roles. A resource to answer their questions should be made available if possible. Their only participation is in After-Action Report meetings (see Lesson 4.3.3), providing their observations (or other invited comments) related to exercise response and recovery play. Their observations are generally less formal and possibly more subjective than those of evaluators, who are following pre-scripted guidance in capturing observed data.

- • <u>Exercise terminology</u>: Terms common in today's lexicon are important to define:

  - ○ <u>Simulation Cell (SIMCELL)</u>[32]: This is the physical location for controllers (or other qualified personnel) generating injects and receiving player communications/responses. The SIMCELL may

The use of standardized exercise terminology and exercise personnel categories makes the exercise design and execution more efficient and avoids confusion.

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[32] Adapted from *Homeland Security Exercise and Evaluation Program.* Volume III: Exercise Program Management and Planning Process. Chapter 4, p. 42. (July 2004). Washington, D.C.

provide MSELs injects simulated for nonparticipating functions (in a functional exercise) or outside agencies/organizations (in a full-scale organization exercise). This may require phones, FAX, radio, or other means of communication to simulate actual experience. For large or full scale exercises, healthcare emergency managers may wish to establish a SIMCELL.

○ MSEL (Master Sequence of Events List): The list of scenario injects that drive play and the scenario progression through time and incident evolution. They may be primary injects or action/information selected to "react" to a player's response to a preceding MSELs injects. The master list may therefore have a large menu of injects for a full-scale exercise, but not all MSELs injects will be necessarily used. MSELs may be injected by controllers performing role play, by simulated victims ("actors") presenting during the scenario, perpetrators, and by other physical actions, including simulated communications. MSELs may also be inserted through a range of media appropriate for the type of exercise, including video, slides, written material, or other presentations.

○ Additional exercise terms are available.[33]

The different types of exercises (tabletop, functional, full-scale) can be viewed as increasingly complex and should be considered in the overall evaluation strategy. For instance, a logical progression would be the tabletop exercise of a specific function before a functional exercise.

• Types of Exercise: Exercises are "typed" by how the scenario is presented, the level of "play" by participants (i.e., oral discussion versus actual physical demonstration of skills and appropriate actions), and the range of functional areas involved. As briefly described in Lesson 4.1.2, exercises are commonly categorized as:

○ Tabletop exercises

○ Functional exercises

○ Full-scale or Field exercises.

The system outputs that are evaluated vary according to the exercise type (for example, decisions that can only be verbalized in tabletop exercise versus actions that can be observed in functional or full-scale exercise). Each type of exercise may be designed with progressive complexity, sophistication of simulation (i.e., realism), and personnel/organization involvement that require more preparation,

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[33] Adapted from *Homeland Security Exercise and Evaluation Program*. Volume III: Exercise Program Management and Planning Process. Chapter 4, pp. 46-48. (July 2004). Washington, D.C.

planning, resources, and support. A more in-depth description of each type of exercise follows.[34, 35, 36]

○ <u>Tabletop Exercises</u>: Tabletop scenarios are presented predominantly via media (oral, video, slides, audio tapes, and others) rather than through physical actions and props, with limited facilitation of actions and decision-making processes. Tabletop exercises progress in complexity and individual and team involvement and control as individuals gain experience in the use of the EOP.

▪ Tabletop exercises are generally focused upon EOP **elements** rather than full EOP **functions**. For example, a management tabletop exercise includes the participation of management personnel (i.e., the "management element") from across multiple functions and from varying management levels within the organizations. They are placed in a simulated situation (scenario) while sitting together, with the scenario prompting them to function in the roles and capacities expected of them in an emergency response and recovery event. Decisions, actions, and other responses are generally verbalized by players, and interaction is facilitated by one or several controllers.

▪ Tabletops may range from "simple" to "advanced" and "interactive," involving progressively challenging scenarios and time constraints. The use of sub-groups with break-out sessions with additional facilitators can increase role playing by participants.

❑ A "basic" tabletop[37] is generally informal, stress-free, and not subject to time constraints. It usually uses a relatively static scenario that only evolves through injects from the facilitator to the collective participant cohort. These are designed and facilitated to superficially evaluate broad concepts, such as policies and overarching strategy. These

Tabletop exercises are an effective and often-used exercise type for evaluating Command and other functional elements.

[34] Adapted from: *Guide to Emergency Management Exercises.* Federal Emergency Management Agency Emergency Management Institute. Emmitsburg, Maryland. 1997.
[35] Adapted from: Environmental Protection Agency. *Emergency Response Tabletop Exercises for Drinking Water and Waste Water Systems*, available at:. http://www.waterisac.org/epa/Pages/intro.html, accessed November 22, 2005.
[36] Adapted from: Sikich G. *Emergency Management Planning Handbook* (1996). Washington, D.C. McGraw Hill.
[37] *Homeland Security Exercise and Evaluation Program.* Volume I: Overview and Doctrine. Chapter 3. Exercise Program Management and Planning Process, Volume 1, p. 20 Washington, D.C., available at: http://www.ojp.usdoj.gov/odp/docs/HSEEPv1.pdf, accessed December 1, 2005.

concepts are applied by tabletop participants according to their individual and team responsibilities within the context of the EOP, with the necessity for some collaboration and cooperation among participants. Generally, simulation is used primarily to prompt the investigation and discussion of issues and problems. Response and recovery equipment is not actually used, nor are resources deployed. Adhering to the definitions set forth in lesson 4.2.1, if this level of tabletop is performed with a primary objective being "familiarization" (i.e., education, training, or drill) rather than evaluation, it would be more correctly categorized as "scenario-based training." The appropriate delineation of objectives for the activity will promote consistent use of terminology, and the precise use of terminology to describe the activity (drills/training versus exercise) will better inform participants.

❑ An "advanced"[38] or "interactive" tabletop is a simulated exercise with an evolving scenario (through injects, often to individuals rather than the entire participant cohort). These tabletops build upon the "basic" type to evaluate specific elements of the EOP and evaluate the organization's capabilities and capacities in response to an exercise scenario. The level of simulation and time pressures are increased and collaboration and cooperation can extend within the organization and to outside organizations to include decision making and implementation. In some cases, limited amounts of equipment may be used and resources deployed.

▪ Tabletops are usually conducted in a conference room or classroom environment and are designed and developed to meet specific objectives related to an identified issue and/ or problem. Discussion and problem solving is conducted in the context of the exercise emergency scenario. The overarching goal is for participants to work with established emergency operations plans, policies, and procedures to demonstrate their individual and team skills (as a reflection of preparedness training) and to evaluate the completeness and effectiveness of the EOP and its components. By working together in a relatively low stress and non-threatening environment, participants are able to identify, investigate, and address

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[38] *Homeland Security Exercise and Evaluation Program.* Volume I: Overview and Doctrine. Chapter 4. Exercise Program Management and Planning Process, Volume 1, p. 20 Washington, D.C., available at: http://www.ojp.usdoj.gov/odp/docs/HSEEPv1.pdf, accessed December 1, 2005.

questions of coordination, responsibility, and authority.

○ Functional Exercises: This type of exercise has full, action-based play that is limited to a specific function or a functional area of the EOP. These simulate reality of operations within a functional area or activity to the maximum extent possible and focus on interactive decision making, coordination, and cooperation in response to the exercise scenario. The "play" provides sufficient freedom to demonstrate initiative and creative problem solving. It generally creates stress through real-time constraints and resource limitations. Increased realism is generated both through injects and by actual performance of actions by participants. Emphasis is placed on interaction **within the function**, but interaction with other functions and "outside" personnel are simulated by controllers or other artificial methods.

Functional exercises evaluate specific components of the EOP. The actions of other components and external agencies are provided by the controllers.

- Functional exercises are designed to evaluate the capacity and capability of a single function, or a complex activity within a function. Functional exercises are appropriate when the function or activity can be exercised in isolation from other functions or activities and/or the interface and interdependencies with other functions and activities can be adequately simulated.

- Functional exercises designed to evaluate operational levels of system preparedness and position competencies should be conducted at the response locations and/or facilities that would be used in an actual event. Communication activities are accomplished through normal response channels, so message traffic may be via radios, telephones, facsimile, and the Internet to add realism.

○ Full-scale or "Field": This is an extension of the functional exercise that includes "play" by all the functions in the EOP, and, therefore, may prompt very complex activities and interaction/coordination. This type of exercise activity uses players, actors, the SIMCELL, and other exercise components defined earlier.

Full-scale or "Field" exercise may provide a more robust evaluation of the EOP. It necessarily requires more preparation and management to adequately conduct.

- The full-scale exercise encompasses functional exercises across multiple functional areas, driven by a single exercise scenario. A more robust evaluation/validation of the EOP policies and procedures may be accomplished than with the other exercise types, in the context of a realistically simulated but controlled scenario. Overall management, coordination, and communication between functions may therefore be fully and objectively evaluated.

- A very realistic exercise can be accomplished in an interactive manner, evolve over a substantial period of time, and involve an extensive commitment of resources. It may include the realistically conducted mobilization of resources and the physical movement of emergency personnel and equipment required for operational response. These and many other complex activities that require the participation of multiple functions may be prompted through exercise injects.

Exercise Development Template

An exercise development template consistent with the ISD process is provided (see text).

Exercise development follows the ISD process as set forth in Lesson 4.2.2. Consistent with the ISD elements, the following steps provide a summary of exercise development actions:

- Analyze

  ○ Review the organization's Hazard Vulnerability Analysis (HVA) findings and its final prioritization of areas of concern.

  ○ Review the EM program/EOP to identify strengths and weaknesses and to determine the functional areas and elements in need of performance evaluation.

  ○ Review the organization's exercise program planning documents (see next section), previous exercise After-Action Reports (see Lesson 4.3.3), and recent EOP changes. This review will prompt the inclusion of specific EOP areas to be evaluated.

  ○ Review personnel assignments to EOP positions of responsibility and/or authority.

  ○ Review regulatory requirements (e.g., JCAHO, OSHA) impacting exercise content and frequency.

  ○ Review inter-organizational agreements and requirements.

  ○ Review other constraints (e.g., budgetary and timing of work shifts).

  ○ Establish realistic and achievable exercise objectives that support the results of the above reviews and best contribute to the continuous improvement of the EM program and EOP.

- Design

  ○ Determine the boundary conditions for conducting an exercise (based upon the identified availability of resources and personnel, willingness and availability of other organizations to participate, regulatory requirements, amount of time to prepare, and other factors from the Analysis activity).

  ○ Finalize the exercise objectives as constrained by the boundary conditions, guided by the findings from the Analysis effort above.

  ○ Select an exercise scenario that is consistent with achieving the exercise objectives.

  ○ Select the most appropriate type of exercise to achieve the intended evaluation.

  ○ In general, the time required from the initiation of exercise design to conducting the actual exercise[39] is approximately:
    - One month for Tabletop exercises
    - Three months for Functional exercises
    - Six to 12 months for Full-Scale, complex exercises involving multiple organizations.

  ○ Determine the exercise setting and levels of involvement.

  ○ Determine the acceptable length of exercise play that allows for the relief and/or rotation of personnel consistent with exercise objectives.

- Develop

  ○ Establish the Hot Wash and After Action Report requirements for exercise evaluation (see Lesson 4.3.2 for definitions).

  ○ Develop guidelines for exercise evaluation.

  ○ Identify the ICS structure to manage the exercise. Select and prepare personnel that will conduct and evaluate the exercise (e.g., exercise director and staff, controllers, observers, evaluators, safety officer).

  ○ Arrange for and prepare exercise actors/simulators (simulated

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[39] *Guide to Emergency Management Exercises.* Federal Emergency Management Agency Emergency Management Institute. Emmitsburg, Maryland. 1997.

victims, perpetrators, and others) and a manager of the actor simulators, if required, to meet exercise objectives (see the section on exercise victims in this lesson for specific victim/actor considerations).

○ Determine and arrange for exercise location and logistics.

○ Arrange for additional staff on duty to manage normal system operations (patient care and others) that can't be temporarily suspended during exercise play.

○ Develop the exercise script.

○ Develop exercise materials.

○ Conduct a safety-focused review of the "developed" exercise.

• Implement

○ Develop the exercise management plan.

○ Distribute the exercise management plan.

○ Check for potential conflicts sufficiently before the exercise date to resolve problems.

○ Check all logistical arrangements sufficiently before the exercise date to resolve problems.

○ For announced exercises remind all personnel to be involved to review their EOP responsibilities and to contact the appropriate person in authority if they require role clarification and/or training.

○ Receive, process (moulage, etc.), and brief the actor/simulators, including a safety briefing; Stage and deploy actors as indicated by the scenario.

○ Receive, process, brief (including a safety briefing) the exercise controllers.

○ Make provisions to reassure patients and exercise non-participants during and after the exercise (see the section on patient reassurance in this lesson for specific considerations).

○ Initiate the exercise consistent with exercise objectives (i.e., an announced or an unannounced exercise). Assure that all

appropriate notifications have been made.

○ Continually monitor the exercise for safety problems and be prepared to terminate the exercise for safety violations (see the section on exercise safety in this lesson for specific considerations).

○ Adjust the exercise scenario as indicated by unexpected developments, time concerns, and the need to assure that exercise objectives are achieved.

○ Terminate the exercise at the appropriate time or when the exercise objectives have been accomplished. Assure that all appropriate notifications have been made.

○ Assure that **incident review** (see Lesson 3.3.8), demobilization, and return-to-readiness activities are conducted.

- Evaluate

○ Conduct and manage the hot wash if indicated (see Lesson 4.3.4).

○ Conduct and manage the After-Action Report process (see Lesson 4.3.4.).

Exercise Program Considerations

- Establishing an exercise program requires the development of strategic exercise planning. This establishes a schedule of exercises with a mix of exercise types, complexity, participants, focus, and other considerations:

○ Exercise program goal: As stated in the introduction of this lesson, the goal of the exercise program is to accomplish a **balanced, comprehensive evaluation** of the EOP's effectiveness and, indirectly, the effectiveness of the preparedness program including:

  ▪ Training

  ▪ Equipment, supplies, and facility maintenance

  ▪ Appropriate recruitment and retention of personnel

  ▪ Revision/improvements based upon prior findings.

Given the value of exercises and the complexity in managing them, emergency managers may wish to develop an "exercise program" with specific considerations (see text).

○ <u>The HVA as programmatic guidance</u>: As discussed above with the development of individual exercises, the exercise program itself should also be based upon the organization's HVA findings and prioritization of risk concerns.

○ <u>Balance in the focus of exercises</u>: Across healthcare organizations, a tendency exists to focus exercises almost completely upon the emergency department functions, including triage, decontamination, and patient treatment, with some attention to trauma care and the operating suite. It is important to evaluate all areas of the healthcare system with important roles during emergency response and recovery. For example, Command Staff or personnel involved with information management should receive a similar level of attention during exercises, commensurate with the selected scenario. A balanced exercise program examines these other critical areas. This broad focus promotes a more appropriate expansion and balance to training courses, system revisions, and other important preparedness activities.

○ <u>Strategic progression within the exercise program</u>: A logical progression in exercise complexity, stress, urgency, and difficulty may be demonstrated through strategic planning for an exercise program:

- Tabletop exercises are generally less complex, less difficult in terms of exercise logistics, and useful for examining coordination and communication interfaces, decision support tools, and other non-physical processes and procedures.

- Functional exercises are the logical progression in an exercise program in terms of developing and conducting task level activities.

- Full-scale, realistic, multi-dimensional exercises are the most difficult to accomplish and to be completely successful require significant understanding of the response system that is to be exercised. Careful attention to exercise management, logistics, communication modalities, coordination of controllers, and MSELs injects is required. The complexity can approach that of actual incident response. In fact, a successfully accomplished full-scale exercise that was designed, developed, and conducted using only "in-house" expertise, may be a valid predictor of how the organization will perform in an incident, regardless of the actual exercise scenario outcomes.

Additional Exercise Issues for Consideration by Healthcare Systems

- Exercise Actors: Managing and coordinating actors (participants are simulating victims and other roles) requires special consideration.

  ○ Recruiting actors: Actors must be recruited and, since they are usually volunteers, the effort to find volunteers and assure that they come at the agreed upon date and time should not be underestimated.

    ▪ Actor recruitment should ideally target professional groups, such as police, fire, military recruits, healthcare personnel (including off-duty personnel from the exercising facility), or health-related students (medical nursing and other health disciplines) or others with some professional understanding of healthcare systems and medical procedures. Alternatively, members from the hospital volunteer cadre may be well suited, since they are familiar with normal hospital operations and comfortable in the hospital environment.

    ▪ Actors should receive pre-arrival instruction so that they are adequately informed in committing to the actor roles, and to adequately being prepared to participate (see Textbox 4.2.3.4 for recommendations).

    ▪ Actor managers should be aware that there are additional issues with volunteer actors. Some that have been experienced include reluctance to give up valuables during DECON exercises, reluctance or aversion to walk barefoot in the healthcare facility or DECON areas, and similar concerns that should be anticipated.

Actors used to portray victims during exercises need to be recruited. Preparatory material should explain the importance of their participation.

Textbox 4.2.3.4

Exercise Actor Pre-arrival Instructions[40]

Volunteers should receive their instructions prior to the day of the exercise. These instructions should tell volunteers about any special considerations, such as:
- Wear old clothing because clothing could possibly be cut or ripped.
- Wear a bathing suit under outer garments because clothing

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[40] Adapted from Homeland Security Exercise and Evaluation Program. Volume III: Exercise Program Management and Planning Process. Chapter 4, p. 42. (July 2004). Washington, D.C.

Actors can be used to play several distinct roles during exercises to add realism. These include victims, victim family members, and the media.

> could be removed for simulated disrobing or become wet during a decontamination process.
> - Bring shower footwear if indicated.
> - Eat and hydrate prior to attending the exercise.
> - Do not wear expensive clothing or jewelry.
> - Inform the victim actor coordinator about any pre-existing health conditions.
>
> Victim actor instructions should also include information on when to arrive, where to report, how long their participation is expected, and whether a meal will be provided during or after the exercise.

○ Preparing actors: Actors simulating victims must be prepared for their roles prior to commencing the exercise play. Tasks include:

  ▪ Familiarizing them with the script

  ▪ Applying "moulage" (i.e., cosmetic makeup and other effects to simulate appropriate injury and illness in victims

  ▪ Staging them for realistic presentation as called for by the drill scenario script

  ▪ Assuring the "victim" actors simulate the affect and behavior of real victims impacted by the designated hazard

  ▪ Provide safety instructions (see below for more detail).

○ Actors beyond the "victim" role: In addition to "victims," actors should be designated as members of the press, as family members looking for loved ones, and so on as indicated by the scenario and the exercise objectives. This lends realism in exercising all other vital components of the EOP beyond direct patient treatment. These actors may also need make-up and other props, and they should be briefed, staged, and deployed as the scenarios unfold.

Actors must receive a briefing on the safety considerations relevant to the exercise.

○ Safety: Actors should be provided with a safety briefing before the start of the exercise play (see below).

○ Actor debriefing: Actors should be provided a forum for debriefing after the exercise, with an opportunity to have questions answered and to provide suggestions for both the exercise process and exercise findings. They should be thanked and, particularly if they are volunteering their time, provided a meal or other token of

appreciation.

- Overall Exercise Safety: Succinct but comprehensive safety planning should be conducted prior to the exercise:

  ○ Safety analysis: Analyze the exercise plan for risks and safety concerns.

  ○ Addressing the physical and psychological risk: Address any identified or anticipated safety issues that could arise from the exercise scenario (such as slip hazards during decontamination). As exercises become more realistic and focused upon unusual hazards, both the physical and psychological risks to actors increase:

    ▪ Some risk of physical harm is incurred when decontaminating (washing off) actor victims and in other exercise actions taking place under duress (e.g., transferring "victims" urgently between stretchers, moving around heavy equipment, and others).

    ▪ Chemical agent and other mass casualty simulation exercises can be more realistic than other types of exercises, and the psychological impact to some actors may approximate that experienced by actual victims in actual events. Disrobing (even to the level of a swimsuit) may cause discomfort for some actors even if they know ahead of time that it will occur. This should be recognized and addressed through proper recruitment, adequate briefing information, and debriefing opportunity for questions and discussion.

  ○ Professional safety supervision: This task is accomplished under the supervision of the exercise safety controller, who oversees the safety aspects of both the exercise planning and the conduct of the exercise.

  ○ Safety briefing for controllers and evaluators: Exercise controllers and evaluators should be given a safety briefing prior to the exercise and should be tasked with being vigilant for, and immediately addressing, any safety concerns they encounter during the exercise.

  ○ Safety briefing for players and actors: Exercise actors should be briefed about safety also. Both players and actors should know (from their safety briefing and written guidelines) that they can stop the play at any time by saying **"this is real"** and then expressing

their concern.

- <u>Exercise artifact versus realism</u>: All exercises introduce a significant amount of exercise artifact (see terminology textbox). This must be recognized and carefully addressed. It will otherwise unrealistically complicate many player decisions. Most significantly, it can make medical, nursing, and other clinical judgments problematic in individual patient decisions.

Exercise artifact can complicate clinical decision making during the activity. This should be addressed.

  ○ Exercise victims' "stories" and their specific clinical "findings" should either obviously indicate the medical decisions that should occur or the clinical decisions ("needs the operating room," "needs to be intubated," etc.). This can be indicated to the exercise clinicians by the "victim" actors or controllers. Cards with the incident medical information may be provided to victim actors to expedite this process and to maintain accuracy of injects.

  ○ At the same time, the exercise of specific emergency operations skills and knowledge should be as realistic as possible. For example:

    ▪ A safe (non-caustic, non-allergenic) but realistic chemical agent simulant could be used in chemically contaminated patient exercises (and training drills) to assure that the decontamination process is fully performed. It can promote more realistic play by both exercise players and "patients," and can be used to evaluate the thoroughness and effectiveness of decontamination.

    ▪ Actual personal protective equipment (PPE) should be worn during these types of exercises. The maintenance of an exercise cache of PPE for this purpose is helpful, since small holes and tears are non-consequential during exercise. The "exercise cache" of PPE and other equipment should be clearly and indelibly marked "training use only."

Terminology alert!

Exercise artifact: artificialities that occur during exercises of all types that affect tasks, processes, outputs, and outcomes in either a positive or negative fashion. They should be recognized and addressed by exercise controllers during the exercise event or by exercise evaluators and after-action report managers during the exercise analysis.

- Player (Participant) Briefing: Personnel participating as "players" in the exercise should also receive instruction, which includes safety issues, the "rules of engagement" for the exercise, and other issues that provide common understanding of what is expected and why it is important to participate earnestly.   This information is commonly conveyed through a written briefing and should occur for all types of exercises (the setting for tabletop exercises is conducive to oral briefing as opposed to written).   A written example is provided in Exhibit 4.2.3.1 below.

Players or participants in the exercise should also receive a briefing prior to commencement of the activity. In most instances, this is best provided in both a written briefing as well as oral presentation.

Exhibit 4.2.3.1: An example of a written hospital exercise briefing for exercise players.

Instructions and Ground Rules for Exercise Players:

- All communications related to the exercise will begin and end with **"THIS IS AN EXERCISE**"….if there is a situation that represents a real-life issue that must be addressed, the communication begins with **"THIS IS REAL".**

- As in actual hospital practice, safety of staff and patients is paramount. Please adhere to all usual safety practices, and abort any exercise activity that suggests a safety concern. It is particularly important to exercise care in lifting and moving simulated victims and other potentially dangeous activity.

- Verbalize issues, decisions we believe we would make, and the actions that we believe we would take, knowing what we know at the time.

- Hospital Capacity will be based upon the **"REAL TIME"** bed status as of **Thursday, September 15, 2005 at 1630..**

- All stretchers and transports are REAL; all victims will be transported on stretchers. Laboratory specimens and ABGs will be transported to the lab.

- We will critique and learn from those decisions and actions later.

- Exercise participants placing telephone or cellular phone calls will identify/maintain log of the organization, agency, office and/or individual with whom they are contacting.

- Decisions and actions can be reversed as you would normally do in a real event, as further information is gathered.

- As you normally would, seek to address issues and correct problems that arise.

- We may encounter issues we don't know how to deal with---that is considered realistic in emergency response. Do the best you can under the circumstances. System issues will be captured for later discussion and resolution. This is not a test of your individual performance.

- All exercises introduce artifact that can actually make many things more difficult in the exercise than they would be in real life. Controllers will try to acknowledge and address them as they arise.

- Please understand that the EOP is primarily a tool to support the clinicians and others performing healthcare system services and maintaining continuity of operations under adverse conditions. It is intended to allow our professionals to apply their expertise in adequately caring for very unusual patient loads (surge capability and capacity), and that the exercise is a method of evaluating and improving the EOP. It is not intended to evaluate usual clinical expertise, or primarily focused upon any individual person's performance, but rather the functional performance of the hospital's emergency response system.

- We ask that each person participating in the hotwash forward comments and suggestions to the Chairperson for Emergency Management, using the format provided, to maximize the consideration of your information. 'Issue' forms to provide this feedback from exercise participants will be made available to all participants.

The Emergency Operations Plan will be revised and expanded as indicated, and emergency preparedness activities (training, maintenance actions, etc.) may be adjusted based upon your input.

- <u>Managing patient care operations while conducting exercises</u>: It is important to remember the regular organizational mission in developing and conducting exercises. Healthcare systems cannot

interrupt much of their regular patient services in order to fully participate in exercises. They also have to address the issue of real patients, families, and visitors being present during exercises.

○ Exercise planners must arrange additional staff to manage the regular healthcare services while other staff members (i.e., "players") are participating in the exercise. This should be considered when examining the costs associated with an exercise.

○ Information and reassurance should be provided to the regular patient, their family members, and other visitors. Otherwise, undue concern will be raised when they witness or experience the intrusive-appearing activities of a realistic exercise. It is therefore important to address this issue in the design and conduct of functional and full-scale exercises.

- Placards should be placed in public areas of the healthcare system (the lobby, waiting areas, hospital entrances) and handouts should be provided to actual patients and their families, explaining that:

  ❑ An exercise will be occurring, which is important in preparing the healthcare organization to respond to community emergencies

  ❑ Regular patients are being cared for by non-exercise personnel without any quality-of-care compromise

  ❑ The exercise may include characteristics that are simulations. For example, parameters that could create anxiety include patients that will be moulaged to appear severely injured and actors yelling and simulating out-of-control victims, family members, medical personnel, and others. For chemical contamination exercises and drills, it should prominently note that "No actual chemicals are in use."

- Hospital personnel who are providing normal patient care to actual patients in the areas where exercise activity will occur should be reminded to verbally reassure patients and family members as the exercise unfolds and perhaps point out the informational signs or brochures.

- Outside agencies (EMS, Public Health, and others) should also be notified for similar reasons.

Healthcare facilities cannot suspend normal operations for exercises. It is therefore important to consider providing information to regular "customers" (i.e., patients and visitors) to preempt any concerns.

- Exercise Evaluation: This important subject is comprehensively presented in Lesson 4.3.3.

- Participating in community-wide exercises: Whenever possible, hospitals and healthcare systems should be active in the development and implementation of **community-wide** exercises. This includes synchronizing the healthcare system's exercise plans as much as possible with those of the community, the healthcare coalition (Tier 2), partner hospitals, EMS, or other single public safety agencies. Additionally, it can include nearby businesses such as universities that conduct emergency response and recovery exercises. It is important for the community to incorporate healthcare facility personnel very early in the exercise planning activities in order to:

  ○ Assure training and exercise products are medically realistic and meet the preparedness needs of the overall hospital/healthcare system response community. This is best accomplished through a healthcare coalition so that all appropriate healthcare organizations have an opportunity to participate in the planning and conduct of the exercise, or at least be adequately represented by coalition members.

  ○ Provide input into the exercise time of day, length, and other parameters in order to optimize the healthcare organizations' ability to participate.

Healthcare system participation in community-wide exercises should permit early inclusion in design and development.

Federal Emergency Response Exercise Guidance

- Federal exercise guidance: The current (2005-2006) guidance for Federally funded exercises is contained in the Homeland Security Exercise and Evaluation Program (HSEEP) and its reference manuals (see Textbox 4.2.3.5).[41]   This is administered through the Office of Grants and Training[42] of the U.S. Department of Homeland Security (DHS). Future Federal funding for exercises, such as those provided through HRSA[43] and other agencies will be linked to adherence with applicable HSEEP guidance.

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[41] *Homeland Security Exercise and Evaluation Program (HSEEP)*, description and reference manuals are available at http://www.ojp.usdoj.gov/odp/docs/hseep.htm, accessed December 8, 2005.

[42] A description of this office is available at http://www.ojp.usdoj.gov/odp/, last accessed June 6, 2006. DHS is currently undergoing reorganization and it is unclear whether this office will change.

[43] Health Resources Service Administration (HRSA), U.S. Department of Health and Human Services. *National Bioterrorism Hospital Preparedness Program, 2005,* information available at: http://www.hrsa.gov/bioterrorism/, accessed May 15, 2006.

○ HSEEP focus: HSEEP guidance provides useful exercise and exercise program concepts and is referenced throughout this lesson. The guidance, however, is oriented towards jurisdictional and larger, more complex exercises, and therefore many of the planning activities are not directly applicable to the development and conduct of exercises focused at the healthcare system level.

○ HSEEP as an educational adjunct: At the same time, the HSEEP manuals explain the complex exercise planning, conduct, and evaluation activities that will occur during these large-scale exercise events. These insights may help healthcare system personnel better anticipate and, therefore, more fully participate in all aspects of community-wide and larger exercises.

○ Consistency with HSEEP: The exercise guidance within this lesson, with the evaluation and organizational learning guidance provided in Modules 4.3 and 4.4, is intended to meet or exceed HSEEP guidelines.

HSEEP provides important considerations for healthcare systems planning exercises. Much of this material, however, is oriented to larger (e.g., jurisdictional) activities. Guidance provided in this curriculum meets and in many areas exceeds HSEEP requirements.

Textbox 4.2.3.5

Homeland Security Exercise and Evaluation Program (HSEEP)

"The Homeland Security Exercise and Evaluation Program (HSEEP) is both doctrine and policy for designing, developing, conducting, and evaluating exercises. HSEEP is a threat- and performance-based exercise program that includes a cycle, mix, and range of exercise activities of varying degrees of complexity and interaction.

"HSEEP includes a series of four reference manuals to help States and local jurisdictions establish exercise programs and design, develop, conduct, and evaluate exercises." *(Direct quote from the HSEEP Web address referenced above.)*

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Module 4.3
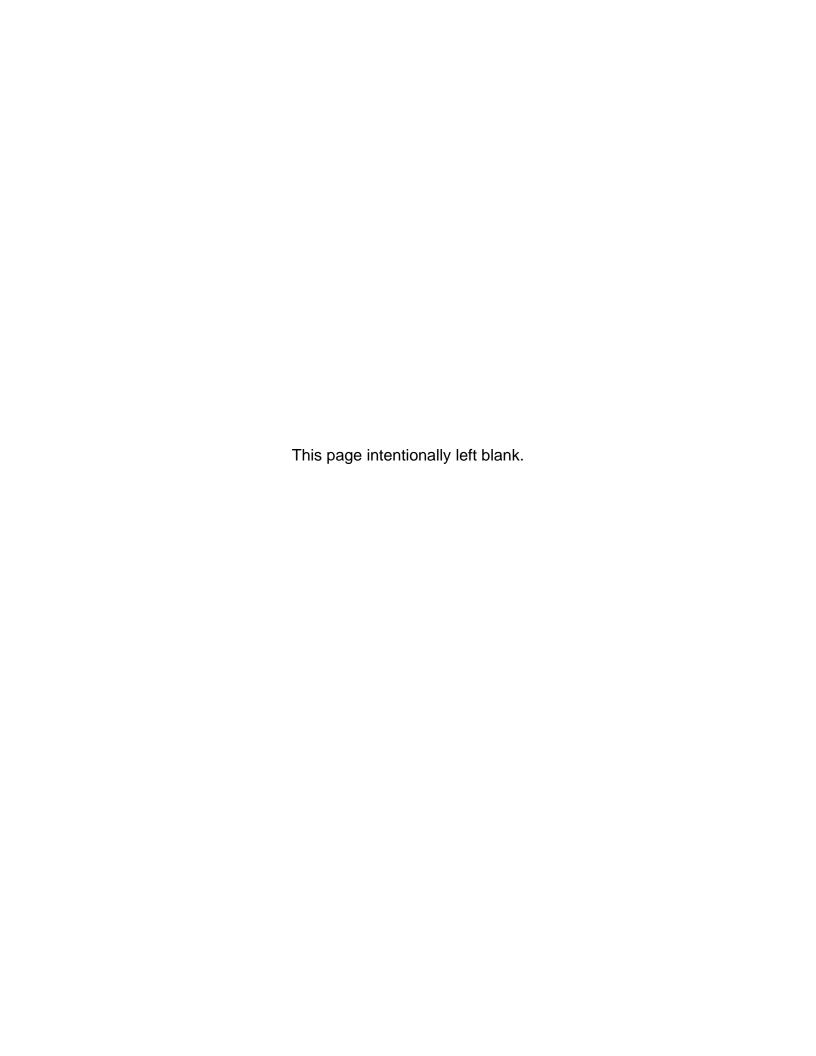
Systems-based Evaluation

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Lesson 4.3.1 Overview, Concepts, and Principles: Emergency Management Program Evaluation

Lesson objectives

- *Explain the meaning and utility of evaluation in the context of EM program.*
- *Describe the characteristics and considerations for performance-based evaluation.*
- *Explain the purpose of conducting evaluation activities.*
- *List the measures, metrics, methods, and analysis used in EM program evaluation.*
- *List and define the key terms associated with EM program evaluation.*

Introduction

Evaluation (see terminology textbox) as a discipline has a long and extensive research tradition. This educational curriculum emphasizes many of these long-standing concepts that support effective evaluation of the EM program, component plans, exercises, and response performance. Many specific industry applications of "evaluation" have arisen in emergency management since the post 9-11 surge in interest and funding (see foreword for discussion of industry applications). Homeland Security applications[44] of evaluation, such as those contained in HSEEP and the many "needs" and "gap" assessment tools that have been promulgated are acknowledged where appropriate and presented where applicable. They are recognized as **industry applications** and, thus, not considered controlling standards. In most cases, effective emergency management program performance, as presented in this text, exceeds the guidance of these applications.

> **Terminology alert!**
>
> ***Evaluation:*** a systematic assessment process that leads to judgments and decisions about plans, programs, or policies.[45]

- Evaluation as a distinct discipline: This unit discusses evaluation as a discipline and differentiates between evaluating the emergency response and recovery function itself (e.g., through exercises) and the

Evaluation as a discipline has an extensive history and is based on certain foundational concepts. More recent "industry applications" are acknowledged that vary from this emergency management conceptual approach.

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[44] Multiple industry applications (homeland security, public health, and others) are recognized.
[45] Adapted from Schalock, R. L. *Outcome-based Evaluation* (2001). New York, Kluwer Academic/Plenum Publishers, p. 6.

programmatic evaluation or the EM program (e.g., evaluation of preparedness planning—effectiveness of instructional activities, exercises, implementation actions, other preparedness initiatives, mitigation activities, and conduct of the overall EM program).

- Evaluation defined: Evaluation is generally defined in dictionaries as:
    1. To ascertain or fix the value or worth of
    2. To examine and judge carefully; appraise.[46]

- Evaluation as the basis for judgment: Evaluation is performed to provide a basis for judgment about the evaluated entity. Judgments are determinations of value or worth.[47] For organizations whose primary objectives are providing goods or services, useful judgments are generally made using performance-based information.

- Formal evaluation: Some variation of evaluation occurs in almost every life activity. **Systematic evaluation, however, incorporates an objective assessment process.** This formal approach minimizes reliance upon subjective impressions and anecdotal evidence in forming the basis for **judgment** of the assessed entity.

- Evaluation and system theory: Systems theory (see discussion in Lesson 1.1.2) has become important in all management fields, not just emergency management. Evaluation is an integral component of systems theory and practice (see Textbox 4.3.1.1).

Textbox 4.3.1.1

Systems Theory & Evaluation

Systems theory revolutionized how organizations and organizational change processes are understood. The full complexity of any organization or system, the people and their personal motivations that make up such a system, and the difficulty of effecting change are important factors in this concept. The systems approach sees organizations as turbulent, unpredictable, rife with conflict, full of opportunities and threats, and always dynamic. Systems theory understands that there is a politics of change in large organizations and that fostering change has much to do with organizational culture.

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[46]From http://www.thefreedictionary.com/evaluate, accessed December 6, 2005.
[47] Adapted from Scriven M. *Evaluation Thesaurus, 4th ed.* (1991). Sage Publications, Thousand Oaks, California.

Systems theory (see Lesson 1.1.3) does not view organizations as "closed" systems or independent of external forces. Instead, organizational systems are seen as made up of interdependent relationships with many defined components: the external environment, the individuals inside the system, the relationships that generate cooperation or conflict, and others. This "open system" recognizes the goals of each individual member can be as important to success as any singular organizational purpose declared by those in leadership positions. As such, systems theory focuses on the complexities of open systems and the necessity for organizations to adapt to ever-changing environments. It seeks to understand the social character of dynamic system interrelationships and their impact upon outcomes. A fundamental principle that characterizes open systems is that objectives can be pursued through a variety of methods and means and there is no single approach that will always produce the desired results.[48]

"Organizational rationality therefore is some result of:
1) constraints that the organization must face
2) contingencies that the organization must meet
3) variables that the organization can control." (J.D. Thompson, 1967)[49]

The complexity, uncertainty, and aggregate challenge that are attributed to organizational change in systems theory have resulted in an approach to program evaluation that advocates methodological pluralism. When organizational change and improvements to essential operations becomes an organizational objective, defining the change needed and evaluating the success of implemented change involves many different types of program evaluation. This combination of qualitative, as well as quantitative, methods recognizes that real-world factors dictate that methods that work well in one area may not work in another. The systems approach to evaluation emphasizes the ability to adapt to a changing environment by tailoring evaluation **styles** to different components of the system in order to produce the most accurate and useful results.

- Evaluation using performance measures: Performance-based evaluation is increasingly recognized as an essential component of

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[48] Katz, D., Kahn, R. *Organizations and the System Concept*. Classics of Organization Theory (1966). J. Schafritz and S. J. Ott. Belmont, Wadsworth - Thomson Learning.
[49] Thompson, J D. Organizations in Action. Classics of Organization Theory (1967). J. Schafritz and S. J. Ott. Belmont, Wadsworth - Thomson Learning.

A systematic evaluation program is a critical activity for any successful organization, yet this importance is not widely recognized.

Instead of a regular ongoing effort, evaluations are often undertaken by organizations based upon specific inciting events (e.g., a "bad" outcome).

Evaluation programs are often considered an unnecessary burden on regular organizational duties. Their importance is highlighted here for day-to-day as well as EM program activities.

systems management (see sidebar for systems theory), but it is not a universally prevalent phenomenon.

○ Prevalence of evaluation in organizations: Systematic, ongoing evaluation activity as a component of organizational management is not as widespread as would be expected, particularly when considering its value to the organization.

   ▪ Evaluation prompts: Many organizations embark on program evaluation activities, not as a matter of common practice, but as needs arise. Commonly, an external catalyst prompts the evaluation activity. Typical initiating factors include:

      ❑ Accreditation requirements (for example, evaluation necessary to obtain or maintain accreditation from an outside organization).

      ❑ Accountability per regulations (for example, Federal organizations are subject to the Government Performance and Results Act of 1993 [GPRA], which instituted a government-wide requirement for agencies to set goals and post an evaluation report annually on program performance[50] [see textbox in Lesson 4.3.2]).

      ❑ Accountability as a requirement for new or continued program funding.

      ❑ Accountability imposed by other stakeholders (organizational leaders, constituents, emergency response partners, and others).

      ❑ Statistical data or other reports that indicate lackluster performance.

      ❑ An adverse outcome that prompts questions about the system or organization itself.

      ❑ The need for new service provision capabilities.

○ Historical reluctance to evaluate: The prevalence of "prompted" evaluation demonstrates the widespread reluctance to make evaluation a standard step in systems development and

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[50] Government Performance and Results Act (GPRA), the U.S. Office of Management and Budget. Available at: http://www.whitehouse.gov/omb/mgmt-gpra/, accessed May 14, 2006..

maintenance. Many of the "quality" related movements in the 1980s and 1990s (Quality Assurance, Quality Improvement, Total Quality Management) were related to overcoming the lack of organized system evaluation and incorporation of change.

○ Resistance to evaluation: For many organizations, the reluctance to commit resources to systematic evaluation may be due to the following categories:

- Evaluation as an expense: Evaluations have effort and cost implications and are often viewed as Herculean tasks. **Efficiency** of the evaluation process can influence acceptance and frequency of use. An efficient process enhances the benefits of evaluation through additional cost-effectiveness and non-monetary benefits that come with system evaluation and change.

- Evaluation as a burden: Identifying issues through an evaluation process that requires corrective action can be vexing, particularly if the corrective actions are beyond the authority, budgetary constraints, or other limitations to those conducting the evaluation. This can be addressed to some extent through an effective organizational learning process (see Lesson 4.4.1), where the responsibility for addressing identified issues can be appropriately assigned, and those assigned are empowered to resolve the issues.

- Evaluation as a professional and legal risk: Evaluations are commonly viewed as risky endeavors, with managers and even general workers not always in favor of documenting failures and shortcomings. The **objectivity** with which issues are identified and described, the **tone and perceived purpose** of the evaluation process (see summative versus formative evaluations below), the f**ocus upon systems versus people** in the assessment, and the **effectiveness at addressing weaknesses** and failures in a positive manner is important in addressing the basis for this inherent reluctance. Legal expertise must be used to assure that earnest evaluation effort does not raise legal and liability risk for the organization. For example, in healthcare, evaluation and quality improvement initiatives are generally covered by medical-legal privilege and not subject to the legal discovery process.

- The case for systematic evaluation: It is important to examine the primary reasons for performing evaluation and then to delineate the purpose (i.e., goal and objectives) for each specific evaluation activity.

There are two general reasons for conducting evaluation activities: 1) Accountability: "is the system performing as planned?" 2) Improvement: "determining whether organizational change is necessary."

Such an approach may counter the resistance to evaluation. Reasons for evaluation may be grouped into two general categories:

○ Accountability: Program evaluation, in many ways, may be viewed as an "insurance policy" that monitors whether performance is accomplishing planned activities and whether the organization's performance is effective and efficient.

○ Improvement or enhancement: Program evaluation is increasingly viewed as the primary vehicle for driving organizational change and therefore improvement. Evaluation is also used to determine whether "organizational change" (see Module 4.4) is being implemented successfully. Many program managers and guidelines make potentially invalid assumptions about the relative ease of affecting such changes. They view the organizational environment as relatively static, roles and responsibilities as predictable, and the ability to achieve desired outcomes as uncomplicated. Effective program evaluation may appropriately temper these assumptions.

• Evaluation purpose as it relates to evaluation design: The controlling reason (i.e., the goal) for conducting a specific evaluation within a system is important to define and communicate at the outset, since it leads the evaluation planners in one of two evaluation design directions:

○ Summative evaluation

○ Formative evaluation

Each is based extensively on systems theory (see sidebar) and each has significant implications for evaluation design.

• Summative versus Formative Approaches to Evaluation: The following descriptions (see terminology textbox) have been adapted from a range of sources to provide clarity for emergency management personnel.

Terminology alert!		
Summative Evaluation	The primary purpose for this type of evaluation is to provide a definitive statement, essentially a "grade," that stands as the judgment on the evaluated entity. The motivation behind these evaluations is **accountability**, including task completion, efficiency (cost containment), and effectiveness. Summative evaluation is more likely to be quantitative, using numeric scores or letter grades to assess achievement. The process of evaluation is designed to provide a **composite judgment** of all evaluated aspects of the entity, hence the term "summative."	*Summative evaluations are conducted for accountability.*
Formative Evaluation	The primary purpose of this type of evaluation is to further shape the direction, strategy, and tactics of the entity being evaluated and provide feedback that will result in positive system change rather than focus upon shortcomings as failure: "evaluations are intended - by the evaluator - as a basis for improvement" (Scriven, 1996). This may identify and replicate best practices within the organizations and improve program management through an interactive evaluation process. These evaluations are tailored to each new environment and the assessments generally achieve more depth and breadth than summative evaluations.	*Formative evaluations are conducted for improvement (organizational learning).*
Summative versus Formative Evaluation	Each type of evaluation approach can serve important purposes in program and plan evaluation, but it is important to recognize the difference in both designing and administering the evaluation instrument. One authoritative text emphasizes "the summative vs. formative distinction is context dependent" (Scriven, 1996). This may best be presented by a widely repeated quote from another evaluation authority: "When the cook tastes the soup, that's formative; when the	

guests taste the soup, that's summative." (Robert Stakes, 1991)[51]

Of the two approaches, formative evaluation is generally far more useful for internal organizational purposes: "Formative evaluation is conducted to provide program staff evaluative information useful in improving the program." (Worthen, Sanders, and Fitzpatrick, 1997)[52]

- Measures, metrics, methods, and analysis in program evaluation: In the context of emergency management for healthcare systems, EM program evaluation is based upon the premise that **a carefully chosen evaluation instrument can be designed that allows emergency managers to evaluate their EM program in comparison to optimal risk reduction and response/recovery operational readiness.** In order to accomplish this, terminology in the evaluation instruments must be carefully defined.

  ○ Definitions: Evaluation is performed to make judgments about the evaluated entity. Judgments are accomplished through a defined evaluation process, which uses "measures" that are compared against evaluation "metrics" through a specific "analytic method" (i.e., measuring). These three terms and their associated concepts are delineated below:

    ▪ Performance measures in program evaluation: The **measures** are the data, observations, and other findings to be captured during the evaluation process. They may be developed from standards, benchmarks, indicators, objectives, work plan schedule, operational checklists, and other authoritative sources, but **must be objectively defined to be measurable and to minimize subjective bias**.

      ❑ Qualifying the "measure" as a "**performance measure**" (see terminology textbox) promotes a more purposeful focus, during the design of the evaluation instrument, on

Performance "measures" are specific elements that are observed during evaluation.

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[51] Quoted in Scriven M. *Beyond Formative and Summative Evaluation*. In M.W. McLaughlin and ED.C. Phillips, eds., *Evaluation and Education: A Quarter Century*. Chicago: University of Chicago Press, 1991: p. 169. Reported in Patton, Michael Quinn, *Utilization-Focused Evaluation: The New Century Text*. Edition 3. Thousand Oaks, California: Sage, 1997: p. 69.

[52] Blaine R. Worthen, James Richard Sanders, and Jody L. Fitzpatrick, *Program Evaluation: Alternative Approaches and Practical Guidelines* (1997), New York: Longman.

collecting data and information that specifically reflects the activity being examined. [53]

> **Terminology alert!**
>
> ***Performance Measure***: The specific data sets, objective observations, or other findings captured during the performance-based evaluation process. Performance measures may address the adequacy of resources applied to the program (inputs); the type, level, and quality of program activities conducted (process); the direct products and services delivered by the program (outputs); or the results of those products and services (outcomes).[54]

○ Performance metrics in program evaluation: Similarly, accomplishing an objective evaluation requires that specific evaluation criteria must be developed to compare the measures against. These may be called "**metrics**" (see terminology textbox) and also should be **prospectively defined** (i.e., prior to the evaluation activity). Program evaluation can include a wide variety of metrics in order to effectively evaluate the many aspects of a program, but certain characteristics should be consistent across all types of metrics:

> **Terminology alert!**
>
> ***Performance Metric***: Specific criteria that objectively describe the desired performance state, against which the "performance measures" may be compared.

Performance "metrics" indicate the desired state that "measures" are compared against during evaluation. These should be objectively established prior to the evaluation activity.

▪ Objective and measurable: Like "objectives," they should be clearly stated, measurable, and realistically attainable under

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[53] Performance measures have commonly been called "performance indicators" in other healthcare system assessments (For example: Hunt, C., Andrews G.: Drop-out rate as a performance indicator in psychotherapy; Acta Psychiatr Scand, 1992 Apr.85(4):275-8). For clarity, performance indicators should be perceived as conceptually distinct from performance measures: "indicators" are commonly more narrow and distanced from representation of actual performance, and therefore may be less effective (see "corruptibility of indicators" later in this lesson).

[54] Adapted from: General Accountability Office. *Performance Measurement and Evaluation* (May 2005). GAO-05-739SP, available at http://www.gao.gov/new.items/d05739sp.pdf, accessed December 13, 2005.

reasonable circumstances. They should also align with the overall organizational objectives.

- ▪ <u>Performance-based</u>: Metrics should be presented in a manner that focuses upon performance and that leads to actionable information for change.

- ▪ <u>Metrics versus type of evaluation</u>: Metrics should be related to the type of evaluation that is selected (i.e., input, process, output, outcome – see definitions below).

- ▪ <u>Acceptable versus unacceptable, or "pass" versus "fail"</u>: Where possible, the metric should indicate a demarcation between an acceptable and unacceptable determination, in order to minimize the subjectivity of the evaluation conclusions.

- ▪ <u>Source for metrics</u>: Whenever possible, the use of EM program documentation should be used directly as the metric (for example, compare findings against the stated objectives of the EM program component being evaluated or against specific competencies). This will minimize necessary evaluation design effort and instead promote more objective, measurable system documentation.

- ▪ <u>"Outside" metrics</u>: Some metrics will be either provided by outside organizations or developed from standards or benchmarks established by outside organizations. These should be carefully examined to assure that they are understandable, objective enough to be measurable, realistic, and appropriate for the organization and its EM program. For example, understanding the intent of JCAHO standards related to healthcare organization emergency management (see Textbox 4.2.3.3 for their standards related to exercise) is important before establishing the EM program metrics to meet that standard.

Analytic methods used in program evaluation indicate the specific comparisons made between "measures" and "metrics."

- ○ <u>Analytic methods in program evaluation</u>: These describe the process of comparing the findings (performance measures) to the metrics. The result leads directly to the basis for "judgment": determining the value of the program (in a summative evaluation) or the recommended change that may move the program closer in line to the expectations (in a formative evaluation). It is important that this analysis also be as objective as possible. Several factors are important in defining the analytic methods for any specific evaluation activity:

- ▪ <u>Comparison against the metrics</u>: Performance measures should generally be compared to a selected metric as a way to assess its relative quality, quantity, level of completion, or other determinations that are being sought.

- ▪ <u>Informal evaluation</u>: In many performance assessment activities, evaluation consists of comparing the measures to some general idea on the part of the evaluator as to the ideal level of performance (i.e., no explicitly stated metrics). The evaluator is simultaneously collecting the measures, interpreting them, and determining their value against this less-than-clearly documented metric. This approach introduces subjectivity, compromises reliability, and makes validity and predictability difficult to assess. This method is common in informal program evaluation and is acceptable when based upon expert judgment (see below), but should be avoided as much as feasible during formal program evaluation.

Other Evaluation Terminology

A wide range of terminology has been used in evaluations. This text will use terms introduced earlier in this section but acknowledges other common terms found in the evaluation-related literature. These include:

- <u>Performance Standard:</u> A statement that establishes the criteria for how well a task or learning objective must be performed. The standard should specify how well, completely, or accurately a process must be performed or product produced. The term "standard" is most commonly used in summative evaluations in place of the term "metric." In formative system evaluation, other terms more applicable to systems process and evaluation science may be used (metrics, competencies, objectives, etc.). Standards may have specific applications:

  - ○ A system or process standard is generally defined by design requirements (inputs) or by required outputs.

  - ○ The task standard reflects task performance requirements (process and output) on the job.

  - ○ The learning objective standard reflects the demonstrated knowledge, skills, and abilities (outputs) that must be achieved from the learning.

- <u>Benchmark:</u> Essentially, this is a synonym for "standard" but may be more broadly described and, consequently, less specific and objectively measurable. HRSA has used benchmarks to establish

metrics for healthcare system performance in its emergency preparedness funding program.[55]

- Indicator: Similar to a "metric," but an indicator is usually a more narrowly described requirement than a standard or benchmark. It is commonly used in summative evaluation in an attempt to present objective criteria that can be associated with overall, more subjective quality in the evaluated entity. The indicator may therefore focus upon criteria that are only an indirect assessment of the quality of a program or service. Because of its narrow and indirect nature, an indicator that becomes used as a formative guide may be applied out of context and therefore become disassociated from indicating any actual level of performance during response and recovery. This "corruptibility of indicators" must be acknowledged and carefully addressed when developing and applying indicators (see Textbox 4.3.1.2).

  ○ It is important to recognize that criteria can be used as a **performance metric** for one component of a program or plan, but only a **preparedness indicator** for the larger entity. For example, an input, process, or output measure for a training course is a **performance measure for that course**. In contrast, the output of a training course is only an indirect **preparedness indicator** in relation to effective incident response. This important distinction has critical relevance when examining the results of the evaluation.

  ○ The relationship between the **preparedness indicator** and the actual "**outcome**" of effective response (i.e., the indicator's actual predictability) must be determined through careful analysis, and confirmed through incidents, appropriate proxy events, or very realistic exercises.

Textbox 4.3.1.2

Predictability versus Corruptibility of Indicators

An **indicator** is intended to "measure" the performance under study, and is selected in large part to be a **predictor of program success** in the area of study. Many of these "indicators" have never been validated. In addition, it has long been recognized in the evaluation literature that the designation of a behavior as an indicator can lead to a change in that behavior, a "corruptibility of the behavior of those

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[55] U.S. Department of Health and Human Services, Health Resources and Services Administration. *National Bioterrorism Hospital Preparedness Program, FY 2005* (July 1, 2005) Continuation Guidance. Available at: http://www.hrsa.gov/grants/preview/guidancespecial/hrsa05001.htm, accessed January 29, 2006.

whose performance is being monitored. The best-known example is teaching to the test..." (Nuttall, 1994).[56]

Essentially, "**corruptibility of indicators**" describes the phenomenon where as soon as a measure is selected as an indicator of successful program function, system participants re-direct their performance, intentionally or not, to perform well on the indicator itself. This focused change affects the "indicator" and its predictability of overall success and, in fact, may actually decrease process, output, outcome effectiveness, and eventual program success.

The Committee on Evaluation of the Metropolitan Medical Response System Program examined an array of existing assessment tools that were applicable to the task of assessing preparedness for chemical, biological, and radiological terrorist acts.[57] The Committee found that the majority of the instruments in use were based upon self-reporting methods and that this type of reporting is particularly prone to corruption of indicators. This type of distortion of actual capabilities was suggested to be occurring across the board in self-reports and was attributed to a perceived need to show "success" in order to keep funding streams open and to avoid appearing unprepared before a constituent public that want assurances that they live in safe, "ready" communities.

The evaluation methods to be used in this case intended to circumvent this problem by instituting multiple evaluation methods and requiring that any self-reports are followed up with site visits by independent evaluators, who will be able to examine readiness without the coercive effect of having to worry about continued funding streams.

Perhaps the best overall way to address this phenomenon is to carefully select indicators that are performance measures: broad enough or objective enough to be difficult to "corrupt" towards. Even more effective may be selecting performance measures such that when performers "corrupt" towards them, they are actually moving towards improved preparedness or more effective response and recovery.

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[56] Nuttall, D.L. *Choosing indicators* (1994); In Riley, K.A., Nuttall, D.L. (Eds.). Measuring quality: Education indicators–United Kingdom and international perspectives (pp. 17-40). Bristol, Pennsylvania: Falmer Press: 23.
[57] Manning, F.J., Goldfrank, L. (eds). *Preparedness Indicators*, in Preparing for Terrorism: Tools for Evaluating the Metropolitan Medical Response System Program (2002). Washington, D.C., National Academy Press: 96.

Selecting a performance measure versus "indicator" or "benchmark" in predicting organizational success: Performance evaluation in complex organizations may require multiple measurement strategies/methods, performance metrics, and many different performance measures to develop an evaluation instrument that is reliable in predicting organizational success. One should avoid reliance upon narrow "indicators" or overly broad and difficult-to-measure "benchmarks" to accomplish this important purpose.

- The "corruptibility of indicators" should be considered when assessing the validity, reliability, and predictability of the indicators for organizational success (see Lesson 4.3.1 and Textbox 4.3.1.2).

- At the other extreme, many "benchmarks" lack the objective, measurable guidance that provides a direct relationship to organizational success (in this case, for mass casualties and other emergencies).

- Some "indicators" or "benchmarks" are furnished by outside organizations[58,59] in their efforts at accountability (i.e., for summative evaluation of the organization's system) or as guidelines to improve system performance. Many are only marginally or vaguely performance-based.

- Any "indicator" or "benchmark" should, wherever possible, be translated into performance measures with metrics that can be objectively evaluated and directly related to predicting organizational success.

- Needs assessment: This is a specific form of evaluation, distinct from performance evaluation, which focuses upon "needs" rather than upon system performance. It is conducted with commonly used evaluation methodology: surveys, interviews, meeting reports, and others. These

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[58] Hearne, S.A.; Segal, L.M.; Earls, M.J.; Unruh, P.J. *Ready or Not? Protecting the Public's Health in the Age of Bioterrorism* (2004). Trust for America's Health. Available at http://healthyamericans.org/reports/bioterror04/BioTerror04Report.pdf, accessed December 21, 2005.

[59] U.S. Department of Health and Human Services, Health Resources and Services Administration, Healthcare Systems Bureau: *National Bioterrorism Hospital Preparedness Program, (FY 2005) Continuation Guidance* uses "critical benchmarks" and other funding requirements applicable to healthcare organizations receiving HRSA funding through their State and local governments; available at http://www.hrsa.gov/grants/preview/guidancespecial/hrsa05001.htm, accessed December 13, 2005.

may take place both for programmatic as well as response and recovery purposes. Needs assessments are commonly performed during the conceptualization phase of program development, during major program or plan revisions ("identifying the specific needs that a program should address"), or during response and recovery, when it is unclear what the incident needs may be. For example, the "modified cluster sampling" done after Hurricane Andrew to assess Floridians' needs was a complex, formal response needs assessment.[60] Conversely, a "suggestion box" is a very simple example of a programmatic needs assessment.

- Task: This term indicates a clearly defined and measurable activity accomplished by organizations or some subset thereof (sections, functions, teams, individuals, and others). It is the lowest behavioral level in a job or unit that is performed for its own sake.

- Expert judgment: Expert judgment (see terminology textbox below) is one of the most difficult concepts to clearly describe, yet is a very important component in almost all professional evaluation of complex systems. **In performance-based evaluation, expert judgment is essentially the determination made by a qualified individual comparing performance measures, often approximated, to the individual's understanding of an optimal yet realistic metric.** Factors qualifying someone as an expert are variously defined, but the following considerations are important:

  - Demonstrated expertise: An "expert" meets some defined level of knowledge, skills, and abilities (i.e., competencies) that usually have been demonstrated by the expert's past **experience**.

  - Experience as the basis: For emergency management system evaluations, "experts" should ideally have successful experience in designing and implementing pertinent emergency management capabilities and demonstrating ability to manage under actual incident circumstances, rather than only scholarly activity (research and writings) or experience primarily as a consultant, trainer, or product and service sales.

  - The "parallel experience" assumption: It is important to examine assumptions that past life experience in seemingly parallel occupations (military, intelligence, law enforcement, governmental agency involved in emergency management, and others) has

Expert judgment is an important analytical adjunct during evaluation activities. It is, however, important that the "experts" are determined based upon valid criteria and that their observations are qualified appropriately.

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[60] Hlady, W.G.; Quenemoen, L.E.; Armenia-Cope, R.R.; Hurt, K.J.; Malilay, J.; Noji, E.K.; Wurm, G. *Use of a modified cluster sampling method to perform rapid needs assessment after Hurricane Andrew.* Annals of Emergency Medicine, 1994, Apr;23(4):719-25.

conferred true expertise directly applicable to the pertinent activity.

○ "Resident" experts: It is also important to recognize the "expert judgment" that is acquired by individuals working, over time, in a professional manner within an organization's emergency management program. The value of this expertise, particularly as it relates to understanding the organization, the nuances important to effective program activities, and the organizational details important in customizing any outside recommendations, should not be underestimated.

Terminology alert!

Expert judgment: "information and data given by qualified individuals in response to technical questions… Expert judgment is generally used when test/observational data are difficult or expensive to obtain and when other sources of information are sparse, poorly understood, open to differing interpretations, or requiring synthesis… expert judgment is an integral part of most problem solving and analysis." *(Los Alamos National Labs)*[61]

In summary: Program evaluation uses multiple types of "**measures**," different "**metrics**" to compare the measures against, and a range of "**analytic methods**" to determine program success or failure and recommended follow-on actions. The use of performance measures is examined here in greater detail.

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[61] Los Alamos National Laboratories. *Eliciting and Analyzing Expert Judgment*. Available at: http://www.stat.lanl.gov/research/exjudge.shtml, accessed December 14, 2005.

Lesson 4.3.2: Evaluation Using Performance Measures in Emergency Management

Lesson objectives

- *Describe the types of performance measures and their application to program evaluation.*
- *Describe the incorporation of EM program evaluation through an organized strategy into EM program management.*
- *Describe potential legal implications of system evaluation and possible methods to minimize legal risk from good-faith quality improvement efforts.*

Introduction

Evaluation of the EM program and its component plans supports organizational learning and the maintenance of a healthcare organization's mission and strategic objectives during all phases of Comprehensive Emergency Management. <u>All healthcare personnel</u> have the responsibility to understand the evaluation process and its application to the EM program and to participate at a level appropriate to their assigned roles and responsibilities.

Performance Measures and Their Application in Program Evaluation

- <u>Types of Performance Measures in Program Evaluation</u>: Program evaluation literature defines four types of measures (data/information/observations, etc.) that may be used in evaluation. They are important to understand, so that evaluation of the programs and program components may be designed and conducted in a logical and consistent manner and provide valid analysis and recommendations for change. See terminology textbox below.

Terminology alert!	
Input, Process, Output, and Outcome Measures in Performance-based Evaluation	
Input Measures	An **input** is effort, funding, personnel, and materiel (i.e., resources) that have been applied to the entity being evaluated (for example, resources applied to a system during development, revision, or maintenance). **Input evaluation measures the quality as well as the**

	quantity of these applied resources in relation to the goals and objectives. The performance measures may be monetary, equipment, supplies, personnel, logistical agreements, standard operating procedures, training units, or even political, legislative, and regulatory mandates. **Input evaluation** often follows a checklist format and comprises simple answers to questionnaire lists.
Process Measures	A **process** is a defined activity, related to planning and/or implementation, carried out to achieve the objectives of the program. It is therefore also referred to as an "**implementation**" measure. **Process evaluation** focuses on these activities as critical components of the system and/or program. While inputs have a "quality and quantity" component, process has "completeness and quality" considerations. **Process evaluation** assesses program objectives and their related system activities: their delivery (i.e., how they are conducted), their feasibility, and their appropriateness for the intended audience.[62] Examples from across the phases of emergency management include assessing process used for budgeting funds, forming a committee, completing component plan tasks, establishing a planned capability or recovery function, developing an incident action plan, and so on.
Output Measures	An **output is the product of an intermediate step that is measurable**. Quantitative measurements to assess program outputs could be: percent of total personnel taking and passing training courses, number of patients receiving care during emergency response, amount of prophylactic pharmaceuticals stockpiled as the result of a pharmaceutical cache activity, and so on. Qualitative measures could be: adherence to outside regulatory guidelines, meeting accreditation standards, and so on. **Output evaluation** often compares measurements against the objectives for a system component or intermediate processes and procedures (rather

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[62] Scheirer, M.A. *Designing and Using Process Evaluation*; In Wholey, J., Hatry, H.; Newcomer, K. *Handbook of Practical Program Evaluation* (1994). San Francisco, Jossy-Bass Inc.**:** pp. 40-68.

	than the overall system itself), or against criteria established by outside organizations where it is in the interest of the organization to comply.
Outcome Measure	An **outcome** is the actual final performance of the system for the circumstances in which the system is being used. The outcomes may be goods and/or services but are commonly some defined endpoint. **Outcomes in an emergency management program are defined by the overall system's goals and objectives.** Essentially, the expected or planned performance outcome is established by the control objectives during an incident or by the goal and objectives of a component EM plan for a defined program interval. The **performance evaluation** captures actual outcomes and compares them, through analysis, to expected system outcome. This may be a quantitative measure, although most commonly **outcomes are qualitative judgments that refer back to the system objectives – "have the objectives been met under the conditions in which the system is intended to operate?"**

This terminology is context dependent:

Within an overall EM program, the terms input, process, output, and outcome are context dependent. For example, an "output" of a training course, trained personnel, could be considered an "input" for a response function that requires trained personnel to operate it. The terms should therefore be qualified as to the specific entity they refer to, and this can eliminate much of the confusion commonly associated with this terminology.

- Validity and Reliability of performance measures: The evaluation literature emphasizes the importance of these factors (see terminology textboxes) in evaluation design.

Performance measures selected for evaluation should be valid (relevant and unbiased) and reliable (reproducible amongst evaluators).

Terminology alert!

"Validity means that 1) independent evaluators can agree on the relevance and appropriateness of criteria for judging value and on evidence that reflects those criteria and 2) safeguards are in place to control potential bias in measurement, data collection, analysis, and the drawing of conclusions.*"* [63]

Terminology alert!

"Reliability means that different evaluators would reach similar conclusions on the basis of the evaluation methods used.*"* [64]

While these factors are important to address when designing evaluation activities, performance measures are rarely either perfectly valid or perfectly reliable in real-world activities that are as complex and vaguely defined as emergency management. What is equally or even more important is determining the value of the selected performance indicators in relation to the overall organizational success, particularly in areas where actual organizational experience is limited.

- Performance measures as predictors of organizational success: Ideally, the performance measures used in evaluation should directly relate to the success of the organization.

  ○ Measures versus system outcome: It is important to recognize that input, process, output, and outcome measures may be valid and reliable and may even register success individually, but the **overall system outcome** may still be a failure (as embodied in the cliché: "The operation was a success, but the patient died."). **It is therefore critical to also determine the approximate ability of**

The selection of performance measures must relate to organizational success in order to provide "predictability."

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[63] Adopted from: Measurement and Data Collection in Evaluation. *Preparing for Terrorism: Tools for Evaluating the Metropolitan Medical Response System Program* (2002). Manning, F.J., Goldfrank, L. Washington, D.C., National Academy Press**:** pp. 75 - 76.
[64] ibid.

the measures (input, process, output, and outcome) to predict overall organizational success (i.e. "predictability").

○ Applied example: For example, if evaluation is being conducted on incident action planning, then process measures (how they did incident planning) may be more important than outcome measures (producing an incident action plan, but with no assessment of quality). The former may have more "predictability" of future success during response to actual incidents.

○ Defining failure as a metric: In developing metrics and measures relative to overall success, defining failure may be as important as defining success. For example, defining specific poor patient outcomes as an indicator of failure may make the performance issue clear and prompt an immediate organizational change.

○ Performance measures and organizational success: Determining the relationship between performance measures and organizational success is relatively easy to achieve in programs that have **regular** outputs and outcomes from daily activity or frequent task performance.

  ▪ The inputs, processes, outputs, and outcomes can be compared to each other and to actual organizational experience. Over time and varying circumstances, the performance measures may therefore be assessed for **their value as predictors of future organizational success**.

  ▪ In emergency management, true emergency response and recovery rarely occurs, and so the predictive value of the four types of performance measures is less certain. The characteristics of inputs, process, outputs, and outcomes must therefore be considered separately for **relative value** and **ease of use**, so that informed decisions are made when selecting performance measures during evaluation design.

• "Relative Value" and "Ease of Use" for each type of performance measure: These important factors can be generally and relatively described for the four types of evaluation measures in a performance-based EM system:

○ **"Ease of use"** of measures: This is related to the ability to translate evaluation findings into measurement units specific to the metric (through analysis) so direct comparison can occur. Generally, the relative ease of use for the four types of performance measures can be described:

Identifying performance measures which predict organizational success is easier when the activities being evaluated occur regularly. As emergency response is not a regular activity for healthcare systems, relative value and ease of use must also be considered in selecting performance measures.

Performance measures to be utilized during evaluation should also be considered for their ease of use (ability to translate directly to metrics).

- Input measures: These are commonly the easiest measures to obtain and catalogue: They are usually simple, straightforward, and easily described units of measure.

- Process measures: These include implementation of system components and accomplishment of interim activities. They are relatively easy to obtain but can require significant interpretation. For example:

  - "What is successful implementation of a planned capability?"

  - "Is the quality of the activity in the process comparable to that expected in the evaluation design (i.e., the metric)?"

  - "Do the measures and metrics in this evaluation have reasonable validity and reliability?" (See "relative value" below.)

- Output measures: In an overall, complex program or plan, these can be more difficult than the preceding measures to define and track in a clearly objective fashion. This may be less of an issue for more straightforward activity, such as specific training.

- Outcome measures: These measures are not easy to use as the primary measures during many EM program activities, since "outcomes" may be rare (major incident response and recovery) or take some time to realize (mitigation and preparedness). Even under actual emergency and disaster conditions, it may be difficult or impossible to attempt real-time outcome evaluation of the emergency response and recovery system performance. For these reasons, EM programs incorporate exercise and proxy events as a means to obtain emergency response and recovery system outcome measures under simulated emergency conditions.

- **"Relative value"** of the types of performance measures: A general comparison may be made of the predictive power of the four types of measures, in terms of predicting future emergency response and recovery performance:

  - Inputs are generally the weakest for predicting success in the organization's performance. Inputs may best be thought of as "necessary but not sufficient." They may, in fact, be most

effectively used for negative predictive value or as a measure of failure: if adequate input (quality as well as quantity) is not accomplished, it is unlikely for the entity to meet performance expectations.

- <u>Process measures are similar to inputs</u> in terms of the importance to overall system performance. Successful process implementation is important to avoid failure, but process measures are usually insufficient alone to indicate future success in emergency response and recovery. They are, however, very important to the After Action Report process (see Lesson 4.4.2).

- <u>Output measures</u> are usually more indicative of overall outcome and therefore system success. While the predictive value probably grows with outcomes that encompass increasingly comprehensive activities, the ease of objectively describing and measuring these outputs decrease.

- <u>Outcome measures</u> are the most likely of the four measures to be accurate stand-alone predictors of system performance. These may be more reliable as predictors if regular outputs occur, which allows for outcome measures across a range of circumstances over time. For example, a successful outcome in a "perfect" situation where the system almost couldn't fail is not predictive for all future scenarios; conversely, a cataclysmic situation with no chance for success is equally unpredictable for system performance under most circumstances. Repeated outcomes experienced over time provide a more realistic picture of expected results over a representative range of circumstance, and also allow for "good and bad days," experienced versus inexperienced personnel on duty at different times, and other factors.

- <u>Input, process, and output evaluations can be indicators of outcomes</u>, but their value as a predictor of organizational success (either individually or through some composite) should not be assumed. The predictive value for all four types of measures should be sought through some objective manner over time. This usually requires significant system experience, either actual or simulated through realistic exercise.

- <u>Using input, process, output, and outcome performance measures in Healthcare System Emergency Management</u>: The following guidance may be useful in determining how each type of performance measure may be analyzed against a defined metric.

○ <u>Input measures</u> may be analyzed (compared) against the design requirements (i.e., resources necessary for the system to function) for the overall EM program and its component plans. "Design requirements" developed during the original planning for the entity may also provide documentation of original designers' expected inputs and, therefore, a metric upon which actual inputs can be measured. For example, in developing a decontamination system for a hospital, the decontamination team design may indicate that four personnel are needed to run the decontamination area and that having three personnel available on each shift for each position will provide the necessary coverage. The input metric for recruiting personnel is therefore set, and the related input measures would be the number of qualified personnel recruited for each position on each hospital shift.

○ <u>Process measures</u> may be analyzed against the system's or sub-system's task lists during mitigation, preparedness, response, and recovery. For example, during an exercise of the hospital decontamination system, was the decontamination area fully set up during the mobilization process? The detailed mobilization checklist is used as the metric by evaluators, and the measures are the action steps that the exercise "players" accomplished during the decontamination area mobilization.

○ <u>Output measures</u> are the "outcomes" for intermediate steps in the overall plan or program being evaluated or for specific sections, functions, teams, and individuals within the overall system. These may therefore be analyzed against the pertinent sub-system objectives. They may also be compared to pertinent areas of the system description and concept of operations (including task lists, operational checklists or job action sheets, and other response and recovery guidance); strategic and tactical plans (programmatic as well as response and recovery); and other aspects of the system documentation.

  ▪ Output measures are commonly used in summative evaluations designed to demonstrate compliance with outside regulatory, funding, and supervisory organizations. For example, demonstrating that the healthcare organization maintains the required number of trained/certified personnel for a hazardous materials spill on the hospital premises is an output measure for healthcare engineers' preparedness.

○ <u>Outcome measures</u> are the overall product, result, conclusion, etc., from the evaluated entity. Outcomes are easier to tie to

organizational success, since they are embodied by the overall mission and objectives of the organization (if those statements are well constructed).

Healthcare System-specific Evaluation Issues

- <u>Outcome as the goal</u>: The overall goal of an emergency management program for healthcare systems is to develop and maintain a program and component plans that will provide an optimal **outcome** in relation to any and all-hazard risk.

    - As with any general EM program, the desired "outcome" is defined by program objectives. These are usually objectives contained in mission statements, as discussed in Unit 2 and Lesson 4.3.3. EM program objectives can be summarized generically as:

        - Minimize or eliminate organizational disruption by loss of mission-critical system

        - Maximize indicated response capacity and capability.

The overall objectives for the EM program include minimizing organizational disruption and addressing capacity and capability during response. These can be considered outcomes in the evaluation program.

- <u>Complexity</u>: Modern healthcare systems are extremely complex, characterized by a multifaceted web of activities that are carried out by a variety of public and private actors. Healthcare system emergency management within this construct involves establishing a management framework, coordinating resources, agreeing upon priorities, planning with parties that are parts of different organizations, and other activities.   This complexity requires evaluation of the healthcare system EM program as a multi-layered network that must be organized to achieve operational readiness.

- <u>Formative versus summative</u>: The approach to evaluation advocated here is primarily formative in nature.   Summative evaluation is used almost exclusively for accountability for external funding and regulatory requirements, and much of that can be drawn directly from the formative evaluation data collected primarily for system improvement

Though at times it may be challenging to achieve, formative evaluation is the preferred type of evaluation approach for healthcare systems.

- <u>Varied evaluation instruments</u>: Due to the complexity of assessing operational preparedness in healthcare systems, multiple evaluation methods are recommended, using inputs, processes, outputs, and outcomes in appropriate applications. Both qualitative and quantitative methods of evaluation may be implemented, which will broaden the understanding of capacities as well as capabilities.

- "Outcome measures" as the ideal: Whenever possible, objective, outcome-based measures should be used. This prescription is supported by the Institute of Medicine's Committee on Evaluation of the Metropolitan Medical Response System Program: "the importance of outcome-based indicators, especially those obtained from exercises or careful evaluations of real disasters, cannot be overemphasized."[65]

- Simulation to evaluate hazard preparedness: Since many of the hazards of concern have not been experienced by individual healthcare systems (i.e., certain potential terrorist acts or technological and natural disasters), simulations and proxy events must be used to stress the system in a manner consistent with system assumptions about the response conditions during a real- world case. This important task requires high quality simulation, as well as assessment tools (see Lesson 4.3.3) to stress the system and discern the degree to which a system is ready for emergency operations.

Organized Strategy for Comprehensive EM Program Evaluation

A specific evaluation strategy should be developed by an organization to assure that its EM program is evaluated in a balanced and comprehensive fashion and that each component is evaluated using the most effective evaluations methods for that type of activity. It should begin with the overall program assessment, which is based upon the program mission and objectives.

- EM program evaluation: As described in Lesson 1.1.2, the overall goal of the healthcare organization's EM program is to support the organization's mission(s) through the accomplishment of specific program objectives, including:

  ○ Resiliency - Continuity of medical and business operations

    ▪ No disruption of usual medical or business operations

    ▪ Protection of personnel, current patients and families, property, and the integrity of the organization.

  ○ Adequate medical surge to meet the incident needs

    ▪ Surge capacity to meet the quantity of patient care needs

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[65] Preparedness Indicators (2002). *Preparing for Terrorism: Tools for Evaluating the Metropolitan Medical Response System Program.* F. J. Manning and L. Goldfrank. Washington, D.C., National Academy Press**:** p. 99.

- Surge capability to meet the unusual types of patient care needs.

- The component plans of the EM program: The EM program has component plans to accomplish these EM program objectives (mitigation, preparedness, and the EOP for response and recovery), and these should all be included in the comprehensive program evaluation. As discussed earlier in this lesson, effective evaluation of both programmatic activities and emergency response and recovery performance requires a range of evaluation methods.

- Strategic options in program evaluation: Two strategic evaluation paths are presented to comprehensively and effectively address evaluation of the EM program:

  ○ Programmatic performance evaluation: This evaluates the effectiveness and efficiency of the EM program is meeting its strategic objectives from the Strategic Administrative Plan and achieving the objectives of the annual work plans. This is primarily focused upon mitigation and preparedness planning, completion of related tasks, and effectiveness/efficiency of the activities. Programmatic evaluation is more fully presented in Lesson 4.3.3.

  ○ Emergency response and recovery performance evaluation: This strategic initiative assesses the actual performance of the system, generally through evaluating system function during emergency response and recovery exercises and actual events. This is a special subset of program evaluation and is more specifically presented in Lesson 4.3.4. It focuses upon the EOP and Recovery Plan, but provides indirect assessment of mitigation and preparedness planning as well.

Two strategic areas of focus are provided for the healthcare system evaluation program (see text).

Evaluation and Legal & Reputation Risk for the Organization

It should be noted that in some instances the findings from evaluation activities can become legally "discoverable" and/or subject to Freedom of Information Act if contained in public agency documentation.

- Creating legal risk from mitigation and preparedness: A potential exists for good-faith efforts to create legal liability or reputation-related crisis. Conversely, the lack of documentation of earnest evaluation to improve mitigation and emergency response and recovery performance can be problematic.

Evaluation programs have legal implications that should not be prohibitive. Emergency managers are encouraged to consult their organizational legal counsel.

- Involving legal counsel: Healthcare organizations should consult their legal advisors on how to protect themselves through the use of "risk management," "quality improvement," or other appropriate legal cover so that earnest efforts to optimize mitigation, preparedness, and emergency response and recovery system performance do not become a legal or financial risk.

- Public versus internal documents: The use of an executive summary or evaluation reports with general statements for "outside" release (the general public, regulatory agencies, and emergency response partners) while unattached appendices contain the necessary detail, are two documentation strategies that may be helpful in addressing these concerns.

- EM as a "quality"-related activity: As discussed in Unit 1, the EM program, including its evaluation process (meeting minutes, interim products, and final report) and all related documentation should formally be defined as an official part of the healthcare system's Safety and/or Quality Assurance/Quality Improvement program. This designation can be strengthened by locating the EM committee in an appropriate position within the organization's committee architecture, such as a subcommittee to the Safety Committee and also reporting to a clinical care committee where quality improvement activities are performed

Lesson 4.3.3 Performance-based Evaluation of the Healthcare Systems Emergency Management Program

Lesson objectives

- *Explain the purpose and describe the different types of EM programmatic evaluation.*
- *Describe different approaches to conducting EM programmatic evaluations.*
- *Describe the different EM programmatic evaluation targets and evaluation methods.*
- *Summarize the steps involved in the strategic planning of EM programmatic evaluation.*
- *Summarize the steps required for effectively designing, developing, and conducting programmatic evaluation.*

Background

Programmatic evaluation in healthcare emergency management, as in any other EM program, is the process of analyzing the entire program, a component plan, or a subset thereof (including policy, process, procedure, product, or personnel). The end purpose of program evaluation is to determine where change is indicated and what change is needed. These proposed changes are then achieved through organizational learning (see Module 4.4).

- Program performance as the focus: Ideally, program evaluation should be performance-based. Lesson 4.3.1 differentiates "performance" evaluation approach for emergency response and recovery systems from the "performance" evaluation for the Emergency Management (EM) program. This lesson focuses upon the latter, EM program evaluation, which employs different metrics, and depends more on input, process, and **programmatic** output and outcome measures than on direct measures from response and recovery performance.

- Importance of programmatic evaluation: Programmatic evaluation is recognized as essential to the long-term success of an organization, providing a method for achieving accountability, program improvements, and indications for the need of programs to evolve in a changing organizational environment. An example that reflects this importance is provided by the Federal Government Performance and Results Act of 1993 (see Textbox below), specifically applicable to all Federal agencies.

> Textbox 4.3.3.1
>
> **Government Performance Results Act (GPRA)**
>
> The Government Performance and Results Act of 1993 (GPRA)[66] was instituted as a government-wide requirement for agencies to set goals and objectives, evaluate their program(s) in the attainment of these goals and objectives, and report on their program(s) performance on an annual basis. Although not specifically mandated for healthcare programs outside Federal government authority, ongoing program evaluations are a necessary basis for any organization's viability, maintenance, and improvement.

EM program evaluations can be classified according to performance measures used and the approach (formative versus summative). More recently published categorization schemes differ slightly, due to the purpose of the evaluation. These can be considered "industry applications."

- Program evaluation definition: Many definitions for "program evaluation" exist and a composite representation is provided (see terminology textbox) from an excellent, Web-based program evaluation guide.

> **Terminology alert!**
>
> ***Program evaluation***: The activity that encompasses "carefully collecting information about a program or some aspect of a program in order to make necessary decisions about the program."[67]

- Programmatic evaluation types: Many "types" of evaluations have been described and a range of classification for these types is presented in the literature. Classification is commonly based upon the specific purpose of the evaluation, the evaluation measures used, or some combination thereof. McNamara refers to "at least 35 different types of evaluation" that have been described according to these factors.[68] Classifications in the literature are generally influenced by the source's orientation towards a summative or formative evaluation purpose (see Lesson 4.3.1 for description of these approaches).

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[66] OMB Website. Senate Committee on Government Affairs GPRA Report, available at: http://www.whitehouse.gov/OMB/mgmt-gpra/gprptm.html#h22, accessed December 5, 2005.

[67] McNamara C. Basic Guide to Program Evaluation (Feb 16, 1998). Available at: http://www.managementhelp.org/evaluatn/fnl_eval.htm, accessed December 12, 2005.

[68] McNamara, C. *Basic Guide to Program Evaluation* (February 16, 1998). Available at: http://www.managementhelp.org/evaluatn/fnl_eval.htm, accessed December 12, 2005.

○ <u>Typed by evaluation measures</u>: For simplicity and consistency with EM concepts, the classification of evaluation types in this text is described by the type of measures used: input, process, output, and outcome evaluation, or the combination thereof (see Lesson 4.3.1). The program area being evaluated and the methods used will further qualify the specific evaluation description within the evaluation type.

○ <u>Translating other categorization schemes</u>: Most other evaluation categorization schemes may be easily translated into this classification. For example, a recent, authoritative representation from a primarily "summative" organization, the U.S. General Accountability Office, is provided (see textbox).   The summative orientation can explain its variance in evaluation types found in the more "formative approach" literature (input, process, output, and outcome) and presented in Lesson 4.3.1.

  ▪ The GAO presents four "types" of evaluation (see Textbox 4.3.3.2), but in its "accountability" role for the U.S. government does not discuss evaluations that are focused upon "inputs" or "outputs."

  ▪ The GAO's "impact evaluation" essentially translates into an assessment of the program in terms of the success of the organization. This may be considered an outcome evaluation as presented in Lesson 4.3.1.

  ▪ The "Cost-Benefit and Cost-Effectiveness Analyses," presented by the GAO as a separate evaluation type, is an example of a specific "industry application" of an outcome analysis.   The accountability industry recognizes cost analysis as one of its primary summative purposes and so has a designated category specifically for it.

Textbox 4.3.3.2

Performance Measurement and Evaluation: Definitions and Relationships[69]

"A program evaluation typically examines achievement of program objectives in the context of other aspects of program performance or in the context in which it occurs. Four main types can be identified, all of which use measures of program performance, along with other information, to learn the benefits of a program and how to improve it."

- ▪ Process (or implementation) Evaluation
- ▪ Outcome Evaluation
- ▪ Impact Evaluation
- ▪ Cost-Benefit and Cost-Effectiveness Analyses

EM program evaluation goals should include assessment of efficiency and effectiveness of the entity being evaluated.

- • Goals of programmatic evaluation: A professional emergency management programmatic evaluation, whether summative or formative, is a proactive and carefully planned activity with two primary goals:

  1. To determine the **efficiency** (financial, time, and effort) with which a program is performing

  2. To assess **effectiveness** or the degree to which a program is achieving its intended goal (or accomplishing a task) or whether program plans will achieve their goals when activated.

EM program evaluation should be incorporated into all aspects of the program, and it should be established as the EM program is established to ensure its success.

- • Programmatic evaluation as an integral component of the program itself: Evaluation should be incorporated into each distinct component of the EM program. Programmatic evaluation that is initiated simultaneously with new program implementation may have a greater ability to be permanent and to produce desired results.

  ○ Early changes: Early monitoring offers the opportunity to make quick improvements with interventions that steer a program towards success.

  ○ Continuous process: It is of great importance to see evaluation as

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[69] General Accountability Office. Performance Measurement and Evaluation (May 2005). GAO-05-739SP, available at: http://www.gao.gov/new.items/d05739sp.pdf, accessed December 13, 2005.

a continuous undertaking, and this is best established at the outset of any program rather than as a *post hoc* consideration initiated in response to an external, often adverse, prompt (see earlier discussion).

○ <u>Timely reporting</u>: A process can be established such that the reports and feedback generated by evaluation can be communicated to program managers and stakeholders in a timely and coherent manner so that corrective actions can be taken and system improvements implemented prior to major problems.

○ <u>Integral to new program development</u>: Evaluation methods should therefore be incorporated into a new program as it is conceptualized, so that it is fully incorporated during the process of program design, development, implementation, and maintenance.

- <u>Evaluation strategy</u>: What is specifically evaluated and how frequently must be carefully considered in any evaluation program. Resources, obvious need for change or improvement, outside accountability and other requirements, and balance with other activities must be considered. This presents a compelling argument for using strategic planning (see strategic planning template later in this lesson) to address these many considerations in an organized fashion. Strategic planning can also be used to acknowledge and account for the extensive informal evaluation that occurs in a well-run EM program (see next bullet).

- <u>Formal versus informal program evaluation</u>: It is also important to recognize that, while this lesson has focused primarily upon formal evaluation, a range of **informal program evaluation activity** also occurs during emergency management program activities. Many aspects of the EM program are evaluated on an informal basis, accomplished by the program manager and EM committee members during review and revision of component plans, during committee discussions, and other activities. The determinations from these informal activities may also be important to capture and incorporate into the organizational learning process (See Lessons 4.4.1 and 4.4.2).

- <u>Timing of evaluations</u>: All aspects of the EM program should undergo performance-based evaluation on some time-related basis. This time-basis may be:

○ <u>Onetime</u>: All important aspects of the EM program should undergo formal evaluation, at least once, to both assure and document adequate performance. This onetime evaluation might be most

All EM programs undergo some <u>intermittent</u> evaluation/review, in addition to single evaluation activities. These may be yearly evaluations (formal), or the regular monthly reviews of specific program components that can be conducted during EM Committee meetings.

appropriate when major changes or revisions are undertaken to the program.

○ <u>Intermittent</u>: Intermittent evaluation occurs according to a pre-determined schedule or to pre-designated trigger criteria that prompts the assessment activity.

▪ <u>Purpose</u>: To assure that important EM functions are evaluated at appropriate intervals.

▪ <u>Timing</u>: The frequency and/or trigger for formal evaluation should be determined in part by the relative importance to mitigation of risk and to emergency response and recovery effectiveness.

▪ <u>EM program review</u>: Much of this intermittent evaluation takes place in the context of an annual EM program review and revision or at the time that the strategic plan for the overall program is reviewed and revised (one year, three year, five year) or other. Much of this is a straightforward assessment of "completion of tasks": "Did we meet the mitigation plan objectives for this year (which were designed to be measurable and objective)?"; "Did we complete the tasks listed in the annual work plans?"; "Did we meet the preparedness plan objectives for this strategic planning period?"

▪ <u>EM committee meetings</u>: Intermittent evaluation is also essentially what is accomplished by EM committee meetings. The agenda, conduct of the meeting, and capture of evaluation data for immediate and for long-term comparison analysis can be considered to be an evaluation process if properly conducted.

○ <u>Continuous</u>: Continuous Monitoring is another specific approach to programmatic evaluation that should be considered.

▪ <u>Purpose</u>: In emergency management, continuous or frequent monitoring (i.e., evaluation and frequent re-evaluation) is used to assure that mitigation, preparedness, response and recovery capabilities critical to success of the organization are evaluated on a continuing basis to assure they are constantly functioning as designed.

▪ <u>Design</u>: Specific performance measures are continuously collected and analyzed. Generally, continuous monitoring is designed so that thresholds are set and/or other anomalies are

readily detectable. Methods for further investigation should be established so that appropriate intervention, if indicated, can be promptly accomplished.

❑ An example of preparedness monitoring is daily radio checks of a hospital mutual aid radio system, conducted at a random time during each 24-hour period, with recording of each healthcare organization's notification confirmation. By performing real-time and monthly analysis, with feedback to healthcare facility chief executive officers, a very high rate of functional participation by hospitals may be maintained over time.[70]

▪ Example from clinical medicine: This concept is common in clinical medicine, when "performance measures" are used for ongoing monitoring of adherence to clinical practice guidelines.[71]

- Selecting targets for program evaluation: As with all other aspects of emergency management, formal evaluation actions must be assigned a relative priority and placed in timeframe based upon needs and available resources. The following provides example areas for consideration in selecting evaluation targets.

  o HVA (see Module 1.3)

    ▪ The HVA findings: Accuracy and comprehensiveness of the hazard survey, assessment, and analysis.

    ▪ The HVA instrument itself: Effectiveness of the HVA instrument in establishing priorities for mitigation, preparedness, response, and recovery planning.

    ▪ The HVA process: Representation of organizational and "outside" parties and other parameters of the organization's HVA process.

  o Mitigation Planning

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[70] Described in multiple documents at www.dcha.org, plus internal D.C. Hospital Association committee documents. Description of Hospital Mutual Aid Radio System (HMARS) presented in: Malson RA. Testimony for The Joint Public Oversight Hearing on District of Columbia Emergency Preparedness (October 28, 2002), available at http://www.dcha.org/EP/102802EmergPrepTest.PDF, accessed January 23, 2006.
[71] Performance measures. American Heart Association. Available at: http://www.americanheart.org/presenter.jhtml?identifier=3012904, accessed December 7, 2005.

Continuous EM program evaluation requires the continuous collection of performance measures. Efficiency for this continuous process can be enhanced by only conducting <u>analysis</u> when certain parameters indicate the need (see text).

- ▪ <u>Mitigation planning objectives</u>: The objectives, which are set in the annual mitigation plan, can be evaluated as to whether they were met (i.e., outcome). In addition, specific tasks (processes) utilized to achieve objectives can be evaluated for efficiency and effectiveness.

- ▪ <u>Specific mitigation plans or activities</u>: A similar evaluation of specific, formally planned mitigation activity can be conducted (for example, changes to the security perimeter, improvements in the physical structure of the facility, increasing generator capacity, adding hurricane shutters, and so on). At the very least, all of these that are "completed" should be documented as such for accountability (and credit provided to the EM committee or others responsible for the activity).

- ○ <u>Preparedness Planning</u>

  - ▪ <u>Preparedness planning objectives</u>: Similarly, the achievement of the preparedness planning objectives (as established) can be evaluated (outcome). Specific tasks within the preparedness plan can be evaluated (process and outcome) for efficiency or effectiveness.

  - ▪ <u>Specific preparedness plans, programs, or activities</u>: These will generally include:

    - ❑ <u>The EM instructional program</u>: Evaluation could include measures of the number and type of education and training courses and instructional drills, numbers certified or trained to a specific competency and proficiency level, and so on. Evaluation of training outputs, for example, could be guided by the question: "Do we have enough positions with the required certifications and qualifications?"

    - ❑ <u>The EM exercise program</u>: Evaluation could include how the exercises were selected, designed, and conducted. This would reflect the **exercises and exercise program**, not the exercise findings related to emergency response and recovery system performance.

    - ❑ <u>EOP implementation and maintenance</u>: this covers a wide range of activities. A sampling includes:

      - ▪ Personnel recruitment

- Facilities construction

- Equipment and supplies acquisition, storage, and maintenance

- Resource typing and other activities.

○ Emergency Operations Plan

- The EOP and its structure, sections, functions, and other aspects is formally assessed almost exclusively through performance-based evaluation of the exercise, evaluative drills, proxy events, and actual incidents (see Lesson 4.3.4). Examples include evaluation of:

  ❑ Functional component coordination.

  ❑ Information management.

  ❑ Incident action planning.

○ Recovery Plan

- Generally, the recovery planning is evaluated in the same manner as the EOP.

- Potential programmatic evaluation methods: a wide-range of valid methods are available to collect "measures," and have been advocated for the spectrum of EM programmatic evaluations.

  ○ Methodology: These include self-assessment, focus groups, participant observation (fieldwork) and logs, document and organizational record analysis, open-ended interviews, ethnographic analysis, questionnaires, surveys, expert judgment, standardized tests, and equipment trials.[72] Every data collection method, whether qualitative or quantitative, has both strengths and weaknesses. An important selection consideration is the use of qualitative versus quantitative methods:

    - Qualitative methods: These require a degree of subjective interpretation, which means that observer bias can become an issue. Without objective guidance, "the evaluator literally

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[72] Adapted from: Wholey, J., Hatry, H., et al (Eds). *Handbook of Practical Program Evaluation* (1994). San Francisco, Jossey-Bass Inc: p. 49.

becomes the primary measurement instrument in the investigative process"[73] when qualitative methods are used. On the other hand, this methodology allows the evaluator to capture nuance and detail and provides the ability to assess issues and areas that are not measurable via quantitative methods.

- Quantitative methods: These often have a checklist character, and although they can produce relevant and helpful measurements, such as **quantity** of training modules taught, they are unable to answer the **quality** of delivery and the outcome questions. They are also not well suited to evaluating internal organizational processes (process evaluations).

- **Quantitative versus Qualitative**: Quantitative methods are often viewed as more objective because they approximate methods employed in the natural sciences and allow the evaluator to be a more detached observer recording numerical values. Qualitative measures, however, if guided by objective, relevant guidelines, operational checklists, and observers recording instruments (see example in Lesson 4.3.4) may attain a similar level of objectivity as an evaluation measure.

○ Evaluation methods guidance: A useful guide for evaluation data collection methods, developed for nonprofit organizations, is provided in Exhibit 4.3.3.3.

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[73] Caudle, S. Using Qualitative Approaches; In Wholey, J., Hatry. H., Newcomer. K. *Handbook of Practical Program Evaluation* (1994), San Francisco, Jossey-Bass Inc: p. 70.

Textbox 4.3.3.3:

Overview of Methods to Collect Evaluation Information [74]

Method	Overall Purpose	Advantages	Challenges
Questionnaires, surveys, checklists	When need to quickly and/or easily get lots of information from people in a non-threatening way	-can complete anonymously -inexpensive to administer -easy to compare and analyze -administer to many people -can get lots of data -many sample questionnaires already exist	-might not get careful feedback -wording can bias client's responses -are impersonal -in surveys may need sampling expert - doesn't get full story
Interviews	When want to fully understand someone's impressions or experiences, or learn more about their answers to questionnaires	-get full range and depth of information -develops relationship with client -can be flexible with client	-can take much time -can be hard to analyze and compare -can be costly -interviewer can bias client's responses
Documentation review	When want impression of how program operates without interrupting the program; is from review of applications, finances, memos, minutes, etc.	-get comprehensive and historical information -doesn't interrupt program or client's routine in program -information already exists -few biases about information	-often takes much time -info may be incomplete -need to be quite clear about what looking for -no flexible means to get data; data restricted to what already exists
Observation	To gather accurate information about how a program actually operates, particularly about processes	-view operations of a program as they are actually occurring -can adapt to events as they occur	-can be difficult to interpret seen behaviors -can be complex to categorize observations -can influence behaviors of program participants -can be expensive

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[74] Adapted from: McNamara, C. *Basic Guide to Program Evaluation* (Febuary 16, 1998). Available at:
http://www.managementhelp.org/evaluatn/fnl_eval.htm, accessed December 12, 2005.

Focus groups	explore a topic in depth through group discussion, e.g., about reactions to an experience or suggestion, understanding common complaints, etc.; useful in evaluation and marketing	-quickly and reliably get common impressions -can be efficient way to get much range and depth of information in short time - can convey key information about programs	-can be hard to analyze responses -need good facilitator for safety and closure -difficult to schedule 6-8 people together
Case studies	To fully understand or depict client's experiences in a program, and conduct comprehensive examination through cross comparison of cases	-fully depicts client's experience in program input, process, and results -powerful means to portray program to outsiders	-usually quite time consuming to collect, organize, and describe -represents depth of information, rather than breadth

Performance-based Programmatic Evaluation: <u>A Template for Strategic Planning</u>

- <u>Strategic EM Program Evaluation Plan</u>: All of the above considerations are incorporated into the development of a logical approach to **overall** EM program evaluation. The selected approach used in any EM program is essentially accomplished through strategic planning. The following outline therefore presents recommended steps to accomplish strategic planning for EM program evaluation activities:

The EM program evaluation considerations presented earlier in this lesson are summarized into a strategic template for overall EM program evaluation.

1. Constitute a strategic planning task group within the EM committee.

2. Convene an evaluation strategic planning session.

3. Review pertinent evaluations accomplished in the past. If not already accomplished, assess strengths and weaknesses of past evaluation activities, including any strategic planning for evaluations.

4. Review annual work plans and determine what additional data exists on the current state of EM program implementation, efficiency, and effectiveness and any areas of concern or other indicators of the current state of the EM program, its component plans, and formal EM program activities.

5. Set statement of purpose and goals of the overall evaluation program or strategic plan.

   ▪ Describe how evaluation will improve the **EM program effectiveness.**

   ▪ Describe how evaluation will improve **EM program efficiency** (accountability or completion, effort and financial costs, and other efficiency-related objectives).

   ▪ Prioritizing strategy for evaluations (a "what-should-be-evaluated-first" guide that establishes a priority for evaluating potential elements/gaps in the EM program and its component plans).

6. Define the process to be used for formal evaluation of the overall EM program and its components. This provides guidance to each specific evaluation team to develop the performance metrics and units of measures and other steps for each specific evaluation (see template for individual evaluations below).

7. Along with the activities in #6, acknowledge the informal evaluation that occurs with EM committee meetings and reviews of EM program documentation. Establish a formal method to capture (i.e., document) findings from this informal activity, so they may be incorporated into organizational learning.

8. Define the metrics that will indicate **EM programmatic success** during the time interval covered by the strategic planning. In many instances, metrics will be easy to provide if the EM program is well described (for example, the mitigation plan objectives could serve as the metrics for evaluating the mitigation plan). If "expert judgment" will be a component of program evaluation, define what constitutes expert judgment (see earlier section on expert judgment).

9. Confirm the recommended strategy/process for evaluation findings to update the EM program and component plans (recommendations to be accepted by the EM committee).

10. Designate the schedule, types, and number of formal and informal evaluations to be conducted for the time interval covered by the strategic plan. Be sure to coordinate this with the exercise planning for the same time period since that is another important evaluation activity (see Lesson 4.3.4) with outputs that must be closely coordinated/merged with programmatic evaluation findings.

11. Develop a tentative assignment of evaluation teams for each activity.

12. Define parties in the local community that may benefit from receiving the evaluation findings.

13. Review, revise, and/or confirm the strategy for implementation of recommended changes, system improvement, and dissemination of recommendations ("organizational learning") within the organization (see Lesson 4.4.2).

Performance-based Programmatic Evaluation: <u>A Template for Each Individual Evaluation</u>

The following process template provides guidance for designing, developing, conducting, and applying programmatic evaluation for each individual evaluation activity. It is presented as a general guide that summarizes the program evaluation material discussed in this lesson.

A template is provided for evaluation of specific components of the EM program.

1. <u>Select an evaluation team</u>: Select personnel to design and develop the evaluation, based upon the area to be evaluated. This is usually a subset of the EM committee, with some representation from the evaluated entity (particularly in a formative evaluation process). For example, chaplains and personnel who manage the family assistance center during healthcare emergencies should be involved in the evaluation of its structure and operations.

2. <u>Establish the evaluation's **specific** goal and objectives</u>: This step may have already been accomplished by guidance from the emergency program manager, the larger EM committee, the EM program strategic planning task group, or by an outside entity. In many of these cases, the evaluation group may translate the guidance into a goal and objectives that are directly useful for designing and developing the specific evaluation process. This should include delineating the "audience" that is to receive and act upon the evaluation report.

3. <u>Establish the evaluation approach</u>: Based upon the goal and objectives and final "audience" for the report, determine whether the evaluation is primarily summative or formative. A simple rule-of-thumb might be: if the evaluation is intended to promote change in the evaluated entity, then a formative process is utilized.

4. <u>Develop evaluation strategies</u>: This involves selecting the methods that will most efficiently and effectively achieve the evaluation objectives.

    ○ <u>Focus</u>: this could have multiple parameters:

       ▪ Narrow (single task or unit) versus wider focus

       ▪ System-focused using system objectives, concept of operations, operational checklists, and other pre-developed materials.

       ▪ Involving data collection for example, looking at organizational responders' and "customer" satisfaction (patients, jurisdictional partners, etc.) where interviews and surveys may be more useful.

       ▪ Other.

    ○ <u>Temporal nature</u>: Whether the evaluation is "onetime," intermittent (if so, regular versus triggered), or continuous (see monitoring above). The timeframe for when the findings are needed must also be considered.

    ○ <u>Establishing metrics and measures</u>: The type of performance metrics and measures are selected using the considerations presented in this lesson (relative value, ease of use, translation to metrics, etc.). This defines the evaluation instrument.

    ○ <u>Evaluation instrument validity, reliability, and predictive value</u>: The evaluation designers should strive towards validity and reliability of evaluation instruments. It is important to examine whether the selected metrics and measures are actually useful predictors of program performance (i.e., **effective performance measures**) for mitigation and preparedness and/or effective performance during emergency response and recovery.

    ○ <u>Determine available sources to obtain data</u>: These include planners, responders, and "customers" (patients, patient families, the media, responders from community partners and others, other reports and data pools, etc.). For information collection involving individual interviews, questionnaires, and surveys, the need for informed consent should be determined through the organization's

institutional review board.[75]

○ <u>Methods of data collection</u>: Methods include observation, self-reporting, interviews and focus groups, survey, facilitated meeting, and others (see Textbox 4.3.3.3).

○ <u>Measures and Metrics to be used, analytic process, and evaluation determinations (judgments)</u>: See remaining steps for details.

5. <u>Evaluators</u>: Determine who will conduct the evaluation.

6. <u>Evaluation design and development</u>: Design the evaluation process, develop, pilot test, and revise if this is indicated.

○ <u>Guidance</u>: Develop the instruction for the exact entity to be evaluated, the specific input, process, output, and outcome measures that will be captured and how they will be analyzed against the metrics.

○ <u>Tools</u>: These include checklists, surveys, interview questions, and others, including the instruments that the evaluators will use to objectively capture the findings.

○ <u>Analysis</u>: Designate personnel to do the analysis (if this activity is separated from the evaluators).

○ <u>Evaluation determinations</u>: Delineate how these will be accomplished and what constitutes success versus failure, adequate versus "improvement needed," or other classification for the final determinations. This commonly should also address resource utilization, efficiency, and cost-effectiveness: "Can you do it with less resources, less expensive resources, or other less expensive approaches?" (i.e., the central focus of some evaluations may be determining cost benefit or cost effectiveness[76]).

7. <u>Conduct the evaluation</u>: Acquire the information and format it so that the information can be objectively analyzed.

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[75] Institutional Review Board is the body that oversees human research studies in healthcare organizations.
[76] General Accountability Office. Performance Measurement and Evaluation (May 2005). GAO-05-739SP, available at: http://www.gao.gov/new.items/d05739sp.pdf, accessed December 13, 2005.

8. <u>Conduct the analysis</u>: The evaluation findings must be objectively compared to the selected measurement index: the evaluated entity's objectives, metrics, standards, indicators, or other criteria.

9. <u>Apply the analysis</u>: This is accomplished according to the evaluation approach (formative versus summative):

    ○ For a **formative evaluation**, the analysis findings should be in a format that can be readily imported into the organizational learning process (see Lesson 4.4.1 for details – the following steps summarize the organizational learning process described in Lesson 4.4.2):

        ▪ <u>Process the analysis:</u> transform the analysis findings to information that objectively describes potential organizational change and its projected impacts.

        ▪ <u>Develop a determination</u>: judgment in the formative evaluation is usually focused upon potential change that will bring improvement or will institutionalize informal but well functioning findings. During the organizational learning process (see Module 4.4), a judgment is made as to whether the recommended change is accepted as is, accepted with a revision to the "action plan for improvement," or is rejected. This is based upon the merits, priorities, cost-effectiveness, and other impacts to the organization,

    ○ For a **summative evaluation**, the findings can be judged as to whether they are a valid presentation of the state of the evaluated entity and whether the entity's performance is acceptable or unacceptable (or can be assigned a "grade") according to the summative criteria.

    ○ For both types of evaluations, it is generally advisable to meet with the personnel from the evaluated entity, explain the findings and determinations, answer questions, and seek feedback on their view of the validity of the findings and determinations. Their recommendations for the "way forward" should be sought from this venue, and in many formative evaluations, this should occur before completion of the following steps. This interaction should be accomplished in a positive fashion wherever feasible and appropriate.

10. <u>Determine further evaluation needs for this issue</u>: Based upon the overall evaluation findings and recommendations, and/or upon "outside" direction, a decision should be made as to whether further

evaluation is needed. If it is, the approximate timeframe and other details should be documented. This would be submitted for consideration in the follow-on strategic preparedness planning that addresses evaluation activity (see Step 3 in the evaluation strategic planning process).

11. <u>Reporting the program evaluation</u>: The evaluation team develops and submits the evaluation report to the appropriate body, which usually is the EM committee. When accepted, they are disseminated and archived through EM program reporting processes.

    ○ Reports can range from brief statements and attachments to the EM committee minutes, to an evaluation section in an EM program annual report, or to formatted, summative answers to meet "outside" organizations' accountability requirements.

        ▪ For organizational purposes, reporting should be developed with format and content most conducive to organizational learning whenever possible (see Lessons 4.4.1 and 4.4.2).

        ▪ Accuracy and level of detail are important, with attention to privacy, professionalism, proprietary interests, and legal/financial risk as indicated and discussed in Lesson 4.3.1.

Lesson 4.3.4 Performance-based Evaluation of the Healthcare System Emergency Operations Plan

Lesson objectives

- *Describe the role and purpose of the After Action Report (AAR) process in system evaluation.*
- *Describe the three types of measures commonly used for response and recovery evaluation.*
- *Describe the three major sources of data for accomplishing performance-based evaluation of emergency response and recovery.*
- *List the steps for a comprehensive AAR development process.*
- *Define the important differences between a "hot wash" and a formal After Action Report meeting.*
- *Describe the "issues-based" format for capturing AAR information and its advantages.*

Introduction

As presented in Lesson 4.3.1, two categories of system evaluation exist for emergency managers. Lessons 4.3.2 and 4.3.3 present a description of performance-based evaluation and the application of performance-based evaluation to the emergency management program, which is a **programmatic evaluation**. The second, very important category is **performance-based evaluation of emergency response and recovery plans**. The latter is presented here.

- Evaluation opportunities: Performance-based evaluation of response and recovery may be accomplished through examination of:

    ○ Actual incidents (emergencies and disasters)

    ○ Exercises (tabletop, functional, and full)

    ○ Evaluative Drills (i.e., drills with a formal evaluative component)

    ○ "Proxy events" and other selected "urgencies" (see Textbox 2.1.2.9).

- Emergency operations evaluation: Due to its nature, the timing of this type of evaluation will occur after some type of "incident." Many terms have been used to describe a post-incident review to capture information from incident or exercise performance (see textbox). The development of all of these different permutations has been strongly influenced by organizational culture, history, mission, and preference.

Evaluation of response and recovery can occur through examination of real incidents, proxy events, exercises, or evaluative drills.

○ The term "**After-Action Report (AAR) process**" (see terminology textbox) presented in SEMS[77] best reflects the **comprehensive activity** that, when utilized after actual or simulated events, provides meaningful data that can be efficiently applied to revise and enhance emergency response and recovery systems.

○ For emergency managers and, more specifically, healthcare system emergency managers, the "AAR process" is best viewed as a method for evaluating system performance after actual or simulated events. The AAR products (incorporated into the After-Action Report itself) can be utilized in a formal fashion to effect "system change." This change may be to the EOP, the Recovery Plan, instructional activity based upon the EOP, mitigation planning, and so on. In terms of evaluating instructional activities, the AAR strives to primarily address the third and fourth levels of the ISD evaluation process discussed in Module 4.2.[78]

Many terms exist and are used to reflect the post-incident evaluation activity. The term After Action Report "process" is utilized in this text, as it reflects the range of activities necessary to achieve a comprehensive review.

> ### Terminology alert!
>
> ***After Action Report (AAR) Process[79]:*** A focused, post-incident or post-exercise activity to capture objective observations, both positive as well as negative, related to response system performance. Its product is commonly referred to as "lessons learned," but a comprehensive process goes beyond the collection of "lessons learned" to accomplish objective improvements in procedures, assignments, equipment, training, and personnel to attain true **organizational learning**.

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[77] Standardized Emergency Management Systems (SEMS) Guidelines, Part III. Supporting Documents, p. 1. Available at: http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/SEMS%20Guidelines/$file/AAR.pdf, accessed December 6, 2005.

[78] For exercises, all 4 levels would be applicable. For responses to actual incidents, ISD levels 3 and 4 would be applicable.

[79] This term "AAR process" is used by SEMS to describe the activity related to developing and conducting the After-Action Review, including meetings and documentation review.

Textbox 4.3.4.1

The Many Terms for Post-incident Evaluation

System evaluation occurring after actual or simulated events ("After-Action") has been addressed with varying success through many different methods over the past decades. Many approaches have been described in both the public (civilian and military) and private sectors. Some of the terms used to describe this range of activities include:
- Post-mortem
- Critique
- Lessons Learned
- Retrospective
- Hot wash
- After-Action Review
- After-Action Report Process.

- AAR process purpose: In emergency management, the AAR process serves the following important purposes:[80]

  ○ Documentation: Establishes a record of evaluating exercise and response activities.

  ○ Performance "findings": Identifies both problems and successes encountered during emergency operations.

  ○ System evaluation: Analyzes findings to determine the effectiveness of the EOP and/or Recovery Plan and indirectly provides feedback for mitigation and preparedness planning.

  ○ Develop recommendations for change: Establishes recommended changes that can be used to form a plan of action for implementing improvements.

- Components of the AAR process: The AAR process, as an organized activity for evaluating emergency response and recovery system performance, encompasses the following sequence of activities:

The AAR process not only identifies successful and problematic issues during response and recovery, it also documents evaluation activities (for future reference) and establishes recommendations for organizational change.

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[80] Adapted from Standardized Emergency Management Systems (SEMS) Guidelines, Part III. Supporting Documents, p. 1. Available at: http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/SEMS%20Guidelines/$file/AAR.pdf, accessed December 6, 2005.

○ <u>Collection</u> of objective, authoritative data and observations

○ <u>Synthesis</u> of the data and observations into useful information

○ <u>Development of a report</u> that provides a brief description of the incident, exercise, drill, or proxy event in a narrative form, and then describes objective issues, both positive and negative, with actionable recommendations.

- <u>Applying AAR process outputs</u>: The actual processing and implementation of recommendations is considered a separate activity, **organizational learning,** and is presented in Module 4.4.

The value of the AAR process is only realized when the "products" of this process are further addressed through organizational learning, as discussed in Module 4.4.

○ <u>AAR process outputs</u>: The **outputs** of the AAR process should therefore be viewed as an **interim product** in systems enhancement or revision. The frequent statement, "we discussed that during all of our prior AAR meetings and nothing is ever done about it" is a reflection of an inadequate completion of the AAR process and organizational learning requirements. Issues raised during any AAR meeting (and by personnel who were unable to attend the AAR meeting) should be ultimately addressed (and decisions disseminated) by processing and analyzing them in a systemic fashion. This is delineated in the discussions on **organizational learning,** presented in Lesson 4.4.1.

○ <u>Timing of the AAR process</u>: Emergency management experience has consistently demonstrated that response system revisions are most likely to be implemented in the time period immediately following the exercise or incident. In order to capitalize on the motivation and, in some instances, the funding available in the immediate post-response period the AAR process must be completed as soon as possible after an incident or exercise.

- <u>AAR process – critical concepts</u>: There are several important concepts related to the AAR process as presented in this text:

A critical concept that deserves emphasis: the AAR process evaluates systems, not individuals.

○ <u>System versus individual position evaluation</u>: It is important to emphasize that an AAR process is a "**system evaluation**," and is not generally used for **individual performance evaluation**. Separate, constructive methods exist for this purpose (see the ICS mandated individual performance evaluation that occurs at the end of incident response in Lesson 3.3.8). In fact, it is advisable to remind participants of this purpose at the beginning of every AAR activity, to prevent the otherwise common tendency to digress the discussion into critique of individual actions.

○ Responsibility for the AAR process: Professionally conducted AAR process requires significant effort and attention to properly prepare, conduct, and complete. As a post-incident activity, the responsibility for organizing and conducting an AAR process is with the emergency program manager (in contrast to the IR, which is conducted by the Command and General Staff that managed the incident response). There are, however, some specific early AAR activities, which are managed by incident response positions as described later in this lesson.

○ Type of information sought: The types of information sought in the AAR process should include positive issues as well those that indicate a need for improvement.

- A true systems evaluation focuses first upon whether the system, as designed and implemented, met its objectives. If so, the successful parameters are important to document.

- Ad hoc activities may have occurred during response that, while not part of the original system design, had positive influence on the organizational success and therefore should be captured for official incorporation into the system.

- Problems that arise during incidents, exercises, and other evaluated activities should be analyzed by comparing them to the emergency response and recovery system construct. Poor outcomes may be due to **poor system performance** (ineffective design, incomplete implementation, inadequate training, or other reason) or other circumstances **beyond** the system design. This analysis is important when developing recommended changes.

- The exact nature of any shortcomings or problems is important to discern so that recommended actions are accurate and comprehensive.

○ AAR process and evaluation measures and metrics: The measures commonly used to evaluate incident performance during response and recovery is usually **process**, **output,** and **outcome** performance measures (see Lesson 4.3.1).

- **Process measures** are related to whether, and how well, response participants executed the indicated "processes" during response and recovery. These processes are tasks, procedures, and other activities that in aggregate are expected to accomplish response and recovery objectives. The **metrics**

Process, output, and outcome measures are more commonly utilized in the AAR process than input measures.

for comparing process measures are drawn from the EOP and/or Recovery Plan. These can include process and procedure descriptions, concepts of operations, operational checklists, and similar documentation. For example, a process evaluation of incident action planning during an exercise examines whether the incident management team executed the defined steps for incident action planning and assesses how well they were performed.

- **Output measures** are focused upon the products of processes, tasks, and other incident response and recovery activities. In the incident action planning example mentioned above, outputs are the actual incident action plan (IAP) and supporting documents produced. Output measures may examine both whether an IAP product was produced and the quality of the IAP compared to the IAP template within the EOP.

- **Outcome measures** generally focus upon achieving the individual activity's or the overall organization's objectives during emergency response and recovery. Developing the metrics for this **outcome-oriented focus** is facilitated by the development of clear, measurable, and achievable objectives for the incident or exercise response. The objectives are then used to define the **outcome metrics** for determining if the measures met expectations.

Metrics utilized in the AAR process are drawn from the EOP and described incident response objectives. This necessitates that they be carefully described.

- **Metrics** for use in analyzing the performance measures obtained during response and recovery are developed from EOP, Recovery Plan, and incident objectives. This emphasizes the importance of carefully defining objectives, system description, concept of operations, and other documentation for all activities in all phases of emergency management.

- **The focus of the AAR process** is best placed on **outcome evaluation** where possible and then secondarily upon **process and output evaluation**. Organizational success in response and recovery, which is usually defined as accomplishing incident response objectives, is best determined through an **outcome** evaluation, as opposed to a primary focus on evaluating **process** or **outputs.** The latter two performance measures generally relate to more tactical accomplishments and do not necessarily predict overall organizational or mission success.

- Incident or exercise information sources for the AAR Process: Three major sources of information are used in developing performance-based information for the AAR process. Different methods may be used for optimal collection of information from each of these sources:

    ○ Analysis of evaluator observations: Evaluators' real-time observations during the incident or exercise are ideally captured in a pre-formatted manner. The evaluators' reports, therefore, contain pre-selected observation categories and guided data sets captured during the simulated or actual incident. The reports are collected and analyzed. This is a common practice during exercises but less likely to be used during actual incidents.

    ○ Response and recovery document collection and analysis: This activity encompasses the collection and analysis of incident-related or exercise-related documentation, most of which is produced during the incident or exercise period.

    ○ After-Action Report (AAR) meetings and participant observations: This is the process of using After-Action Report meetings and formatted collection of information from participants to capture their observations and recommendations from the response and recovery activity.

    With all three sources, acquired performance information is processed into content and format that is **objective and actionable in terms of system change, measurable to assess implementation, and able to be tracked through further analysis and implementation** (see Module 4.4).

After Action Report (AAR) Analysis of Evaluator Observations

- Evaluator observations: This source of emergency response and recovery evaluation is based upon the collection and analysis of observed performance during response and recovery activity.

- Evaluator method: As noted in Lesson 4.2.3, **evaluators** are used during exercises, and occasionally during incidents, to capture objective performance information.

    ○ Evaluator selection: Evaluators should be selected who have extensive knowledge of the facility's EOP. It is not useful to have personnel who do not understand the information they are collecting or the EOP metric being used for comparison.

The three major sources of information for the AAR process are: evaluator observations, incident documentation, and AAR meeting products. These sources serve as the major focus of the remainder of this lesson.

Evaluators are more likely to provide useful information if they are appropriately selected and prepared.

Objective observations are enhanced by providing evaluators with a recording instrument that prompts the documentation of specific performance measures.

○ Evaluator briefing: When used for exercises, evaluators require specific information. They should be briefed on areas of interest to be evaluated, the scope and purpose of the exercise, the timeline, the recording instrument (see below), as well as many other important concepts.

○ Evaluator placement: Evaluators are placed strategically at locations where they can make and record observations related to the specific exercise evaluation objectives.

○ The observations collected by evaluators should be as objective as possible. To accomplish this, an exercise checklist and/or other guidance should be provided to the evaluators. This guidance should be consistent across all exercises in an EM program, so that collected data is consistent in format and description across all evaluators in any single exercise and, importantly, consistent across all exercises for that organization. Over time, a judgment of the **reliability, validity, and predictability** of the observed measures may then be made relative to actual system performance. With the development of optimal observation tools, improvements to the system (organizational learning) may be evaluated through follow-on exercises.

○ Recording instrument: This evaluation checklist should prompt the development of a recording instrument that provides key observations that reflect EOP and/or Recovery Plan performance at three levels:

  ▪ The performance of the **individual positions** in the evaluator's assigned area. The purpose of these observations is to evaluate the positions as described in the EOP, not to evaluate individuals performing in those positions. The observations should be captured in a manner related to the described duties for positions (operational checklists or Job Action Sheets) and their competencies, and should include some evaluation of the position integration within the appropriate EOP function.

  ▪ The performance of the **EOP or Recovery Plan functions** in the evaluator's assigned area. These observations are based upon the function-specific objectives and tasks, as described in the EOP (relevant EOP System Description and Concept of Operations, functional, and support annexes [see Unit 3]). This should include some evaluation of the function's integration within the appropriate ICS section and overall EOP/ICS for the organization.

- ▪ The performance of the **overall EOP** and its overall incident command system as observable in the evaluator's assigned area (relevant EOP System Description and Concept of Operations, functional and support annexes [see Unit 3]). This includes, if relevant, evaluating performance in coordinating with outside response organizations, the media, politicians, and others as indicated.

- ○ An example instrument, or exercise evaluator guidance (EEG),[81] is provided in Textbox 4.3.4.2 below.

Textbox 4.3.4.2

Hospital Emergency Operations Exercise Evaluation Checklist
(Developed for evaluation of the decontamination function)

Date: _____

Evaluator: _____

Hospital exercise site: _____

Incident notification time: _____

DECON SYSTEM activation/notification: _____

DECON System Facility Mobilization:
- Time when DECON site was operational:
- DECON Facility set-up:
  (Use facility set-up checklist in EOP for guidance)
Comments: _____

DECON System Personnel Mobilization
- Personnel arrival times:
- Personnel briefing (yes/no): (Use initial briefing process described in EOP)
  - Incident details
  - Safety details

- DECON team personnel assignments made:
  - Team leader

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[81] Exercise Evaluation Guidance (EEG) is the term and acronym used for this instrument in the HSEEP guidance, although the guidance itself differs from this text.

- Patient reception staff
- Decontamination staff
- Safety officer
- Security staff
- Support Staff

• DECON team in-processing (use in-processing checklist for guidance)
- Pre-PPE Medical Check
- PPE donning
- PPE safety check
- Buddy assignments

Comments: _____

DECON System Operations (Use DECON System Description, ConOps,[82] position checklists, and competencies for guidance)
• Vehicle and Patient Reception
• Interaction with EMS and other outside responders
• Ambulatory DECON
• Non-ambulatory/medical DECON
• Stretcher transfer and ambulatory transfer to clean area
• Patient triage in clean area
• Support to DECON operations (re-supply, troubleshooting, etc.)
• Security function
• Communication issues
• Management of drop-off vehicle
• Processing of clothing and valuables
• Provision of regular updates to Operations section

DECON System Demobilization (Use DECON System Description & Con Ops demobilization sections for guidance)
DECON SITE:
• Clearing of victims and response personnel from DECON site
• Securing of DECON site
• Removal and securing of all victim belongings
• Removal of all remaining debris
• Wash down of equipment and facility, allow to dry
• Return of equipment and unused supplies to storage area
• Inventory, acquisition and return to readiness of cache

DECON TEAM PERSONNEL:
• Appropriate technical DECON of responders in PPE
• Appropriate doffing of PPE

---

[82] ConOPs = Concept of Operations

- Rehydration and medical checkout
- Function-specific Incident Review[83]
- Hot wash or AAR function-specific meeting

Equipment/supplies deficit or malfunction:
_____
_____
_____
_____

Interface problems with other departments/sites:
_____
_____
_____
_____

Problems with emergency operations plan as written:
_____
_____
_____
_____

Safety issues: _____
_____

Security issues: _____
_____

Demobilization issues: _____
_____

Issue related to the planning or conduct of the emergency operations exercise itself *(this is included for evaluation of preparedness planning related to exercise).*
_____
_____

Suggestions: (add pages as necessary)

- Information from these evaluator reports is collated as indicated, compared and analyzed to assess adequacy of response and

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[83] See description of Incident Review in Unit 3, where this is distinguished from a hot wash or AAR meeting

recovery performance in relation to the EOP guidance. Both positive and problem issues are identified.

After Action Report (AAR) Document Collection and Analysis Process

Incident-related documents such as healthcare system incident action plans serve as an important source of information for the AAR process.

- Incident-related documents: This method for evaluating the emergency response and recovery system performance is accomplished through an analysis of incident-related or exercise-related documents.

- Sources for incident-related documents: Multiple documentation sources may be available, and valuable for assessing system performance. Two source categories (internal and external) of information should be considered:

  - Incident-related documents generated by the organization during the incident response and recovery: This source is likely to provide information that is different from that in the evaluator forms (above) and the AAR Meeting methods discussed below for capturing information for the After Action Report process. Incident-related documents include:

    - ICS-generated forms, reports, and other incident documentation: The collection of these should be initiated by the Documentation Unit of the Plans Section during the incident response/recovery and demobilization activities, and continued until the ICS function is demobilized. The Documentation Unit should therefore determine who they are to transfer this ongoing responsibility to and how they are stored. These documents are useful in determining what occurred, when, and under what circumstances. Additionally, they can serve as **performance measures** to compare against incident guidelines/metrics (what should have occurred). Examples of pertinent ICS documents include:

A range of internal documents can provide important information for the AAR process.

      - Incident action plans and all supporting plans developed to support the activities in each operational period

      - Unit Logs (completed ICS 214s)

      - Incident Summaries (ICS 209s)

      - Function and position checklists used during the incident

❑   Patient tracking documents

❑   Official communications from external agencies (local jurisdiction's EOC, EMS, other healthcare facilities through the healthcare coalition [Tier 2], etc.)

❑   Check-in sheets (completed ICS 211s)

❑   Demobilization sheets (completed ICS 221s)

❑   Financial documents related to response (e.g., bills for vendor emergency contracts)

❑   Situation reports and other official documentation developed by the healthcare organization and transmitted to external agencies, patients, or others.

○   <u>Incident-related documents from outside organizations</u>:   Due to their nature, some of these documents may not be generated until immediately after the incident response and recovery phases of the incident or exercise.   Many of these may be collected by the Public Information Officer and Liaison Offices during performance of their incident duties and should be transmitted to the Documentation Unit for archiving for AAR purposes.   Additional documents that should be sought by those charged with the AAR document analysis include:

■   Pertinent media reports.

■   Satisfaction or other victim surveys as indicated.

■   Outside research that analyzes the response.   Usually, this must be a "quick response" research activity to be useful in the AAR process timeframe, as opposed to the typical research methods in medicine and public health.

■   Observations pertinent to the organization's performance that may have been produced during a community-wide hot wash or AAR process, if they are available in the appropriate timeframe.

■   AARs developed by external agencies, if they are available in the appropriate timeframe.

Incident-related documents from entities external to the organization can provide another important source of information for the AAR process.

After Action Report (AAR) Meetings

- AAR Meetings and associated documentation: The AAR Meeting (see terminology textbox) and associated documentation is the third and commonly the most emphasized source of information for the AAR. This source of information for the AAR process focuses upon participants' observations from their experience during the pertinent response and recovery activities.

- Method: The method for capturing participants' observations consists of **AAR Meetings** (often called "After Action Reviews") and the **organized processing of information produced in the meeting/s**. It is based upon oral and written (preferable) input from incident response and recovery participants and observers. While most of this input is obtained during "AAR meetings," incident or exercise participants and observers who are unable to attend meetings should be encouraged to submit their input, in a standardized format and procedure, outside of the meetings themselves.

- The AAR meeting is distinguished from the "Incident Review," presented in Lesson 3.3.8, which is an important response demobilization activity and not evaluative in nature. **While a brief review of the incident is used to start most AAR meetings, this is distinct from a formal Incident Review.**

> **Terminology alert!**
>
> ***After Action Report Meeting:*** The gathering of incident or exercise participants and observers in a tightly moderated effort to discuss the incident response and/or recovery for the purpose of obtaining system performance information useful to the AAR process.

- Preparation and planning for the AAR meetings: The AAR meeting approach is not a simplistic process of just "calling everyone together" for a meeting.   It requires planning and management to establish the environment, facilitation, and documentation to ensure that issues are captured in the appropriate format to optimize organizational learning. The "meetings," called "workshops" in SEMS, may be viewed as a vital instrument for gathering objective information on the response and recovery performance. The following AAR meeting preparation steps may be useful:

○ <u>Present the AAR objectives</u>: The primary objective of the AAR process is to obtain participants' observations and recommendations related to incident response and recovery activities. The findings and recommendations should be presented in relationship to the organization's EOP and/or Recovery Plan to be most efficient. Participants should be informed of this to shape their input.

○ <u>Delineation of responsibilities</u>: The AAR process, including the AAR meetings, is officially the responsibility of the EM program and, therefore, the emergency program manager and the EM committee. They may wish to involve personnel who were assigned to the Plans Section during the response.

■ This is consistent with SEMS, "…the responsibility for initiating the After Action Report process should be assigned to the Documentation Unit within the Planning/Intelligence Function… At the completion of the emergency period, and after the field ICS and emergency operations center have been deactivated, the responsibility for the continuance of the After Action Report process should be assigned elsewhere within the organization. In many organizations, the same personnel may actually be assigned to the After Action Report function to provide continuity." [84]

■ Persons responsible for organizing and managing the AAR meeting activities, facilitating the AAR meetings, and developing the information from the AAR meeting participants should all be pre-designated. For continuity purposes, it is helpful to include incident Plans Section personnel if possible. In some instances, it is even appropriate to utilize a Plans Section Chief as the facilitator, as the methods for conducting the AAR meeting should follow many of the same principles used for conducting meetings during response and recovery.

○ <u>Identify required meeting resources</u>: Support materials are identified and secured for the AAR meeting. For example, adequate audiovisual equipment should be acquired.

○ <u>Documentation Review and Analysis</u>: The pertinent documents collected and collated during the document analysis activities of the AAR process (see above) should be analyzed prior to the

The AAR process is ultimately the responsibility of the EM program. It is useful to utilize individuals in the AAR process who served in response positions (especially Plans personnel) to provide continuity and consistency from the response to the AAR.

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[84] Standardized Emergency Management Systems (SEMS) Guidelines, Part III. Supporting Documents, p. 2. Available at: http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/SEMS%20Guidelines/$file/AAR. pdf, accessed December 6, 2005.

meeting for findings and for possible issues to raise during the AAR meeting. Though many of these documents may not be presented or referred to during the actual meeting, they are referenced during the writing of the AAR Report.

In evaluating complex incidents or full EOP activations, individual functional elements should meet prior to the full AAR meeting to develop their input.

○ <u>Function-specific meetings</u>: In evaluating a full EOP activation or complicated partial EOP activations, each ICS section should meet prior to the full AAR meeting and develop their AAR input.[85] In some particularly large or complex incidents, even smaller or more specific sectional sub-units (key operating units) may also meet to capture their function-specific input. Examples of these smaller sub-functions include the decontamination team, the "initial patient care function" (i.e., the Emergency Department and supplementary staff), or the Operating Suite staff. This approach is similar to a "bottom up approach" described by the U.S. Army, in which squads and platoons meet first and then their respective leaders participate in the larger AAR.[86] In fact, much of the important systems-related information should be documented prior to the overall AAR meeting by the responsible parties.

▪ These preparatory meetings should generally follow the guidelines/agenda listed for the full AAR meeting (see below).

▪ For efficiency and effectiveness, the information from these preparatory meetings should be documented according to the "issues-based" template described below for use during the AAR meeting.

Participants in the AAR meeting should be pre-identified. Information from additional personnel is developed during preparatory meetings (see text) and reviewed prior to the AAR meeting.

○ <u>Identification of AAR meeting participants</u>: The critical participants who should be present are identified and informed. Contrary to an Incident Review in which the purpose is to clear misconceptions, AAR meetings typically should involve a more limited participant group. Command and General Staff, Branch Supervisors, and Unit Leaders are usually mandated participants, and others may be invited. It should be noted that in evaluating partial EOP activations, the participants in the AAR might be fairly limited.

○ <u>Select timing and site</u>: The timing and location of the AAR meeting and preceding function-specific meetings is selected and disseminated to the appropriate personnel. The timing should be

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[85] For smaller AARs, participants may individually list these items according the same format, rather than have a formal function-specific meeting.
[86] Headquarters Department of the Army. Battle Focused Training (FM 25-101), Appendix G: After Action Reviews (September 30, 1990). Available at: http://www.globalsecurity.org/military/library/policy/army/fm-25-101/index.html, accessed January 29, 2006.

selected to ensure the fullest participation possible (e.g., early morning Thursday as opposed to Monday mid-day, etc.). The location should provide adequate space for the participants.

○ Develop an agenda and outline for the AAR meetings: An agenda for each AAR meeting should be established according to the guidelines below under "Conduct of the AAR meeting." It should be disseminated to participants before the start of the meeting.

○ Select AAR meeting facilitator: This is the individual responsible for leading the discussion and ensuring that the stated objectives of the meeting are met and in the prescribed timeframe. As noted above, a Plans Section Chief is often the ideal individual for this role due to the nature of his or her duties during response and recovery.

• Conduct the AAR Meeting: The AAR meeting should be structured to ensure the purpose is met, the appropriate information is clarified and captured, and time-utilization is efficient.

○ Adhere to the agenda: The meeting facilitator should therefore move through the structured agenda that covers all aspects of the emergency response and recovery system that was the focus of the exercise or incident (as defined by the incident or exercise objectives).

○ Maintain balance to the input: No one issue or sub-set of participants should dominate the meeting. This generally argues against AAR meeting methods that use "open-ended questions" as the approach to AAR meeting facilitation, even though some medical authors have proposed this for generating discussion.[87] This industry application for healthcare organizations can create inefficiencies in meetings and developing AAR information.

  ▪ Brainstorming, debates, extensive problem-solving debates, and free-flowing discussion are typically not conducive to an efficient AAR meeting process, anymore than they are in the meetings used to manage an actual incident (see Unit 3).

  ▪ Human tendency is to focus solely on the problems encountered and the presentation of suggested solutions. The AAR Meeting facilitator should **balance the positive and the negative** as indicated by the overall system performance and

To ensure an efficient process, the AAR meeting should avoid extensive and detailed discussion of any single issue. Contentious issues should instead be assigned to appropriate parties for resolution, with presentation of the information to the AAR committee.

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[87] Evaluation of Hospital Disaster Drills: A Module-Based Approach. AHRQ Publication No. 04-0032. By Johns Hopkins Evidence Based Practice Center. 2004. Available at: http://www.ahrq.gov/research/hospdrills/hospdrill.htm, accessed January 18, 2006.

keep the discussion objective and depersonalized at all times.

- Additionally, many organizations conduct the AAR meeting with the idea that most of the "learning" that is to occur from the exercise or incident will be accomplished by the AAR meeting itself. This "learning," while important, must be recognized as individual personnel learning that is limited to attendees and those with whom the attendees interact in an instructional activity later (i.e., training). This "lessons learned" objective must be distinguished from the much more important objective of **organizational learning**, presented in Lesson 4.4.1, where the findings of the AAR meeting, along with the other sources of data (described above) are used to accomplish **permanent change in system design, equipment, supplies, and instructional activity**.

○ Template for conducting the AAR meeting: the following is a suggested template for an AAR Meeting agenda, incorporating the preceding considerations:

A template agenda is presented to summarize the AAR meeting considerations that are presented in the text.

- Review AAR objectives for participants: The facilitator should briefly review the objectives of the AAR process (and therefore the meeting) as noted above. The concept of focusing on systems as opposed to individual performance should be emphasized.

- Review the AAR process: After briefly presenting the AAR meeting agenda, the facilitator should provide an outline of how material generated is reviewed, analyzed, and incorporated into systems enhancement.

Efficient AAR meetings are conducted in a similar fashion to incident Planning Meetings.

- AAR meeting ground rules and meeting facilitation: The meeting facilitator should present the meeting "ground rules," which are similar to those utilized during response and recovery meetings (management, planning, operations briefing, etc.). They are designed to limit outside distractions, adhere to the agenda, keep the conversation focused, and maintain order. (e.g., participants speak only when recognized by the facilitator, they know how to be recognized, and they engage in no side conversations). The meeting should be moderated to avoid lengthy soliloquies or extensive problem-solving discussions (these should be assigned to individuals to complete outside the meeting and report back to the EM committee). Meeting facilitation also keeps the input balanced and assures that all appropriate response and recovery areas are covered.

- **Brief review of incident activities**: The facilitator should provide a brief synopsis of incident activities highlighting important developments and response activities. The material from incident-related documents (see above), as well as from the evaluators, can be utilized to develop this synopsis. It is important to note that this discussion is unilateral (the facilitator talking) and has a different purpose than that of the formal IR done as part of incident demobilization. It is not primarily intended to discuss conflicting views of what occurred, or clear misconceptions about the incident, but is conducted to set the stage for examining the response during the AAR meeting.

- **Function-specific input**: Each function has a designated representative address the group listing important AAR issues (ideally, they should have been pre-identified during functional meetings and/or a hot wash). The majority of the AAR meeting time is devoted to this input:

  - The issues should be presented and discussed using the issue documentation format presented below (issue, background, proposed solution, proposed responsible party).

  - For particularly complex events, Branch Supervisors, Unit Leaders, or other leadership incident positions may be called upon to speak to a specific issue.

  - In addition, AAR meetings examining large or complex events may wish to follow Concept of Operations stages,[88] allowing each function to comment independently on each stage as indicated. As an example, each section would be provided an opportunity to comment on their mobilization stage in the incident response.

  - Clarifying questions may be asked, but general debate or problem-solving discussion is sidelined for resolution outside of the AAR meetings.

- **Overall organizational objectives for the incident or exercise response**: Although the facilitator has presented the control objectives for the exercise or the response during introductory remarks, comments on them are best held until the individual functions have been examined. At this point, the facilitator

Each function is given the opportunity to provide summary statements of their AAR findings. For complex incidents or exercises, these comments may be provided in a sequential fashion for each of the stages in the Concept of Operations.

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[88] In this text, the "Response Phase" of CEM is divided into the stages of Incident Recognition, Activation/Notification, Mobilization, Incident Operations, Demobilization, Transition to Recovery in the concept of operations presented in detail in Unit 3.

should provide a brief opportunity for participants to comment on whether these control objectives were met.

- ▪ Closing comments: Follow-on activities to the AAR meeting (e.g., the organizational learning process) should be briefly presented so that participants are aware of how their input will be used. Timelines for resolution of controversial issues that came to light during the meeting, development of the written AAR, and incorporation of accepted EOP changes should be presented. Any assignment of participants into these follow-on activities could be sought at this time. The facilitator and healthcare system administrators may wish to make closing comments (e.g., expressing appreciation for participants' efforts, presenting encouraging remarks regarding personnel performance during the event being evaluated, and reinforcing the importance of the emergency management professionalism to the organization and the community).

The "Hot Wash" as a Component of the AAR Process

Some organizations and agencies use a separate evaluation tool called a "hot wash." Healthcare emergency managers may wish to consider the use of this tool but must understand that it has a distinctly different purpose and construct than an AAR meeting.

- • Immediate review and feedback: In emergency management, it has become increasingly common for participants to meet immediately after an exercise or incident and evaluate the response. In some instances, it may be important after these events to provide a relatively informal forum for **all** participants and observers to "**express" their thoughts and reactions** and for leaders and managers to **express their appreciation** for the time and effort expended by all. The overall AAR meeting, in contrast, commonly is more formal and has a limited participation, with management participants from each level of response rather than "all players."

- • The "hot wash": A "hot wash" (see terminology textbox below) is normally conducted immediately after the conclusion of an exercise or actual event. If conducted in a non-threatening and non-judgmental manner, the hot wash can capture important system performance issues while reinforcing individual and team learning. In lieu of an incident review, it can also provide a means for addressing inter-personal conflicts and misperceptions before they are internalized and become counterproductive.

  - ○ Planning and preparedness: A hot wash should not be an ad hoc gathering. It requires planning and management to establish the environment, facilitation to bring individuals into the discussions, and documentation as much as possible to ensure that positives ("strengths") and negatives ("areas for improvement") are

expressed.[89] It is critical that this information be captured (by the controllers and evaluators) and imported into the AAR process, so the "lessons" do not become "lessons forgotten."

○ <u>Participation</u>: A hot wash is more likely to have the participation of all the relevant players, and may also be opened up to formal observers.

○ <u>Not a substitute for a formal AAR meeting</u>: A hot wash is important in those incidents where post-incident circumstances do not permit the formal preparation and conduct of an AAR until well after the response phase (e.g., in particularly complex recovery events). In these instances, the less formal hot wash provides the means of identifying and capturing information while still fresh in participants' minds. It should be emphasized that the **hot wash is an intermediate process** and should not be accepted as a replacement for the AAR. Ultimately, the more formal AAR process should be conducted, or the hot wash must take on the characteristics of the AAR meeting (with information capture). This curriculum's definition of "hot wash" may differ from that of other disciplines, but provides more precise meaning.

Terminology alert!

Hot wash: A systems performance review that is generally less formal and detailed than the After-Action Report (AAR) meeting and occurs in close proximity to the end of the incident or exercise.   Preparation for a hot wash is commonly less extensive than for an AAR meeting. The results of the hot wash may serve as a starting point for a later, more formal AAR meeting.   It should never be considered the endpoint to an After-Action Report process for an incident or exercise, or replace formal AAR meetings.

○ <u>Recent U.S. Department of Homeland Security Guidance</u>: The following definitions, provided by HSEEP guidance, are provided for comparison (see Textbox 4.3.4.3).[90]

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[89] These two terms were used in the HSEEP description of hot wash. See HSEEP "hot wash" description and reference in the textbox.
[90] U.S. Department of Homeland Security. Homeland Security Exercise and Evaluation Program. Available at http://www.ojp.usdoj.gov/odp/docs/hseep.htm, accessed December 20, 2005.

Textbox 4.3.4.3

"Hot Wash" Description (HSEEP)[91]

"A **hot wash** occurs immediately following an operations-based exercise and allows players/ responders the opportunity to provide immediate feedback. It enables controllers and evaluators to capture events while they remain fresh in players' minds and to ascertain players' level of satisfaction with the exercise and determine any issues or concerns and proposed improvement items. Each functional area (e.g., fire, law enforcement, medical) should conduct a hot wash, which should be facilitated by the lead controller for that area."

○ "Hot wash equivalent" for exercise management and evaluators: For exercises, HSEEP guidance also recommends a similar meeting, called a "**debrief**," be held for those who participated in the planning and conduct of the exercise (see Textbox 4.3.4.4).

Textbox 4.3.4.4

"Debrief" Description (HSEEP)[92]

"The **debrief** is a forum for planners, facilitators, controllers, and evaluators to review and provide feedback on the exercise. It should be a facilitated discussion that allows each person an opportunity to provide an overview of the functional area they observed and document both strengths and areas for improvement. The debrief should be facilitated by the Lead Exercise Planner or the Exercise Director; results should be captured for inclusion in the AAR. Other sessions, such as a separate debrief for hospitals (during an operations-based exercise), may be held as necessary."

Information Capture from All AAR Process Activities

○ Information capture: Information on system performance and potential organizational changes should be captured in a standardized format during **all AAR activities**. This includes:

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[91]U.S. Department of Homeland Security. Homeland Security Exercise and Evaluation Program, Volume I: Overview and Doctrine, p. 29.
[92] Homeland Security Exercise and Evaluation Program, Volume I: Overview and Doctrine, p. 29.

- The analysis and evaluation of incident-related documents

- The analysis and evaluation of the evaluators' reports

- The function-specific AAR pre-meetings

- The AAR meeting and comments from response and recovery participants unable to attend the meetings.

○ Standardized information formatting: A standardized format should allow for efficient processing of information. The recommended format is presented in Textbox 4.3.4.5.

A standardized format for capture of AAR information is critical to ensuring an efficient process. The model presented here is based upon methods utilized by multiple Federal agencies.

Textbox 4.3.4.5

**Issues-based Approach to
Presenting AAR Information**

The following general template is useful for capturing each issue presented during the AAR meeting or determined via analysis of the incident-related documents and evaluators' reports discussed earlier in this lesson.

Issues for Action

Brief statement of the issue: One or two sentences that describe the issue.

Background: One or two paragraphs that briefly summarize how the issue, as described, relates to the emergency response and recovery system. It may also be important to present the history of the issue, other information that explains why it is important, and the implications for not addressing or resolving the issue.

Suggested action: A brief description of how the identified issue should be addressed, according to the AAR participant or the appropriate ICS section or function. This should be action-oriented, written in a positive manner that provides the strategy and activities necessary to fully resolve the issue. If the proposed solution involves capital expenditure, it is helpful to include some comments as to how the purchase can be funded. Whether the presented issue relates to a positive or negative experience during response, this section should address the recommended permanent systems enhancement: the appropriate EOP change, education or training change, and so on. It must be objective, actionable, and focused on "system" rather than "person" (i.e., "So and So should be fired"

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would be considered an unacceptable recommendation, whereas "'x' change to the 'y' position description and position qualifications is necessary").

Proposed responsible party: A brief suggestion is listed indicating what party or parties within the EM program (and possibly also external to the organization) are thought to be most responsible for the suggested system change.   For example, the "better communications" issue could be related to equipment acquisition or repair if the communications hardware didn't work. It also could be a training issue for Command and General Staff or Section Chiefs if the problem was not enough attention to disseminating information. If the issue must be addressed primarily by an "outside" organization (in an issue, for example, like "EMS dispatch failed to notify the hospital of additional incoming casualties"), the responsible party would be the healthcare organization's position of authority that interacts with the "outside" organization during preparedness activities. It should be noted that some organizations do not include this final category, deferring to the committee processing the "issues sheets" to assign implementation responsibility.

- ○ This "issues" documentation format provides the following advantages:

  - ▪ Validated in national response experience: The suggested template for documentation of findings at an "issues" level (see textbox below) is adapted from that used by multiple Federal entities for AAR documentation (e.g., The FEMA National Urban Search & Rescue Response System and others), and similar to the format used by the Department of Veterans Affairs.

  - ▪ Allows efficient data sorting of information according to purpose: This format organizes information into a series of individual "units," with each unit constructed around a single identified issue. The information therefore may be easily sorted and re-sorted as necessary for different purposes during processing of information and incorporating change through organizational learning. For example, the issue sheets that relate to one specific area of response, such as the hospital incident command post, may be grouped together (i.e., sorted by function) when completing the evaluation of that function. During organizational learning activity, however, all issue "sheets" with training recommendations (i.e., sorted by accepted training revision recommendations) would be grouped

together electronically or physically for consideration when revising the pertinent training courses in the EM preparedness planning.

▪ Allows efficient revision: The formatting also provides for an efficient approach to revising the issue sheet information, as each issue is considered, amended, further processed, and resolved (i.e., rejected or accepted and incorporated) during the organizational learning process described in Lesson 4.4.2.

○ Information collection and cataloging: The issues sheets are all collected (by paper where necessary or, ideally, in an electronic format such as Excel) and catalogued by EOP function. This process may use the same function designators used in developing the function-specific AAR pre-meetings discussed above. For example, the Veterans Health Administration sorts issues by the categories listed in the textbox below. This aligns with the VHA's EOP structure, so findings from the AAR process can be easily aligned with EOP changes.

Textbox 4.3.4.6

Department of Veterans Affairs - Emergency Management program

After Action Report (AAR)[93]
Issues for Action

I. Functional/Key Activity Area:
- Command and Control (CC)
- Public Information (PA)
- Planning/Intel (PI)
- Logistics (LG)
- Finance/Admin (FA)
- Operations (OP)
- Business Continuity (BC)
- Plant & Utilities (PU)
- Safety & Security (SS)
- Health & Medical (HM)

• Post-information collection activities in the AAR process:

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[93] *Emergency Management Program Guidebook (2005),* After Action Report Sample. Department of Veterans Affairs, Washington D.C., available at: http://www1.va.gov/emshg/page.cfm?pg=114, accessed June 6, 2006.

The actual After Action Report has multiple purposes and careful attention should be given to the development of this document.

○ Developing the AAR: Designated individuals should collate the material from the AAR process and write the AAR document (see suggested template below). The AAR has specific purposes and therefore careful consideration and attention should be given to completion of this important document. The AAR can be used for:

▪ Historical reference: The After-Action Report provides an accounting of the incident or exercise details, as well as the emergency response and recovery activities. It documents both the successes and the problems encountered during these activities and provides an assessment of response and recovery system effectiveness.

▪ Education and training in the future: The After-Action Report itself can serve as a resource for future education and training and for planning future exercises.

▪ Systems enhancement efforts: The After-Action Report serves as the official mechanisms for documentation of systems enhancement recommendations. The issues that are not immediately decided are tracked in a continuous manner through the EM program organizational learning process until finally resolved (see Lesson 4.4.2).

Textbox 4.3.4.7

**Suggested Template for AAR Report
for Healthcare Systems**

▪ Executive summary: to include purpose of AAR Report and synopsis of major or principal recommendations for systems enhancement. This important section could serve as a redacted copy for sharing external to the organization (e.g., with jurisdictional response agencies or other healthcare systems).

▪ Introduction: a review of the AAR process, its relation to the EM program, and its relation to the incident in question (exercise, drill, real response, etc.)

▪ Incident Summary: A chronological summary that describes the incident or the exercise scenario. For smaller, partial EOP activations, this may take the form of a brief synopsis. For more complicated events or full EOP activations, this may best be represented by outlining important activities according to the stages outlined in this text's Concept of Operations (Incident Recognition, Activation/Initial Activation, Mobilization, Incident
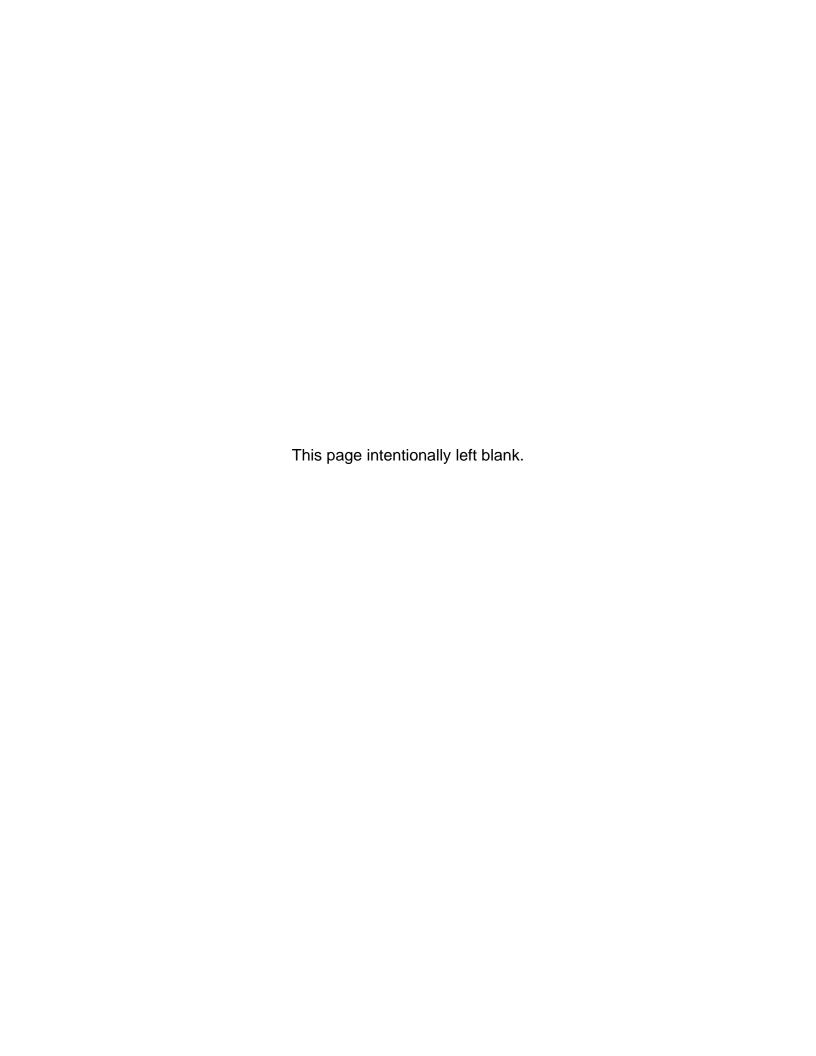

Operations, Demobilization, Transition to Recovery). Reference may be made to important attachments, such as specific ICS forms or other included documents.[94]

▪ <u>Recommendations by function</u>: The recommendations from the AAR meeting should be catalogued by ICS sections and sectional functions. Interacting systems, agencies, and programs (media, mutual aid, and others) should be noted when involved in the response.[95] As decisions may have already been made in regards to incorporation of some of the systems changes, a method of tracking these should be included in this catalogue. Some systems prefer to present this material in a spreadsheet format for use in tracking issues that have not been rapidly or fully resolved.

▪ <u>Conclusions</u>: Brief commentary on organizational control objectives for the incident and relationship to organizational performance.

▪ <u>Attachments</u>: Pertinent documents are attached for reference in the AAR report.

○ <u>Disseminating the AAR</u>: The appropriate parties to receive the AAR should be evident in a review of the AAR process goal and objectives. Personnel within the healthcare system, as well as appropriate authorities, emergency response partners, and those who supported the organization during the activities evaluated by the AAR, are candidates for this dissemination list.

• <u>The use of Quality Improvement/Total Quality Management "cover" from legal discovery</u>: The AAR process (meetings, interim products, and final report), as well as all related documentation, should be designated as an official part of the healthcare system's Quality Improvement/Total Quality Management program or otherwise addressed per the organization's legal experts (see Lesson 4.3.2). This can potentially prevent the information from being subject to legal discovery or Freedom of Information Act requests. All documents related to the AAR process should be clearly labeled indicating they are a part of this process.
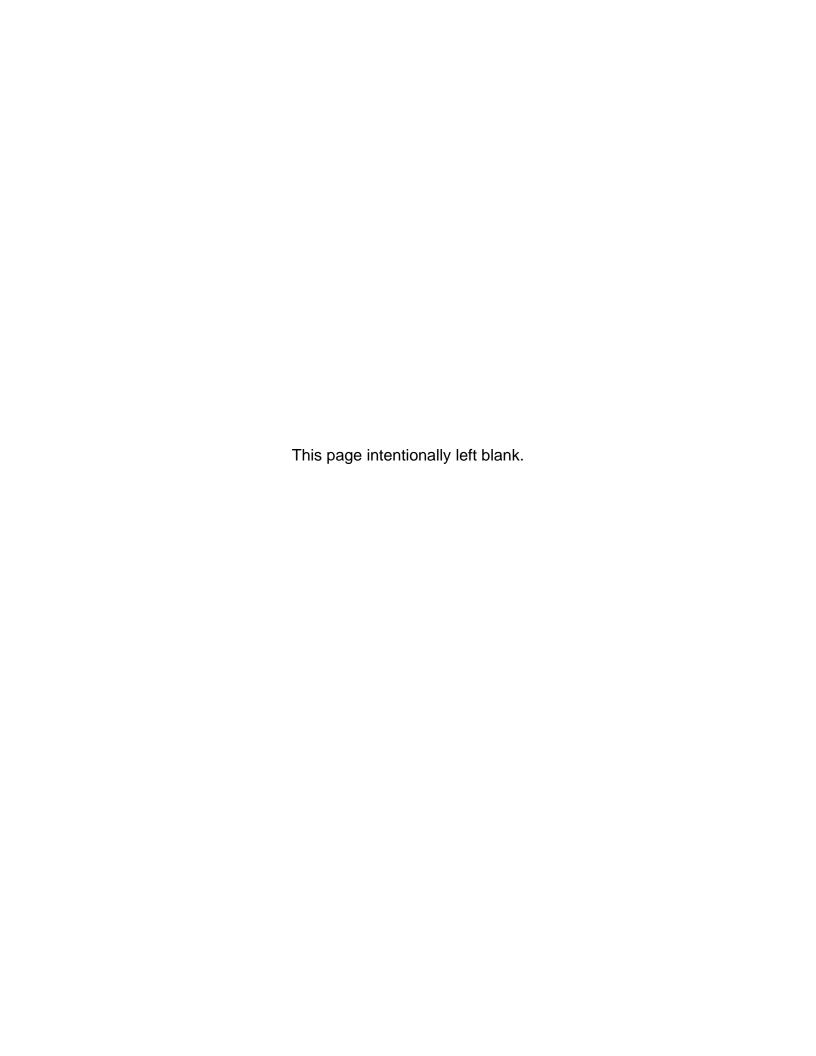
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[94] Practically, it is not possible in most instances to attach all relevant incident documents to the AAR report. Instead, the AAR report should describe how and where these important documents have been stored (physically or electronically).

[95] From *Standardized Emergency Management Systems (SEMS) Guidelines*, Part III. Supporting Documents, p. 8. Available at:
http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/SEMS%20Guidelines/$file/AAR.pdf, accessed December 6, 2005.

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Module 4.4

Organizational Learning:
Incorporating Improvement into the Emergency
Management Program

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Lesson 4.4.1 Overview, Concepts, and Principles: Organizational Learning

Lesson objectives

- *Describe the learning organization and its strengths.*
- *Describe organizational learning.*

Introduction and Background

While the concepts "ICS," "EOP," and the "Emergency Management program" and others presented in this text are relatively recent developments, management of organizations is not. It has been studied for many decades, and many of the important research findings and principles that developed are applicable to emergency management and incident command, particularly if modified for the very different emergency and disaster context (rapid pace, more uncertainty, and so on).

Management researchers and practitioners have worked for many years to address questions related to optimal organizational function. Even if initially constructed for optimal operation, the organization's environment is not static and so it must adapt (i.e., "change") as its environment evolves.

All successful organizations must adapt and change to evolving circumstances. This applies not only to the regular, day-to-day management of organizations, but also to EM program component plans as well.

- The process of change is continuous: How the organization interacts externally, how it manages internally, how it changes its outputs (products and/or services) to meet evolving demands, and many other aspects of the organization requires continual evaluation and change. The range of change may be characterized in many ways, from "adjustments" to "evolution" and even major "transformation."

- All potential changes should be considered within the strategic context for the organization:

  - "Is this change for one sub-area of the organization consonant with the organization's overall mission and objectives?"

  - "Does this change to a process unintentionally change other areas of the organization and, if so, is the overall change a benefit or detriment to the organization's overall mission and objectives?"

- The changes must also be managed well at the tactical level within the organization. For example, tactical questions must address:

○ "What is the best way to accomplish this change, addressing cost-effectiveness, worker motivation, and other issues?"

○ "How do you make the change permanent?"

○ "How do you assess the impact of the change once it is accomplished?"

- Varied approaches: A range of management approaches have been developed to accomplish change. Several methods became prominent within the U.S. medical establishment over the past two decades: Quality Assurance, Quality Improvement, Total Quality Management, and others.[96] In pursuit of this goal, it may be more effective to consider the organization itself before focusing upon improvements through change.

  ○ The "learning organization": A prominent conceptual approach in this management research views the goal as transforming the business or other entity needing change into a "learning organization." The term "learning organization" has been presented by a range of authors in the research literature. One of the earliest and best-recognized descriptions is Peter Singe (see Textbox 4.4.1.1). While the terminology these authors use differs from that used in modern comprehensive emergency management (CEM) [see Unit 1], many of the conceptual descriptions are consonant with the system approach to emergency management. For instance, the first of Senge's five basic "disciplines" for a learning organization is "systems thinking," which is entirely consistent with the emphasis found throughout this EM text.

A prominent concept utilized in management research is one called the "learning organization." This concept places emphasis on the importance of needed change within the organization.

Textbox 4.4.1.1

Learning Organizations – Peter Senge

"This then, is the basic meaning of a 'learning organization' - an organization that is continually expanding its capacity to create its future." Peter Senge, page 491.[97]

The dimension that distinguishes learning from more traditional organizations is the mastery of certain basic disciplines or

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[96] Ahire, S.L., Landeros, R., Golhartotal, D.Y. *Quality Management: A Literature Review and an Agenda for Future Research.* Production and Operations Management (Summer 1995) Vol. 4, No. 3, pp. 277-306.
[97] Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization.* Reported in Ott, S.J., Parkes, S.J., Simpson, R.B. Classic Readings in Organizational Behavior. Belmont, California, Thomson Learning: pp. 484 - 491.

"component technologies." The five that Peter Senge identifies are said to be converging to innovate learning organizations. They are:

- Systems thinking
- Personal mastery
- Mental models
- Building shared vision
- Team learning

He adds to this recognition that people are agents, able to act upon the structures and systems of which they are a part. All the disciplines are, in this way, "concerned with a shift of mind from seeing parts to seeing wholes, from seeing people as helpless reactors to seeing them as active participants in shaping their reality, from reacting to the present to creating the future" (Senge 1990: 69). [98]

- ○ <u>Open participation</u>: A critical concept of the learning organization[99] is that individuals across the organization can actively and productively participate in organizational change that leads to improvement. This can only occur if the organization's systems have been designed to promote this behavior while assuring that proposed change is considered within the organization's overall mission and objectives.

- ○ <u>System change and individual mastery</u>: This systems thinking therefore allows the members of an organization to see how they may actively participate in creating the reality they experience, and equally how they can change that reality and address problems they face in a shared fashion (i.e., Senge's "Building shared vision"). This phenomenon is thought to push organizational personnel to strive for individual excellence, or Senge's "personal mastery."

- ○ <u>Contrast with traditional organizations</u>: Traditional organizations are not considered to make management thinking as open to the influence of others in the organization, to dialogue, and to teams as learning units. The ability to learn at all levels of an organization, therefore, may not be as prevalent in traditional authoritarian and/or hierarchical organizations. The concepts of

The individuals that make up an organization participate in the development and implementation of change. This is essential to being a "learning organization."

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[98] Smith, M.K. "Peter Senge and the learning organization." The Encyclopedia of Informal education (2001). Available at: www.infed.org/thinkers/senge.htm, accessed December 13, 2005.

[99] Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization.* In Ott, S.J., Parkes, S.J., Simpson, R.B. *Classic Readings in Organizational Behavior.* Belmont, California, Thomson Learning: pp. 484 - 491.

the learning organization address this, promoting participatory change while assuring an awareness of each component's role in the overall organization and the organization's role in its environment: these are Senge's "mental models."

These concepts are very helpful in developing an understanding of how to address emergency management within a healthcare organization. How the healthcare organization views emergency management in general, and emergency management within their organization, is important to the success of the emergency management program. How leaders, managers, and others within the organization view change to their usual environment (structure, process, procedures, etc.) for emergency management purposes, and changes to the emergency operations plan that affect them, is equally important. This is particularly important when it comes to significant change since any meaningful and permanent change to an organization has very real implications for many individuals in the organizations. Without careful attention to detail, many of these affected individuals (including leaders) are not nearly as vested in the emergency management vision as the emergency program managers and committee.

- The term "**learning organization**" has therefore been defined by the authors for use in this discussion (see terminology textbox below).

> **Terminology alert!**
>
> ***Learning organization***: An **organization** that conducts continuous evaluation of its experience and transforms that experience into lasting improvements in performance.[100] This is accomplished through change to objectives, structure, process, personnel qualifications (including competencies, which describe knowledge/skills/abilities), facilities, equipment, supplies, and other parameters. This "learning process" is accessible to the whole organization and relevant to its core mission and objectives.

- ○ <u>Learning organization in business continuity</u>: An example from the business community that highlights this approach and is applicable to emergency managers is presented in Textbox 4.4.1.2.

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[100] Adapted from Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization*; In Ott, S.J., Parkes, S.J., Simpson, R.B. *Classic Readings in Organizational Behavior.* Belmont, California, Thomson Learning: pp. 484 - 491.

Textbox 4.4.1.2

Marriott International, Inc.

Marriott is a lodging company with properties and offices throughout the world. Their "Business Continuity Program" (BCP)[101] is considered to be one of the best.

"… a sensible structure that combines executive-level
            support with grassroots participation"[102]

To support its planning efforts, Marriott has a comprehensive company policy on BCP that mandates all company locations plan for business interruptions and report compliance on an annual basis. Dr. Penny Turnbull [senior director of crisis management and business continuity for Marriott International, Inc.] says, "The corporate policy provides clear direction for planning within a robust framework, enabling a consistent approach to planning across the enterprise, and yet allows local flexibility, taking into account the size and function of the location and the myriad of national, regional, and local challenges. This is also reflected in our response methodology, which takes a tiered approach as well, escalating response activities and authority from the local level up to corporate HQ as needed.

"Compliance," she continues, "is reported from the unit level, all the way up through the corporate structure. Finally, each of the company's executive vice presidents is responsible for certifying the compliance of their business area; this is reported to the board annually."

But Dr. Turnbull realizes BCP is more than crafting policy and assigning responsibility. "All BCP efforts are supported by the BCO [Business Continuity Office] and its comprehensive Website on the company's intranet that provides a planning guide, resource library, and other valuable tools and resources," she says.

Executive support, while essential, isn't everything. "All of the literature you read says you have to get executive-level support

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[101] "Business Continuity" is the term for the continuity of operations and emergency management that is commonly used by commercial businesses – see NFPA 1600.
[102] This Marriott textbox information is reproduced from: Rojas B. BCP the Marriott Way. *Continuity Insights* magazine (November-December 2004). Available at http://www.continuityinsights.com/magazine_archive_mag.cfm?article=120104, accessed December 9, 2005. Reproduced with permission.

before you can move the program forward. Which is true, but at the same time, I need the support of our facilities and engineering staff, our security officers, the employees who are living and breathing and doing this every day. If they're not believers, I can have all the executive support in the world, but it doesn't really help much. You need both," she says. "You need the top down, but you really need to build a strong foundation from the bottom up."

Not only does business continuity touch all the different functional parts of the organization, it goes up and down the entire corporate ladder— from hourly workers to C-level executives. That's the approach that Marriott takes in planning, "involving everyone in-between," she says. "Everyone has a role to play."

And everyone must understand what that role entails and why it is important. Your plans are only as strong as the people who will carry them out, says Dr. Turnbull. "People have to make decisions, ultimately, and that's what gets you through a crisis."

- Organizational learning: While "personal mastery" is a highlight of the learning organization, it is important to recognize that effective change must reach beyond personnel enlightenment, and, from an emergency management context, well beyond "lessons learned" by individuals within the organization. The term "**organizational learning**" is used to emphasize this concept (see terminology textbox) and to distinguish it from "lessons learned" (see Textbox 4.4.1.3).

Terminology alert!

Organization learning: A systems-based **process** for assessing proposed changes to the system and incorporating the accepted proposals to effect lasting change in system performance. This is accomplished through alteration to system structure, process, competencies, facilities, equipment, supplies, and other parameters. This process is accessible to the whole organization and relevant to the organization's core mission and objectives.

Consonant with the "learning organization," "organizational learning" implies that the entire organization incorporates improvements. This is distinguished from individual "lessons learned" and is, in the aggregate, more productive for the organization.

Textbox 4.4.1.3

"Organizational Learning"
Versus "Lessons Learned"

"**Organizational Learning**" uses a defined process to effectively and permanently incorporate change. The organization therefore evolves and improves beyond the simple "personnel learning" that is commonly found in the "**lessons learned**" approach to exercise and incident evaluation.

The concept "**organizational learning**" is therefore contrasted with this narrow people-focused "lessons learned." Change based only upon personnel learning becomes lost or diluted over time, personnel attrition, and organizational restructuring. "Lessons" soon become "lessons forgotten," only later to re-emerge as "lessons re-experienced."

Organizational learning, in fact, captures the "lessons learned" idea as a more comprehensive principle: "personal mastery" per Peter Senge.

○ In the overall EM program structure, organizational learning is a preparedness function and must be well coordinated with the evaluation activities that occur during training, exercise, and EM program reviews.

Lesson 4.4.2 Organizational Learning in the Emergency Management Program: Incorporating Effective and Lasting Change

Lesson Objectives

- *Describe the application of organizational learning to emergency management in healthcare systems.*
- *List procedures for analyzing and accepting suggested changes from the AAR process, program evaluations, and other sources.*
- *List strategy and practical procedures for prioritization and incorporating changes to the EOP and the EM program.*
- *Describe methods for formatting and tracking suggested EM program and EOP changes.*
- *Describe methods for disseminating EM program and EOP changes.*

Background

As described in the previous lesson, a learning organization is one that places appropriate emphasis on the incorporation of recommended improvements into the system itself. The distinguishing characteristic is that the **organization "learns"** along with any concurrent individual personnel "lessons learned."

- Learning across all CEM phases: For emergency management systems, organizational learning occurs throughout the four phases of emergency management (mitigation, preparedness, response, and recovery). It is an ongoing process (this is depicted diagrammatically in Figure 2.AB) with different sources for the learning. In addition, there are different approaches to incorporating **programmatic change** versus **response and recovery plan** changes. For instance, recommendations for response developed from an AAR may be analyzed and incorporated during the recovery phase, whereas changes made to preparedness plans (altered training courses or schedules and others) or mitigation plans (change in mitigation priorities and others) take place during their annual review and revisions. New or newly recognized issues that are suddenly urgent are addressed as they arise.

- EM committee responsibility: All of these program and plan changes are accomplished through the emergency management committee and EM program. It is therefore imperative that appropriate attention and support be assigned to developing effective organizational learning methods.

- Varied terminology: Many different approaches, with their associated terminologies, are used to describe the incorporation of systems enhancements. Some of the more prominent and pertinent include:

  ○ SEMS: SEMS uses the term "Action Plan for Improvement" (see Textbox 4.4.2.1) to describe the organizational changes selected after review of response and recovery. In SEMS, this is presented as the final component of the After Action Report (AAR) process. This text, in contrast, treats organizational learning as a separate activity.

Different terms in emergency management have been used to describe organizational learning activities. They are all in general agreement on their scope and focus.

Textbox 4.4.2.1

Standardized Emergency Management System (SEMS) Guidelines[103]
_____

Action Plan for Improvements
(This section of the report can be done separately or included as appropriate.)

It should describe for each of the principal recommendations:

     - Description of actions to be taken

     - Assignments

     - Associated costs and budget

     - Timetable for completion

     - Follow-up responsibility.

  ○ HSEEP: HSEEP (see Lesson 4.3.3) addresses improvements after exercise evaluation as separate but closely related to the AAR, and uses the term Improvement Plan (IP).[104] Both HSEEP and SEMS describe the importance of incorporating systems enhancements and describe it in the context of the AAR process.

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[103] From: *Standardized Emergency Management Systems (SEMS) Guidelines*, Part III. Supporting Documents, p. 9. Available at: http://www.oes.ca.gov/Operational/OESHome.nsf/PDF/SEMS%20Guidelines/$file/AAR. pdf, accessed December 6, 2005.
[104] HSEEP: Homeland Security Exercise and Evaluation Program. Volume III: Exercise Program Management and Planning Process. Chapter 4, pp. 48-49. (July 2004). Washington, D.C. Vol. 1, Overview and Doctrine: 30.

○ <u>Other</u>: Some organizations utilize the term "Corrective Action Process" (CAP). This process is associated with the development of the AAR and the tracking and incorporation of the changes to improve the system. The types of events that generate data for the CAP are more extensive than those described in SEMS and HSEEP, as the CAP is used after responses to actual events, exercises, drills, and program reviews.

Textbox 4.4.2.1

A Sample Corrective Action Process

Many organizations have processes that provide systems improvements and enhancements. The VHA has in the past used the term Corrective Actions Process (CAP). There are eight steps described in this process:
1. Develop a problem statement that states the problem and identifies its impact. [Part of the AAR.]
2. Review the past history of corrective action issues from previous evaluations and identify possible solutions to the problem.
3. Select a corrective action strategy and prioritize the actions to be taken.
4. Provide authority and resources to the individual assigned to implementation so that the designated change can be accomplished.
5. Identify the resources required to implement the strategy.
6. Check on the progress of completing the corrective action.
7. Forward problems that need to be resolved by higher authorities to the level of authority that can resolve the problem.
8. Test the solution through exercising once the problem is solved.

In effective systems management, indicated change should rarely be revolutionary or transformational.

• <u>The magnitude of EM program change</u>: EM programmatic and component plan changes are generally evolutionary rather than revolutionary, assuming the program and plans are originally based upon sound management principles, such as ICS, SEMS, NFPA 1600, and others presented in Unit 2. Most indicated change will, therefore, be definable at the "issue" and "action" level, rather than as strategic reorganization or major function overhaul.

• <u>A defined process for organizational change</u>: For effective learning organizations, the process of analyzing, prioritizing, and incorporating change across the organization is so critical that it should be recognized as a **distinct** process (organizational learning).

○ <u>Standardized expectations</u>: This allows standardization of the

change process for all recommended change actions, no matter what source (see below) generates the recommendation.

○ Consistent guidance: Detailed guidance can be developed that can promote optimally effective change methods and reflect the ongoing nature of change through all EM program phases.

○ Knowledge distribution: Notification and explanation of all significant changes to the EM program and component plans should be disseminated in a standard fashion. This serves to maintain awareness and involvement at all levels of the organization, as highlighted in the discussion of the "learning organization" (see Lesson 4.4.1).

○ Process improvement: The organizational learning process can itself be evaluated and improved.

- Information sources: Multiple "sources" provide information to healthcare system emergency managers that could indicate need for improvement to emergency management systems. These sources are active throughout the life cycle of emergency management (i.e., the periods of non-response, as well as during emergency operations). Some of the more important examples include:

  ○ After Action Reports: AARs are generated after exercises, formally evaluated drills (evaluative drills), and response to actual events (see Lesson 4.3.3). While primarily focused on emergency response and recovery plans, mitigation and preparedness may also be affected (e.g., a proposed change to training or education).

  ○ EM Program Reviews and Formal Programmatic Evaluations: These performance-based program evaluations (see Lesson 4.3.2) provide data that may be considered for changes to all the component plans of the EM program but most specifically to the mitigation and preparedness plans (mitigation and preparedness plans are typically reviewed annually – see Unit 1).

  ○ HVA revisions: An HVA revision or new hazards and/or vulnerability may necessitate a change to any or all of the EM program component plans. As this may occur at anytime, the organizational learning process must be capable of addressing these changes as they arise.

  ○ External prompts: Recommendations and mandates that result from new regulatory requirements, outside investigation of an adverse outcome, funding mandates, new threat advisories, and

EM programs may receive an indication that there is a need for organizational learning from multiple sources. These apply to both the overall EM program and to the EOP.

other urgent prompts may indicate a need for change.

○ <u>Technology and knowledge evolution</u>: EM program activities may encounter new information exclusive of the above processes that indicate the need for urgent change outside of the normal program review and revision process. This may be the discovery of a newly available resource of any type (e.g., a template process, a physical item, a knowledge resource), and could come from a source internal or external to the organization.

The Organizational Learning Process for Healthcare System Emergency Management

Organizational learning is a primary activity of the Emergency Management Committee.

- <u>Organizational learning assignment</u>: The responsibility for the EM program organizational learning process is held by the emergency program manager, but the authority and day-to-day direction to oversee it may be delegated to another individual as the direct coordinator. **Organizational learning is in fact a primary objective of the emergency management committee in developing and maintaining an optimal EM program.** The responsibility for analyzing, processing, tracking, and acting on suggested systems changes should be specifically delineated within the context of the EM program. The process for accessing the appropriate in-house and external expertise when considering unusual, technically advanced, or very expensive change should also be described.

- <u>Characteristics of the organizational change process</u>: An effective organizational learning process in emergency management should have the following characteristics:

Standardized methods for submitting proposed changes promote a more efficient organizational learning process.

○ <u>A standardized submission method</u>: It is important to establish a standardized method for easily submitting recommendations (from managers, employees, and others). This should include a centralized location/person for collection and collation. This may be a member of the EM committee or the healthcare system emergency manager. The collection resource should have a publicized e-mail and postal address, drop box, Website submission procedure, and any other contact method that assures a single, easily accessible portal.

○ <u>A standardized proposal format</u>: Wherever possible, change proposals should be submitted using the standardized format used by the organization for delineating issues in the AAR and program evaluation reports (see Lessons 4.3.2 and 4.3.3). This categorized approach (issue, background, proposed action, and proposed

responsible party) is relatively simple but encourages objective issue description and actionable recommendations. Proposed changes coming into the system from nonstandard sources (funding mandates, regulatory announcements, and others) should be converted to this format by the collection portal prior to further processing.

○ Standardized processing of proposed changes: Each proposed change should be processed through the same series of steps:

A standardized system for processing proposed changes is also advantageous.

  ▪ A group is assigned the responsibility of processing the recommended change: The processing of each proposed change is typically assigned to a designated group of individuals intimately involved with the EM program. A subcommittee or the full EM committee may suffice, depending on the size and nature of the organization. Additional personnel may be added as necessary for specific topics.

  ▪ Analysis of the clarity of the proposed change: Each proposed change should be evaluated for the clarity of how the issue has been presented. Before considering the merits of any proposal, it is important that the original intent of the proposed change is understood by all involved. Clarifications should be sought as necessary.

  ▪ Revision of the proposal: Once well understood by the committee members, the proposal may require additional revisions so that the proposed change is appropriately objective, measurable, actionable, and "trackable" (i.e., able to be tracked through the acceptance and incorporation process). For example, at this stage, the "Proposed Actions" should comprehensively describe all that is necessary to address the issue as proposed. This is critical for the follow-on step to be accurate.

As part of the analysis of any proposed change, the impact of the change must be considered. If this is not addressed, unexpected and unintended consequences may diminish the value of an organizational change.

  ▪ Assess EM program implications: Full consideration should be given to the program implications of **each** of the proposed changes. What appear to be relatively straightforward changes can actually have unintended consequences on the EM program component plans. This step includes considering the following implications:

    ❑ System design

    ❑ Equipment and supplies

❑ Position qualifications and training

❑ Financial impact

❑ Regulatory compliance of accepting the proposed changes.

For example, changing the responsibilities of a specific response position in the EOP necessitates changes in the documented EOP, changes in training for that position, and potentially changes to the competencies for that and other response positions. This consideration is not meant to be prohibitive, but is designed to more accurately reflect the required steps to fully change the system in a sustained manner.

▪ <u>Manage the decision on proposed change</u>: A specific disposition should be made for each proposed change. It is contradictory for a learning organization to develop and collect proposed system enhancements and then never make a final decision as to how and whether the action will be accomplished. The following distinct disposition categories may be helpful in standardizing this process:

Decision categories may be used to standardize the change decision process.

❑ <u>Accept as written</u>: Accept the proposed change and the actions to accomplish it.

❑ <u>Accept with revision</u>: Accept the proposed change but with revised actions.

❑ <u>Declining proposed change</u>: There are many reasons that a proposal may be declined. It is imperative that this assignment be accompanied with a reasoned explanation and not an excuse. The explanation is important beyond providing a rationale to the individual(s) who developed the recommendation. If the issue is raised during subsequent programmatic evaluations or AAR processes, the explanation should provide context (circumstances) and an understanding at that time for why the issue was declined.

❑ <u>Deferring decisions</u>: This category is used when an issue is deferred to a future time period (specified in the deferral), for implementation during a scheduled programmatic revision, during future construction, pending further **specific** study or availability of funds, and so on. During the action tracking activities (see below), these deferred actions should periodically be reviewed for continued relevancy, for

update of the planned actions, or for change in prioritization. This category should be rarely used, and the specific deferment reason documented with a time designation for when the deferment reason should be resolved. A final decision should be made at that time.

- Prioritization of issues for implementation: A relative priority should be assigned to each accepted change action. After AARs and programmatic evaluations, multiple proposed changes may be accepted and they cannot all be accomplished simultaneously. Providing some ranking of issues and their related actions can be helpful in scheduling organizational learning activities and in determining final disposition of deferred actions. This curriculum does not propose any overly prescriptive methods be used to assign issues to a specific prioritization scheme (e.g., high, medium, low priority). Most implementation actions, in fact, may be designated as "routine" and many of these may be collected and implemented during a planned EOP or Recovery Plan revision, or during the annual development of the follow-on year's mitigation or preparedness planning.

- High priority issues: Some issues, however, may be high priority and having a method to indicate this may be helpful (e.g., flagging some specific considerations as "high priority" as appropriate and then providing a relative ranking for the reminder). Some considerations for assigning a high priority to an issue include:

  - Life-safety issues: Issues that create a higher than acceptable risk to healthcare system personnel, other responders, or to patients and their families (i.e., "life-safety issues") are of particular importance and generally should receive the highest priority attention.

  - Legal and regulatory issues: Some legal or regulatory issues may carry significant legal, financial, and/or reputation risks for the organization and require a degree of higher prioritization above "routine." For instance, changes recommended to the Preparedness Plan that promote compliance with JCAHO regulations (e.g., appropriate number of exercises per year) could be significant. Compliance with funding regulations, such as those promulgated by HRSA,[105] are included in this consideration.

Prioritization of recommended changes can help with strategic implementation. Specific characteristics (see text) can help with selection of the "high priority" issues for change.

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[105] U.S. Department of Health and Human Services, Health Resources and Services Administration, Healthcare Systems Bureau. National Bioterrorism Hospital

❑ Beginning of incident versus end of the event issues: Proposed changes that affect system response near the onset of the Response Phase, as opposed to changes to the end of the Response Phase, may take higher priority. For instance, proposed changes to mobilization procedures may be assigned a higher priority than demobilization procedures since the former could impede effective response. This does not negate, however, the importance of the latter's issues.

▪ Implementing accepted change: The process for implementing the accepted change actions should be delineated in the work plans. It should include:

❑ Assigning actions to the responsible parties

❑ Establishing a work plan with timeline for incorporation of the change

❑ Developing a budget (as applicable)

❑ Determining the methodology and timing for evaluating the change once implemented (as applicable).

● Decision authority for organizational change: Many decisions for EM systems change can be made at the level of the emergency program manager and EM committee, but some enhancements may require presentation to higher authorities within the system for acceptance and approval (e.g., capital expenditures). Others may be reported in aggregate or per the senior administrators' (chief executive and operating and financial officers) directives. Guidelines for what needs approval and what needs to be reported and when should be sought when developing the organizational change process.

● Tracking the disposition of accepted change:

○ The organizational learning process is ongoing throughout the year and must maintain accountability for the issues and actions under consideration or implementation.

○ This requires that a means for adequate tracking be built into the

The authority to select proposed changes may rest with different entities within the organization. In many instances, changes are easily selected and implemented by the EM program committee. In others, executive approval may be necessary.

Preparedness Program Continuation Guidance (FY 2005). Available at: http://www.hrsa.gov/grants/preview/guidancespecial/hrsa05001.htm, accessed December 16, 2005.

organizational learning process. Otherwise, critical as well as routine improvements may be lost or unnecessarily delayed.

○ A suggested template for tracking systems enhancement, according to the discussion above, is provided (See Exhibit 4.4.2.1 below).

Exhibit 4.4.2.1 Organizational Learning Tracking Template. The "Final Status" column should be completed for all "accepted" actions.

Issue	Proposed Actions	EMP Implica-tions & Decision	Priority	Work Plan & Timeline	Budget	Assigned respon-sibility	Interval status	Final Status	Re-evaluation Date & Methods

Dissemination of Systems Enhancements

Changes to any of the EM program component plans must be adequately publicized within the appropriate areas of the EM program, and a wide dissemination is encouraged wherever appropriate to maintain situational organizational awareness as much as possible. Several considerations are applicable to this:

- Urgent versus routine: Depending on the change, the method of dissemination may be urgent or routine. In some instances, the Baseline Situation Unit could be utilized to announce certain critical EM program changes, such as major resource acquisitions or major revisions to the facility's Emergency Safety Procedures (ESP) procedures. This type of announcement could be made as an EM program advisory as described in Unit 3. In other instances, changes can be announced in less urgent methods through EM committee meetings and reports or other methods.

- Targeted dissemination: Many accepted and incorporated changes will be for targeted audiences. Changes that affect **only** a very specific function or position can be disseminated in a targeted fashion.

- Tracking receipt of dissemination: For particularly critical changes, a method for tracking receipt of the change should be considered. A common method is for the indicated personnel to sign a sheet

Selected and incorporated changes are only effective if they are appropriately disseminated.
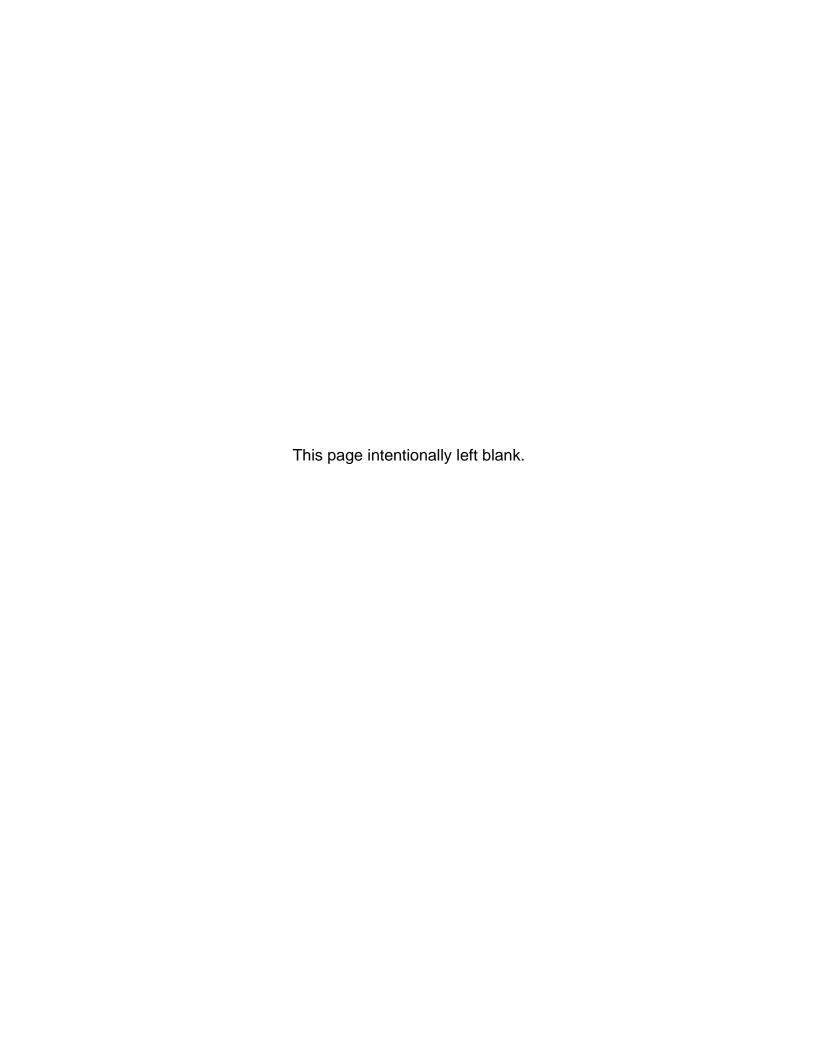
indicating they have read and understand the systems change, and this is treated almost as a certification activity as discussed in the lesson on training (see Lesson 4.2.2).

Evaluation of Change

- Within organizational learning, evaluation of change is important to:

  ○ Assure that it has been adequately accomplished

  ○ Assure that the change is sustained

  ○ Assess the changes effect in terms of addressing the issue that prompted the change action

  ○ Assess the value of the change to the organization

  ○ Determine if any unforeseen adverse impacts were created by the system change.

- This evaluation may be formal or informal as indicated by the magnitude and importance of the change. The evaluation may be accomplished through multiple methods (see Lesson 4.3.1), including:

  ○ Exercise (see Lesson 4.2.3)

  ○ Evaluative drill (see Lesson 4.2.2)

  ○ An objective of a future routine programmatic evaluation (see Lesson 4.3.2)

  ○ Through interviews, surveys, and other programmatic evaluation methods discussed in Lesson 4.3.2.

Summary

Using defined, objective evaluation and standardized organizational learning processes will assure that organizational change is based upon balanced and accurate operational and cost-effectiveness considerations. This should minimize the political, personality, and narrow financial influences that commonly dominate emergency management programs.

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Emergency Management Academy

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