Emergency Response Planning

- **Understand the context of the plan**
- **Specify an incident command system**
- **Develop the components needed to support the system**
- **Update the system components on a regular basis**
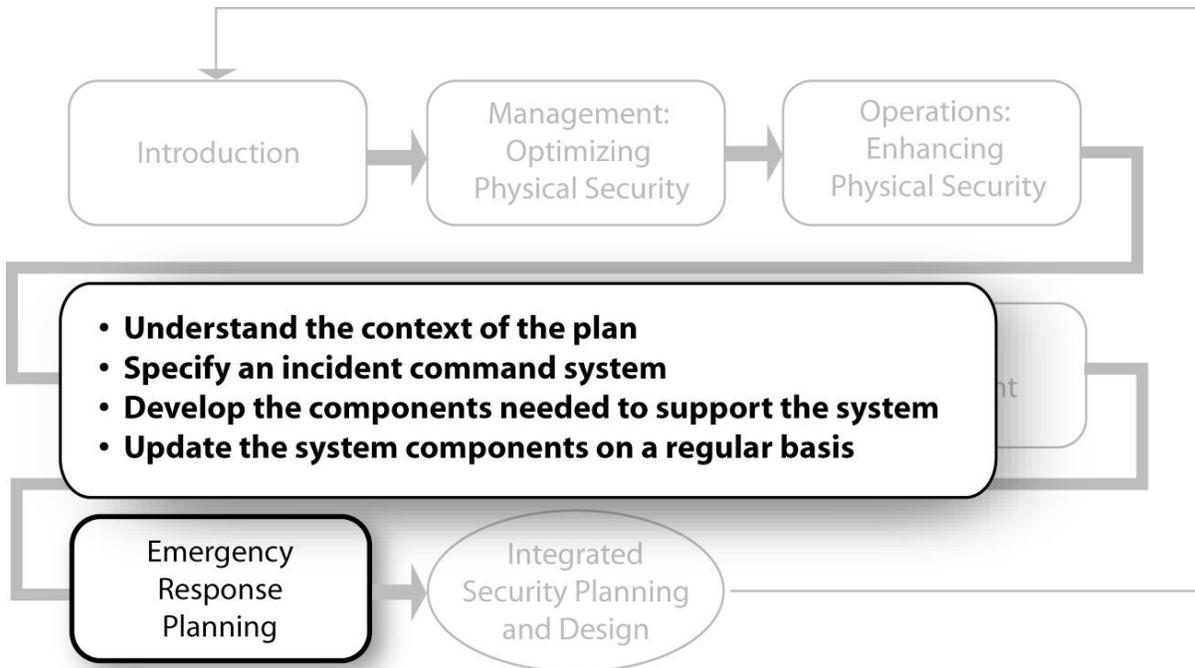
7.1 Overview

A security system can never prevent all events, thus a utility needs to be prepared to respond and recover from malevolent acts and unintentional events (such as natural disasters and accidents). Emergency response is divided into four types of actions: planning, response, recovery and termination.

This section presents information for water utilities to consider when planning for and responding to incidents in order to minimize disruption of service and to protect employees and the public. The issues discussed provide the basis for development of an Emergency Response Plan (ERP). General information and resources on emergency response are provided in this section; references listed in Section 7.2.4, "Additional Information for Developing ERPs," and the bibliography should be consulted for emergency response plan specifics.

7.2 Emergency Response Background

To prepare an effective ERP, it is important to understand its background and purpose.

7.2.1 Regulations

As discussed in Section 1.2.2.1, "Regulatory Drivers," the Public Health Security and Bioterrorism Preparedness and Response Act requires the creation of or an update to an ERP for all community

drinking water systems serving populations greater than 3,300. The focus of this guidance is to help utilities to incorporate the responses needed in the face of man-made threats as well as those responses already included for natural disasters and accidents.

Many states have created regulations in parallel with or in response to the Act. Utilities are encouraged to ask their state regulatory agencies and local public health districts to provide those prescribed requirements for water emergency plans.

Emergency plans are an important tool in planning and recovery for all utilities. Joint utilities (water and wastewater) should consider combining the ERP efforts for the required water system emergency plan with a wastewater and stormwater plan to gain additional value for the time and money invested on the water plan.

7.2.2 Purpose

The purpose of an ERP is to provide a utility with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of human-caused or natural origin. There are two types of data needed to develop an ERP: detailed information about the risks to critical water system facilities and knowledge of emergency response protocols, personnel, and resources.

Water utilities performed vulnerability assessments (VAs) before ERPs were developed or revised as part of complying with the Act. The VA identified and prioritized the types of risks to the utility's critical assets, as well as listing ways to reduce risk to these assets. This information is used to develop an ERP that focuses on response to and recovery from these risks.

The ERP is also developed using knowledge obtained through workshops and consultations with local emergency management personnel and first responders; this communication provides the utility with specifics about local resources and begins the agency coordination necessary to successfully respond to an emergency. With this information, the ERP can clearly outline the communication and coordination that will occur between the utility and local emergency response personnel, including police, fire, and public health officials. The ERP will also define procedures, identify available equipment and personnel resources that can assist the utility in response and recovery.

7.2.3 Governmental Support
for Emergency Response: NIMS and ICS

On March 1, 2004, the DHS established the National Incident Management System (NIMS) pursuant to Homeland Security Presidential Directive-5. NIMS consists of five major subsystems that collectively provide a total systems approach to risk incident management. These five elements are the Incident Command System (ICS), Training, Qualifications and Certification, Publication Management, and Supporting Technology.

On September 8, 2004, the DHS sent a letter to state governors that outlines the requirements of NIMS as our nation's first standardized approach to incident management and emergency response. The minimum FY 2005 requirements for local jurisdiction support of NIMS are:

1. Completing the Introductory NIMS Awareness Course, available online at http://training.fema.gov/EMIWeb/IS/is700.asp.
2. Formally recognizing the NIMS and adopting NIMS principles and policies. The NIMS integration center (NIC) has tools to help with NIMS (www.fema.gov/nims).
3. Establishing a NIMS baseline by determining which NIMS requirements the jurisdiction already meets. There is a NIMS Capability Assessment Support Tool (NIMCAST) under development from NIC.
4. Establishing a timeframe and developing a strategy for full NIMS implementation.
5. Institutionalizing the use of the ICS.

ICS is a standardized response management system that is a key component of NIMS. It is an "all hazard/all risk" approach to managing crisis response operations as well as non-crisis events by enhancing command, control, and communication capabilities. In the early 1970s, ICS was developed to manage rapidly moving wildfires and to address the following problems:

- Different emergency response organizational structures

- Unclear or unspecified incident objectives

- Too many people reporting to one supervisor

- Lack of reliable incident information

- Inadequate and incompatible communications

- Lack of structure for coordinated planning among agencies

- Unclear lines of authority

- Terminology differences among agencies

Information and training on ICS can be obtained online at http://training.fema.gov/emiweb/is/crslist.asp.

7.2.3.1 Benefits of ICS

The adoption of ICS offers these benefits:

- A flexible, but formal, response management system that allows for the cultivation of response management expertise at all levels of applicable response organizations.

- Increased coordination between utilities, their personnel, and other first responders such as police, fire, public health, and public works departments

- Application to any response situation ("all hazard/all risk")

- Logical and smooth organizational expansion and contraction

- Autonomy for each agency participating in the response

- Increased support of trained personnel during major incidents

- A "public domain" system that allows unrestricted distribution by commanding officers to improve capabilities and unify the local response community into a more effective organization

7.2.3.2 ICS Command Structure

The Incident Management Team, as shown in Figure 7-1, consists of the Command Staff (incident commander, public information officer, liaison officer, and safety officer) as well as the operations, planning, logistics, and financial sections of the utility. Not all positions may be activated during an emergency. Based on this structure, the ERP describes the utility personnel who will fill each role (at least two people for each position on the team) and their roles and responsibilities.
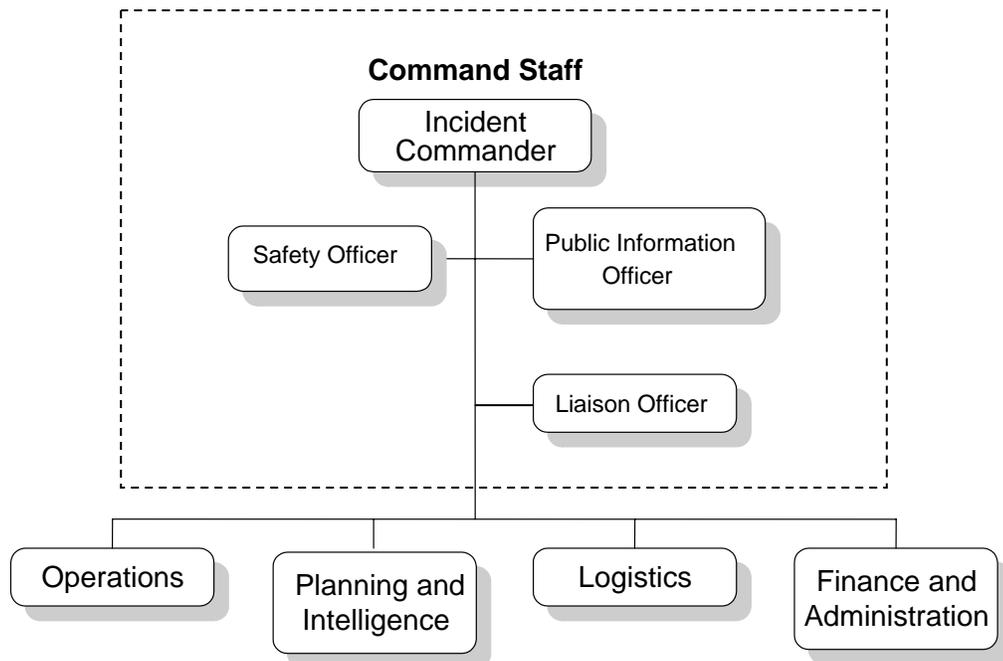

FIGURE 7-1
Incident Management Team Organizational Structure

During an emergency situation, the Incident Management Team members will, at a minimum:

- Identify an Incident Commander to manage the Operations, Planning/Intelligence, Logistics, Finance/Administration Sections, and related sub-functions of the ICS.

- Set priorities and implement previously developed Incident Action Plans (IAPs).

- Control and mitigate emergency situations.

- Coordinate and support all field-level incident activities within the utility service area.

- Gather, process, and report information to stakeholders within the utility service area and to other levels of the ICS.

- Coordinate with local governments, organizations with which the utility has mutual aid agreements, or regional Emergency Operations Centers (EOCs) as appropriate.

- Coordinate the transition of expanded ICS responsibilities to outside agencies when the scope and parameter of emergency response exceeds jurisdictional capability.

- Request resources from appropriate agencies.

- Organize recovery and cleanup of emergency response activities.

7.2.4 Additional Information for Developing ERPs

It is not the intent of the ERP section of this document to supplement the exhaustive research already conducted by AWWA and the EPA on emergency planning, but only to emphasize a few areas for further consideration. Additional information can be found at the following web sites: http://www.awwa.org/advocacy/learn/security/ and http://www.epa.gov/ebtpages/emergencies.html.

- EPA has developed "Emergency Response Plan Guidance for Small and Medium Systems," and "Large Water System Emergency Response Plan Outline: Guidance to Assist Community Water Systems in Complying with the Bioterrorism Act." These documents can be downloaded from the Water Security Page on the EPA's web site (http://cfpub.epa.gov/safewater/watersecurity). Select "Emergency/Incident Planning" under Primary Topics.

- VSAT™, described in Section 1.4.4.2, has an ERP module that can be used to guide a water utility through ERP development.

7.3 Key Components of an ERP

The basic components of an ERP address the four types of actions involved in emergency response: planning, response, recovery, and termination. The sections below describe the ways in which each action can be included in an ERP.

7.3.1 Introduction

To familiarize the reader of the ERP with ideas relevant to the development and use of the plan, it is helpful to include an introduction to the document. The introduction describes how the four actions are integrated into the ERP, as well as its purpose, goals, underlying regulatory requirements, and overall document organization.

7.3.2 Planning

Planning is integrated into the ERP in a number of areas, including in the overview of utility facilities, concept of emergency operations, emergency facilities and equipment, the crisis communications plan, incident management, document management, training, water contamination and decontamination.

Planning is also part of the utility's emergency response partnerships, mutual aid agreements, and emergency response policies, procedures, and documents that summarize the scenarios from the vulnerability assessment that are addressed in the ERP.

7.3.2.1 Overview of Utility Facilities

An overview of a utility's facilities is needed to identify that the essential information on which to base decisions is ready in the event of an emergency. The overview can include a description of the raw water supplies, treatment and distribution systems, storage capability, and design standards. Tables can be useful in displaying the volume of information concerning critical facilities, such as pump station locations. System maps, site plans, flow diagrams, hydraulic profile schematics, and data tables can either be part of the overview or readily available to aid in the understanding of system capacities and the interrelationships between system components.

7.3.2.2 Concept of Emergency Operations

The concept of operations lays out the plan for emergency response. This section can include descriptions of emergency direction and control, the incident management team, and mutual aid agreements. The emergency direction and control portion discusses the ICS, unified command, and initial and sustained operations.

The incident management team portion describes the roles for utility personnel (at least two people should be prepared to assume each position on the team) and their associated responsibilities. The team normally consists of an incident commander, public information officer, liaison officer, and safety officer, as well as the operations, planning, logistics, and financial representatives (see Figure 7-1). Not all positions may be activated during an emergency. In some cases, depending on the size of the utility or the severity of the event, one individual may fill multiple roles.

Mutual aid agreements describe the additional resources that the utility can expect to receive from or provide to other organizations in the event of an emergency.

This section also includes other relevant planning materials, such as the utility's polices and procedures, and plans to mitigate emergency incidents, such as how the utility will respond to threats. It describes activation of the Emergency Operations Center (described in the following section), response capabilities, personnel safety provisions, and protective action protocols.

A relevant source of information for utilities as they plan to assess and respond to threats is the EPA's Emergency Response Protocol Toolbox (http://www.epa.gov/safewater/security). Utilities can refer to the Toolbox for guidance on handling the various stages of threat assessment, including the possible stage, credible stage, and confirmed stage, as well as site characterization and use of laboratories that are capable of detecting a broad range of contaminants.

7.3.2.3 Emergency Facilities and Equipment

The emergency facilities and equipment section discusses the EOC, emergency equipment, and communication resources. An EOC is a pre-designated facility where the overall response and support for an emergency will be coordinated. The EOC can be a portable or fixed separate room equipped and designated for emergencies only or one that can easily be equipped for use during emergency events. Primary and secondary EOC locations for the utility are designated, as well as city

or county EOC locations. A map showing the relationship between these EOCs, as well as their addresses and telephone numbers, is a helpful tool during an emergency.

The EOC should have sufficient administrative and office supplies, including the items listed below:

- Communication equipment (telephones, computers, fax, two-way radios, etc.)

- Copies of the ERP, system-related maps and drawings, and operational procedures

- Chalk or white boards, paper, pens, calendars, logbooks, printers, etc.

- Tables and chairs

Consideration should also be given to providing overnight accommodations at or near the EOC including cots and bedding, a supply of food and water, and bathrooms with showers.

Emergency equipment addresses the recommended equipment, from safety gear to office supplies, to be stored in the EOC, along with references to available field equipment such as vehicles and portable generators. The communication resources related to facilities and equipment consist of available intra-agency and inter-agency communication methods available during an emergency, such as cell phones, two-way radios, and the GETS service (previously described in Section 2.9.1, "Communications Equipment").

7.3.2.4 Crisis Communications Plan

During a crisis, clear and timely communication can save lives, property, and credibility. The crisis communications plan details communication procedures and capabilities within the incident management team and with stakeholders, crisis communications tools, and key messages for the public. If there is a need to communicate to the public directly or through the media, this role should be performed by a person designated by the Incident Commander.

Planning communications with stakeholders, both internal and external to the utility, includes identifying who should be notified during crisis situations and the procedures for such notifications. This section often includes primary and alternate emergency contact information (such as current telephone numbers and the order in which contacts are made) for, at a minimum, the following groups:

- Utility's Incident Management Team

- Crisis communications team

- Utility personnel and next-of-kin

- Local, state, and federal organizations, including emergency response and regulatory agencies

- Chemical and equipment suppliers or other vendors

- Contractors and consultants

- Mutual-aid partners

- Media

- Sensitive customers

The crisis communications plan discusses the various tools for disseminating information to internal and external audiences. The key messages section emphasizes the importance of facilitating rapid communication during an emergency event, providing press release templates and guidance on interaction with the media and the public. Communication resources (such as those included as part of "Facilities and Equipment") can also be included in this plan.

Section 2.10, "Interagency Coordination," of this document discusses the importance of coordination and communication with emergency responders and local emergency management agencies, health departments, and neighboring utilities, and provides tips on improving coordination. The better the coordination and communications protocols are established before an emergency, the more efficient and successful the response will be in a crisis.

7.3.2.5 Incident Management

Incident management planning specifies how utilities will respond to, recover from, and terminate an emergency, including the way in which operations will proceed and how damage will be assessed and repaired.

Emergency response checklists can be used to guide the operation of affected facilities during and after the emergency. The types and content of the checklists can vary depending on location and nearby agencies. For example, utilities may want to develop response checklists for:

- activation and deactivation of the utility's EOC

- evacuation

- sheltering-in-place

- power failure

- severe weather

- earthquakes

- medical emergencies

- fire/explosion

- chemical release

- destruction/failure of any part of the system

- dam failure

- bomb threat

- unauthorized entry

- workplace violence

- civil disorder/terrorism

- contamination threat to the system

- SCADA attack (both electronic and physical)

Many of the events may occur in conjunction, requiring the use of more than one checklist. For example, a fire or explosion may also result in a medical emergency and chemical release.

7.3.2.6 Document Management

Document management plans consider records preservation and storage, and the documentation required for insurance coverage. Records preservation stresses the importance of the incident commander's responsibility to compile all records associated with an emergency event and to arrange for record storage in accordance with standard utility procedures. Records storage identifies the security requirements for the documents, including how the records are handled and by whom, and the physical security of the storage location.

One type of essential records to be collected and preserved are the handwritten or electronic logs generated during the emergency. Developed and controlled by the Incident Management Team, these logs become official documentation of the emergency and can serve as the basis for the post-incident review.

The insurance coverage section describes how additional funding for emergency response and recovery from major disasters may be obtained. To file claims with FEMA, other governmental agencies, the utility's insurance carrier, or private organizations, specific supporting documents must be created and provided. A description of the documents needed and how they should be processed can be included here.

Because it is important to track the location of copies of the ERP so that all are updated when changes to the plan are made, utilities may want to consider developing a tracking log. This log can identify the copy by number, the individual who has been assigned that copy, as well as that individual's address and telephone number.

7.3.2.7 Training

The ERP also contains a section that discusses the utility's emergency response training program. Training and drilling are critical to successful emergency response. The quality of the ERP will not matter if utility personnel are not trained to use it, or if utility personnel and emergency responders are not used to working together.

The training section covers both internal and external training methods. Internal training methods may include employee awareness training, classroom training, tabletop exercises, drills, full-scale exercises, electronic mail response training, and emergency response coordination with federal and state emergency response organizations. External support training can include such subjects as hazardous waste training by HAZWOPER, use of a fire extinguisher, and CPR/first aid. (These methods are addressed in more detail in Section 2.5.6, "Training.")

Training programs, such as those that follow, can be specifically related to emergency response:

- **Orientation sessions.** Orientation sessions include basic instruction and explanation of the ERP and IAP procedures. Written tests may be used to verify a specified level of comprehension by the attendees.

- **Table-top exercises.** Table-top exercises are extremely helpful in testing emergency procedures and enabling communication between personnel who would respond to an emergency. Participants are presented with a fabricated major event and are asked to discuss their potential responses. Table-tops involve many players acting out an emergency situation in an indoor setting within one or more rooms. An exercise director facilitates the exercise and develops a plausible scenario with a "trusted agent" from the utility. After the exercise is complete, the exercise director conducts a review of the exercise and lessons learned with the participants. Information on FEMA's training program is located at http://www.fema.gov/fima/education.shtm.

- **Exercises drills.** Larger-scale field drills that involve the utility and other agencies are an eye-opening exercise for participants. These dress rehearsals for emergencies are an excellent way to find flaws in communication, equipment, response times, and many other areas that are critical to recovery during a real emergency. These exercises are the most expensive of the possible training methods, but are very worthwhile if a community can afford to coordinate them.

7.3.2.8 Water Contamination and Decontamination

Utilities can develop response plans for water contamination and decontamination with information provided in the EPA Emergency Response Protocol Toolbox modules. Plans can discuss incidents that include threat warnings, the threat evaluation process, site characterization, and laboratories. The threat warning section can describe the various types of threat warnings and references threat documentation forms that may be included in an ERP appendix.

As discussed in the Module 2 of the Emergency Response Protocol Toolbox, the threat evaluation process includes three stages: possible, credible, and confirmed. The possible stage section defines how to determine the threat should be investigated or dismissed as impossible. The credible stage section defines whether there is enough information and evidence to indicate a contamination event may have occurred and the actions that should be taken. The confirmed stage is based on definitive information demonstrating that the water has been contaminated, which is preferably through a laboratory analysis that proves the presence of contaminants.

The laboratories section discusses the contact and protocols that utilities should have when working with laboratories that are capable of detecting a broad range of contaminants. It also discusses the various guidelines that the laboratories should follow.

Knowledge of decontamination is evolving quickly, as are other topics in the security arena. The EPA Water Security web site (http://cfpub.epa.gov/safewater/watersecurity/) has documents to assist utilities in understanding contamination and decontamination, and how to plan for these types of actions.

7.3.2.9 Appendices of Related Information

The appendices to the ERP can include various documents relevant to emergency response of the utility, such as those listed below:

• EPA-suggested measures for responding to emergencies at water utilities (e.g., Table 1-4, "Summary of EPA Water Utility Response, Recovery and Remediation Guidance for Man-made and/or Technological Emergencies")

• Maps and other relevant system information

• Copies of mutual aid agreements

• Contamination and/or bomb threat documentation forms

• Contamination threat evaluation worksheets

• Generic site characterization plans

• Site characterization report forms

• Equipment lists

• Example public notices and press releases

• Damage assessment reporting forms

7.3.3 Response

Response to an emergency event includes containment and control of a situation; mitigation of the emergency situation; damage assessment, in which the utility determines the extent of damage, and estimates repair or replacement costs; prioritizing actions, in which the utility identifies the resources necessary to return the damaged system to full operation; and implementing actions, in which the utility works to stabilize the system and return to normal. The response actions are based on the information provided in the ERP.

Numerous agencies have published information providing assistance for utilities in formulating ERPs. Some of the more widely known are included here.

• FEMA has developed extensive information relating to emergency prevention and response. A number of these documents are listed in the references section of this document. Additional information and documents can be found on the FEMA web site at http://www.fema.gov. Locate the FEMA Library for information on "Preparation & Prevention," "Disaster and Emergencies," and "Response and Recovery."

• The EPA's Response Protocol Toolbox: Planning for and Responding to Contamination Threats to Drinking Water Systems contains six modules designed to help the water sector effectively and appropriately respond to intentional contamination threats and incidents. The Toolbox files can be downloaded in PDF or Microsoft® Word format at http://www.epa.gov/safewater/ watersecurity. Locate the information by selecting the primary topic of "Emergency/Incident Planning," then selecting the toolbox from the list of "Emergency Response Tools and Guidance Documents."

- Also available from the EPA is a "Laboratory Compendium" database of laboratories with water testing capabilities. This database was populated through voluntary information from laboratories nationwide. It can be used to determine where to send contaminated water samples for testing. With permission from EPA, a utility can access the compendium at http://www.epa.gov/safewater/watersecurity. Locate the information by selecting the primary topic of "Emergency/Incident Planning," the selecting the compendium from the list of "Emergency Response Tools and Guidance Documents."

- The American Society of Industrial Security (ASIS) published an "International Disaster Preparation Guide" in 2003. This easy-to-read overview of emergency response that is useful for utility employees is available on-line at http://www.asisonline.org. Select the guide title from the Crisis Response list.

7.3.3 Recovery

Planning helps a utility to continue to meet its mission during and following an emergency. The recovery plan emphasizes the importance in appointing a recovery manager who then selects a recovery team to develop a strategy prior to emergency termination. The types of activities that could be conducted during recovery include determining repair costs and contracts, conducting an environmental consequence assessment, considering long-term operational changes, undertaking facility and/or environmental restoration, and the disseminating information. This section identifies plans that can help to ensure continuity during recovery from an emergency event.

7.3.3.1 Water System Operations Centers

It is recommended that the essential operations centers establish alternate location(s) for the continuation or resumption of normal business operations. This includes establishing alternate locations for computer, communications, and SCADA systems, as well as equipment storage and supplies. Alternate work locations should include the necessary telephones, computers, and other office-related machines and supplies.

Alternate business operations should be tested and exercised as part of the training program.

7.3.3.2 Electronic Records

The storage and retrieval of records is an integral part of a good recovery plan. Onsite backup storage of computer files is problematic and can be devastating. Options include the establishment of real-time backup and offsite storage of computer information. In the absence of real-time backup, daily backup and offsite storage of records can be considered a basic recommendation. Backup operating systems and software are recommended if needed for the alternate operations locations to be used properly.

7.3.3.3 Communications, Control, and Coordination

Managers and supervisors require continuous information to react as best suits the emergency situation, especially in the case of the relocation of the operations centers. Communication with other water operations staff may be necessary through the use of alternate radios and cell-phones.

Support from outside agencies can be planned and anticipated during alternate and recovery operations. Sharing of communications and control equipment and services can be arranged ahead of time, and such activity tested in the atmosphere of exercises.

7.3.3.4 Lessons Learned

Immediately following a table-top exercise, field exercise, or actual emergency response, the ICS leaders should convene a Lessons Learned review. The lead representatives in the ICS organization can review the response actions with their personnel immediately following the exercise or event. These key staff members can then meet to discuss updates and upgrades to the ERP and follow-on actions. From this review, changes to procedures, actions, and supporting information can be streamlined. Changes to existing ERP documents should be coordinated, then tested at the next scheduled exercise.

7.3.4 Termination

There are impacts and costs incurred during emergency operations. Consequently, steps can be planned and established that will facilitate a resumption of normal operations and the formal cessation of emergency operations.

- Make a determination as to the time, materials, and equipment necessary to return original structures to operating condition.

- Complete the documentation of internal and external labor costs, supply costs, equipment costs, infrastructure costs from power and telephone, and the opportunity costs resulting from the loss of routine activities during the emergency.

- Maintain and safeguard such summary records to support subsequent reimbursement claims, to critique the emergency response; and to make them available for future study to determine whether response modifications should be made.

- Identify the equipment needed or to be replaced due to loss or improvements learned as a result of the emergency.

7.4 Revisions to ERPs

An ERP is never a final document. ERPs should be revisited and revised often. A utility staff member can be assigned responsibility and given utility-wide authority for keeping the ERP up-to-date, including maintaining contact lists and equipment information. A review of the ERP should take place annually at a minimum, and should be based on the operational and procedural recommendations of the most recent vulnerability assessment, results of training exercises, and lessons learned from actual emergency responses. The vulnerability assessment identifies and

prioritizes risks to the utility, and the ERP should contain procedures for responding to and recovering from these risks. The ERP should also be updated to include procedures involving new security equipment and technology used at the utility.

7.5 Sample ERP Outline

The following outline is an example of an ERP for a medium-sized utility. The contents of the outline have been based on EPA guidance documents. Many types of response plan formats are available, as discussed in Section 7.2.4, "Additional Information for Developing ERPs."

I.   Plan Development Introduction

II.   Overview of Facilities

III.   Concept of Operations

       Emergency Direction and Control

       Incident Management Team

       Mutual Aid Agreements

IV.   Emergency Facilities and Equipment

       EOC Location (Primary and Alternate)

       Emergency Equipment and Supplies

       Physical Communication Resources

V.   Crisis Communications Plan

       Communicating within Your Team

       Communications with Stakeholders

       Crisis Communications Tools

       Key Messages

VI.   Incident Management

       Emergency Response

       Damage Assessment

       Recovery Organization

       Recovery Plan

       Termination and Review

VII.   Document Management

       Records Preservation

       Insurance Coverage

VIII.   Training

   Internal

   External

IX.   Water Contamination and Decontamination

   Threat Warnings

   Threat Evaluation

   Site Characterization

   Laboratories

Appendices

   Summary of Mutual Aid Agreements

   Emergency Contact Lists

   Emergency Response Checklists