Guidance Manual for

EPA Chemical Safety Audit Team Members

Chemical Emergency Preparedness and Prevention Office

Office of Solid Waste and Emergency Response

U.S. Environmental Protection Agency

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1. Introduction

1.1 Purpose of this Manual

The purpose of this Manual is to provide guidance to the U.S. EPA regional offices in implementing the Chemical Safety Audit (CSA) program, which is an outgrowth of the efforts of the Environmental Protection Agency (EPA) under the Chemical Accident Prevention (CAP) program. This document is intended solely as guidance. It does not represent final agency action nor is it ripe for judicial review. This is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. The Agency may change this guidance at any time without public notice.

This Manual, commonly referred to as the "Blue Book," includes a discussion of the following topics:

- Audit authority under CERCLA;
- Roles and responsibilities of audit team members;
- Audit preparation;
- Conducting the audit;
- Audit protocol and report preparation; and
- Audit follow-up activities.

It is recommended that each audit team member have a copy of this Manual to be used in conjunction with the Training Manuals provided at the Chemical Safety Audit Training Course. This Manual contains recommended actions, as well as mandatory procedures that must be followed to ensure the health and safety of program auditors as well as program integrity. All required/mandatory procedures or activities presented in this Manual are identified with the words "**[Required Activity]**" at the end of the sentence in which they are presented. Unless noted as a required activity, the described procedure is considered a recommendation, and the regional office has discretion in its implementation.

1.2 Program Background and Overview

The Chemical Accident Prevention (CAP) program emerged from concerns raised by the release of methyl isocyanate at Bhopal, India, and of aldicarb oxime at Institute, West Virginia. Awareness of the critical threat to public safety posed by similar incidents led to an emphasis on preparedness and planning for response to chemical accidents. Simultaneous with the development of preparedness activities by EPA was the passage and implementation of the Emergency Planning and Community Right-to-Know Act -- Title III of the Superfund Amendments and Reauthorization Act (SARA) in 1986. Because prevention is the most effective form of preparedness, the CAP program promotes the effort to enhance chemical accident prevention activities. The primary objectives of the CAP program are to identify the causes of accidental releases of hazardous substances and the means to prevent them from occurring, to promote

industry initiatives in these areas, and to coordinate activities with the community, industry, and other groups (e.g., academia, professional organizations, and trade associations).

Many of the key concerns of the CAP program arise from the SARA Title III section 305(b) study entitled Review of Emergency Systems. This study, published in June 1988, made a number of recommendations on the future course of prevention activities by EPA, and identified several aspects of current practices that will require careful consideration in an overall prevention strategy. The study identified the importance of facility management commitment to implementing and maintaining systems to prevent, mitigate, and prepare for potential chemical accidents. First, while it is evident that risk awareness among the larger chemical producers is high, many large distributors and users of hazardous chemicals, as well as many smaller operations, have not yet attained a comparable level of accident consciousness. The study also indicated the need for new technologies in certain key areas: process area monitoring devices, back-up detectors, mitigation devices, and practices to adequately identify disabled equipment of these types. Third, the report suggested that a great degree of caution must be exercised in analyses using real-time dispersion models, and indicated that employee familiarity with hazard evaluation methods was limited, which in turn suggests that improper or ineffective techniques may be in practice. Finally, the examination of management practices revealed a failure to place sufficient emphasis on safety-related issues such as standard operating procedures, employee training, preventive maintenance, and post-accident investigation, as well as a general lack of commitment to safety.

As a follow-up to this national prevention study, EPA has undertaken cooperative initiatives with other federal agencies, states, industry, professional organizations, and trade associations, as well as environmental groups and academia. These joint efforts have and will continue to serve to determine and implement a mechanism for developing and sharing information on release prevention technology and practices, and to enhance the state of practice in the chemical process safety arena. In addition, EPA analyzes and disseminates information on accident prevention practices and technologies garnered from the Accidental Release Information Program, Acute Hazardous Events, Emergency Release Notification System, and National Response Center databases; on-scene coordinator reports; and EPA audits and inspections. Finally, with the inclusion of the facility risk management provisions in the Clean Air Act Amendments of 1990, the accident prevention goals of the CSA program have been formalized.

The Chemical Safety Audit program is part of the CAP initiative and has been designed to accomplish the following chemical accident prevention goals:

- Visit facilities handling hazardous substances to gather information on safety practices and technologies;

- Heighten awareness of the need for, and promote, chemical safety among facilities handling hazardous substances, as well as in communities where chemicals are located;

- Build cooperation among facilities, EPA, and other authorized parties by coordinating joint audits; and

- Establish a database for the assembly and distribution of chemical process safety management information obtained from the facility audits.

The chemical safety audit itself consists of interviews with facility personnel and on-site review of various aspects of facility operations related to the prevention of accidental chemical releases. Specific topics addressed include:

- Awareness of chemical and process hazards;

- Process characteristics;

- Emergency planning and preparedness activities;

- Hazard evaluation and release modelling efforts;

- Release detection and monitoring techniques;

- Training of operators and emergency response personnel;

- Facility and corporate management structure;

- Preventive maintenance and inspection programs; and

- Community notification mechanisms and techniques.

Observations and conclusions from the audits are detailed in a report prepared by the audit team. The report identifies and characterizes the strengths and weaknesses of specific chemical accident prevention program areas to allow the elements of particularly effective programs to be recognized, and to share information on problematic practices. Copies of the report are given to the facility and to its corporate management so that weak and strong program areas may be recognized. The audit reports are intended to contribute to the study of emergency systems begun in the Review of Emergency Systems, and in turn, to produce improvements in the ability of the audited facilities -- and industry in general -- to prevent or mitigate releases of hazardous substances and to share this information with the community and other interested groups. In this fashion, the CSA program serves as a vital component of EPA's Chemical Accident Prevention Program. **Attachment 1** contains the Chemical Safety Audit Program Fact Sheet, which summarizes the audit program background, goals, and scope. It can be used as a separate document to inform interested parties about the audit program.

It should be noted that the CSA program is not a compliance or inspection program. The audits are intended to be non-confrontational and positive, so that information on safety practices, techniques, and technologies can be identified and shared

between EPA and the facility. However, if serious problems are discovered during the audit, EPA has a variety of legal authorities to use in response to them, which are discussed later in the body of this Manual. Violations observed during the course of an audit may also be referred to the respective EPA program office or federal agency or department for determination of what actions are to be taken following the audit.

1.3 CSA Program and Section 112(r) of the Clean Air Act

The future direction of both the CAP program and the CSA program will be very much affected by the passage of the Clean Air Act (CAA) Amendments of 1990. The accidental release prevention requirements found in section 112(r) of the Clean Air Act require EPA to promulgate regulations that require certain facilities to take steps to prevent accidental releases of chemicals and mitigate the severity of releases that do occur.

The facilities that will be covered by these regulations will be defined by a list of substances and threshold quantities that EPA will promulgate. The Accidental Release Prevention (ARP) regulations will require that facilities develop and implement a risk management plan (RMP) -- including a hazard assessment (off-site consequence analysis and a five-year accident history), a prevention program, and an emergency response program -- within three years after promulgation of the regulation. The RMP will be registered with EPA, and submitted to the Chemical Safety and Hazard Investigation Board, the state, and local emergency planning and response authorities. The RMP will also be made available to the public.

The CAA also requires EPA to establish an auditing system to review, and if necessary require revision of the RMPs submitted by facilities. The auditing system in the RMP rule outlines criteria for selecting facilities for audits. A more detailed auditing strategy is being proposed in the guidance to states for implementation of the ARP program. CAA section 507 further requires states to provide small businesses with technical assistance on how to comply with the Act.

The role of the CSA program in advancing EPA's accident prevention initiative, particularly its relevance in the context of the new section 112(r) requirements, will continue to evolve. In the short term, the regions should continue to perform audits under the current CSA format until they and the states begin administering the ARP program under section 112(r). The goal is to ensure that the states' auditing and inspection programs and technical assistance capability are adequate to assume the primary responsibilities of the ARP program.

2. Program Authority under CERCLA

2.1 Purpose of the Statute

The Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) was enacted December 11, 1980, and amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986. CERCLA authorizes the federal government to respond where there is a release or a substantial threat of a release into the environment of any hazardous substance, pollutant, or contaminant that may present danger to the public health or welfare or to the environment. **Attachment 2** contains an overview of major CERCLA provisions related to the CSA program. These include CERCLA sections 104(a), 104(b), 104(e), and 106(a). The statutory text is also included, 42 U.S.C.A. sections 9601, 9604, and 9606.

2.2 Facility Entry and Information Gathering Tools

2.2.1 Statutory Authority

CERCLA sections 104(b) and 104(e), as amended by SARA in 1986, provide authorities for entering a facility and accessing information. While CERCLA provides authority for states to use statutory authorities for entry and information gathering, such authorities may only be accessed pursuant to a contract or cooperative agreement with the federal government. Since no state currently has such an arrangement, states, as well as local governments, must use their own authorities for audit participation. **[Required Activity]**

2.2.2 EPA Policy and Practice

When entering pursuant to CERCLA, EPA auditors must ensure that the facility has experienced a release of a hazardous substance, pollutant, or contaminant, or that there is "reason to believe" that there exists a threat of such a release. The audits are intended to be non-confrontational and positive, cooperative efforts, such that information on safety practices, techniques, and technologies can be identified and shared between EPA and the facility. Consequently, and in conformance with other EPA program policies, audits will be performed under the above authority pursuant to the consent of the facility owner or operator. Consensual entry, however, can be revoked at any time during the audit. When withdrawal of consent takes place, the audit team shall leave the facility, regardless of the fact that the team has the authority to be there. **[Required Activity]** In either situation (i.e., entry refusal prior to audit or during audit), if consent is lacking, an order can be issued to require entry. Section 4.2 of this Manual provides guidance on obtaining entry upon consent and actions to be taken if the facility refuses entry.

An audit can also be conducted at facility invitation. When entering at the invitation of the facility (i.e., not pursuant to CERCLA authority or other statutory authorities), the audit scope can potentially be limited, since the facility determines what information will be made available to the audit team. In addition, invitational entry can be revoked by the facility at any time during the audit. The audit team has no legal authority (i.e., as compared to consensual entry) to continue the audit, and must leave the facility. **[Required Activity]**

The only exception to the described facility discretion concerning entry withdrawal for both consensual and invitational entry is if the audit team identifies a release or threat of a release of a CERCLA hazardous substance from a facility into the environment. If either of these situations are observed, the audit team must follow the prescribed procedures in section 2.3 of this Manual. **[Required Activity]**

2.2.3 Confidential Information

During the course of an audit, team members may encounter information that may be entitled to confidential treatment. Facilities can claim confidentiality on information under CERCLA section 104(e), as amended. If confidential business information (CBI) at a facility has been collected under another authority (e.g., TSCA, CWA), CERCLA section 104(e) allows authorized team members to handle this confidential business information as CERCLA CBI.

This information will be handled in accordance with 40 CFR Part 2. Authorized representatives and Agency employees can access and view CBI under CERCLA. Contractors who are pre-identified by contractor name and contract number to the facility can have access to this data (refer to section 4.2 of this Manual). On February 5, 1993, EPA's Office of General Counsel issued a rule (58 FR 7187) that authorizes the disclosure of CBI information (collected under a variety of environmental statutes, including CERCLA section 104) to enrollees in the Senior Environmental Employment (SEE) Program. Thus, members of the American Association of Retired Persons (AARP) now have the same access to CBI as EPA employees.

There are no specific training courses for handling CERCLA CBI, either on-site or off-site. In general, all confidential information must be marked as such and placed in a locked filing cabinet or a safe. It is advisable, however, that audit participants take a regional CBI course.

2.2.4 Attorney-Client Privilege

In the event that a facility withholds information based upon "attorney-client privilege," the regional Office of Regional Counsel (ORC) should be immediately notified and provided the following information:

- Name of document(s) withheld;

- Specific reason why withheld; and

- Name of facility attorney, address, and telephone number.

If a request for information during the course of the audit is refused, the audit should continue unless the absence of the requested document(s) makes it impossible to do so. The Office of Regional Counsel should be consulted of the refusal after the site visit and requested to pursue the matter as necessary.

2.3 Response Actions if a Release or a Threat of a Release Exists

During an audit, the team may observe a release or the potential for a release of a CERCLA hazardous substance from a facility into the environment.

If a release is observed, the team members must take the following actions: **[Required Activity]**

- Follow facility emergency evacuation procedures to safety; and

- Regroup; the Team Leader must notify the Regional Emergency Response Section to inform the on-duty On-Scene Coordinator (OSC) of events occurring at the facility. This action is not intended to serve as the facility's notification under any statute or regulation.

If the threat of a release is observed, the Team Leader must take the following actions: **[Required Activity]**

- Regroup, if necessary with the entire audit team at the facility management office;

- Inform the facility owner/operator of the observed situation; and

- If the facility owner/operator fails to take appropriate actions to mitigate the potential threat of release, the Team Leader must notify the Regional Emergency Response Section to apprise the OSC of events occurring at the facility.

In both of the above situations, notification to the Regional Emergency Response Section must be made regardless of whether the Team Leader or members of the audit team are OSCs. The communication with the region will determine the scope of the response action to be taken to mitigate the release or threat of release.

At this point, the audit must not continue until the release or threat of release has been mitigated, as determined by the OSC. The OSC and/or Remedial Project Manager (RPM) shall have the authority vested in them by the National Contingency Plan, 40

CFR Part 300. In addition, the OSC and/or RPM may take any necessary response actions when he/she determines that conditions at the site may present an imminent and substantial endangerment.

2.4 Relationship to Enforcement/Compliance Regulatory Programs

An EPA chemical safety audit is not an enforcement inspection or multi-media compliance audit, such as a RCRA compliance inspection or an environmental audit. Nor should an audit be confused with compliance inspections conducted by the Occupational Safety and Health Administration (OSHA) of the Department of Labor. A chemical safety audit is a visit to a facility to learn about and share technologies, techniques, and management practices for preventing and mitigating chemical accidents.

Relationship to OSHA

OSHA's primary responsibility is to protect workers, ensuring a safe and healthy environment for employees. OSHA conducts inspections to identify facility compliance with specific requirements and standards for employee health and safety and for accident investigations, especially where worker injuries or death occur. EPA and OSHA have established a Memorandum of Understanding on facility inspections, as well as coordinating activities through a variety of other means.

Relationship to EPA Regulatory Programs

The audit findings are presented in a final report. If appropriate, the report can include recommended process safety practices that the facility may want to consider adopting. Report findings and recommendations are not mandatory actions that the facility must adopt, as are those identified during an enforcement/compliance inspection. The audit focus is not on reviewing facility compliance with other regulatory programs; other media program offices already perform these activities. Use of CERCLA sections 104(b) and 104(e) provide EPA with the authority to enter a facility and access information for the purpose of conducting the safety audit.

Audit team members, however, will often consist of representatives from other EPA media program offices who are charged with the authority to conduct enforcement or compliance inspections and audits. In this situation, the role of this media program official must be determined prior to notifying the facility of the audit. **[Required Activity]** Facility notification involves citing the CERCLA entry and information gathering authorities. If this media program official intends to exercise authorities other than CERCLA sections 104(b) and 104(e), then the facility must be notified that these additional authorities will be exercised. In this situation, there are two separate EPA activities being conducted at the facility: a chemical safety audit and an enforcement/compliance inspection. This additional use of other authorities must be presented in the same letter that cites use of CERCLA authorities. **[Required Activity]** Facility notification procedures are presented in section 4.2 of this Manual.

During the conduct of a chemical safety audit that is not coupled with an enforcement inspection as presented above, program violations may be observed. These violations should be referred to the respective program office or federal agency/department for determination of what actions are to be taken following the audit.

2.5 Relationship Between CERCLA and SARA Title III

The CSA program is being conducted under CERCLA authority. While the idea of the CSA program originated from the activities undertaken to prepare the section 305(b) study mandated by Congress under SARA Title III (see the introduction to this Manual), and from similar audits conducted following catastrophic releases, there is no statutory link between the CSA program and the SARA Title III program.

The CERCLA and SARA Title III programs, however, have similar release notification provisions. A release or spill of a chemical above a certain threshold amount (the chemical's designated "reportable quantity" or "RQ") will often require two separate notifications: if the chemical is a CERCLA "hazardous substance," the National Response Center (NRC) must be notified under CERCLA section 103(a), and, if the chemical is a CERCLA hazardous substance and/or an "extremely hazardous substance" (EHS) under SARA Title III, the emergency coordinator of the local emergency planning committee(s) (LEPC) and the state emergency response commission(s) (SERC) likely to be affected by the release must be notified under SARA Title III section 304(a). CERCLA hazardous substances are listed at 40 CFR Part 302; EHSs under SARA Title III are listed at 40 CFR Part 355.

Although the two lists overlap considerably, they are not identical; approximately 138 EHSs are also CERCLA hazardous substances. It should be noted that all EHSs are proposed to be designated as CERCLA hazardous substances. In situations where the release is above the RQ of a chemical that is listed both as an EHS under SARA Title III and as a hazardous substance under CERCLA, notifications under both authorities must be given by the facility; this is because each notification is a separate requirement, and the contents and recipients of the notifications differ.

In addition, similar goals are shared by both the CSA program and the SARA Title III program. These include the following:

- Increased level of preparedness for responding to accidental releases of chemicals both at a facility and in a community;
- Increased awareness and understanding of chemical hazards; and
- Increased levels of safety practices related to producing, treating, handling, disposing, and transporting of hazardous substances at a facility.

Involvement in the CSA program by representatives of LEPCs and SERCs, either as audit team members, information sources, or both, is encouraged to enhance the goals of both these programs. However, state and local government participation in the audit, itself, must be performed under state and local authorities.

3. Role of Audit Team Members

3.1 Audit Team Composition

An EPA audit team consists primarily of EPA employees, and other designated representatives, including contractors and the American Association of Retired Persons (AARP) enrollees. The participation of other federal, state, and local government personnel, particularly SERC and LEPC representatives, is encouraged, but they should be made aware that they will be entering and accessing information from a facility under their own authorities. Section 3.3 of this Manual further discusses the participation of non-EPA audit team personnel.

The audit team can vary in size, depending upon the level of detail of the audit (e.g., number of chemicals and/or processes under investigation; national significance). At a minimum, however, there must be two technical experts on a team for collection and verification of technical findings and observations. **[Required Activity]**

The following list represents suggested roles, responsibilities, associated disciplinary backgrounds, and other parameters for composing a team. This list is provided as guidance and in no way is a required format for forming an audit team. In many cases, your team composition may require you to combine or divide roles.

Team Leader

- Must be EPA employee; **[Required Activity]**
- Coordinates audit logistics, makes team assignments, coordinates initial liaison with facility personnel, and coordinates preparation and distribution of final site visit report; and
- Provides any needed follow-up information.

Deputy Team Leader

- Must be EPA employee or designated representative; **[Required Activity]**
- Provides logistical support, as directed by Team Leader; and
- Assumes other responsibilities delegated by Team Leader.

Chemical Process Hazards Reviewer

- Must be EPA employee or designated representative;
- Responsible for collection and verification of process-related information;

- Primary liaison with facility technical personnel; and
- Requires technical knowledge of chemical hazards, process engineering, and maintenance procedures.

Chemical Accident Prevention Reviewer

- Must be EPA employee or designated representative;
- Responsible for collection and verification of facility information;
- Liaison with appropriate facility technical personnel;
- Requires technical knowledge of chemical accident prevention, including hazard evaluation and modeling techniques and release prevention/mitigation systems.

Safety and Training Reviewer

- Must be EPA employee or designated representative;
- Responsible for collection and verification of facility information;
- Primary liaison with facility health and safety personnel;
- Requires knowledge of operator, safety, and worker right-to-know training programs.

Emergency Planning and Response Reviewer

- Must be EPA employee or designated representative;
- Responsible for collection and verification of facility information;
- Primary liaison with appropriate facility personnel responsible for planning and response;
- Requires knowledge of emergency planning and response requirements.

Technical expertise for the chemical safety audit program refers to knowledge, experience, and disciplinary training in plant process design, engineering, operations, training, and emergency planning. Example disciplines include:

- Chemical, civil, industrial/safety, and environmental engineering,
- Plant process experience,
- Environmental science,

- Industrial hygiene,
- Geology, and
- Environmental and emergency management and planning.

Personnel with the appropriate expertise can be found in the following regional program offices: media (e.g., air, water, radiation); RCRA; TSCA; Superfund (e.g., emergency preparedness and response, removal, health, and safety); and Research and Development.

In selecting team members, the skill base of the team must accommodate the need for coverage of the major audit elements:

- Process and safety system technologies;
- Operating procedures;
- Training programs;
- Emergency planning activities; and
- Management activities.

Specific tasks should be assigned to each team member. Each member should know his/her respective role in all facets of the facility audit. Certain members may be assigned the lead on one or more facets of the audit, and the other team members, because of their individual skills and experiences, should be prepared to contribute to the completion of that facet of the audit.

In summary, an EPA audit team can consist of EPA employees, EPA contractors (e.g., Technical Assistance Team), AARP enrollees, and representatives from federal, state, and local governments. Two basic restrictions apply to the "team;" one, the Team Leader must be an EPA employee, and two, the Chemical Process Hazards Reviewer must be an EPA employee or designated representative (i.e., EPA employee, contractor, or AARP enrollee). **[Required Activity]** This last restriction is required to ensure continuity in communicating the audit scope and intent.

The following provides an overview of the anticipated roles and responsibilities for EPA employees, contractors/TAT personnel, and AARP enrollees:

- EPA employees coordinate audit program and lead the audit team.

- Contractors/TAT personnel provide technical support as defined by EPA.

- AARP enrollees:

  -- Provide support role in audits;

  -- Apply professional expertise and experience in chemical engineering or other technical or industrial fields for reviewing process safety technologies at facilities;

- Apply other expertise in such areas as safety management or training for involvement in other aspects of the audit (i.e., reviewing emergency plans, training manuals, and emergency notification procedures and/or systems);

- Participate in report preparation, including observations and recommendations from the audit;

- Identify facilities for potential audits, using information sources such as Accidental Release Information Program (ARIP) data, and coordinate with regional response centers; and

- Are limited to field activities that do not stress physical limitations.

3.2 Training and Safety Requirements

Field activities for EPA employees are subject to the training requirements embodied in EPA Order 1440.2, Health and Safety Requirements for Employees Engaged in Field Activities. The Order establishes policies, responsibilities, and mandatory requirements for occupational health and safety training and certification, and occupational medical monitoring.

EPA Order 1440.2 requires that a Site Safety Plan be developed for EPA employees conducting a chemical safety audit at a facility handling hazardous substances. EPA regional offices can either use the model site safety plan (see **Attachment 3**), or develop their own program that complies with EPA Order 1440 and the Occupational Safety and Health Administration's worker protection standards codified at 29 CFR 1910 and 1926. The plan should include a description of the proposed audit scope, facility health hazards, necessary protective equipment, contractor participation, and decontamination procedures, and must be completed and approved by the EPA project coordinator, branch chief, on-scene supervisor, and health and safety manager. Under certain circumstances, a more extensive plan may also be required. For more information, contact the safety and health office in your region.

Audit team members should dress appropriately, including steel-toed boots, safety glasses, and hard hats. Team members should provide their own safety equipment, and should not rely on the facility.

Prior to participating in an audit, all EPA team members, which include EPA employees, contractors, and AARP enrollees, must have completed the following training courses:

- Training in occupational health and safety procedures under EPA Order 1440.2. Attending a 24-hour or 40-hour health and safety course that is approved and sponsored by EPA and conducted by EPA or its contracted agents fulfills the requirement of this Order; **[Required Activity]** and

- EPA Chemical Safety Audit Training Course. (Course attendance flexibility is discussed below.)

In addition to the listed training, annual medical monitoring is required. **[Required Activity]**

In some audits, a specialized technical expert (i.e., contractor or other EPA program personnel) who normally does not participate in CSA program activities will assist in conducting the audit. Under these circumstances, it will be difficult for such an individual to have taken the EPA CSA course. Consequently, the requirement for the CSA course is flexible depending upon the situation. The health and safety training requirements and medical monitoring, however, are not flexible. **[Required Activity]** This requirement should not pose any problems, since it would be rare for a technically qualified contractor or EPA employee not to have had this training.

Suggested topics for additional, but not required, training include:

- Handling of confidential business information;

- Interviewing techniques;

- Hazard evaluation techniques;

- Chemical processing techniques;

- Negotiating techniques; and

- Technical writing.

3.3 Non-EPA Personnel Participation on Audit Team

Non-EPA team members may include representatives of other federal agencies and departments, states/SERCs, local officials/LEPCs, and any other group not previously identified as an EPA team member. The regions are encouraged to invite participation by non-EPA personnel in audits, but entry into the facility must be authorized pursuant to authorities other than CERCLA. Participation of non-EPA personnel must be in a support role as defined by the Team Leader. In addition, non-EPA personnel cannot serve in the capacity of Team Leader or Chemical Process Hazards Reviewer. **[Required Activity]**

SERC and LEPC participation is encouraged to enhance their knowledge of chemical hazards and process safety for use in planning activities under SARA Title III and in future Clean Air Act Amendments Risk Management Program activities. SERCs, LEPCs, and other federal agencies also serve as a valuable source of information in preparing for the audit.

It is important to inform these representatives of the required health and safety training that EPA employees and representatives undergo prior to audit participation. As discussed in the next section, non-EPA participants require their own liability coverage.

3.4 Liability

Liability associated with conducting audits is described in the following sections for each group potentially represented on an audit team.

3.4.1 Federal Employees

Under the Federal Employees Liability Reform and Tort Compensation Act of 1988, a suit can no longer be maintained against a Federal employee in his or her individual capacity for any act (discretionary or non-discretionary) performed within the scope of the employee's employment. All such suits must now be brought against the United States government. If named in a suit in his or her individual capacity, employees should promptly notify the Office of Regional Counsel and the Office of General Counsel.

The legislation does not change the potential liability of a Federal employee in his or her individual capacity for grossly negligent actions (usually taking the action out from under the scope of the employee's employment), for Constitutional violations, and for a violation of a statute "for which a claim is otherwise authorized." All audit participants should have audit responsibilities clearly delineated in their job description.

3.4.2 AARP Enrollees

There are no provisions for indemnifying AARP enrollees from personal liability under the cooperative agreement between AARP and EPA. Since AARP enrollees serve only in support roles in all aspects of CSA program implementation, the Regional Chemical Emergency Preparedness and Prevention Coordinators and their staff are responsible for ensuring that enrollees are not placed in situations that could result in job-related personal liability.

3.4.3 Technical Assistance Team Contractors

The Federal Employees Liability Reform and Tort Compensation Act of 1988 only covers TAT contractors when responding to a CERCLA hazardous substance release or performing a clean-up/removal related to such release. Audit activities for TAT contractors are not covered under this Act, since the contractor is not specifically handling hazardous substances, pollutants, or contaminants. TAT contractors must investigate liability coverage with their respective employer.

3.4.4 Federal, State/SERC, and Local/LEPC Government Personnel

All non-EPA personnel will be entering a facility under their own authorities and would require their own liability coverage.

3.5 Conflict of Interest

Conflict of interest refers to any person (i.e., EPA employee, contractor, AARP enrollee, non-EPA personnel) who has a financial interest associated with the facility being audited, has been previously employed with the facility, or a facility subsidiary, and/or has been a consultant for the facility. Persons with conflict of interest should not participate in any activities, either on-site or off-site, associated with the facility audit. **[Required Activity]** In addition, such persons must identify themselves to the Team Leader and excuse themselves from the audit of that facility. **[Required Activity]**

4. Preparing for the Audit

4.1 Facility Selection

At present, there are no established procedures for selecting a facility for an audit. Each region has flexibility in identifying facilities. A variety of options useful to identifying a facility are discussed below. Although there is substantial flexibility in facility selection, there are two important requirements:

- A release of a CERCLA hazardous substance, pollutant, or contaminant must have occurred, or there must be "reason to believe" that a threat of such a release exists at the facility; **[Required Activity]** and

- The Office of Regional Counsel and the SERC of the state where the audited facility is located must be consulted to identify any legal actions currently being pursued or anticipated. **[Required Activity]** It is advised that regional media programs also be consulted.

The following list provides a variety of options to consider when selecting a facility. Information sources to be used in evaluating these options include federal, state, and local release notification reports and follow-up reports, OSC reports, Regional Response Centers, ARIP, ERNS, and other sources (see **Attachment 4** and chart in section 4.3).

- Previous release history of the facility;

- SERC and/or LEPC referral;

- Proximity to sensitive population(s);

- Public sensitivity;

- Opportunity for sharing new technology;

- Population density; and

- Concentration of industry in the area.

In addition, the region may wish to select facilities for a chemical safety audit as part of a larger regional initiative, such as an evaluation of facilities using a specific chemical or located near a particularly sensitive environment. For example, during fiscal year 1992 a number of facilities that produce and use hydrogen fluoride were examined by audit teams nationally, while Region 5 conducted all of its audits in coordination with its Great Lakes Basin pollution prevention initiative.

4.2 *Facility Notification*

Once a facility has been selected, the process of notifying the facility and scheduling the audit can be initiated. Although each region will invariably establish its own procedures for notifying a facility and coordinating the audit, the following suggestions and tools should be integrated into that process. These suggestions are designed to help establish a constructive rapport with the facility and to ensure the correct use of statutory authorities and other legal requirements.

The Team Leader should make an initial phone call to the facility owner/operator. The purpose of this call is to identify a "contact" at the facility for all correspondences, to communicate/explain the purpose and intent of the audit, and to schedule dates for conducting the audit. In some instances, it may be useful to schedule a pre-audit meeting with the facility to obtain further information.

The phone call should be followed by a letter to the facility contact that summarizes the initial conversation and confirms any decisions made during the call. In addition, the letter serves to confirm audit statutory authority, provide the facility an opportunity to claim confidential information, and to identify the contractor, if a contractor is participating. As previously stated in section 2.2.3 of this Manual, the contractor must be identified by contractor name and contract number in order to have access to confidential information.

Attachment 5 is a sample letter designed to fulfill the above goals. While language may be added to the letter, such as a summary of a phone conversation, the legal aspects of the letter as contained in the attachment should not be materially altered. **[Required Activity]** It is suggested that all correspondence with the facility be reviewed by the Office of Regional Counsel (ORC).

Unfortunately, not all efforts to schedule and coordinate an audit based upon the voluntary consent of the facility will be successful. After receiving either the facility's written or verbal denial of EPA's request to conduct the audit, a letter must be sent to the facility (1) confirming this denial; and (2) invoking use of the CERCLA 104(b) and 104(e) authorities for entry. **[Required Activity]** **Attachment 6** contains a sample letter specifically designed for this situation. Preparation of this letter must be coordinated with your Office of Regional Counsel. **[Required Activity]** The suggested letter states that continued refusal of facility access can result in EPA issuing an order requesting entry and/or initiating an enforcement action. Any further activities and contact with the facility should be pursued in coordination with the Office of Regional Counsel.

4.3 Facility Background Information

Preliminary preparation is an important factor in conducting an organized audit. The team may find it useful to collect the facility background information several weeks in advance of the audit. This will require contact with the facility and state and local officials to arrange delivery of these materials. The audit team can then review this information and become more familiar with the facility prior to the audit. Using this technique, the team will be able to prepare a detailed list of topics and questions to help organize their activities during the facility visit. The following list is a sampling of the types and sources of information that will assist a team in preparing for the audit:

Type of Information	Sources of Information
Release History	OSC reports; ARIP questionnaires; ERNS; SARA Title III sections 304 and 305(b) reports; state release files
Regulatory History	Local, state, and federal air, water, and waste permits; SARA Title III sections 302, 304, 311, 312, and 313 submissions
Hazardous Chemicals (Hazards, Amounts, and Locations)	SARA Title III sections 311 and 312 submissions; OSHA hazard communication and process safety management standard documents; hazards analysis; NIOSH Pocket Guide to Chemical Hazards
Chemical Processes	Industry standards and processing techniques from trade and professional groups (e.g., AIChE, ASSE, and the Chlorine Institute); process flow diagrams and piping and instrumentation diagrams
Community Involvement	CAER; LEPC; and SERC

The "Audit Protocol/Report Preparation Guidance" as presented in section 6.0 of this Manual provides further detail on the types of information that may be requested from the facility prior to conducting the audit. **Attachment 4** contains further information on these listed sources.

4.4 Preparing for the Site Visit

Prior to conducting the on-site audit, a pre-visit meeting should be conducted with the entire audit team, including any non-EPA personnel who will be visiting the facility. This meeting should be held as close to the date of the site visit as possible to keep the important points being emphasized fresh in everyone's mind. By this time, the audit team should already be operating as a unit; all team members should be familiar with the audit protocol, the information previously collected by the team should have been

reviewed, additional information to be obtained at the facility should have been identified, and the team members should have developed individual agendas. The pre-visit meeting serves to reinforce what already is in place and should cover the following items:

- Clearly establish the responsibility and authority of the team leader;
- Review highlights of the audit's objectives and note any specific team member responsibilities;
- Review any personal health and safety issues that may be present at the site for the team to prepare for and avoid (see section 3.2);
- Review information about key personnel and operations at the site;
- Establish objectives and an agenda for each day of the site visit;
- Cover logistical matters such as a nightly team meeting to discuss results and plan the next day's activity; and
- Cover any other topics that the Team Leader identifies.

5. Conducting the Audit

The on-site chemical safety audit will consist of the following four phases:

- Entry;
- Opening Meeting;
- On-site Activities; and
- Exit Briefing.

5.1 Entry

The audit team should arrive at the facility during normal working hours at a time and date pre-determined with the facility. At the facility entrance office, the facility may provide a blank sign-in sheet, log, or visitor register. It is acceptable for the audit team members to sign it. EPA employees and authorized representatives, however, must not sign any type of "waiver" or "visitor release" which would relieve the facility of responsibility for injury, or which would limit the rights of the Agency to use the data obtained from the facility. **[Required Activity]** When such a waiver or release is presented, the Team Leader should politely explain that such a document cannot be signed, and a blank sign-in sheet should be requested. If the team is refused entry because they do not sign such a release, the Team Leader must report all pertinent facts to the ORC, and leave the facility if the matter cannot be resolved. **[Required Activity]** All events surrounding the refused entry must be fully documented including the name of the person(s) refusing entry. **[Required Activity]** Procedures described in section 4.2 of this Manual concerning refusal of entry must then be followed. **[Required Activity]**

5.2 Opening Meeting

The entire audit team will meet with the plant manager and his/her key staff, and will likely discuss the entire audit. The staff of the plant manager could include superintendents of safety and operations, a lawyer, and corporate representation. The team should be very clear about its purpose and should be prepared to discuss the audit starting with an explanation of the CSA program, facility selection, the audit purpose and scope, the background research performed, the specific objectives for the site visit, and the report that will be written.

During the meeting, the audit team should outline its specific on-site agenda and the cooperation needed to accomplish that agenda. In addition, the meeting provides a good opportunity for the facility to provide the audit team with an overview of its

operations and safety programs and may include a general tour of the whole facility (as appropriate). This meeting typically requires at least a half day.

5.3 On-Site Activities

Once past the opening meeting, the audit team may split up into smaller groups to take a plant tour and interview other operations and management personnel. The plant tour should include specific tours of the chemical handling and process areas. The team should interview personnel involved in such areas as process safety, process operations, technical support, personnel, emergency planning and response, and environmental management.

During these tours and interviews, individual team members should be obtaining information and making observations that fulfill the needs of their individual responsibilities. The questions and prompts for discussion contained in the annotated audit protocol can be helpful.

During this or any other part of the site visit, it is possible that an observation will be made or that information will be obtained that should be of significance to the audit team, but that is beyond the scope of the facility audit. In this event, the Team Leader should be notified.

5.4 Exit Briefing

In this final meeting, the entire audit team will meet with the plant manager and his/her key staff to discuss the results of the audit as it presently stands. The plant manager may be accompanied by the same people who attended the opening meeting. The facility will want to know about all significant team findings and, more importantly, about the conclusions that have been drawn and the recommendations that will be made.

Prior to the exit briefing, the audit team should have a private meeting to establish an agenda for this meeting. Significant observations and findings should be listed for discussion with the facility. The team should identify conclusions based on this information only to the extent that a consensus among team members can be reached. A team consensus is also necessary for identifying any recommendations to the facility at this time. In the absence of team consensus, it is inappropriate to offer conclusions or recommendations to the facility during the exit briefing. This does not, however, preclude drawing such conclusions or making any recommendations in the audit report that will be written later.

6. Audit Protocol/Report Preparation Guidance

6.1 Purpose and Structure

This protocol/report preparation guidance (see **Exhibits 1 and 2**) provides a detailed topic outline to direct the scope and content of the audit and a structure for preparation of the audit report. The protocol and report format have been integrated to accomplish the following goals:

- Provide detailed guidance on the types of information that should be reviewed during the audit and discussed in the report;
- Ensure continuity in report preparation; and
- Provide an organized and detailed report format for easy access to specific lessons learned on chemical process safety management practices.

Because of the scope of the audit or the resources and expertise of the audit team, it may not need, or be able, to address all areas of the protocol. However, all areas of the protocol should be addressed in the audit report (e.g., state that the audit team did not review the facility's hazard evaluation and modeling capabilities).

By providing this Manual to facility personnel prior to conducting the audit, the facility will also have a more thorough understanding of the audit scope and intent. The facility can prepare for the audit by assembling information and identifying personnel with the required expertise to assist the audit team.

This guidance is structured to address each of the major elements of chemical process safety management at the facility being audited. These include:

- Facility Background Information;
- Chemical Hazards;
- Process Hazard Information;
- Chemical Accident Prevention;
- Accidental Release/Incident Investigation;
- Facility Emergency Preparedness and Planning Activities;
- Community Emergency Planning and Response Activities; and
- Public Alert and Notification Procedures.

Preceding each of these sections in the annotated protocol/report guidance (**Exhibit 2**) is a brief overview of the purpose of this section with respect to the audit scope.

Exhibit 1

Outline of Protocol/Report Preparation Guidance

1.0 INTRODUCTION

2.0 SUMMARY OF FINDINGS/CONCLUSIONS

3.0 BACKGROUND

- 3.1 General Facility and Audit Information
- 3.2 Purpose of the Audit and Facility Selection Process
- 3.3 Audit Methodology

4.0 FACILITY BACKGROUND INFORMATION

- 4.1 Site and Surrounding Area Description
  - 4.1.1 Facility Profile
  - 4.1.2 Site Topography and Meteorological Conditions
  - 4.1.3 Site Access
  - 4.1.4 Special/Sensitive Populations and Environments
  - 4.1.5 Regional Demographics
  - 4.1.6 Identification of Vulnerable Zones

5.0 CHEMICAL HAZARDS

- 5.1 Overview of Hazards for Chemical(s) Being Audited
- 5.2 Facility Management of Chemical Hazard Data

6.0 PROCESS INFORMATION FOR HAZARDOUS CHEMICALS

- 6.1 Storage and Handling
  - 6.1.1 Storage Systems
  - 6.1.2 Shipping/Receiving
  - 6.1.3 Material Transfer
- 6.2 Process Description
  - 6.2.1 Overview of Processing Steps and Operating Procedures
  - 6.2.2 General Description of Process Equipment Capacity
  - 6.2.3 Back-ups and Redundancy
  - 6.2.4 Process Parameter Monitoring
  - 6.2.5 Environmental Monitoring

Exhibit 2

Annotated Protocol/Report Preparation Guidance

STANDARD DISCLAIMER (see **Attachment 7**)

1.0 INTRODUCTION

- Purpose and scope of the audit program (**Attachment 8** contains standard language to describe the purpose and scope of the program); and
- Paragraphs identifying facility name and location and why audited

2.0 SUMMARY OF FINDINGS/CONCLUSIONS

- Briefly summarize audit findings (both positive and negative)

3.0 BACKGROUND

3.1 GENERAL FACILITY AND AUDIT INFORMATION

- Facility name, location, principal activities;
- Dates audit conducted; and
- Listing of team members and their affiliation, areas of responsibility, and expertise.

3.2 PURPOSE OF THE AUDIT AND FACILITY SELECTION PROCESS

- Briefly explain why facility was selected. Audit could be conducted for a number of reasons such as:
  - To follow up on an accidental release or series of releases (include description of triggering incident);
  - To focus on particular technologies, processes, operations, or chemicals;
  - Regional or headquarters initiatives;
  - At request of state and/or local officials; or
  - At facility invitation.

3.3 AUDIT METHODOLOGY

- Summary of the process areas and other locations that were investigated and why they were selected; and

- Important audit limitations (e.g., no comparison of safety systems across several similar operations was performed).

4.0 FACILITY BACKGROUND INFORMATION

A history of site activities and a description of the surrounding area provides information on the potential risk that facility activities may pose to the surrounding community and the environment in the event of an accidental chemical release.

4.1 SITE AND SURROUNDING AREA DESCRIPTION

4.1.1 Facility Profile RJK

- Facility history and principal activities (i.e., date built, modifications and improvements, releases, etc.), size and layout, and ancillary operations (e.g., power generation, warehouse, distribution center, laboratory, waste treatment, etc.); and

- Reference maps in appendix or use simple maps in text.

4.1.2 Site Topography and Meteorological Conditions

- Natural disaster potential (e.g., earthquake, flood);
- Geology; and
- Climate.

4.1.3 Site Access

- Transportation routes, including railroad and waterways; and
- Site security (e.g., fencing and gates, security guards, and access by non-authorized persons).

4.1.4 Special/Sensitive Populations and Environments

- Hospitals, schools, and nursing homes; and JEM
- Wetlands, drinking water supply, etc.

4.1.5 Regional Demographics P-JK

- Economy, population, industrial and growth patterns

4.1.6 Identification of Vulnerable Zones

5.0 CHEMICAL HAZARDS

This section serves to not only focus briefly on the hazards associated with particular substances, but to provide pertinent facts on the facility's understanding of what are the chemical hazards for each substance.

5.1 OVERVIEW OF HAZARDS FOR CHEMICAL(S) BEING AUDITED

- Brief description of hazards; and
- Reference detailed information in appendix (i.e., MSDS, etc.) -- do not rewrite MSDS information.

5.2 FACILITY MANAGEMENT OF CHEMICAL HAZARD DATA

- What the facility recognizes as the hazards associated with the chemical(s);
- Documentation available on hazards associated with chemical(s) (e.g., MSDS, corrosion rates, reactivity data, etc.);
- Availability of such data to employees (e.g., OSHA Hazard Communication Standard training);
- Mechanism for reviewing and updating information;
- Mechanism for documenting suspected acute and chronic toxic effects (e.g., medical and industrial hygiene personnel); and
- On-site availability of emergency medical care.

6.0 PROCESS INFORMATION FOR HAZARDOUS CHEMICALS

A review of facility operations associated with the processing of the chemical(s) being examined can reveal facility practices and techniques for handling process hazards, as well as reveal facility understanding of the process hazards. (Within each subsection, the report should address every chemical and process examined during the audit for which observations, conclusions, and/or recommendations were noted.)

6.1 STORAGE AND HANDLING

6.1.1 Storage Systems

- Storage methods;
- Capacity;
- Location, including compatibility and spacing;
- Hazard identification (placards and labelling);
- Maintenance and housekeeping of area; and
- Block diagrams to illustrate major process flows.

6.1.2 Shipping/Receiving

- Method(s) of receiving and shipping (e.g., tank trucks, rail cars, pipelines, cylinders, barges, etc.);
- Schedules and quantities of shipments;
- Responsible personnel and level of training;
- Coordination of transportation issues with the community contingency plan; and
- Transportation corridors used.

6.1.3 Material Transfer

- Transfer method(s) from storage to processing areas and between different stages of process;
- Pipe coding/labelling for flow direction and contents;
- Other transfer systems (e.g., compressors, ejectors, pumps, blowers, etc.);
- Housing of transfer systems; and
- Off-site accessibility.

6.2 PROCESS DESCRIPTION

6.2.1 Overview of Processing Steps and Operating Procedures

- Listing different operations and process steps in chronological order for hazardous chemical; can use block-type flow diagram to illustrate steps;
- Chemical production or use rates;
- Chemical reaction(s) description (e.g., catalysts, activators, inhibitors, exothermic, etc.);
- Blending or separation steps;
- Material incompatibilities;
- Pressure and temperature variations; and

- Consequences of deviation: what happens to chemicals spilled, leaked, vented, etc.

6.2.2 General Description of Process Equipment

- Capacity and design conditions;
- Construction material;
- Flow rates;
- Parameters monitored, controlled, and recorded (at equipment or in control room);
- Production or use rates for chemical; and
- Comparison of design limits and operating parameters.

Note: **Attachment 9** contains further guidance on reviewing process operations.

6.2.3 Back-ups and Redundancy

- List systems with back-ups or automatic shutdowns;
- Description of back-ups and how and why used;
- Availability of back-up power systems;
- Method of detecting inoperative control equipment and availability of back-ups; and
- For facility with scrubbers or flares, their capacity for handling accidental releases.

6.2.4 Process Parameter Monitoring

- Description of process parameters for operations and processes and why used;
- Performance history at facility;
- Monitoring and recording procedures; and
- Procedures for addressing unsafe parameter levels.

6.2.5 Environmental Monitoring KGA

- Description of system(s) used to monitor hazardous chemical levels within work areas and in the surrounding environment (e.g., types, location, etc.);
- Connection to alarm and communication systems; and
- Performance history at facility.

6.3 PROCESS HAZARDS

- Hazards facility has identified for the process and determined to present a significant risk to the facility and/or the surrounding community (e.g., storage tank failure, pipeline leak, process vessel overpressurization)

7.0 CHEMICAL ACCIDENT PREVENTION

Practices and technological systems for controlling the process hazards presented in section 6.0 of this protocol/report outline, are an important part of chemical process safety management. This section is intended to describe mechanisms for implementing and maintaining safe process systems. Management directives are reviewed in this section to identify goals and implemented activities, such as training and equipment maintenance procedures, that present the facility's perspective and commitment to safe management of process hazards.

7.1 MANAGEMENT ACTIVITIES

7.1.1 Corporate Role in Facility Process Safety Management

- Corporate safety policy, guidance, and directives; and
- Technical and financial assistance (e.g., process modifications, information exchanges, and capital improvements).

7.1.2 Facility Role in Process Safety Management

- Policy and directives;
- Goals and objectives; and
- Employee safety committees and incentive programs.

7.1.3 Audit Activities and Procedures

- Frequency of facility audits;
- Responsible department and involvement of external personnel (e.g., corporate and private consultants);
- Audit scope;
- Audit procedures and time frame; and
- Implementation of audit recommendations (e.g., policy and procedures).

7.2 PROCESS OPERATION AND MAINTENANCE

7.2.1 Standard Operating Procedures

- SOP manuals available (e.g., operating procedures manual, supervisory operating manual, safety manual, accident and fire prevention manual);
- How procedures/manuals reviewed and approved;
- Listing of personnel roles and responsibilities;
- Applicability of manuals to tasks conducted during normal and emergency situations;
- Other process guides: operating logs, shift turnover procedures, overtime procedures, call out procedures during emergencies, reporting procedures for unusual circumstances or process deviations;
- Experimental operating conditions for process changes, and management of change; and
- Startup, shutdown, and routine operation checklists.

Note: **Attachment 10** contains a summary of the types of documentation and other materials that the audit team may want to review for more information on facility SOPs.

7.2.2 Training Practices

- Types of training available for operations and maintenance personnel;
- Methods and frequency of training;
- Who performs training and qualifications;
- Frequency and procedures for revising training;
- Refresher courses and retraining;
- Upset simulations and drills;
- Use of process simulators;
- Job duty qualifications/prerequisites;
- Types and frequency of job qualification evaluations (e.g., performance reviews, tests);
- Employee turnover rate; and
- Master qualification list.

7.2.3 Equipment Maintenance Procedures

- Work order systems;
- Maintenance and testing scheduling;
- Preventive and predictive maintenance;
- Equipment history records;
- System for spare parts control;
- Level of training;

- Frequency and method of communication between maintenance and operations personnel;
- Prioritization of maintenance and inspections;
- Securing equipment during shift breaks;
- Assuring proper repairs replacement; and
- Management of change for equipment (e.g., appropriateness of materials of construction).

7.2.4 Instrument Maintenance

- Work order systems;
- Frequency and testing of instrument calibration, sensor inspections, and alarm and interlock inspections;
- Instrument history records;
- System for spare parts control;
- Frequency and method of communication between maintenance and operations personnel;
- Number of employees and shift coverage;
- Level of training;
- Management of change for instruments (e.g., appropriateness of calibration settings); and
- Error checking.

7.3 Hazard Evaluation and Modeling

7.3.1 Hazard Evaluation

- Type(s) or method(s) used at facility (e.g., What If, Hazop, etc.) and why selected;
- Processes and operations evaluated;
- Procedures for targeting/scheduling evaluation (e.g., new procedures, process modification, incidents);
- Frequency and basis for updating methods;
- Who participates in and reviews evaluation(s) and the qualifications of such personnel;
- Use of results and methods of documentation;
- Performance of consequence analysis to understand impacts of any potential release;
- Implementation of results and recommendations; and
- How is process change managed.

7.3.2 Modeling

- Uses and types of models for tracking releases into air, surface water, and groundwater;
- Processes, chemicals, and operations to which models have been applied;
- Goals of modeling activities (e.g. support for emergency planning and emergency response);
- Assumptions built in to the models (both by user and developer) and facility perceptions of strengths and limitations (e.g. dense gas releases, terrain effects, single-phase versus multi-phase modeling capability);
- Parameters covered by surface and groundwater models (e.g. degradation, photolysis, volatization, geochemical processes, local hydrology, adsorption, desorption);
- Validate model against experimental measurements; and
- Use during incidents and the results (e.g., improvements in emergency response or planning).

7.4 Release Prevention Systems

- Facility activities related to preventing a release

  -- Description of type(s) of systems in place;
  -- Why used;
  -- Performance history at facility;
  -- Testing and inspections; and
  -- Modifications performed.

Examples of activities to prevent chemical releases:

- Improvements in process and equipment design;
- Reduction of inventories;
- Changes in siting of particular equipment;
- Increased training and safety reviews;
- Improved process controls;
- Installation of interlocks; and
- Failsafe design.

7.5 MITIGATION SYSTEMS

- Description of type(s) of system(s) in place;

- Why used;

- Performance history at facility; and
- Frequency of testing and inspections.

Examples of release mitigation systems include:

- Water sprays and sprinkler systems;
- Foams;
- Physical separation of buildings and equipment; and
- Physical barriers, including dikes, curbing, raised doorways, and containment walls).

8.0 ACCIDENTAL RELEASE INCIDENT INVESTIGATION

Facility procedures for identifying the underlying causes of unplanned incidents, including fires, explosions, or releases of hazardous chemicals, and for preventing similar incidents from recurring serve as an important step toward the actual prevention of future incidents.

8.1 HISTORY OF ACCIDENTAL RELEASES/INCIDENTS

- Types (e.g., reportable, near miss);
- Chronicle of releases;
- Reporting history; and
- Community response and interaction.

8.2 FACILITY INVESTIGATION PROCEDURES

- Written procedures (e.g., guidelines, time frames);
- Types of releases to be investigated (e.g., near misses; or those reportable under federal, state, or local law);
- Personnel responsible for investigations;
- Management involvement;
- Actions taken resulting from investigation; and
- Use of reports to share results (e.g., through training programs and lessons learned) and distribution scheme.

9.0 FACILITY EMERGENCY PREPAREDNESS AND PLANNING ACTIVITIES

Emergency activities in preparing for and responding to accidental releases illustrate facility knowledge, dedication, and practices for mitigating incidents.

9.1 Facility Emergency Response Plan

- Type and coverage of facility response plans (e.g., OSHA emergency action plan, SPCC plan, corporate plan);
- Update schedule and procedures (i.e., how often revised and by whom); and
- Key procedural areas covered (e.g., release notification, evacuation, response and mitigation activities).

9.2 Emergency Response Exercises and Simulations

- Types, frequency, and groups involved; and
- Uses of findings.

9.3 Fire, Evacuation, and Rescue Corridors

- Procedures for conducting evacuations;
- Condition and accessibility of fire and rescue corridors; and
- Detail and location of facility and community maps (Maps should be referenced in appendix.).

9.4 Emergency Equipment Provisions

- Types;
- Locations;
- Inspection and maintenance policies, including testing; and
- Sources of equipment (off-site versus on-site).

9.5 Emergency Response Chain of Authority

- Chain of command (e.g., designation of control during an emergency); and

- Coordination with off-site response personnel.

9.6 Emergency Response Management Procedures

- Management's role in response incident situations.

9.7 Emergency Communication Network within the Facility

- Types and accessibility of communication system(s) and backups, including sirens, walkie-talkies, and phones;
- Testing of communication system; and
- Ability of personnel to interpret warning signals.

9.8 Emergency Response Personnel Training Requirements

- Categories of facility emergency response personnel;
- Type of training available and frequency;
- Who performs training; and
- Refresher courses.

9.9 Follow-up Release Procedures

- Incident clean-up (e.g., self, private contractors); and
- After-action review of response with all involved parties (e.g., public and private organizations).

10.0 COMMUNITY AND FACILITY EMERGENCY RESPONSE PLANNING ACTIVITIES

Communication to the community about facility activities and coordination with the community in developing emergency response plans indicate a level of facility commitment to safety, as well as revealing unique outreach activities.

10.1 Facility Planning and Outreach Activities with Community

- Awareness and participation in LEPC activities;
- Participation in CAER activities; and

- Outreach activities, scholarship programs, open houses, joint training, education, etc.

10.2 Local/Community Emergency Response Planning

- Community plan status;
- Coordination between facility and community in plan preparation and exercise;
- Coordination with hospitals and emergency medical services on treatment of chemical exposure victims;
- Coordination with community response structures and procedures; and
- Mutual aid efforts and facility involvement in non-facility-related community responses.

11.0 PUBLIC ALERT AND NOTIFICATION PROCEDURES

Public alert and notification procedures identify unique procedures and facility commitment to safety for the community.

11.1 Procedures for Public Notification of Releases

- Alarm systems (e.g. sirens, air horns, whistles);
- Communication networks (e.g., radio, television, phone); and
- Back-up systems.

11.2 Schedule for Testing Procedures

- Frequency of tests; and
- Number and type of individuals notified.

11.3 History of Notification Procedures and Evaluation

- Type of incident;
- Timeliness of public notification; and

- Number of individuals notified and methods of public and private emergency notification.

11.4 Community and Facility Contacts

- Alternate contacts; and

- Telephone number update procedures.

11.5 Facility and Media Interaction

- Direct communication links; and

- History of past interaction.

12.0 CONCLUSIONS

The conclusions highlight safety practices observed at the facility. As described in section 6.2.2, *Tips for Writing the Report*, the information should be presented in a factual manner and should refrain from judgments of adequacy or inadequacy. This section summarizes facility practices that reflect the facility's understanding of and commitment to chemical process safety management.

13.0 RECOMMENDATIONS

If applicable, the audit team may wish to make one or more recommendations regarding observed processes, practices, technologies, and so forth. Any such recommendations should be stated clearly, and be practical and technologically feasible at the facility. Recommendations are not required or mandatory actions that must be taken by the facility. They should be presented as options that the facility may consider to enhance their knowledge of and practices in chemical process safety management.

APPENDICES

During the audit process, the team will gather a variety of materials relating to the operations of the facility. Most of this material, however, while very helpful in conducting the audit and preparing the audit report, does not belong in the main body of the audit report and should instead be placed in appendices or maintained in the files of the regional office for future use. Examples of the types of material that might be included as appendices are:

- Sample facility memoranda, guidelines, SOPs, policy statements;
- Correspondence between the facility and the regional office; and
- Graphics such as photographs, maps, charts.

All materials should be labeled with the:

- Name of the facility;
- Date of the audit; and
- Other necessary identifying information.

6.2 Writing the Report

6.2.1 Post-Visit Meeting

The entire audit team should reassemble as soon as possible after completion of the site visit. This is important because the details of the site visit can become confused and fade rapidly. Certain items should be covered in this meeting:

- Require that team members immediately review and edit their notes from the site visit to obtain clarity and completeness;
- Begin using the audit report outline as a basis for organizing all audit information;
- Consider the major audit elements during the review and analysis process, the initial stage in to the completion of the audit report:
  - Facility Background Information;
  - Chemical Hazards;
  - Process Hazard Information;
  - Chemical Accident Prevention;
  - Accidental Release/Incident Investigation;
  - Facility Emergency Preparedness and Planning Activities;
  - Community and Facility Emergency Response Planning Activities; and
  - Public Alert and Notification.
- Review all important observations and findings identified to this point in the audit; and
- Determine whether or not any particular conclusions can be drawn or recommendations made for inclusion in the report.

6.2.2 Tips for Writing the Report

There are two main areas of consideration when preparing a report:

- Writing style; and
- Report format flexibility

Writing style

In many instances during report preparation, several individuals will be working on separate sections pertaining to his/her role in conducting the audit. Although several different writing styles may be presented in the report, it is very important that they all

have one common element of presentation style -- information is factual, relevant, complete, objective, and clear. The entire report, including the *Conclusions* and *Recommendations* sections, should be presented in a factual manner and refrain from judgments of adequacy or inadequacy.

The *Conclusions* section should highlight facility safety practices observed during the audit, identifying unique facility practices that should be shared as well as areas for improvement. This summary should reflect the facility's understanding of, and commitment to, chemical process safety management, and should refrain from judgments of adequacy or inadequacy. As an example of how to present conclusions, consider the following pair of statements:

> **Incorrect.** "The facility has adequate procedures to investigate and respond to the cause(s) of accidental chemical releases."
>
> **Correct.** "The facility prepares follow-up reports for accidental releases of hazardous chemicals that occur both on- and off-site. The report addresses the cause of the incident, recommended actions to prevent the release from reoccurring, and a schedule and list of responsible individuals for implementing these actions." [If the facility uses a form for this practice, it could be referenced in an appendix.]

The first statement does not provide any information on the facility's follow-up procedures; in addition, a judgement is made on the procedures, which may or may not be valid. The latter illustrates procedures that the facility takes following an accidental release of hazardous chemicals both on- and off-site. Its style of presentation is factual and provides clear information on what the facility does without commenting on the adequacy or inadequacy of the procedures.

The *Recommendations* section should provide clearly stated suggestions and include the factual basis for each recommendation. The recommendations should be both practically and technologically feasible for the audited facility -- they are neither mandatory nor required, and are simply being presented for consideration by the audit team to the facility to enhance its chemical process safety management. As an example of how to present recommendations, consider the following pair of statements:

> **Incorrect.** "The facility should implement a preventive maintenance program."
>
> **Correct.** "The facility should evaluate the appropriateness of its use of the periodic maintenance system for maintaining pressure relief valves. This evaluation could include, among other aspects, a review of alternative schemes, such as preventive maintenance and predictive maintenance."

The first statement does not provide any information on the facility's existing maintenance program and it does not specify the particular application for the recommended preventive maintenance. The latter clearly describes the current status of

the element in question and provides alternatives for consideration. In addition, the style of presentation is appropriate for the cooperative nature of the audit program. In both the *Conclusions* and *Recommendations* sections, all statements must address observations that are presented in detail in the main body of the report.

Report format flexibility

The introduction to this section of the Manual addresses the purpose and uses of the report protocol/outline. One important purpose is to ensure consistency in report preparation. This consistency will help to facilitate analysis of conclusions and recommendations and will assist CEPPO in effectively identifying successful and problematic practices and technologies, and in sharing information with the regions, other program offices, other federal agencies, state and local governments, facilities, and other involved parties.

There are 13 major report sections (i.e., 1.0, 2.0, etc.), and when preparing the report, each of these must be addressed. **[Required Activity]** For some facilities, however, information relevant to a major section may not exist, or the audit team may not have been able to examine materials relevant to this element. For example, the facility may not have any system for alerting/warning the public that a release has occurred (section 11.0), or this element may not have been reviewed by the audit team. Rather than skip that section of the report, it should be stated that the facility does not have a public alert/warning system, or that this element was not examined in the audit.

6.2.3 Follow-up Information

With almost any audit, there is usually a need to contact the facility after the site visit has occurred to clarify a point or to obtain more complete information. A chemical safety audit is no different. The preferred way to handle follow-up inquiries is for the Team Leader to designate a person or persons to serve as the contact with the facility; the facility may take a similar approach in making any further responses to EPA. This minimizes the opportunity for miscommunication and lends a credible appearance to the conclusion of the audit.

6.2.4 Standard Report Disclaimer

A standard report disclaimer accompanies all audit reports and is located after the cover page. **[Required Activity]** **Attachment 7** contains a sample disclaimer. The report disclaimer serves to describe the scope and limitations of the audit report contents by identifying the time frame in which the audit was conducted, and by clarifying the facility's role in adopting or implementing any of the report contents.

6.3 Review and Finalization Procedures

In preparing the final audit report, there are two considerations to keep in mind:

- Access of draft report information through the Freedom of Information Act (FOIA); and
- Report inclusion of facility confidential information.

6.3.1 Access of Draft Information

In order to ensure that draft report information is not available to the public through FOIA prior to report finalization, the EPA regional office can designate an EPA official (e.g., Section, Division, or Branch Chief) to approve the report as "final." This procedure is not mandatory, but highly recommended, since this process is cited under the Deliberate Process Privilege Section, exemption 5 of FOIA [5 USC 552(b)5].

Additional actions can be taken to prevent draft information from being accessible under FOIA. For example, all draft materials can be stamped "DRAFT." Draft materials can include the following citation at the bottom of each page or on a cover sheet:

"Pre-decisional Document, Not Disclosable Under FOIA"
" - Do Not Cite or Quote - "

Please note that these actions do not have legislative or regulatory authority, as compared to the finalization process described above.

6.3.2 Facility Confidential Information

Another suggested activity during the report finalization process is submission of the draft report to the facility to identify any confidential information. The facility should be contacted to establish a deadline (e.g., two weeks) to avoid lengthy delays. Any information identified as confidential should be treated as such. Comments on the report that are provided by the facility can, but do not have to be taken into consideration as the report is finalized.

6.4 Report Distribution

When the audit report is final, standard distribution by the Regional Chemical Emergency Preparedness and Prevention (CEPP) Coordinator is required to the following groups and organizations: **[Required Activity]**

- SERC and LEPC in which the facility is located;

- Facility owner/operator;
- Facility CEO;
- EPA Headquarters, Chemical Emergency Preparedness and Prevention Office; and
- Any other federal, state, and local agencies or departments that assisted in conducting the audit.

The region should ensure that at least one unbound copy of the report suitable for photocopying is provided to CEPPO.

The Regional CEPP Coordinators should also consider distributing final audit reports to other EPA offices; other federal, state, and local agencies or departments; and other private and public sector organizations. Sharing the report with regional media offices is encouraged. EPA Headquarters will also circulate copies to interested headquarters media offices, the Prevention Work Group, and other federal programs. Press releases of audit activities (e.g., facility visit, report finalization, etc.) are also discretionary for the Regional CEPP Coordinators and EPA Headquarters CEPPO staff.

To help professionals conducting audits, EPA Headquarters is developing a computerized database that contains profiles of all of the chemical safety audit reports. The profiles are summaries of the audit reports organized in a uniform format consistent with the CSA protocol. The database has search capabilities that allow the user to identify report profiles based on SIC code, specific chemical hazards, etc. The information contained in the database will be useful to the regions for a variety of purposes, such as learning how a particular industry operates (e.g., the types of chemicals and kinds of processes in use and the typical problems encountered), as well as identifying field experts and comparing processes at different facilities for the same chemical. CEPPO will also be able to use the database to assemble and distribute information on chemical process safety management and chemical accident prevention issues and to assess the implementation of the CSA program.

6.5 Preparing the Report Profile

An audit report profile should be submitted to headquarters in conjunction with the submission of the audit report for inclusion into the database. The profile (see **Attachments 11 and 12**) organizes the key information contained in the report, including information on the facility and the audit team as well as report conclusions and recommendations, in a format suitable for direct entry into the CSA database. In addition to providing the basis for the continued development of the CSA database, the profile format can also assist the audit team during the audit process. The profile can serve as a method of organizing issues of interest and assigning areas of responsibility to team members prior to the audit, monitoring the progress of the team during the audit

visit, and organizing the collected information during report writing. The specific information that should be included in the CSA report profile is described in the annotated profile in **Attachment 12**. A hardcopy and an electronic version of the profile should accompany the audit report when it is submitted to EPA headquarters to facilitate entering the profile information into the database.