

Recommended Practice for Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response

API RECOMMENDED PRACTICE 1174
FIRST EDITION, DECEMBER 2015



AMERICAN PETROLEUM INSTITUTE

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0 Introduction

This Recommended Practice (RP) has been developed for onshore hazardous liquid pipeline operators (hereinafter “the operator”), with the intent to align industry, government, and emergency response organizations’ expectations, practices, and competencies and to promote safe, timely, and effective response to incidents. It defines the fundamental emergency response requirements for those claiming conformity to the requirements of this document.

While this document may include some elements of other management systems (such as safety, environmental, financial, or risk management), it does not include all requirements specific to those systems. This document may be used either in conjunction with or independent of other industry-specified documents.

For an operator to function effectively, it must determine and manage numerous linked activities. An activity that transforms inputs into outputs is one way to define a process. This document promotes a process approach for the application of specific clauses when developing, implementing, and improving the effectiveness of pipeline emergency response programs. This approach provides for uninterrupted control over the stated requirements, as well as facilitating the overlap of processes, including the following:

- a) demonstrating management commitment,
- b) structuring risk management decisions,
- c) increasing confidence in risk controls,
- d) providing a platform for sharing knowledge and lessons learned, and
- e) promoting a safety-oriented culture.

Process activities include determination of needs throughout pipeline operations, provision of resources, identification of the proper sequence or order of a series of activities, monitoring and measuring the effectiveness of the activities performed, and applying changes or corrections to those activities as needed.

Goal of the Document

The goal of this document is to provide operators with an enhanced framework to enable continual improvement of pipeline emergency response. The framework builds on an operator’s existing pipeline-related activities and draws upon industry experiences, lessons learned, and existing standards. The framework is comprehensive in its intent to define the managerial elements for safe, timely, and effective emergency response.

NOTE “Pipeline” is defined in Terms and Definitions (see 3.1.16) to address, more broadly, pipeline systems.

Figure 1 illustrates this RP’s four strategic areas of focus (communication, training, exercise, and learning) and the associated goals of each.

API 1174 Emphasis

This RP emphasizes:

- increased proactivity through training and planned exercises,
- improved communications and clarified response management responsibilities throughout the operator’s organization (including contractor support), and
- provision of safe, timely, and effective emergency response by regularly evaluating operations to identify and address risks



Figure 0.1—Strategies and Goals

These factors make response management activities more effective, comprehensive, and integrated.

Standard Management System Principles

This RP is based on the following standard management system principles.

- Commitment, leadership, and oversight from top management are essential to the overall success of an emergency response process. Management commitment ensures that the elements set forth in this RP are established with clear accountability for implementation and with a clear connection from objectives to day-to-day activities.
- A safety-oriented culture is essential to enable the effective implementation and continual improvement of emergency response processes and procedures.
- Management of risk is an integral part of the design, construction, maintenance, and operation of a pipeline.
- Pipelines are designed, constructed, operated, and maintained in a manner that complies with federal, state, and local regulations and conforms to applicable industry codes and consensus standards with the goal of reducing risk, preventing incidents, and minimizing the occurrence of abnormal operations.
- Application of a comprehensive and systematic approach to pipeline emergency response creates an organization that can mitigate incidents and promotes a learning environment for continual improvement.
- Protection of life and property and minimization of adverse environmental consequences are essential.

- Periodic audits of the implemented elements of the document are essential to ensure effective execution of procedures, to identify improvement opportunities, and to improve performance.
- Support for and encouragement of employees to report risks, hazards, and safety incidents by providing a feedback system enables the operator to learn from experience.

The operator may consider using the Plan–Do–Check–Act (PDCA) cycle (see Annex A).

Recommended Practice for Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response

1 Scope

This Recommended Practice (RP) provides to operators of onshore hazardous liquid pipelines a framework that promotes the continual improvement of emergency planning and response processes, including identification and mitigation of associated risks and implementation of changes from lessons learned. This RP assists the operator in preparing for a safe, timely, and effective response to a pipeline emergency.

This RP applies to assets under the jurisdiction of the U.S. Department of Transportation (DOT), specifically U.S. Title 49 *Code of Federal Regulations (CFR)* Parts 194 and 195. Operators of non-DOT jurisdictional pipelines or tank assets could make voluntary use of this document.

This RP is not intended to apply to the following:

- a) post-response environmental remediation,
- b) exploration and production operations,
- c) offshore hazardous liquid pipeline operations,
- d) facility piping, or
- e) natural gas transmission and distribution pipeline operations.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies (including any addenda/errata).

API Recommended Practice 1162, *Public Awareness Programs for Pipeline Operators*

FEMA *National Incident Management System Document* (NIMS Document) ¹

ISO 9000:2005 ², *Quality management systems—Fundamentals and vocabulary*

USCG/U.S. EPA *Incident Management Handbooks* ³

USCG Title 33 *CFR* Part 154, *Facilities Transferring Oil or Hazardous Material in Bulk*

USCG Title 33 *CFR* Part 155, *Oil or Hazardous Material Pollution Prevention Regulations for Vessels*

U.S. DOT Title 49 *CFR* Part 194 ⁴, *Response Plans for Onshore Oil Pipelines*

U.S. DOT Title 49 *CFR* Part 195, *Transportation of Hazardous Liquids by Pipeline*

¹ FEMA, a division of U.S. Department of Homeland Security, Washington, DC 20528, www.fema.gov

² International Organization for Standardization, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, www.iso.org.

³ U.S. Coast Guard Marine Safety Center (part of DOT), 2100 Second Street, S.W., Washington, DC 20593, www.uscg.mil.

⁴ U.S. Department of Transportation, 1200 New Jersey Ave, SE, Washington, DC 20590, www.dot.gov.

U.S. EPA Title 40 *CFR* Chapter I Subchapter J Part 300⁵, *National Oil and Hazardous Substances Pollution Contingency Plan. (National Contingency Plan)*

3 Terms, Definitions, Acronyms, and Abbreviations

3.1 Terms and Definitions

For the purposes of this RP, the following terms and definitions apply.

3.1.1

activation

Act or process of mobilizing personnel, equipment, or a combination thereof to engage in a response operation.

3.1.2

compliance

Act or process of satisfying the legal and other applicable requirements of a regulation or regulatory body.

3.1.3

correction

Action to eliminate a detected nonconformity.

3.1.4

corrective action

Action to eliminate the cause of a detected nonconformity or undesirable situation.

3.1.5

document (noun)

Written statement of requirements or record of actions taken and completion of requirements.

3.1.6

effectiveness

Extent to which planned activities are completed and planned results achieved

NOTE Adapted from ISO 9000:2005, 3.2.14.

3.1.7

emergency

Event that requires immediate response to mitigate a problem or conduct subsequent investigations, as defined in regulation or as defined by the operator.

NOTE An emergency can involve injuries, significant property damage, released product, a fire or an explosion or a natural disaster. Emergencies can be accompanied by media attention, can impact third parties, or can require notification of local, state, tribal, or federal regulatory agencies.

3.1.8

job aid

Guidance that assists a worker in performing a role or task and provides quick-reference information rather than in-depth training.

3.1.9

legal requirement

Obligation imposed on an operator, including those that are statutory or regulatory.

⁵ U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, Washington, DC 20460, www.epa.gov.

3.1.10**management**

Person or group of people, as defined by the operator, who directs and controls all or part of a pipeline facility, location, department, or other function; has the fiscal responsibility for the organization; and is accountable for ensuring compliance with legal and other applicable requirements.

NOTE For some operators, top management (see ISO 9000:2005) and management are the same.

3.1.11**management of change****MOC**

Process used by operators to manage changes to their pipeline facilities, processes, organizations, and documents to ensure that changes are identified, planned, controlled, and communicated.

3.1.12**management system**

Framework of elements that an organization uses to direct and control work to achieve its objectives in an intentional and continual manner.

3.1.13**operator**

Person who owns or operates pipeline facilities.

3.1.14**oil spill removal organization****OSRO**

Company that specializes in cleaning up oil spills and is classified in accordance with the United States Coast Guard OSRO Classification Guidelines and 33 *CFR* 154 and 155.

NOTE 1 Adapted from the National Pollution Funds Center Glossary on the United States Coast Guard website.

NOTE 2 Such companies often serve as contractors or subcontractors for spill response efforts.

3.1.15**periodic**

Period of time as defined by regulation or, in the absence of regulation, by the operator.

3.1.16**pipeline**

All parts of a pipeline facility through which a hazardous liquid or carbon dioxide moves in transportation, including, but not limited to, line pipe, valves, and other appurtenances connected to line pipe, pumping units, fabricated assemblies associated with pumping units, metering and delivery stations and fabricated assemblies therein, and breakout tanks.

3.1.17**pipeline monitoring system**

Methods used by the operator to monitor the condition of its pipeline system.

NOTE Such methods may include supervisory control and data acquisition (SCADA), volume balance, etc.

3.1.18**procedure**

Specified way to conduct an activity or process.

3.1.19**public safety answering point****PSAP**

Entity responsible for receiving 9-1-1 calls and processing those calls according to a specific operational policy.

3.1.20**record** (noun)

Document providing evidence of activities performed or results achieved.

3.1.21**risk**

Situation or circumstance that has both a likelihood of occurring and the potential for negative consequence.

3.1.22**Unified Command****UC**

Application of Incident Command System (ICS) used when there is more than one agency with incident jurisdiction or when incidents cross political jurisdictions.

NOTE Agencies work together through the designated members of the Unified Command to establish their designated Incident Commanders at a single incident command post and to establish a common set of objectives and strategies and a single Incident Action Plan. This is accomplished without losing or abdicating authority, responsibility, or accountability.

3.2 Acronyms and Abbreviations

For the purposes of this standard, the following acronyms and abbreviations apply.

ACP	Area Contingency Plan
API	American Petroleum Institute
CFR	Code of Federal Regulations
DOT	Department of Transportation
EPA	Environmental Protection Agency
ERAP	Emergency Response Action Plan
FEMA	Federal Emergency Management Agency
GPS	global positioning system
HAZWOPER	Hazardous Waste Operations and Emergency Response
HASP	Health and Safety Plan
HCA	high consequence area
HVL	highly volatile liquids
HSEEP	Homeland Security Exercise and Evaluation Program
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IMT	incident management team
ISO	International Organization for Standardization
IT	information technology
LEPC	Local Emergency Planning Committees

LOFR	Liaison Officer
MOC	management of change
NCP	National Contingency Plan
NFPA	National Fire Protection Association
NIMS	National Incident Management System
OSRO	oil spill removal organization
PDCA	Plan–Do–Check–Act
PIO	Public Information Officer
PPE	personal protective equipment
PREP	National Preparedness for Response Exercise Program
PSAP	public safety answering point
SCADA	supervisory control and data acquisition
SDS	safety data sheet
SIT	Situation Unit Leader
UC	Unified Command
USCG	United States Coast Guard
WCD	worst-case discharge

4 Emergency Management System

4.1 General

The operator shall establish an emergency management system. The emergency management system should address legal requirements, regulations, operator lessons learned, best practices, applicable consensus standards, and recommendations of this document.

4.2 Management Commitment

Management shall demonstrate commitment to the establishment of an emergency management system. To achieve the operator's emergency management system objectives, management should demonstrate its support through company policy, management participation, and allocation of resources and funding.

NOTE Funding and resource requirements for development and implementation of an emergency management system vary according to the system's objectives, design, and scope. Management support affects acceptance of the emergency management system and the overall effectiveness and success of the program.

4.3 Management System Recommendations

4.3.1 General

The emergency response management system should include the following:

- a) statements of the system's policies and objectives;
- b) documented procedures established for the emergency response activities as required by regulation, this RP, or the operator;
- c) documents, records, and job aids to ensure the safe, timely, and effective planning, operation, and control of emergency response processes, and conformance with specified requirements;

- d) identification of legal and other applicable emergency response requirements or standards that the operator uses for compliance;
- e) processes intended to ensure continuity and promote system improvement; and
- f) measurable goals and objectives.

4.3.2 Procedures

The operator should ensure that all procedures referenced within this system are established, documented, implemented, evaluated, maintained, and periodically reviewed.

4.3.3 Communication of Management System

The operator should communicate the emergency management system to appropriate personnel within various departments of an operator's organization. These departments may include:

- emergency response;
- risk management;
- health, safety, environmental, and security;
- insurance, finance, and procurement;
- operations;
- communications and public relations.

4.3.4 Control of Documents

The operator should maintain a documented procedure for the identification, distribution, and control of documents that are required for its emergency management system and by this RP. The procedure should specify responsibilities for document approval and re-approval, and should identify the controls needed to ensure that the required emergency response documents, including revisions, translations, and updates:

- a) are reviewed and approved for adequacy prior to issue and use;
- b) identify changes and revision status; and
- c) remain legible and available.

The operator should remove obsolete documents from all points of issue or use or otherwise identify documents to prevent unintended use if they are retained for any purpose.

4.3.5 Control of Records

The operator shall verify the records requirements of all applicable laws and regulations (federal, state, local, or tribal) and develop a documented procedure to identify the controls and responsibilities needed for the identification, collection, storage, protection, retrieval, retention time, and disposition of records. The operator shall establish, control, and retain records as required by law, regulations, internal company policy, and this RP.

4.4 Management of Change

4.4.1 General

The operator shall maintain a documented procedure for management of change (MOC). For each MOC, the operator shall identify any required approvals prior to the introduction of such changes.

This procedure shall consider permanent or temporary changes. The process shall incorporate planning for the effects of the change for each of these situations.

NOTE MOC is a formalized approach used to introduce and approve proposed modifications and to transition organizations, teams, and individuals to a desired future state, environment, procedure, or process.

4.4.2 Types of Change

The types of changes that an MOC procedure addresses shall include the following:

- technology,
- procedures,
- personnel (internal and contractor),
- organizational roles and responsibilities,
- training.

4.4.3 Elements of MOC Procedure

An MOC procedure should include the following:

- reason for change,
- authority for approving changes,
- analysis of implications,
- documentation of change process,
- communication of change to affected parts of the organization,
- time limitations,
- qualification and training of personnel affected by the change (including contractors).

NOTE Application of MOC may trigger use of risk assessment to evaluate the impact of change on overall risk.

5 Preparedness

5.1 General

The operator shall have a documented emergency preparedness program as part of an emergency management system. The operator shall account for the preparedness requirements of federal, state, local, and tribal agencies. The operator's emergency preparedness program should incorporate the recommendations of this RP.

The operator's management should ensure the availability of resources that are essential to establishing, implementing, maintaining, and improving the emergency management system.

NOTE Resources may include emergency response equipment, human resources, specialized skills, infrastructure, technology, and finances.

5.2 Planning

5.2.1 General

The operator should develop an emergency preparedness program that incorporates the planning recommendations of this Section.

5.2.2 Response Plans

The operator shall develop Response Plans to address the response to a release or the substantial threat of a release of hazardous liquid. The operator shall have policies and procedures in its Response Plans that describe how to activate internal and external response resources. The operator's policies or procedures should include the definition of emergency, internal and external notification procedures, response information to activate initial resources, and escalation of resources as needed.

The operator's Response Plans shall include, as a minimum, all of the requirements listed in 49 *CFR* 194 or 195, as appropriate. Based on industry experience, the operator's Response Plans should focus on the following.

- a) Procedures and resources for responding to an incident, including the following:
 - 1) preventive and mitigative measures;
 - 2) type and volume of product;
 - 3) descriptions of the response zone (49 *CFR* 194.5), including country, state, and county or parish for those zones in which a release could cause substantial harm to the public or the environment.
- b) Review of the National Contingency Plan (NCP) and any applicable Area Contingency Plans (ACPs) to ensure Response Plan consistency.
- c) Procedures for complying with the National Incident Management System (NIMS) (see 6.5, Annex B, and NIMS Document for detailed discussions of NIMS).
- d) Description of the roles of the federal, state, local, and tribal on-scene coordinators.
- e) Responsibilities of the operator and of federal, state, local, or tribal agencies.
- f) Safety procedures at the release site, including the following:
 - 1) hazard assessment,
 - 2) personal protective equipment (PPE),
 - 3) emergency medical services,
- g) Tactical response guidelines (see 5.2.10).

- h) Alternative response strategies including provisions that require agency approval such as in situ burning or dispersants.
- i) Significant and substantial harm criteria in accordance with 49 *CFR* 194.103.
- j) Environmentally sensitive areas.
- k) Historically, culturally, and economically sensitive areas.
- l) Notification procedures.
- m) Qualified individual name and 24-hour contact information.
- n) Procedures for training, equipment testing, and drill programs (see 5.3 for additional information).
- o) Plan management.

5.2.3 Safety

The operator's primary goal during any incident response shall be ensuring personnel and public safety. The operator shall develop a personnel safety plan and a separate public safety plans that address the following:

- a) Health and Safety Plan (HASP);
- b) hazard and risk assessment;
- c) equipment needs;
- d) emergency notifications;
- e) emergency medical service;
- f) hazardous materials handling;
- g) air monitoring;
- h) hazard zones;
- i) decontamination;
- j) weather conditions;
- k) public protection (e.g. evacuations, shelter-in-place, etc.);
- l) perimeter security;
- m) training verification and needs;
- n) product information (e.g. safety data sheet [SDS]);
- o) PPE.

5.2.4 Risk-based Planning

5.2.4.1 General

The operator should incorporate a risk-based approach for emergency response planning. The operator should apply risk-based planning to identify areas that may require additional planning and resources.

NOTE 1 The operator may adapt its integrity risk model to include emergency planning.

NOTE 2 The formula for determining risk is the likelihood of an event occurring multiplied by the potential consequences of the event.

NOTE 3 Release volume may be considered as either likelihood or consequence.

5.2.4.2 Risk Formula: Likelihood

To determine likelihood, the operator should consider a variety of factors, which may include the following:

- pipeline operations,
- depth of cover,
- integrity data,
- pipeline history,
- release volume.

5.2.4.3 Risk Formula: Consequence

To determine consequence, the operator should consider a variety of factors, which may include the following:

- federally defined high consequence areas (HCAs);
- operator-defined at risk population areas;
- product;
- supervisory control and data acquisition (SCADA) capabilities;
- flow path, remote valves, and check valves;
- scenic or commercial water impact;
- high commercial or industrial impact;
- areas of historic and cultural significance;
- areas of congregation;
- areas with oil spill removal organization (OSRO) coverage and/or capability gaps;
- availability of specialty equipment (e.g. high capacity pumps, frac tanks, tanker trucks);
- political or media sensitivity.

5.2.5 Pipeline Facility Description

The Response Plan should include descriptions of all pipeline facilities and components, operations, and transported commodities. The operator should include the following information associated with its pipeline facility and the associated system or systems.

a) Pipeline facility or system description as follows:

- 1) operator;
- 2) contact information for qualified individual;
- 3) location (physical address);
- 4) latitude and longitude coordinates;
- 5) country, state, and county or parish;
- 6) federal land;
- 7) tribal land;
- 8) water crossings;
- 9) descriptions of the response zones;
- 10) line sections and breakout tankage in each response zone (milepost or survey station numbers or operator designations);
- 11) special access agreements and locations.

b) Equipment and pipeline facility operations description as follows:

- 1) control centers;
- 2) pipeline-specific information (size, diameter, length, etc.);
- 3) pump stations;
- 4) tank data (volumes, containment, etc.);
- 5) valve type (i.e. remote or manually operated) and location;
- 6) remote shutoff capabilities;
- 7) underground storage facilities.

c) Product information as follows:

- 1) commodities transported;
- 2) reference SDS;
- 3) batching;

4) blending.

d) Other considerations as follows:

- 1) worst-case discharge (WCD) volume and scenarios with releases in sensitive areas;
- 2) HCAs;
- 3) waterways within planning distance;
- 4) wildlife habitats or refuge areas;
- 5) location of response resources.

NOTE The operator may include connecting facilities and carriers, such as incoming and outgoing third-party pipelines, adjacent facilities, or rail lines.

5.2.6 Discharge Planning

The operator shall determine a WCD for each of its response zones and provide in its Response Plan the methodology, including calculations, used to arrive at that volume. State and local jurisdictions may have additional volume calculation requirements.

The operator should identify alternative discharge scenarios using the risk-based approach described in this RP. Considerations should include the following areas HCAs as a minimum:

- populated areas,
- water crossings and nearby water bodies,
- environmentally and economically sensitive areas,
- areas of historic and cultural significance,
- other operator-identified risk areas.

To determine the quantity of released product, the procedure should include pressure, flow rate, shutdown time, and drain down quantity after the line is shut down.

NOTE Alternative release scenarios beyond regulatory WCD calculations could include tanks, pipeline segments, etc.

5.2.7 Response Times

The operator shall establish response times in accordance with regulatory expectations. The operator should seek ways to improve upon regulatory response times.

Initial emergency response activities can be divided into phases as shown in Table 1. Although shown separately, these phases can happen simultaneously.

5.2.8 Roles and Responsibilities

The operator shall identify the roles and responsibilities of its emergency responders in accordance with NIMS Incident Command System (ICS) and communicate those responsibilities to designated personnel (see 6.5 and Annex B). The operator should understand the roles and responsibilities of local first responder agencies under NIMS.

Table 1—Initial Emergency Response Phases

Phases	Activities
Phase 1: Discovery, Shutdown, and Notification	For a confirmed incident, the operator shall follow pipeline shutdown procedures and activate the emergency response procedures within the Response Plan. Within the first hour of a confirmed incident, the operator should make immediate notifications (see 5.2.9.2) and set up or integrate into an existing Incident Command. The operator should also assess incident potential.
Phase 2: Resource Mobilization	The operator shall over-respond by deploying more resources (personnel, equipment, and contractors) than initial information indicates may be required. The operator shall deploy or stage resources strategically and scale the response effort to fit the incident as data and information become available. As an example, the operator may mobilize and deploy resources prior to confirming an incident.
Phase 3: Initial Response Actions	Once the operator's representatives have arrived onsite (if not already present), they shall meet with local first responders to assess the situation and integrate into Unified Command (UC). The UC will establish an Incident Action Plan (IAP).

5.2.9 Emergency Procedures

5.2.9.1 General

The operator shall establish emergency response procedures that ensure the ability to communicate promptly, respond quickly to the emergency, mitigate risks, and protect people and the environment.

5.2.9.2 Notifications

The operator shall identify specific communication requirements, response team 24-hour contact details, and a process for emergency notifications with contingencies for critical or unique situations. In addition, the operator should identify an escalation strategy for when a responder is not available or not able to be contacted. This communication process and system should be auditable and trackable. Notifications should include the following:

- local public safety answering point [PSAP; 9-1-1, or 10-digit requirements (if 9-1-1 is not available), or both];
- responsible party's Incident Commander (IC);
- internal response teams [qualified individual, incident management team (IMT), etc.];
- local first responders and public safety officials;
- National Response Center;
- Local Emergency Planning Committees (LEPCs);
- federal agencies;
- state agencies;
- tribal representatives;
- contractors, OSROs, or mutual aid;
- affected public;
- other affected operators or utility companies (shared rights-of-way, connections, etc.).

The operator should identify the priority of notifications in accordance with regulation.

5.2.9.3 Shutdown

The operator shall develop specific operating procedures for immediate shutdown and isolation of a pipeline during an emergency. This procedure shall describe how to safely shut down the pipeline, what actions shall be taken to investigate the issue, detailed communication requirements, and defined responsibilities. The operator shall establish a process that describes how to restart the system after a shutdown.

5.2.9.4 Public Protection

5.2.9.4.1 General

The operator shall work with response agencies to make decisions related to public protection, including evacuations and shelter-in-place orders. The Response Plan should consider conditions for recommending public protection measures. The operator should be prepared to provide financial or other resources to support long-term evacuations and other public protection measures. The operator should consider the following items when making public protection recommendations:

- commodity (type of product and associated hazard);
- potential volume of released product;
- weather conditions (wind, rain, snow, etc.);
- terrain;
- expected duration of public protection measures;
- proximity to public;
- duration of response.

5.2.9.4.2 Evacuation and Shelter-in-place Orders

The operator should cooperate with the local response agencies in case of an evacuation or shelter-in-place order. The operator should consider the following for short-term and long-term evacuation:

- transportation,
- security,
- evacuee contact or communication needs,
- populations with disabilities or access and functional needs,
- lodging and meals,
- medicines and health care,
- public health,
- pets,
- determination of when evacuees may safely return home,

- process for verifying evacuees,
- ongoing communication with evacuees,
- communication of potential health impact information to emergency medical centers,
- on-site emergency first aid.

NOTE The local response agency has authority over evacuation and shelter-in-place orders. The operator may have to support and provide resources for those orders.

5.2.10 Tactical Response Guidelines

5.2.10.1 Tactical Response Scenarios

The operator's response tactics should cover its pipeline facilities, operations, and environment. The operator should utilize available pre-plans to assist in the development of the tactical response objectives, including ACPs, geographical response plans, and tactical response plans. Scenarios that can require tactical response include product releases

- a) in a populated area,
- b) to water,
- c) into a wetland,
- d) on land,
- e) into subsurface,
- f) on tribal lands,
- g) in parks or recreational areas,
- h) in environmentally and economically sensitive areas, and
- i) in areas of historic and cultural significance.

5.2.10.2 Tactics

All response tactics shall address safety considerations or unique hazards (such as fire, explosions, submerged oil, water intakes, etc.). Tactics should include the following:

- system shutdown and isolation;
- containment methods such as booming, diking, or damming techniques;
- tank transfers;
- environmental protective measures;
- recovery and cleanup methods; and
- transportation and storage of recovered material.

5.2.11 Resource Management

5.2.11.1 Assessment

The operator shall establish criteria or incident classifications to assess the level of resources required to respond to emergencies. The operator should consider the nature of the incident, including the following:

- hazard (e.g. product release, fire, or explosion);
- volume and area affected;
- location;
- type of product;
- weather conditions;
- community impacts;
- environmentally and economically sensitive areas;
- areas of historic and cultural significance.

5.2.11.2 Resources

The operator shall identify specific resources that can be activated quickly to over respond to the emergency. The response team should include the following:

- operator personnel and operator-owned equipment;
- OSRO;
- mutual aid and co-op agreements;
- IMTs;
- local first responders (fire department, law enforcement, emergency medical services, PSAP, emergency management, etc.);
- contractors;
- consultants (including wildlife rehabilitation experts);
- agencies.

The Response Plan should address the use of volunteers in alignment with the ACP and state programs.

5.2.11.3 Resource Verification

The operator should consider including an audit program for its OSROs to provide assurance that they will be able to provide the needed resources and capabilities.

5.2.11.4 Equipment

The operator shall identify equipment needs and develop an equipment strategy. The operator should consider the following response equipment during emergency planning:

- safety equipment;
- protection and containment equipment;
- source control equipment;
- depressurization equipment;
- recovery equipment;
- decontamination equipment;
- aerial support (helicopters, line flyers, unmanned aerial vehicle);
- vessels or boats;
- air and water sampling and monitoring equipment;
- disposal, storage, and transportation equipment;
- firefighting resources (foam, specialized hazmat equipment, water supply, etc.);
- equipment to rehabilitate wildlife.

NOTE Staging and early mobilization of equipment is critical to achieving a safe, timely, and effective response and to mitigating consequences.

5.2.11.5 Sustained Response Considerations

When developing the Response Plan, the operator should consider all requirements needed to sustain the response team for long-term (e.g. weeks, months, or years) operations, which can include lessons learned from prior response activities. Sustained response considerations should include the following as a minimum:

- food;
- shelter;
- PPE;
- laundry;
- portable toilets;
- power generators;
- lighting;
- offices, meeting facilities, equipment, and staging areas;
- personnel scheduling;

- communication and information technology (IT) equipment;
- equipment maintenance;
- supplies and logistics;
- off-site claims processing and public information location.

5.2.12 Responder Outreach

In addition to the operator's API 1162 programs, the operator should develop outreach programs to provide information regarding pipeline emergency response techniques, training, and engagement opportunities. The operator should have a planned and systematic approach to communicate with local first responders and to foster coordination during an emergency. The operator should have public awareness programs to assist in this effort.

Engagement opportunities should include the following:

- a) drill planning, participation, execution, and evaluation;
- b) site visits;
- c) active participation in LEPCs;
- d) training opportunities such as the following:
 - 1) web-based or in-person training,
 - 2) lessons learned meetings,
 - 3) reviews of prior incidents.

5.2.13 Emergency Response Action Plan

The operator should develop an Emergency Response Action Plan (ERAP) for each of the response zones in which it operates. ERAPs should provide key information, such as the following, that can be useful in the initial stages of an emergency response:

- contact lists,
- notification lists,
- resource lists,
- response checklists,
- initial ICS forms (such as the ICS 201),
- basic tactics,
- SDS.

5.2.14 Business Impact and Continuity

5.2.14.1 Business Continuity Plan Objectives

The operator should have a Business Continuity Plan, which focuses on preserving critical processes and day-to-day operations during major incidents or disasters and minimizing financial impact on the business. The objectives of a Business Continuity Plan should include the following:

- maintaining viability of the business and continuing to provide a minimum acceptable level of service;
- managing and controlling risks;
- minimizing interruption to operations;
- coordinating the restart plan and, when appropriate, returning to the same service level as prior to the business interruption.

NOTE During emergencies, suspension or reduced levels of service in some processes, operations, or functions may be acceptable for a short time period. However, as the incident timeline progresses or is affected by other ancillary issues, suspended or reduced levels of service can threaten the operator's capability to conduct business and support customers.

5.2.14.2 Business Continuity Plan Content

The Business Continuity Plan should:

- identify key critical business processes, functions, and systems;
- document plans to minimize impact to each process, function, and system; and
- concentrate on impacts that directly affect the operator, such as personnel resourcing, loss of infrastructure (e.g. office locations, equipment, operations, information services or IT infrastructure and applications, etc.), or inability to deliver product or services.

NOTE The operator may prepare a Business Continuity Plan as part of a larger emergency management system or as a supplemental document.

5.2.15 Corporate Crisis Management

The operator should establish a Corporate Crisis Management Plan that:

- provides identified executive leadership with the information needed to respond to pre-determined trigger events, or incidents that have the potential to develop into a crisis if not addressed;
- enables the operator to respond in a safe, timely, effective, and organized manner by establishing clear roles and responsibilities for executive leadership, including boundaries among business units, IMTs, and corporate headquarters;
- guides the focus of effective executive leadership to avoid becoming over involved in the operational response; and
- provides clear definition of the difference in roles and responsibilities for the IMT, which is focused on managing the incident itself, versus the crisis management team, which is focused on managing the effects of the incident.

5.2.16 Plan Document Management

In accordance with Section 4, the operator shall establish and implement a process that documents the location of the Response Plan, how the Response Plan can be accessed, how changes or modifications to the Response Plan are managed and communicated to stakeholders, and how previous versions are removed or destroyed to prevent access to older content. This process shall address complex facilities that share regulatory agency requirements and how the Response Plan is communicated to all parties. In addition, the process should identify the parties responsible for plan document management.

The operator shall update the Response Plan and submit it to the Department of Transportation (DOT) if any of the following occur:

- change in qualified individual;
- change in WCD;
- change in commodity transported (such as a change from crude to refined products);
- new construction or purchase in a response zone not covered by the previously approved plan;
- revisions to the applicable ACPs or NCP that have significant impact on the equipment appropriate for response activities;
- addition or revision of an OSRO;
- revision of emergency response procedures;
- change of circumstances that can affect full implementation of the Response Plan.

The operator should provide the Response Plan to response agencies upon request. The operator should consider risks associated with sharing security sensitive information. The operator may direct a requesting response agency to the DOT.

5.3 Training and Exercises

5.3.1 General

The operator shall develop a training and exercise program for emergencies. The operator shall use National Preparedness for Response Exercise Program (PREP) Guidelines to satisfy exercise requirements. The operator's training and exercise program should meet the unique needs of the operator. The operator may consider using the Homeland Security Exercise and Evaluation Program (HSEEP).

5.3.2 Spill Response Training

In addition to providing response training required by regulation, the operator should provide general spill response training to those employees expected to respond to an emergency. Training should prepare the response team members for operating in a NIMS ICS environment, for using response plans, and for recognizing the types of spills and response techniques. The operator may adapt spill response training to the expected actions of a spill responder. Spill response training may include the following:

- Hazardous Waste Operations and Emergency Response (HAZWOPER; 29 *CFR* 1910.120),
- NIMS ICS,

- Response Plans,
- fate and transport of spilled hazardous liquids,
- environmentally sensitive areas,
- basic response equipment,
- OSRO program,
- ACP and NCP,
- the operator's response management system.

Incident response and management personnel should have a sufficient degree of competence in their assigned roles based on the operator's emergency response strategy. The operator should develop a methodology to determine competencies needed for participation in its IMTs. The operator shall maintain records of personnel training, which may include competency determination.

5.3.3 NIMS ICS Training

The operator shall use NIMS ICS, which is the only federally accepted response management system for emergency incidents. The operator may choose a variety of methods for ensuring its IMTs are competent in NIMS ICS.

NOTE The operator may train personnel in all positions or provide position-specific training.

The NIMS ICS training program should include:

- a) identifying the following:
 - 1) the size and complexity of the response team that the operator determines to use,
 - 2) the training needed to ensure the response team can participate in a NIMS ICS structure for an incident of the size and duration anticipated,
 - 3) the specific positions the operator determines to staff,
 - 4) the level that the operator determines is necessary to train the personnel for operations and command staff roles and responsibilities,
 - 5) the key personnel to be trained in those positions;
- b) providing training through workshops, seminars, tabletop exercises, classrooms, and computer-based learning;
- c) documenting the training and retaining the documents per the operator's retention policy and applicable laws and regulations; and
- d) evaluating the training on a regular basis and providing refresher training as needed.

5.3.4 Tactical Response and Equipment Deployment Training

The operator shall develop a program to provide training to operator personnel who are expected to deploy equipment during an emergency. The operator should also provide training to operator personnel who will directly supervise equipment deployment by contractors. Training should prepare operator personnel to understand the following:

- a) how equipment operates;
- b) how to perform the following:
 - 1) deploy and use equipment,
 - 2) avoid hazards when using equipment,
 - 3) use equipment in all weather conditions,
 - 4) maintain equipment,
 - 5) decontaminate equipment;
- c) when to use and not to use equipment.

The operator shall document training and retain training records per the operator's retention policies and applicable laws and regulations.

5.3.5 Drills and Exercises

5.3.5.1 General

The operator shall use PREP for exercise design and evaluation. These exercises should include specific information identifying scenarios that could impact the environment, community, and operator resources. The operator may develop exercises internally or through contractors. The operator (internal exercises) or a government agency (external exercises) may initiate drills and exercises.

The operator should participate in relevant external exercises sponsored and conducted by outside entities such as other operators, government regulatory agencies, co-ops, or emergency response agencies. The operator should invite other operators to attend, participate in, observe, or evaluate exercises.

5.3.5.2 Incident Management Team Exercises

In accordance with PREP, the operator shall participate in annual IMT exercises that:

- a) familiarize IMT members with their duties and responsibilities in the event of an incident and to evaluate the IMT's response capabilities;
- b) develop relationships to improve coordination with response agencies and other government organizations that may participate in actual incidents; and
- c) test the effectiveness of the operator's response plans.

5.3.6 Critiques and Evaluations

The operator should continually evaluate its training and exercise program. The operator should modify its programs based on after-action reports and improvement plans.

The operator should develop after action reports and improvement plans for incidents such as the following:

- a) a death or a personal injury requiring hospitalization;
- b) a release resulting in a fire or explosion not intentionally set by the operator;
- c) estimated property damage, including cost of cleanup and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding US \$50,000;
- d) pollution of any stream, river, lake, reservoir, or other similar body of water that violated applicable water quality standards, caused a discoloration of the surface of the water or adjoining shoreline, or deposited a sludge or emulsion beneath the surface of the water or upon adjoining shorelines;
- e) highly volatile liquid (HVL) releases of 5 barrels or more or other liquid releases of 50 barrels or more;
- f) in the judgment of the operator were significant even though it did not meet the criteria of any other paragraph of this section.

5.3.7 Training Documentation

5.3.7.1 Procedure

The operator should develop and maintain a documented procedure for defining and identifying personnel competency requirements, training requirements, or other actions to achieve the necessary competency of personnel. The procedure should apply to those personnel whose responsibilities fall within the scope of emergency response. The procedure should include provisions for determining and documenting the effectiveness of the training or other actions taken toward achieving required competency.

5.3.7.2 Record Retention

The operator shall maintain records that document the level of training received by each response team member and that verify completion of required refresher courses. The operator shall retain records of training for all emergency response personnel to verify accuracy and qualifications. If the operator relies on OSROs to meet response requirements, the operator shall retain records (e.g. annual letter of certification or training and exercise records) that verify that the OSRO has been trained and completed equipment deployments per PREP.

6 Response

6.1 General

The operator shall respond to emergencies in accordance with regulatory requirements and with the operator's policies, procedures, and Response Plans.

6.2 Discovery

The operator who has discovered or been notified of an incident shall perform the following, in order of priority:

- a) determine the safety of the reporting party and others in the vicinity of the incident;

- b) assess the situation and its potential consequence;
- c) gather as much information as is available, including the following:
 - 1) name of reporting party and contact information,
 - 2) location of incident [address or global positioning system (GPS) location],
 - 3) time of discovery,
 - 4) incident description (source, assets involved, fire, vapor fog, bubbles, etc.),
 - 5) product type and estimated volume,
 - 6) impacts (e.g. environmentally sensitive areas, population, waterways, historically and culturally significant areas, etc.),
 - 7) immediate risks or exposures,
 - 8) current response actions (public protection, road closures, notifications, etc.),
 - 9) initial remedial actions (source control),
 - 10) name and contact of on-scene emergency agencies,
 - 11) weather conditions,
 - 12) possible responsible party,
 - 13) possible cause.

6.3 Activation

6.3.1 Response Activation

Upon the indication of an incident, the operator shall activate the emergency response procedures outlined in the Response Plan. The operator's response programs should include a tiered or scaled response to incidents ranging from those with minimal to extensive public and environmental impact, property damage (see 6.4), or media attention. The operator should activate a higher response tier when faced with minimal information early during the response. The response activities in 6.3.2 through 6.3.4 should happen quickly and can occur simultaneously.

6.3.2 Shutdown and Investigation

The operator's procedures shall address the process for classifying and investigating alarms received through internal means such as a pipeline monitoring system. The procedures shall also address notifications or complaints of a potential incident received from an employee, the general public, or emergency response agency. If information is conflicting or incomplete, then the operator should provide controllers guidance regarding when to shut down the pipeline and activate the response activities.

Procedures should include the following processes:

- using controller scripts or other methods to obtain information and ensure the caller is not in danger;
- shutting down the pipeline system;

- closing valves;
- conducting field investigations;
- analyzing pressure data or other pipeline monitoring system data to determine the release location;
- conducting measurement verification.

6.3.3 Notifications

6.3.3.1 General

The operator's process shall include provisions to make immediate notifications as defined in the Response Plan. The operator should prioritize placing calls to the local PSAP.

6.3.3.2 Internal Notifications

Depending on the severity of the incident, the operator should notify the following internal contacts:

- qualified individual or IC,
- local operations personnel,
- incident and crisis management teams,
- operations control center.

6.3.3.3 External Notifications

The operator shall notify local first responders so that emergency response plans and hazard assessments can be initiated and information regarding public protection can be distributed. The operator shall ensure that the information provided to local first responders is sufficient for responders with varying levels of experience and knowledge.

The operator shall share critical information so first responders can analyze the situation and plan their response. Critical information should include product type, anticipated volume release, hazards, actions to be taken, etc.

Depending on the severity of the incident, the operator shall notify external contacts, which may include the following:

- local PSAP (9-1-1, or 10-digit requirements [if 9-1-1 is not available], or both);
- local first responders;
- LEPCs and other local agencies;
- NRC;
- federal, state, or tribal government agencies;
- contractors, OSROs, or mutual aid;
- affected public or another operator, utility company, etc.;
- landowners;
- impacted customers.

6.3.4 Command Structure

The operator shall activate a command staff consisting, as a minimum, of an IC and Safety Officer. The operator may designate additional command and general staff positions, as identified by NIMS ICS, based on the response scope and complexity (see 6.5 and Annex B for descriptions of the ICS).

6.4 Resource Mobilization

The operator shall immediately deploy personnel and equipment to the general incident location. The operator shall deploy resources strategically, scaling the response effort to fit the incident as data and information become available. The operator shall initially over respond to the incident and scale the response as additional information about the nature of the incident is gathered.

The operator should have a process established to determine if an escalation of resources is warranted. The operator should consider the following during the escalation evaluation process:

a) site conditions, including the following, which can affect the amount and type of resources and equipment:

- 1) area affected:
 - i) community impact (e.g. for air quality or drinking water impact),
 - ii) highly populated areas,
 - iii) environmentally sensitive areas (impact to surface water),

- 2) type and estimated volume of product,

- 3) current and future weather conditions;

b) consequences, including the following:

- 1) injuries,
- 2) a fire or explosion,
- 3) significant property damage,
- 4) media attention.

NOTE The operator may consider a staggered deployment method for critical positions [e.g. Public Information Officer (PIO), Liaison Officer (LOFR), Situation Unit Leader (SIT)] so that initial priority tasks can be completed while the IMT is en route to the scene.

6.5 Incident Command

6.5.1 General

The operator shall use NIMS ICS to respond to an emergency. The operator should staff the Section Chief positions within the Incident Command System (ICS) and should identify deputies for command and general staff positions. See Annex B for a description of the Operational Period Planning Cycle and NIMS ICS.

NOTE 1 The positions and sections described in 6.5.2 through 6.5.7 are common to most pipeline incidents.

NOTE 2 NIMS ICS is flexible and expandable based on the severity of the incident.

6.5.2 Incident Commander

The operator shall designate an Incident Commander (IC) based on qualifications and experience. The IC shall be responsible for the overall management of the incident. The responsibilities of the IC should include the following:

- ensuring that adequate safety measures are established;
- assuming all command staff roles until delegated;
- delegating command staff positions;
- representing the responsible party in the UC structure, when appropriate;
- understanding the roles of federal, state, local, and tribal on-scene coordinators;
- determining incident objectives and general direction for managing the incident;
- establishing priorities.

6.5.3 Safety Officer

The Incident Commander shall designate a Safety Officer to develop and recommend measures for ensuring safety and to assess or anticipate hazardous and unsafe situations. The responsibilities of the Safety Officer should include the following:

- identifying hazardous situations associated with the incident;
- developing the site safety plan;
- briefing Incident Command on safety issues or concerns.

6.5.4 Operations Section

The Incident Commander shall designate an Operations Section. The Operations Section shall be responsible for the management of all tactical operations directly applicable to the incident. The Operations Section shall direct the preparation of operational plans, request or release resources, direct operations field personnel, monitor progress, and implement the IAP.

Specific responsibilities associated with implementing the IAP should include the following:

- converting incident objectives into strategic and tactical options;
- developing work assignments and allocating tactical resources;
- evaluating on-scene operations and making adjustments to organization, strategies, tactics, and resources as necessary.

6.5.5 Planning Section

The Incident Commander shall designate a Planning Section. The Planning Section responsibilities should include the following:

- collecting, evaluating, and disseminating incident situation information and intelligence to the IC and Incident Command personnel;

- coordinating and facilitating IAP meetings, preparing status reports, and maintaining the status of resources assigned to the incident;
- supervising preparation of the IAP, depending upon the severity of the incident and based on input from the Operations Section, UC, and IC;
- compiling and displaying incident status information (maps, weather, safety plan, current operational status, or common operating picture) obtained from field observers and other responders.

NOTE The Planning Section may establish a Situation Unit, Environmental Unit, Resources Unit, or Documentation Unit.

6.5.6 Logistics Section

The Incident Commander shall designate a Logistics Section. The Logistics Section shall be responsible for providing resources, such as facilities, services, personnel, and material, and for managing associated resources in support of the response. The Logistics Section shall participate in the development and implementation of the IAP.

Additional responsibilities of the Logistics Section should include the following:

- identifying short and long-term service and support requirements for planned and expected operations;
- developing and reviewing the Communications Plan, Medical Plan, and Traffic Plan;
- establishing a procurement process for equipment and services.

6.5.7 Finance/Administration

The Incident Commander shall designate a Finance/Administration Section to manage all financial, administrative, and cost analysis aspects of the incident. Responsibilities of a Finance/Administration Section Chief should include the following:

- ensuring that cost tracking processes and services are established;
- providing financial and cost analysis information as requested;
- managing and directing all administrative matters pertaining to compensation for injury and claims-related activities (claims compensation hotline, hiring a third-party claims specialist, etc.).

NOTE 1 The Finance/Administration Section may also direct the community and humanitarian assistance aspects of a response.

NOTE 2 External agency and responder costs may be the responsibility of the operator and may be tracked by the Finance/Administration Section.

6.6 Response Priorities

6.6.1 General

Incident Command shall act to minimize impacts and stabilize the incident. Response priorities during an emergency shall be life safety, product containment, source control, and protection of property and the environment.

6.6.2 Life Safety

Incident Command shall make public, personnel, and responder safety the top priority and take immediate actions, including the following, to protect the public and responders:

- conduct hazard assessments;
- establish environmental monitoring (air, ground, and water);
- establish safe zones (hot, warm, and cold zones);
- identify at-risk populations.

6.6.3 Containment and Source Control

Incident Command should act to contain the released product and implement source control measures, including the following:

- shut down pumps,
- close remotely and manually operated valves,
- build earthen dams and underflow dams,
- deploy booming,
- block culverts,
- dig interceptor trenches,
- restart downstream pumps.

NOTE 1 Source control is critical to the initial response and to reducing the amount of product released to the environment.

NOTE 2 Pipelines can continue to release product after the shutdown measures are completed.

6.6.4 Environmental Protection

Incident Command shall develop and evaluate tactics and plans to reduce impact to the environment. Evaluation of tactics should include a net environmental benefit analysis, which evaluates the efficiency and necessity of techniques versus the potential for further impacts. Tactics and plans should consider the following:

- water intakes,
- surface waters,
- wetlands,
- groundwater,
- wildlife,
- selection of response techniques,
- availability of response resources.

6.7 Business Continuity

The operator should assess the effects of a response on internal and external (third-party) business. The operator should implement, as necessary, policies and procedures to address business claims compensation, third-party business disruption, and business interruption.

6.8 Response Transition

Early during the response, the operator should engage the UC to determine the end objectives for the response. General staff should develop a plan for transitioning from emergency response into a project or environmental remediation phase.

NOTE Endpoints for response transition may include mitigation of the immediate threat and recovery of released product.

The operator should plan for the transition from emergency response to an environmental remediation project to ensure all emergency response activities are completed before the demobilization of personnel. The operator should assign adequate resources for environmental remediation.

6.9 Debriefing and Evaluation

The operator shall develop a post-incident debriefing and evaluation process and shall establish a process to ensure that emergency response plans, policies, and procedures are updated. Debriefing and evaluation should identify the effectiveness of plans, procedures, equipment, and techniques. The process should involve a debriefing of the individuals who played a role in Incident Command (agencies and first responders included) as well as a method to capture feedback from those individuals that were involved with field-related activities. The operator should consider the following items during the debriefing and evaluation process:

- safety,
- source control,
- release detection,
- notifications,
- situational assessment and evaluation,
- personnel and contractor mobilization,
- resources and resource mobilization,
- response effectiveness,
- NIMS ICS,
- release volume estimation,
- government affairs,
- public relations (community and media response),
- documentation,
- communications.

The operator should have a method for capturing, tracking, and sharing lessons learned and corrective actions with the operator's internal business units and with other companies. The operator should find opportunities to engage response agencies to share these lessons learned.

7 Management System Review

7.1 General

The operator should plan and implement the monitoring, measurement, analysis, and improvement processes needed to ensure conformity to the emergency response management system requirements of this RP, and to continually improve the effectiveness of the system.

Emergency response management system monitoring, measurement, analysis, and improvement should include determination of applicable methods, including techniques for the analysis of data and the extent of their use.

7.2 Monitoring, Measuring, and Improving

7.2.1 Internal Audit

7.2.1.1 Performance of Internal Audit

The operator should ensure that competent personnel perform audits. Personnel performing audits should be independent of those who performed or directly supervised the activity being audited to ensure objectivity and impartiality of the audit process. Records of the audits should provide objective evidence of implementation and maintenance of the emergency management system.

7.2.1.2 Audit Review and Closure

The operator should identify timeframes for addressing detected nonconformities. The management responsible for the area being audited should ensure that any necessary corrections and corrective actions are implemented and effective. The operator should report in the management review the results of internal audits and the status of corrective actions. The operator should maintain records of the results of internal audits.

7.2.2 Analysis of Data

To demonstrate the suitability and effectiveness of the emergency management system, the operator should maintain a documented procedure for the identification, collection, and analysis of data related to system performance.

The operator should use data to evaluate where continual improvement of the effectiveness of the emergency management system can be made.

NOTE Examples of data may include:

- the status of corrective actions resulting from previous management reviews;
- results and recommendations of incident investigations, evaluations, and lessons learned;
- results of internal and external audits and evaluations; and
- stakeholder feedback.

7.3 Corrective Action and Continual Improvement

The operator should maintain a documented procedure to correct management system nonconformities, to take corrective actions to eliminate the causes, and to minimize the likelihood of recurrence. Corrective actions should be appropriate to the effect(s) of the nonconformity encountered.

The procedure should identify requirements for the following activities:

- a) reviewing a process nonconformity;
- b) determining and implementing corrections;
- c) identifying the root cause and contributing factors of the nonconformity and evaluating the need for corrective actions;
- d) implementing corrective action to minimize the likelihood of recurrence;
- e) identifying the timeframe and responsible person(s) for addressing corrections and corrective action;
- f) verifying the effectiveness of the corrections and corrective action taken;
- g) applying MOC when the corrective action requires new or changed controls within the emergency management system.

Records should identify the activities performed to verify effectiveness of the corrective actions taken. The operator should maintain records of the activities for control of corrections to nonconforming processes.

7.4 Management Review

7.4.1 Input Requirements

The input to management review should include the following, as a minimum:

- a) emergency management system goals and objectives;
- b) effectiveness of actions resulting from previous management reviews;
- c) results of audits;
- d) changes that could affect the emergency preparedness and response processes, including changes to legal and other applicable requirements;
- e) process performance;
- f) status of corrective actions;
- g) recommendations for improvement.

7.4.2 Output Requirements

The output from the management review should include a summary assessment of the effectiveness of the emergency management system. The assessment should include any required changes to the processes, any decisions and actions, required resources, and improvement of products in meeting user requirements.

Top management should approve the output of management reviews. The operator should document management reviews and maintain records of these reviews.

Annex A (informative)

Plan–Do–Check–Act

A.1 General

The Plan–Do–Check–Act (PDCA) cycle is a four-step model for implementing change (see Figure A.1). This methodology can be applied to the management of an entire system as well as to individual processes. PDCA encourages the creation of strategies and plans that are executed according to guidelines, that are checked for quality, and the results of which are used to adjust the next generation of plans. PDCA is iterative and is maintained to achieve continual improvement.



Figure A.1—PDCA Cycle

For individual processes, PDCA is useful when starting a new improvement project; when developing a new or improved design of a process, product, or service; or when defining a repetitive work process.

For the overall system, PDCA is useful when planning data collection and analysis to verify and prioritize problems or root causes, as a model for continual improvement, or when implementing any change.

A.2 PDCA Components

PDCA components are:

- Plan:** This step entails establishing the objectives and processes necessary to deliver results in accordance with the organization's policy and the expected output. By establishing output expectations, the completeness and accuracy of the process is also a part of the targeted improvement.
- Do:** This step entails execution of the plan using established processes and collection of data and information for analysis in the following steps.
- Check:** This step entails reviewing the outcome of the work against the established objectives; monitoring and measuring the processes against policies, objectives, and requirements; reporting the results; studying the results and comparing them against the expected results to ascertain any differences; looking for deviation in implementation from the plan; and determining the appropriateness and completeness of the plan to enable execution.
- Act:** This step entails continually improving process performance; requesting corrective actions on significant differences between actual and planned results; analyzing the differences to determine their root causes; and determining where to apply changes that will include improvement of the process or product.

PDCA is cyclical and iterative, meaning the entire process begins again from the start. Each cycle through these four steps results in improvement opportunities. The scope to which PDCA is applied may be refined during subsequent iterations of the cycle.

Annex B (informative)

Incident Command System

The NIMS Incident Command System (ICS) provides the following:

- an organization and management structure, including detailed processes, used to respond to emergency situations and ensure a coordinated response; and
- unity of command, common terminology, optimal span of control, flexible and modular organization, and management by objectives

NIMS ICS uses detailed processes to identify objectives and priorities and develop an IAP. The process used to develop an IAP consists of a planning cycle, referred to as a planning “P” (see Figure B.1). IAPs ensure that responders are working towards the same goals set for that operational period.

NIMS ICS consists of a command and general staff with specified roles and responsibilities. Figure B.2 shows an example of a NIMS ICS organization structure.

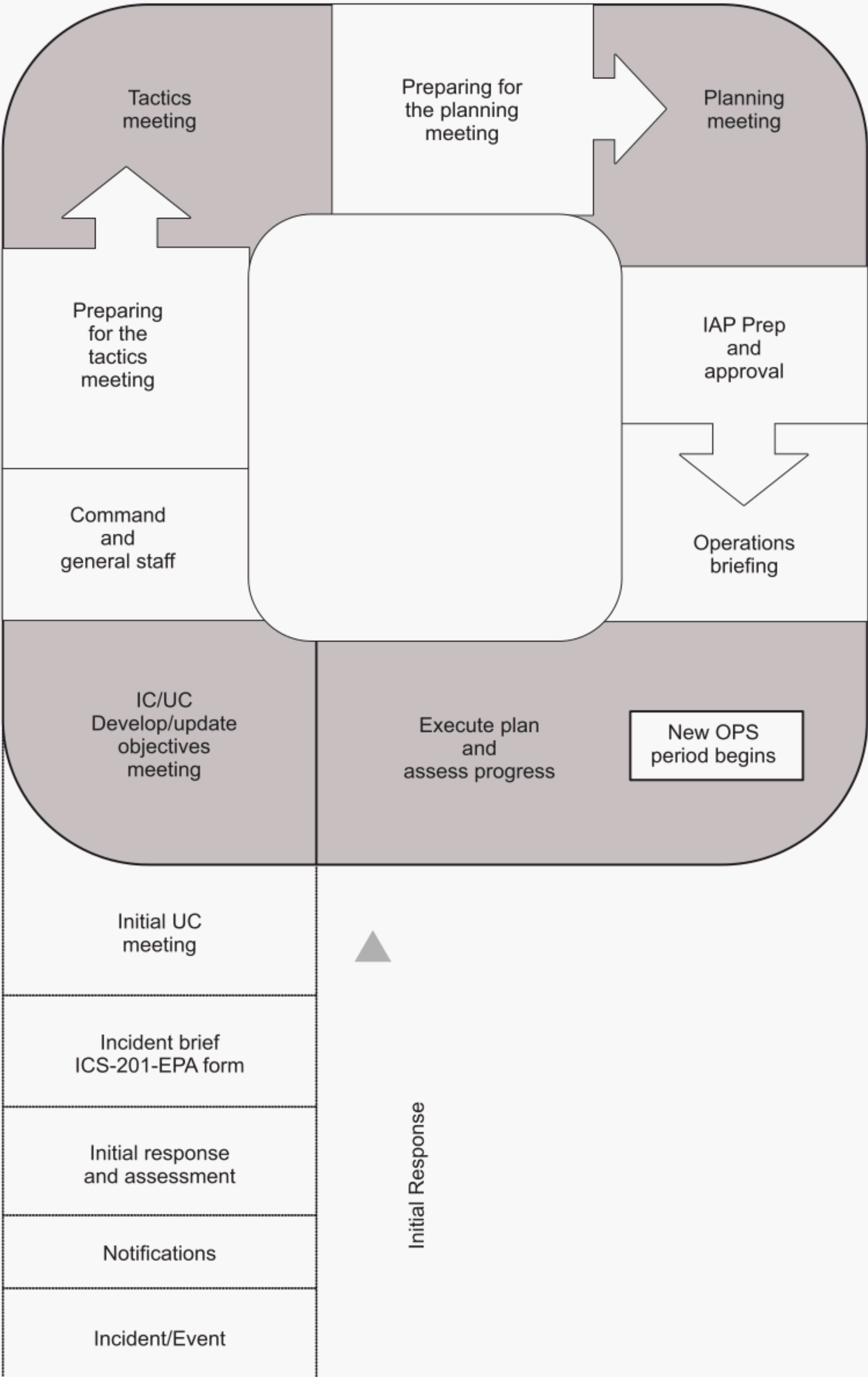


Figure B.1—The Operational Period Planning Cycle [1]

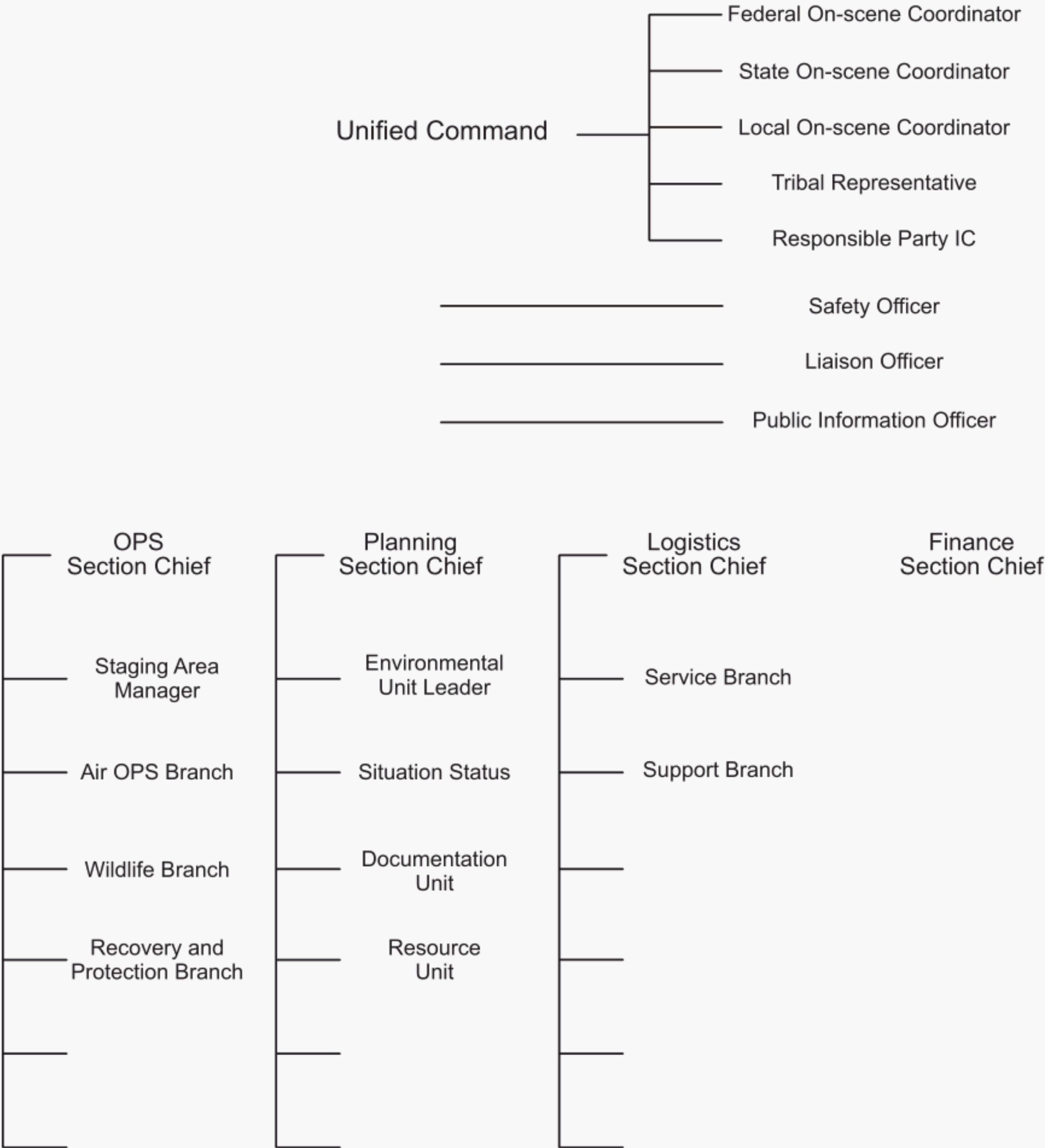


Figure B.2—NIMS ICS Organization Structure Example

Bibliography

- [1] United States Coast Guard/EPA, *Incident Management Handbook*, September 2014
- [2] FEMA *National Response Framework*
- [3] ISO 19011, *Guidelines for Auditing Management Systems*
- [4] NFPA 472 ⁶, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents
- [5] U.S. DOT *Emergency Response Guidebook*
- [6] API Recommended Practice 1173, *Pipeline Safety Management Systems*

⁶ National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-7471, www.nfpa.org.



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