

**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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Note: This Manual supersedes all previous versions.

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FACT SHEET

MARCH 1993

CHEMICAL SAFETY AUDIT PROGRAM

BACKGROUND

The Chemical Safety Audit (CSA) program has evolved from the efforts of the U.S. Environmental Protection Agency (EPA) under the Chemical Accident Prevention (CAP) program. The 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) by Congress in 1986. Because prevention is the most effective form of preparedness, the CAP program promotes an effort to enhance 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 share activities with the community, industry, and other groups.

Many of the key concerns of the CAP program arise from the SARA Title III section 305(b) study entitled Review of Emergency Systems. As part of the information gathering efforts to prepare this study, EPA personnel conducted a number of facility site visits to learn about chemical process safety management practices. The study covers technologies, techniques, and practices for preventing, detecting, and monitoring releases of extremely hazardous substances, and for alerting the public to such releases. One of the key recommendations resulting from the study was the continuation and expansion of the audit program.

As a follow-up to this national prevention study, EPA has undertaken cooperative initiatives with federal agencies, states, industry groups, professional organizations, and trade associations, as well as environmental groups and academia. These joint efforts will serve to determine and implement a means to share information on release prevention technology and practices, and to enhance the state of practice in the chemical process safety arena.

PROGRAM GOALS

The CSA program is part of this broad initiative and has been designed to accomplish the following chemical accident prevention goals:

- Visit facilities handling hazardous substances to gather information on and learn about 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.

PROGRAM AUTHORITY

The Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA or Superfund) was enacted December 11, 1980, and amended by 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.

CERCLA Sections 104(b) and 104(e), as amended by SARA in 1986, provide authorities for entering a facility and accessing information to conduct a chemical safety audit by EPA. 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 there is no such arrangement, states, as well as local governments, must use their own authorities for audit participation.

As a matter of EPA policy under the CSA program, all facilities that will receive an audit should have experienced a release of a hazardous substance, pollutant, or contaminant, or there should be reason to believe that there exists a threat of such a release. The audits are intended to be nonconfrontational and positive, such that information on safety practices, techniques, and technologies can be identified and shared between EPA and the facility. Involvement in the CSA program by Local Emergency Planning Committees (LEPCs) and State Emergency Response Commissions (SERCs) formed under SARA Title III is encouraged to enhance the goals of both of these programs. However, as stated above, state and local government participation in the audit, itself, must be performed under state and local authorities.

AUDIT SCOPE

The audit 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;
- Hazard evaluation and release detection techniques;
- Operations and emergency response training;
- Facility/corporate management structure;
- Preventive maintenance and inspection programs; and
- Community notification mechanisms and techniques.

Observations and conclusions from audits are detailed in a report prepared by the audit team. The report identifies and characterizes the strengths of specific Chemical Accident Prevention program areas to allow the elements of particularly effective programs to be recognized. Copies of the report are provided to the facility so that weak and strong program areas may be recognized. The audit is conducted following the Guidance Manual for EPA Chemical Safety Audit Team Members, issued by EPA Headquarters. This guidance contains recommended actions, as well as mandatory procedures that must be followed to ensure the health and safety of program auditors and program integrity. Each member of the audit team should have a copy of the manual, and a copy of the manual is transmitted to the audited facility.

AUDIT TEAM COMPOSITION

An EPA audit team primarily consists of EPA employees, and other designated representatives including contractors and the American Association of Retired Persons (AARP) enrollees. Other federal, state, and local government personnel may also be team members. 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).

FACILITY SELECTION

At present, there are no established procedures for selecting a facility for an audit. Each EPA region has flexibility in identifying facilities. Options to consider in selecting a facility include:

- Previous history of the facility;
- SERC and/or LEPC referral;
- Proximity to sensitive population(s);
- Public sensitivity;
- Regional accident prevention initiatives;
- Opportunity for sharing new technology;
- Population density; and
- Concentration of industry in the area.

REPORT DISTRIBUTION

Standard distribution by EPA regional offices of the audit report will be at a minimum to:

- SERC and LEPC in which the facility is located;
- Facility owner/operator and facility CEO;
- EPA Headquarters; and
- Any other federal, state, and local agencies or departments that assisted in conducting the audit.

Distribution is available to other EPA offices, other federal, state, and local agencies or departments, and other private and public sector organizations.

ACCOMPLISHMENTS

During the first four years of the CSA program, the regions have conducted audits at over 150 facilities in 46 states and Puerto Rico. EPA has analyzed the conclusions and recommendations listed in the audit reports to identify trends within and across industries, processes, and chemicals to assist in the further development of the CSA and CAP programs, particularly in light of the accidental release provisions of section 112(r) of the Clean Air Act. At the same time, follow-up activities performed by several of the regional offices indicate that the majority of the recommendations to improve chemical process safety practices suggested by the audit teams have been implemented or are scheduled to be implemented at audited facilities.

CSA PROGRAM BENEFITS

- Identification of effective, field-proven chemical accident prevention technologies and practices.
- Better understanding of the causes of chemical releases.
- Greater awareness by facilities of chemical safety and understanding of available techniques, and specific suggestions for improved programs.
- Identification of problem areas in industry where more attention is needed.
- Cooperation and coordination of chemical safety programs with other federal and state agencies through joint audits and training.

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For more information on the Chemical Safety Audit program, contact the Chemical Emergency Preparedness Program (CEPP) office in your EPA regional office.
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THE CHEMICAL SAFETY AUDIT PROGRAM:

FY 1993 STATUS REPORT



December 1993

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EXECUTIVE SUMMARY

This report provides a comprehensive overview of the status of the U.S. Environmental Protection Agency's Chemical Safety Audit (CSA) program since its inception in FY 89, a review of the successful and problematic trends of CSA program implementation in FY 93, and a discussion of the future direction of the program.

The CSA program evolved from the efforts of the U.S. Environmental Protection Agency (EPA) under the Chemical Accident Prevention (CAP) program into a program which this year alone encompassed the review of the chemical process safety management systems of over 50 facilities and the training of more than 100 federal, state, and local officials. In addition, the CSA program continued the development of a database of chemical safety audit information and conducted numerous other related activities, including outreach and technical assistance for both the public and private sector.

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 share the results with the community, industry, and other interested groups. The CSA program was established as part of this broad initiative. The purposes of the CSA program are:

- To visit facilities handling hazardous substances to gather information on safety practices and technologies;
- To heighten awareness of the need for, and promote, chemical safety among facilities handling hazardous substances, as well as in communities where chemicals are located;
- To build cooperation among facilities, EPA, and other authorized parties by conducting joint audits; and
- To establish a database for the assembly and distribution of chemical process safety management information obtained from the facility audits.

The CSA program is not a compliance or regulatory program; however, EPA does have legal authority for entering a facility and conducting a chemical safety audit under CERCLA sections 104(b) and 104(e), as amended by SARA. The audit consists of interviews with facility personnel and an on-site review of various aspects of facility operations related to the prevention of accidental chemical releases. Observations and conclusions from the audit are detailed in a report, available to the public, that identifies both problematic and successful chemical process safety management practices, as well as technologies for preventing and mitigating chemical releases.

This status report is intended to provide EPA headquarters and regional management with a better understanding of the purpose and goals of the audit program, the type of information being generated and its uses, and how the program is being implemented both at headquarters and in the regions. The following four topics are the focus of this report — program activities, program results, regional program implementation, and analysis of audit results.

Program Activities/Results

In June 1993, CEPPPO issued a revised edition of the *Guidance Manual for EPA Chemical Safety Audit Team Members*, which outlines the two important modifications to the CSA program that were implemented during FY 93 — the institution of audit follow-up activities and the preparation of audit report profiles by the regional offices. To supplement the audit and audit report preparation, the regional offices were requested to establish an audit follow-up program. Many of the regional offices initiated follow-up programs in FY 93, or continued pre-existing programs, ranging from conference calls involving

the audit team and facility representatives, follow-up site visits conducted by audit team members, and follow-up questionnaires sent to audited facilities. In addition, the regional offices have been requested to prepare an audit report profile in conjunction with the submission of the chemical safety audit report. The profile is a summary document that organizes the key information in the audit report in a format compatible with the CSA program database. The 19 profiles submitted by the regions during FY 93 represent an important first step in streamlining program analysis; headquarters continues to work with the regions to ensure that the information submitted is consistent with the needs of the CSA database.

The results of the audit program, documented in Chapter 2, are based on the number of audits conducted and reports completed in each region, along with a summary of the audits by the facility's Standard Industrial Classification (SIC) code and by the hazardous substances examined during the audit. An overview of participation in training workshops offered by EPA headquarters is also included. As of the close of FY 93, the regions had submitted a total of 211 final audit reports to EPA headquarters for the 218 audits that were conducted between FY 89 and FY 93, including four follow-up reports on previously audited facilities. Information from the 75 most recently submitted reports were examined for this status report, including a number of reports from audits conducted in FY 89 to FY 92 that were not submitted to EPA headquarters in time to be included in the FY 92 Status Report. Among these latest audits were more than a dozen non-manufacturing facilities (primarily wastewater treatment plants and nondurable wholesalers) handling hazardous chemicals that are generally unfamiliar with the elements of chemical process safety management, but are potentially subject to the provisions of CAA section 112(r).

In FY 93, each regional office was responsible for conducting from three to seven chemical safety audits under EPA's tracking and evaluation system, with a combined target of 42 audits. Nine of the ten regions achieved their individual targets, with a total of 51 audits conducted by the regional offices. In FY 92, the target for all ten regions was 41 (each region was responsible for conducting from three to eight audits), and a total of 41 audits were conducted. The combined target for the regional offices was 40 in FY 91, and a total of 53 audits were conducted. In the first two years of the program (FY 89 and FY 90), each region was assigned a target of conducting four audits per year, and the regions conducted 32 audits in FY 89 and 39 audits in FY 90.

A continuing trend in the CSA program has been the interest of some states in developing or enhancing their ability to conduct chemical safety audits or to develop their own CSA program to support chemical accident prevention initiatives at the state and local level. This interest has been fostered by the states' emergency preparedness responsibilities under the Emergency Planning and Community Right-to-Know Act (also known as Title III) and related state legislation. The regional Chemical Emergency Preparedness and Prevention (CEPP) offices have been actively supporting state and local involvement in the CSA program, including developing state CSA programs and participating in state-sponsored training workshops. As described in Chapter 1, the most notable examples of this activity are the states Nevada and Colorado.

The Chemical Emergency Preparedness and Prevention Office (CEPPO) has designed a four-day chemical safety audit workshop that provides potential audit team members with the training to conduct an audit; beginning in FY 93, these courses were presented by EPA's Environmental Response Team as part of their regular training curriculum. From FY 89 through FY 93, a total of 18 workshops, attended by 551 individuals, were conducted in Regions 2 through 10; 148 individuals attended the five workshops held in FY 93. The most noteworthy trend in these workshops has been the increased involvement of state and local officials, who account for approximately 30 percent of the overall attendance. This represents a concerted effort within the CSA program to increase awareness and participation by these individuals in combination with increasing state and local interest in chemical process safety issues.

In addition, CEPPO has developed an advanced training course that discusses in detail audit preparation, report writing, and audit follow-up, as well as more technical issues on chemical process safety management. The workshop is designed for personnel who have previously participated in an audit or have attended the CSA workshop. A pilot workshop was held on December 15-17, 1992, in Denver, Colorado, with 42 attendees.

To realize the goals of the CSA program to collect and disseminate information on chemical process safety issues and to improve program coordination, CEPPO has assembled a computerized database to provide EPA regions and headquarters with information gathered from final chemical safety audit reports organized in a uniform format consistent with the CSA protocol. Through analysis of the database, one can identify successful and problematic techniques or practices employed to manage process safety at facilities handling hazardous substances. Although the database is not directly available to the public and industry, it will be used by CEPPO to develop guidance and technical assistance documents that will be distributed to individuals and organizations involved in chemical accident prevention. In addition, the database has been provided to federal, state, and local officials attending the training workshops, who are using the audit report information to increase their familiarity with chemical process safety issues and to support their own inspection and auditing activities.

Regional Implementation Status

Chapter 3 discusses the status of CSA program follow-up, coordination, and implementation activities conducted by the regional offices during FY 93. A review of the number of audits conducted and the scope of regional program activities from FY 89 through FY 93 indicates that most regional offices have been committing more and more resources for CSA program implementation. At the same time, following up on a concern first identified in the FY 1990 Status Report, the time required to finalize audit reports has been reduced significantly. As of September 30, 1993, final reports had been submitted for almost all chemical safety audits that have been conducted, although sixteen final audit reports — including nine reports from FY 93 audits — remain outstanding. During FY 93, Regions 1, 2, 3, 4, 6, and 7 submitted audit report profiles to headquarters in conjunction with 19 audit reports. In combination with the fact that more audit reports have been prepared in a fashion consistent with the CSA protocol, this effort will simplify entering the information into the CSA database.

A key trend in regional office activities under the CSA program during the past year has been the institution or continuation of follow-up programs to track the implementation of audit team recommendations by audited facilities. Regions have approached the follow-up process from a variety of angles, including mailing questionnaires, returning to facilities for post-audit reviews, and conducting telephone interviews, all of which serve as an effective means to coordinate with the audited facilities on their progress. Overall, the regions have received a substantial degree of positive feedback from audited facilities in response to audit team recommendations.

At the same time, the CSA program has provided the opportunity for greater cooperation and communication with state and local officials as a result of their participation in the audit process and associated training and outreach activities. State and local audit participants stress the beneficial aspects of the program from increased government-industry coordination to enhanced understanding of chemical process safety issues in the community. In addition, as the CSA program has developed, the regional offices have initiated new programs and activities and introduced modifications to audit procedures that take advantage of the program's flexibility. Initiatives such as mini-audit programs and chemical-specific audits, as well as greater pre-audit planning, coordination with other environmental and health and safety programs, and industry outreach efforts have also been the products of the evolution of the CSA program.

FY 93 Audit Analysis

Chapter 4 provides an overview of conclusions and recommendations taken from recent EPA chemical safety audits, based on the latest 75 final CSA reports received by EPA headquarters as of September 30, 1993. This year the results have been organized according to the major elements of generally accepted chemical process safety management practices, which form the basis for the facility risk management programs proposed as part of the regulation implementing section 112(r) of the Clean Air Act. Thirteen major chemical process safety elements are examined in this chapter: corporate and facility management, process hazard analysis (hazard evaluation), offsite consequence analysis, process safety information, release prevention and mitigation measures, standard operating procedures, equipment and instrument maintenance, training, safety audits, accident investigation, management of change, pre-startup review, and emergency preparedness and response.

Each section of Chapter 4 provides an overview of the key features in the implementation of one of these chemical process safety elements, as well as the role each element plays in maintaining a safe facility. The section also illustrates notable audit team observations and conclusions on related facility practices taken from the latest 75 audit reports. For example, most of the audited facilities did not have formal programs in place to conduct process hazard analyses and offsite consequence analyses. While the audit teams noted that most of these facilities did evaluate process hazards on a less formal basis, very few facilities had initiated any efforts to determine the potential offsite consequences of a release.

Conclusion

EPA views the Chemical Safety Audit (CSA) program as a cornerstone in the Chemical Accident Prevention program and as a continuing means of focusing chemical accident prevention initiatives. Current benefits from the CSA program include the following:

- CSA training workshops and audit participation provide EPA, SERCs, LEPCs, and other federal agencies with a better understanding of chemical process safety management and facility practices to prevent and mitigate chemical releases;
- Audit activities foster a more cooperative attitude between government and industry on chemical process safety issues; and
- Jointly conducted audits and training are supporting cooperation and coordination on chemical safety programs among federal, state, and local government agencies.

With the pending implementation of the risk management plan (RMP) requirements under CAA section 112(r), the focus and scope of the CSA program will change. Because the regulations are still under development and the deadlines for industry compliance are several years away, the evolution of the CSA program will occur in two phases. In the first phase, before final regulations are published, the CSA program will be used to help develop and enhance the expertise and capabilities needed to implement the RMP program. The second phase will address the long term future of the CSA program in relationship to the implementation of the RMP program which includes an auditing program, training, and technical assistance efforts.

Because the focus of the CSA program and the proposed RMP elements are similar, the two key elements of the CSA program — chemical safety audits and CSA training — will ensure that EPA, SERCs, and LEPCs have the expertise and capabilities to understand these RMPs, and will play a critical role in the successful implementation of the RMP program. At the same time, the increasing state and local interest and involvement in the CSA program will provide continuity on chemical process safety issues until state RMP programs are established. Additionally, the audits themselves serve as a means to assist

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industry in understanding more about the holistic nature of chemical process safety management. The audits have proved useful in helping more than the facility audited — many have shared their audit experiences and recommendations with other facilities within their company.

The implementation of CAA section 112(r) and the development of independent state chemical process safety programs will further expand the potential contribution of the CSA program to chemical accident prevention. Future activities under the CSA program include:

- Dissemination of information from CSA reports as part of technical guidance to promote a greater awareness among facilities, particularly small businesses, and state and local officials about chemical process safety management, and an understanding of effective prevention and preparedness techniques; and
- Continued use of CSA training workshops to prepare EPA regional, as well as state and local personnel, for their responsibilities under CAA, particularly in understanding risk management programs, providing technical assistance to covered facilities, and preparing personnel for audits and inspections of facilities subject to section 112(r).

A more detailed discussion of the future direction of the CSA program is provided in Chapter 1.

1.0 CHEMICAL SAFETY AUDIT PROGRAM: HISTORY AND FUTURE

In the five years since EPA initiated the Chemical Safety Audit (CSA) program in 1988, more than 200 chemical safety audits have been conducted by EPA regional offices, and a CSA program database and an extensive training program have been established. At the same time, the CSA program has prompted a growing interest among state and local officials in the audit process, and in the underlying concepts of chemical process safety management. With the pending publication of final regulations and guidance on the requirements of the Risk Management Program mandated under section 112(r) of the Clean Air Act (CAA), the CSA program has assumed a critical support role in the development of the national chemical accident prevention effort spearheaded by EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO).

Of the 218 chemical safety audits conducted over the five years ending September 30, 1993, 211 final audit reports have been completed by regional personnel (see Appendix B). To compile information for this report, the final audit reports received by CEPPO have been summarized in standardized profiles consistent with the CSA protocol. The profiles provide a summary of audit observations and include the audit team's conclusions and recommendations. The profiles also contain information on facility name, location, primary processes, and product(s), the hazardous substances examined for the audit, and the name, affiliation, role, and expertise of each audit team member. Information from the latest profiles (those completed after the publication of the FY 1992 Status Report) will be provided by the distribution of the CSA database in April 1994.

The following section of this chapter discusses the potential influences of the Clean Air Act Amendments of 1990 on the future of the CSA program. The remainder of this chapter describes the key features of the existing CSA program, including its history, scope, and purpose, and key program activities — supporting state and local government involvement in the CSA program, conducting CSA training workshops, and maintaining the CSA database. Chapter 2 provides a statistical overview of the results of CSA program activities and achievements. Chapter 3 provides an overview of regional activities in implementing the CSA program. Finally, Chapter 4 reviews facility chemical process safety practices identified in the latest 75 final CSA reports submitted to CEPPO since the publication of the FY 92 CSA Status Report.

1.1 Future Role of the CSA Program

With the pending implementation of the risk management plan (RMP) requirements under CAA section 112(r), the focus and scope of the CSA program will change. Because the regulations are still under development and the deadlines for industry compliance are a few years away, the evolution of the CSA program will occur in two phases. In the first phase, before final regulations are published, the CSA program will be used to help develop and enhance the expertise and capabilities needed to implement the RMP program. The second phase will address the long term future of the CSA program in relationship to the implementation of the RMP program which includes an auditing program, training, and technical assistance efforts.

The RMP provisions require facilities handling regulated substances above specified thresholds to prepare and implement a risk management program — including a hazard assessment, a prevention program, and an emergency response program — within three years after the final regulation is promulgated. The program must be described in a risk management plan (RMP). The RMP must be registered with EPA, and submitted to the Chemical Safety and Hazard Investigation Board, state emergency response commission (SERC), and local emergency planning committee (LEPC), and be made available to the public. The CAA also requires EPA to establish an auditing system to review, revise, and update the RMPs. The auditing system in the proposed RMP regulations outlines the criteria for developing a state auditing program. In addition, an auditing strategy is being proposed in the guidance to states for implementation of the accidental release prevention program. CAA sections 112(r) and 507 further require EPA to provide technical assistance on how to comply with the Act.

Because the focus of the CSA program and the proposed RMP elements are similar, the two key elements of the CSA program — chemical safety audits and CSA training — will ensure that EPA, SERCs, and LEPCs have the expertise and capabilities to understand these RMPs, and will play a critical role in the successful implementation of the RMP program. At the same time, the increasing state and local interest and involvement in the CSA program will provide continuity on chemical process safety issues until state RMP programs are established. Additionally, the audits themselves serve as a means to assist industry in understanding more about the holistic nature of chemical process safety management. The audits have proved useful in helping more than the facility audited — many have shared their audit experiences and recommendations with other facilities within their company (see Chapter 3).

The more than 200 audits conducted and over 500 federal, state, and local officials trained represents a body of expertise and experience that will provide a pool of resources at all levels of RMP implementation. To illustrate the effectiveness of the CSA program as a resource for other programs and projects, several regional offices in FY 93 conducted audits of facilities handling hydrogen fluoride to facilitate CEPPPO's Congressionally mandated study of that chemical. Additionally, more recent audits have, and are being planned to, focus on the use of section 112(r) substances in refrigeration systems. Because it is likely that large number of facilities are unaccustomed to this type of regulations, it is important for EPA to understand their current chemical process safety practices.

The CSA training is another ongoing opportunity for building the expertise and knowledge base needed for implementing the RMP program. Each regional office will have the opportunity in FY 94 to hold a CSA course at a location of their choosing. For example, a CSA workshop in FY 93 was held in Columbus, OH, at the request of the state.

After the promulgation of the final RMP regulations, EPA will be faced with the task of training both the regulators and the regulated community. The resources for developing such training will be conserved by using the training materials developed for the CSA workshops and the advanced CSA course. These training materials focused on specific RMP elements, including process hazards analysis, SOPs, maintenance, training, prevention and mitigation systems, safety audits, management of change, pre-startup review, and incident investigation.

Even though the focus of the audit will be changed under the RMP program (i.e., compliance-based), the basic structure for conducting an audit will be the same and a large cadre of trained and experienced regional, state, and contractor personnel will be available to conduct such audits. But it is nevertheless important to recognize the importance of the voluntary nature of the CSA program. As the Administrator encourages, cooperative efforts with industry to protect human health and the environment are essential in today's competitive global economy.

In order to provide such opportunities in this arena, CEPPPO is considering preserving the voluntary component of the CSA program intact. The CSA program could serve as a consultative program — similar to OSHA's program for assisting industry in complying with the Hazard Communication standard — to continue to help industries improve their chemical process safety practices. The program could be designed to ensure that facilities audited were selected in part because of corporate commitment to share audit results with other facilities within their company and their industry. This type of program can also be useful in reducing EPA costs associated with enforcing the RMP provisions.

1.2 State CSA Programs

An important trend in the CSA program has been the growing interest of states in enhancing their ability to conduct chemical safety audits or to develop their own CSA program to support chemical accident prevention initiatives at the state and local levels. This interest has been fostered by the states' emergency preparedness responsibilities under the Emergency Planning and Community Right-to-Know

Act (also known as Title III) and related state legislation, as well as the potential responsibilities of overseeing the implementation of the Clean Air Act's Risk Management Program. Regional CEPP offices have been actively supporting state and local involvement in the CSA program by involving them in all phases of the audit process and conducting training workshops at locations in keeping with state and local interest in the program — more than half of the attendees at the initial training workshops held during FY 93 were state and local officials.

In addition, the regions have been providing support for the development of state CSA programs. During FY 92, Region 8 provided technical assistance to the Colorado SERC in designing, organizing, and delivering two workshops to train LEPC members from across the state. Region 9, with headquarter contractor support, assisted Nevada in the design and delivery of a training workshop and in developing an audit program, as part of the implementation of the state Chemical Catastrophe Prevention Act (CCPA) to support a CCPA-authorized chemical safety audit program. As more and more SERCs and LEPCs look for ways to better prepare for, and prevent, chemical accidents, particularly in light of the Clean Air Act regulations, interest in the CSA program will continue to increase. Chapter 3 provides more information on regional efforts to promote the CSA programs at the state and local levels.

1.3 CSA Training Workshop

In order to provide guidance on the procedural and technical aspects of conducting an audit and to promote a better understanding of the objectives of the CSA program, EPA has designed the Chemical Safety Audit program workshop. In FY 93, EPA's Environmental Response Training Program added the four-day CSA workshop to its regular curriculum. Workshops were held in Long Beach, CA, on January 26-29, 1993, Columbus, OH, on April 6-9, 1993, Edison, NJ, on June 8-11, 1993, and Atlanta, GA, on July 20-23, 1993; CEPPO also developed and presented a pilot for an advanced CSA workshop in Denver, CO, on December 15-17, 1992. A total of 551 EPA regional, AARP, contractor, state and local government, and other federal agency personnel, and other individuals, have attended the eighteen workshops.

The Denver workshop was the first installment of an advanced training workshop to discuss more technical issues related to conducting audits and preparing audit reports for personnel already familiar with the CSA program. The two-day workshop provided a forum for audit team members to share experiences and lessons learned with teams from other regions. The workshop focused on techniques for preparing for the audit, writing the audit report, and following up on the results of the audit, as well as more technical details related to specific elements of the CSA protocol, and also featured a tour of a nearby facility.

For FY 94, the Environmental Response Training Program plans to present eleven four-day CSA courses on the schedule provided below. The specific locations for ten of these workshops will be determined by the appropriate regional office to encourage further state and local interest and participation in the CSA program:

- | | | |
|---|-----------------------|-----------------------|
| • | October 26-29, 1993 | Region 8 |
| • | December 7-10, 1993 | Region 9 |
| • | February 1-4, 1994 | Region 6 |
| • | March 1-4, 1994 | Region 7 |
| • | April 12-15, 1994 | Region 2 |
| • | May 3-6, 1994 | Region 1 |
| • | May 17-20, 1994 | Region 10 |
| • | June 21-24, 1994 | Region 5 |
| • | July 19-22, 1994 | Region 3 |
| • | August 2-5, 1994 | Region 4 |
| • | September 20-23, 1994 | ERT, Cincinnati, Ohio |

These four-day workshops are designed for presentation to a combination of regional, AARP, contractor, and state and local government personnel who are or will be involved in conducting chemical safety audits. The topics addressed during the current four-day workshop include:

- EPA's Chemical Accident Prevention program;
- Chemical process safety management;
- *Guidance Manual for EPA Chemical Safety Audit Team Members*;
- Chemical safety audit protocol;
- Chemical and process hazards;
- Hazard evaluation techniques and application;
- Process safety systems and practices;
- Incident investigation; and
- Interview techniques.

In addition, a series of sequential group exercises are held during the workshop to provide participants with the opportunity to apply theoretical knowledge in scenarios that simulate all phases of conducting a chemical safety audit, including interviewing facility personnel.

1.4 CSA Program Modifications

The latest edition of the *Guidance Manual for EPA Chemical Safety Audit Team Members* (June 1993) outlines two important modifications to the CSA program implemented for FY 93 — the preparation of report profiles by the regional offices and the institution of audit follow-up activities — as well as a clarification of the existing policy regarding the handling of confidential information. The following sections outline these changes.

Report Profile Preparation

As part of the audit process, the regional offices should prepare an audit report profile for headquarters in conjunction with the submission of the chemical safety audit report. The profile (see the annotated profile in the revised *Guidance Manual for EPA Chemical Safety Audit Team Members* (June 1993) for more information) organizes the key information in the audit report, including background information on the facility and the audit team, as well as audit team 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. 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 CSA database. The profiles submitted by the regions during FY 93 represent an important first step in streamlining program analysis; headquarters will continue to work with the regions to ensure that the

information submitted is consistent with the needs of the database. A review of the regional profiles is contained in section 3.1 of this report.

Audit Follow-Up Activities

To supplement the audit and audit report preparation, the regional offices have been requested to establish some form of audit follow-up program. The follow-up program will support EPA's efforts to evaluate the effectiveness of the CSA program in improving, as well as heightening awareness of the need for, chemical process safety among chemical producers, distributors, and users. In addition, it is hoped that the analysis of audit results will provide a basis for amending the focus and direction of the CSA program to better achieve its goals.

The specific nature of the follow-up activities has been left to the discretion of the regional offices, but at a minimum the program should be designed to track audited facilities' implementation of CSA report recommendations. This will allow Headquarters to analyze trends in the implementation of CSA recommendations as a function of issue (e.g., employee training or instrument maintenance), level of effort (e.g., fixing a relief valve or replacing a storage tank), and type and size of facility.

Within this framework, the regional offices are free to examine other audit issues (e.g., format, relationship with state and local officials) and to communicate with the facility in writing or in person. Some of the regions also may wish to develop a method to verify whether the information received from the facility is accurate, to the extent that regional resources permit. This may involve the continued participation of state and local officials in the audit process or another facility visit by EPA or Technical Assistance Team (TAT) members.

During FY 93, many of the regional offices initiated follow-up programs, or continued existing programs. A variety of follow-up approaches have been implemented (e.g., telephone calls, questionnaires, and site visits), reflecting the varying role of the CSA program in the regions' overall chemical accident prevention efforts; see section 3.2 of this report for more details. Notable examples of regional follow-up activities include:

- Extensive post-audit discussions routinely take place between Region 1 and the facility to determine if the facility plans to address EPA recommendations. These discussions typically take the form of a conference call involving the regional personnel that participated in the audit and personnel knowledgeable about safety and plant operations.
- Since FY 92, Region 8 has sent questionnaires to audited facilities six months and one year after the completion of the final audit report to check on the facility's progress in implementing the recommendations of the audit team. The questionnaire tracks each of the audit team's recommendations, and the facility indicates its response to the recommendations, including their future plans for implementing the recommendations.
- Region 6 has continued the follow-up program initiated in FY 92. The program consists of visits by a two-man team to facilities audited during the previous year, using a standard questionnaire as the basis for interviews with the facility personnel who participated in the original audit. The region collects data on the number of recommendations implemented and the reasons why other recommendations were not implemented.

In addition to these efforts, the regions have participated in site-specific follow-up activities, such as simulation exercises and response training. The regional offices should refer to the latest edition of the *Guidance Manual for EPA Chemical Safety Audit Team Members* (June 1993) for more information and guidance on the development of audit follow-up programs.

Handling 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 must be handled in accordance with 40 CFR Part 2. Authorized representatives, including pre-identified contractors, and Agency employees can access and view CBI under CERCLA. 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.

1.5 CSA Database

To collect and disseminate information on chemical process safety issues and to improve program coordination, CEPPO has assembled a computerized database to provide EPA regions and headquarters with information gathered from final chemical safety audit reports, organized in a uniform format consistent with the CSA protocol. The information contained in the database is useful to EPA regional offices for a variety of purposes, such as identifying field experts and comparing processes and safety practices at different facilities for the same chemicals. Although the database is not directly available to the public and industry, it will be used by EPA to develop guidance and technical assistance documents that will be distributed to individuals and organizations involved in chemical accident prevention.

Through analysis of the data, CEPPO uses the CSA database to identify successful and problematic techniques or practices employed to manage process safety at facilities handling hazardous substances. In addition, CSA data are supporting the development of regulations and guidance for the risk management plans required under CAA section 112(r). CEPPO also refers to the database to assess the implementation of the CSA program in terms of the types of facilities visited (e.g., manufacturing versus non-manufacturing facilities, or chemical manufacturers versus other manufacturers), the criteria for selecting facilities to audit, and the types of hazardous substances reviewed (e.g., Title III extremely hazardous substances versus CERCLA hazardous substances).

In addition, the database has been provided to interested federal, state, and local officials who have attended CSA training workshops. These individuals are using the database as a source of background information on chemical hazards, process hazards, and successful and problematic facility practices in preparation for their own inspection and auditing activities. For example, by reviewing the information on typical operating hazards and release prevention practices at the paper mills contained in the CSA database, these officials have been better prepared to conduct inspections of similar paper mills under their own jurisdiction.

As described above, the CSA database makes it possible to examine audit information about specific facilities quickly. For example, the database user can easily examine and compare audit observations and recommendations for facilities that use similar chemicals, that manufacture similar products, or that are located in the same EPA region. Users can search the database for different types of information, such as chemical names or Chemical Abstract Service (CAS) numbers, SIC codes, processes, and process safety practice or technique, or a combination of fields. For example, a user could search the database to identify the type of containment systems present at chemical manufacturing facilities (SIC code 28) that use chlorine. EPA regional and headquarters personnel (as well as other federal and state and local officials implementing similar programs) can also use the database to:

- Identify field experts for auditing advice or participation in an audit;
- Identify facilities with similar processes or practices to support an ongoing audit;
- Compare successful or problematic safety practices among similar facilities;
- Identify previous recommendations for a similar process safety practice or technique;
- Compare safety equipment among similar facilities; and
- Assemble information on a specific chemical safety process management practice.

The current version of the CSA database, distributed in May 1993, contains profiles of 120 chemical safety audits. In April 1994, each regional CEPP coordinator will receive an update to the CSA database containing information from the latest final audit reports.

1.6 CSA Program Background

History

The CSA program is part of a broad EPA initiative designed to accomplish four chemical accident prevention goals:

- Visit facilities handling hazardous substances to learn and understand problematic and successful practices and technologies for preventing and mitigating releases;
- Heighten awareness of the need for chemical safety among chemical producers, distributors, and users, as well as in communities where chemicals are located;
- Build cooperation among authorized parties by coordinating joint audits where appropriate; and
- Establish a database for the assembly and distribution of chemical safety information obtained from facility audits and from other sources.

Following the 1984 release of methyl isocyanate in Bhopal, India, and subsequent incidents in the United States, 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. EPA established the Chemical Emergency Preparedness Program to help states and communities plan for chemical emergencies. Many of the features of this voluntary program were incorporated into the Emergency Planning and Community Right-to-Know Act (also known as Title III), which establishes a chemical emergency preparedness infrastructure within each state, territory, and Indian land.

Recognizing accident prevention as the next step after instituting local emergency preparedness efforts, EPA created the Chemical Accident Prevention (CAP) program in 1986. The CAP program seeks to identify causes of accidental releases of hazardous substances and the means to prevent them from occurring, to promote accident prevention practices in industry, and to share information with the community, industry, and other groups (e.g., academia, professional organizations, trade associations, labor, and environmental groups).

Many of these key concerns were identified in the Congressionally mandated Title III section 305(b) study, *Review of Emergency Systems*. This study reviewed technologies, techniques, and practices for preventing, detecting, and monitoring releases of extremely hazardous substances, and for alerting the public to such releases. As part of the information gathering efforts to prepare this study, the CAP program conducted a number of audits of facilities to evaluate, first-hand, their chemical process safety management practices. As one method of acquiring additional information and encouraging awareness of accident prevention at facilities, the study recommended that EPA continue the program of facility audits, thus inaugurating the CSA program.

Authority

While the CSA program is not a compliance or regulatory program, EPA does have legal authorities for entering a facility and conducting a chemical safety audit. The primary authority for EPA and its designated representatives to enter a facility and review its records and operations is provided by CERCLA sections 104(b) and 104(e), as amended by SARA. 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. If serious problems are discovered during the audit, however, EPA may use a variety of legal authorities to address them.

Audit Team

An EPA audit team consists primarily of EPA employees and other designated representatives, including contractors and AARP members. Other federal, state, and local government personnel, particularly representatives of state emergency response commissions (SERCs) and local emergency planning committees (LEPCs) established under Title III, are encouraged to participate in audits as team members or as observers. The audit team can vary in size depending on the scope of the audit and the expertise of individual team members. Although states and local governments must use their own authorities for audit participation, the CSA program encourages the involvement of LEPC and SERC members throughout the audit process.

Audit Selection

In selecting a facility for a chemical safety audit, the EPA regional office may consider a number of factors, including but not limited to the hazardous substances used, the facility's history of releases, the facility's proximity to a sensitive population or area of high population density, its accident prevention technologies, or the industry's concentration in the area. The regional office may want to review federal, state, and local release notification reports and follow-up reports; On-Scene Coordinator (OSC) reports; Regional Response Centers; Accidental Release Information Program (ARIP) reports; and other sources. Currently, most facilities selected have been identified based on their history of accidental releases, using ARIP, the Emergency Response Notification System (ERNS), and other release information sources.

At present, EPA regional offices are not required to follow any formal procedures when selecting a facility for an audit, provided the following two important requirements are met:

- Under CERCLA, EPA may enter a facility only if a release of a CERCLA hazardous substance, pollutant, or contaminant has occurred at the facility, or there is "reason to believe" that a threat of such a release exists; and
- The Office of the Regional Counsel and the SERC must be consulted to identify any legal actions currently being pursued or anticipated against the audited facility. Although not compliance-oriented, a chemical safety audit conducted at a facility where legal action is on-going or anticipated may interrupt or otherwise have an impact on the settlement process. It is also suggested that other regional program offices be consulted.

EPA can, of course, enter a facility and conduct an audit at the invitation or with the voluntary consent of the facility's management.

Audit Process

The audit 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 detection techniques;
- Training of operators and emergency response personnel;
- Facility and corporate management structure;
- Preventive maintenance and inspection programs; and
- Community notification and response coordination mechanisms.

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 its corporate management so that weak and strong program areas may be recognized.

The audit is conducted in accordance with the *Guidance Manual for EPA Chemical Safety Audit Team Members*, which contains mandatory procedures, as well as recommended actions, to follow to ensure the health and safety of program auditors and program integrity. Each member of the audit team should have a copy of the manual, and a copy of the manual should be sent to the facility prior to the audit. The guidance manual also contains an audit protocol (see Appendix A), a detailed outline that directs the scope and content of the audit and provides a structure for preparing the audit report. The protocol is designed to provide CSA teams with an organized and detailed format for conducting an audit and preparing a comprehensive report. By following the protocol in preparing CSA reports, regional staff will ensure continuity and consistency in report preparation.

EPA sets individual targets for the number of audits (and audit reports) to be completed each year by each region. During FY 93, a total of 42 audits and audit reports was targeted, with each region responsible for conducting from three to seven audits. CEPPPO uses the Strategic Targeted Activities for Results System, or STARS, to track the regions' progress toward these goals, although STARS does not involve a review of the focus and contents of the audit reports.

2.0 OVERVIEW OF CSA PROGRAM RESULTS

This chapter provides an overall summary of the achievements of the Chemical Safety Audit program focusing on the following subjects:

- Chemical safety audits and audit reports completed in each fiscal year;
- Breakdown of the audited facilities by Standard Industrial Classification (SIC) code;
- Hazardous substances examined by the audit teams; and
- Chemical safety audit training workshops conducted.

2.1 Chemical Safety Audits and Reports Completed

As of the close of FY 93, the regional offices have finalized a total of 211 audit reports for the 218 chemical safety audits conducted, including three follow-up audits for which no audit report profile was prepared.

For both FY 89 and FY 90, each EPA region was assigned a target of conducting four audits each year under the Agency's tracking and evaluation system, Strategic Targeted Activities for Results System (STARS). Beginning in FY 91, the STARS measure was expanded to include both the fulfillment of an on-site facility visit and the subsequent audit report; in addition, specific STARS targets were set for each region to reflect regional priorities and capabilities. In FY 91, 40 audits were targeted for the ten regions, with each region required to complete from three to six audits. In FY 92, 41 audits were targeted for the ten regions, with each region required to complete from three to eight audits. In FY 93, 42 audits were targeted for the ten regions, with each region required to complete from three to seven audits.

Exhibit 1 provides totals for the number of chemical safety audits that the regional offices conducted during each fiscal year. The number of reports completed by each regional office is also included. The chart indicates that 32 chemical safety audits were completed in FY 89, 39 in FY 90, 53 in FY 91, 41 in FY 92, and 53 in FY 93. Exhibit 2 provides a summary of the chemical safety audits and final reports completed by region.

2.2 Chemical Safety Audits by SIC Code

The majority of the regional offices conducted chemical safety audits at chemical manufacturing facilities (SIC code 28). Exhibit 3 provides a breakdown by SIC code of the audited facilities for which this information is available; please note that some facilities are categorized in more than one SIC code. Of these 199 audited facilities, 120 were chemical manufacturing facilities; most of these were further classified under SIC codes 281, 282, 286, or 287. Other industries at which a number of chemical safety audits were conducted are petroleum refineries — SIC code 29 (15), paper manufacturers — SIC code 26 (12), electronics manufacturers — SIC code 36 (10), primary metal manufacturers — SIC code 33 (7), fabricated metal manufacturers — SIC code 34 (7), and food producers — SIC code 20 (7).

The remaining facilities audited were classified in a variety of other SIC codes, including 34 facilities classified outside the manufacturing sector. A particular trend identified in FY 93 was the increase in audits performed at nondurable wholesalers (SIC code 51) that handle hazardous substances. In FY 93, seven nondurable wholesalers were audited, more than doubling the five audits performed at this type of facility over the previous four years. In FY 92, several public water treatment facilities were audited; this trend continued in FY 93, as three additional such facilities (SIC code 95) were audited. Other non-manufacturing facilities audited under the CSA program in FY 93 include facilities involved in oil and gas extraction and electric, gas, and sanitary services. New areas where CSA audits were performed

Exhibit 1

Summary of Chemical Safety Audits and Final Reports by Year and Region

FY 89 through 93

Region	FY 89	FY 90	FY 91	FY 92	FY 93	Total Audits	Final Reports
1	4	4	3	3	3	17	17
2	2	4	3	3	4	16	15
3	4	4	4	5	5	22	22
4	5	5	15	6	10	41	40
5	3	5	3	3	4	18	13
6	4	5	5	4	4	22	22
7	0	0	4	6	11	21	21
8	3	4	6	4	5	22	22
9	4	4	4	4	3	19	19
10	3	4	6	3	4	20	20
Total	32	39	53	41	53	218	211

Exhibit 2
Summary of Chemical Safety Audits and
Final Reports Completed by Region

FY 89 Through FY 93

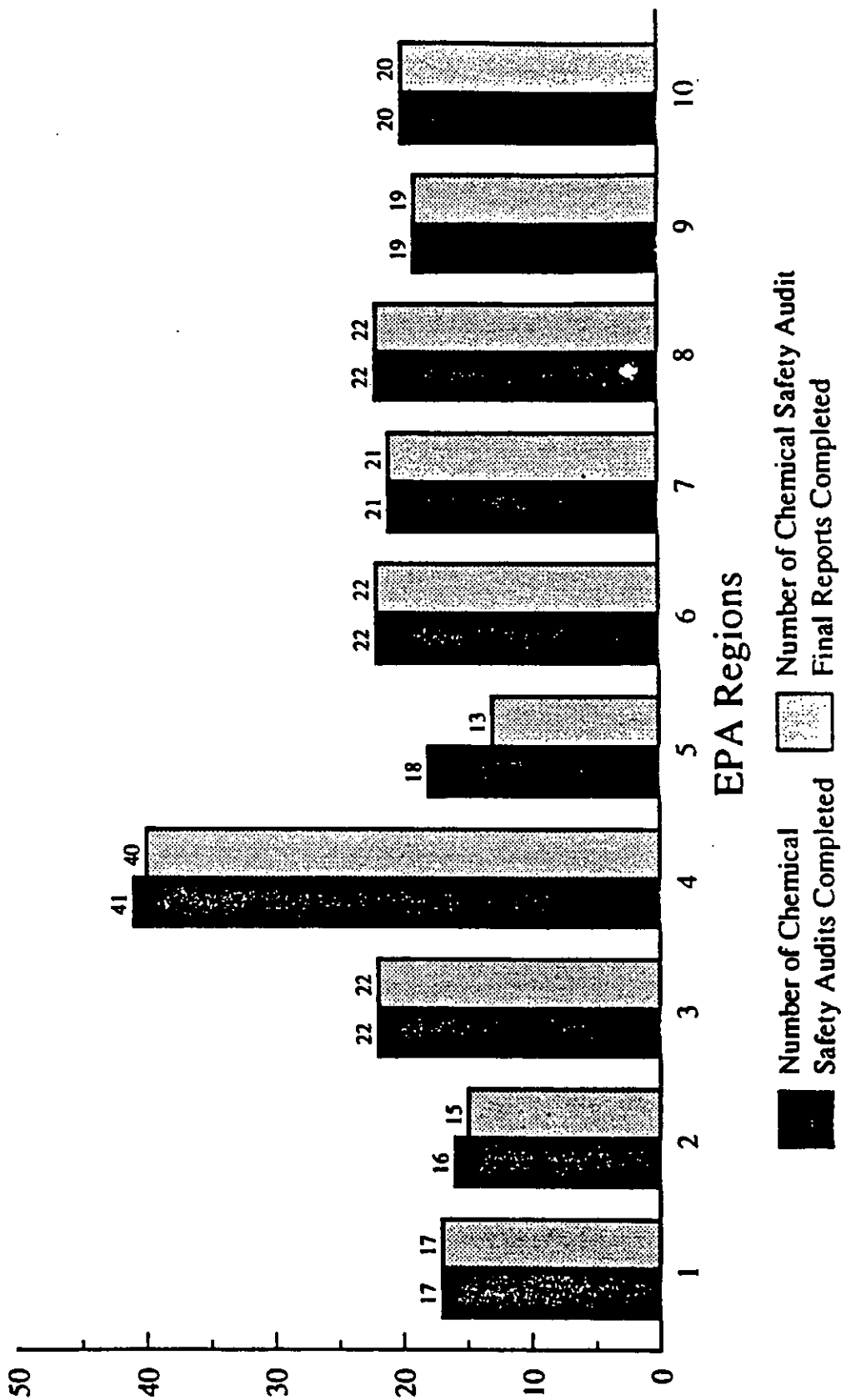
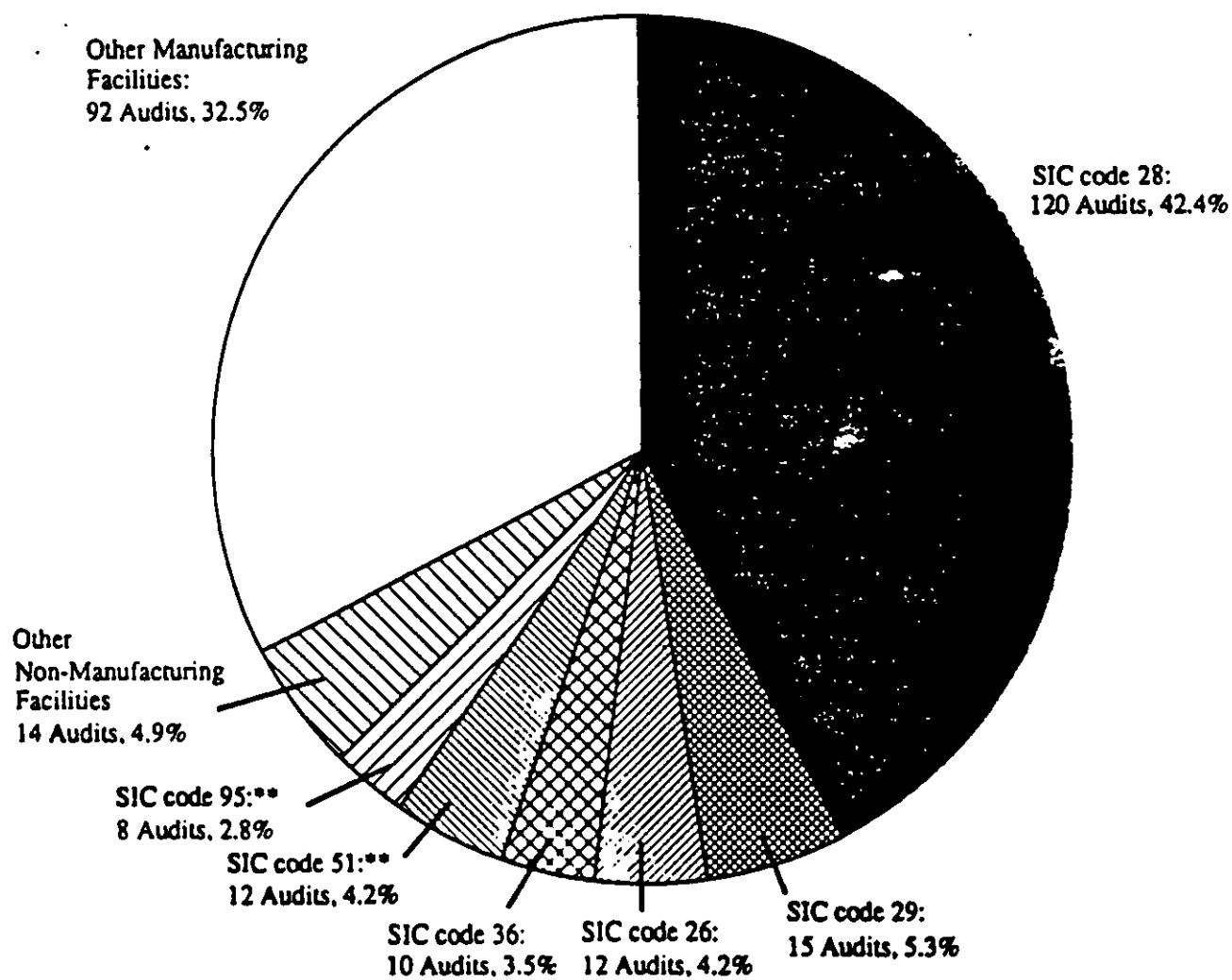


Exhibit 3
Breakdown of Audited Facilities
by SIC Code*
FY 89 Through FY 93



* This analysis is based on SIC Codes gathered from 199 audited facilities. Several of the audited facilities are classified under more than one SIC code. This information is reflected in the exhibit.

** - Non-manufacturing facilities

in FY 93 include facilities involved in special construction trade (SIC code 17), textile mill production (SIC code 22), and wholesale equipment hardware (SIC code 50).

2.3 Chemical Safety Audits by Hazardous Substance

A total of 164 different hazardous substances were examined by audit teams at the 199 audited facilities for which this information was available, including 151 classified as CERCLA hazardous substances and 65 listed as Title III extremely hazardous substances. Exhibit 4 provides a breakdown of the hazardous substances examined during the audits; Appendix C of this report provides a complete listing of the hazardous substances examined. On average, four hazardous and extremely hazardous substances were examined at each facility. The five most commonly examined substances were sulfuric acid (82 audits), chlorine (80), sodium hydroxide (69), hydrochloric acid (52), and ammonia (46).

2.4 CSA Training Workshops

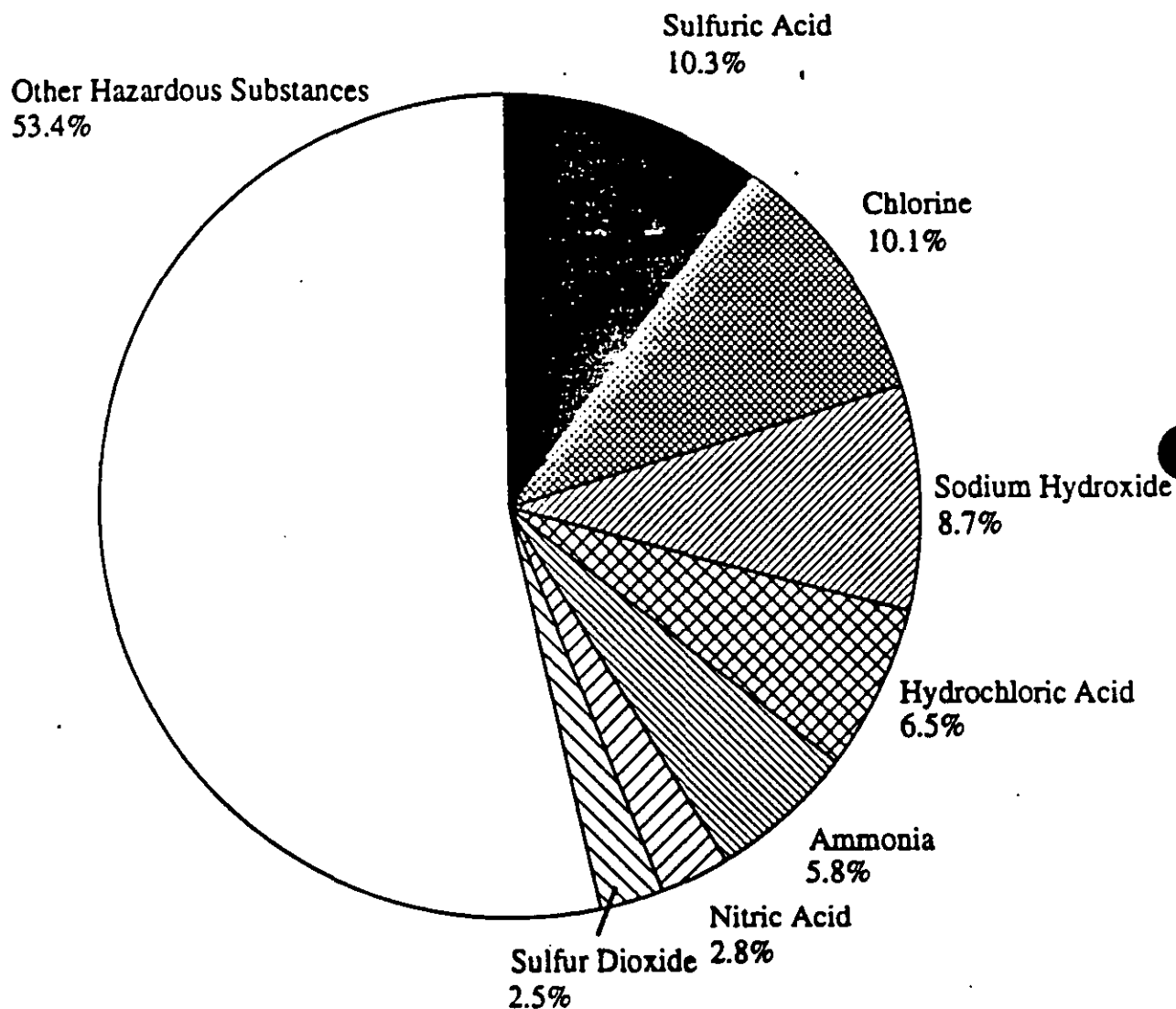
As of the close of FY 93, 18 CSA workshops had been conducted in nine of the ten EPA regions. For the first time, one of these workshops focused on advanced training to provide more detailed information on both the procedural aspects of conducting chemical safety audits and the technical aspects of chemical process safety management that a CSA team may encounter during an audit. Since FY 90, the host regions have been co-sponsors of the CSA workshops and provided valuable assistance in organizing and conducting the workshops. Hosting the workshop in cities near the locations of the regional office has also allowed other EPA program offices and other federal agencies to attend.

The advanced training workshop was held in Denver, CO. During FY 93, four other training workshops were held in Long Beach, CA, Columbus, OH, Edison, NJ, and, for a second time, in Atlanta, GA. Counting those individuals who attended both the advanced and initial training sessions separately, a total of 551 attendees participated in the 18 workshops.¹ A variety of groups were represented at the workshops including 152 regional personnel, 25 AARPs, 150 contractor personnel (primarily TAT members), 106 state officials (from 22 states), 58 local officials, 21 representatives from other federal agencies (primarily FEMA, OSHA, and the U.S. Air Force), 11 industry representatives, and 28 others (e.g., EPA HQ personnel). For the first time, two representatives from an academic institution attended a CSA training workshop. Exhibit 5 provides a breakdown of CSA workshop attendees by affiliation. Exhibit 6 compares the percentage of attendees by affiliation between FY 89 to FY 92 and FY 93. The increase in the percentage of state and local representatives reflects a concerted effort within the CSA program to increase awareness and participation by these representatives in the program. For instance, a CSA workshop was held in Columbus, Ohio, at the request of the State of Ohio to have this type of training for their LEPCs.

Exhibit 7 is a breakdown by region of the number of audit team members who have received training. State and local officials, HQ personnel, HQ contractors, and other federal agency representatives are not included in these figures. The largest number of personnel attending a workshop were from Region 4 (73), Region 3 (60), Region 2 (43), Region 8 (29), and Region 6 (28).

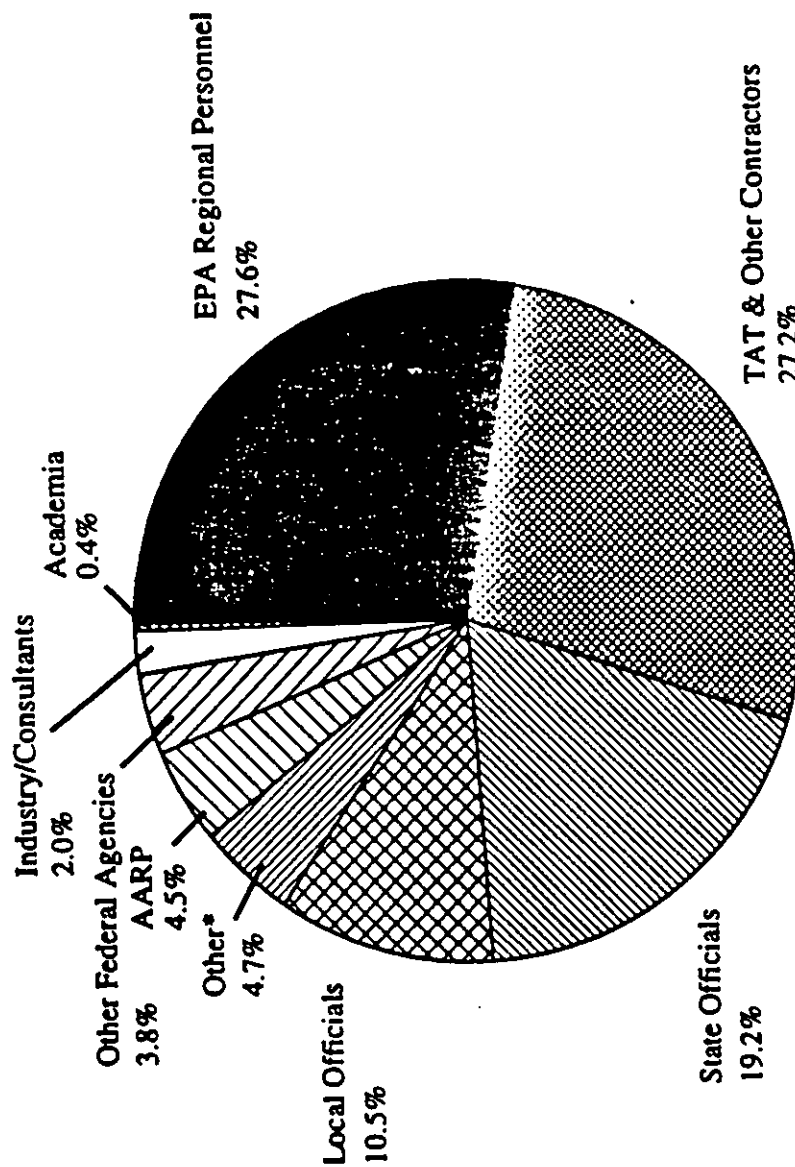
¹The actual number of separate individuals who have attended CSA workshops is 524. Individuals who attended both the initial and advanced workshops have been counted twice, while those who attended multiple initial workshops have been counted only once.

Exhibit 4
Hazardous Substances Examined*
FY 89 Through FY 93



* In addition to CERCLA hazardous substances, this chart also includes extremely hazardous substances listed under SARA Title III section 302, but not designated as CERCLA hazardous substances.

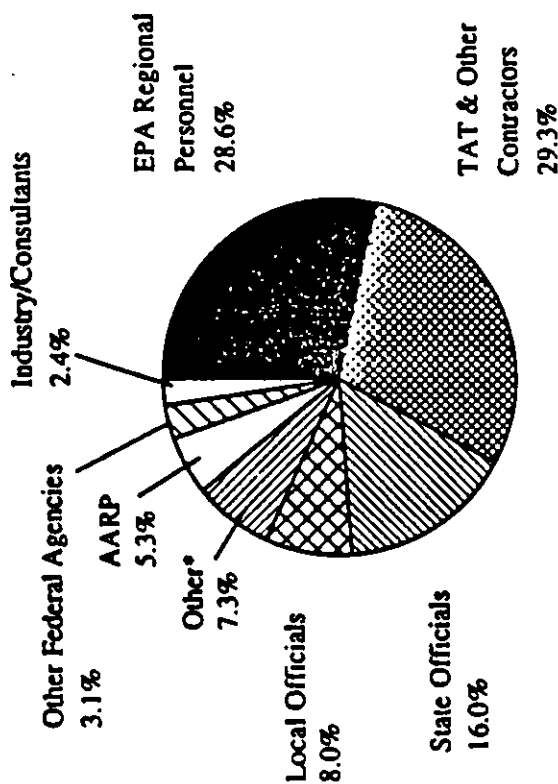
Exhibit 5
Chemical Safety Audit Workshop Attendees
by Affiliation
FY 89 Through FY 93



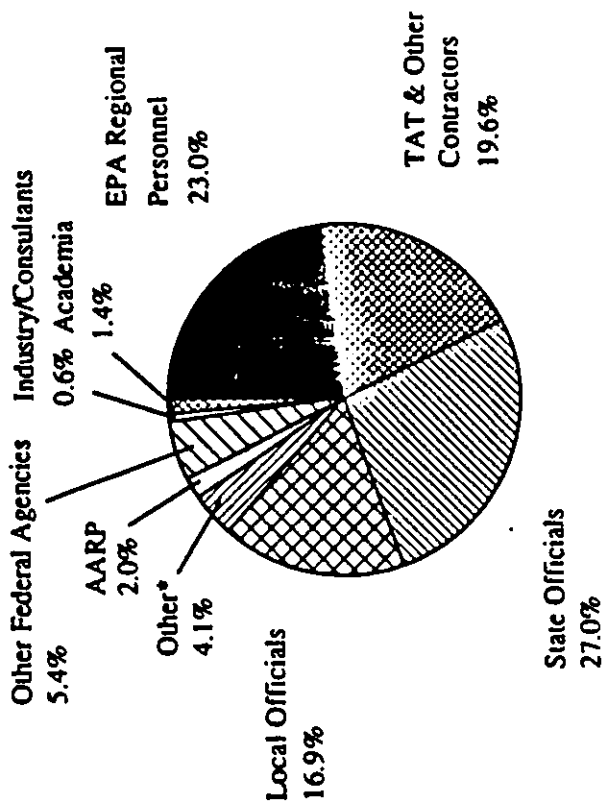
• Other includes personnel from EPA HQ and HQ contractors.

Exhibit 6 Chemical Safety Audit Workshop Attendees by Affiliation

FY 89 Through FY 92

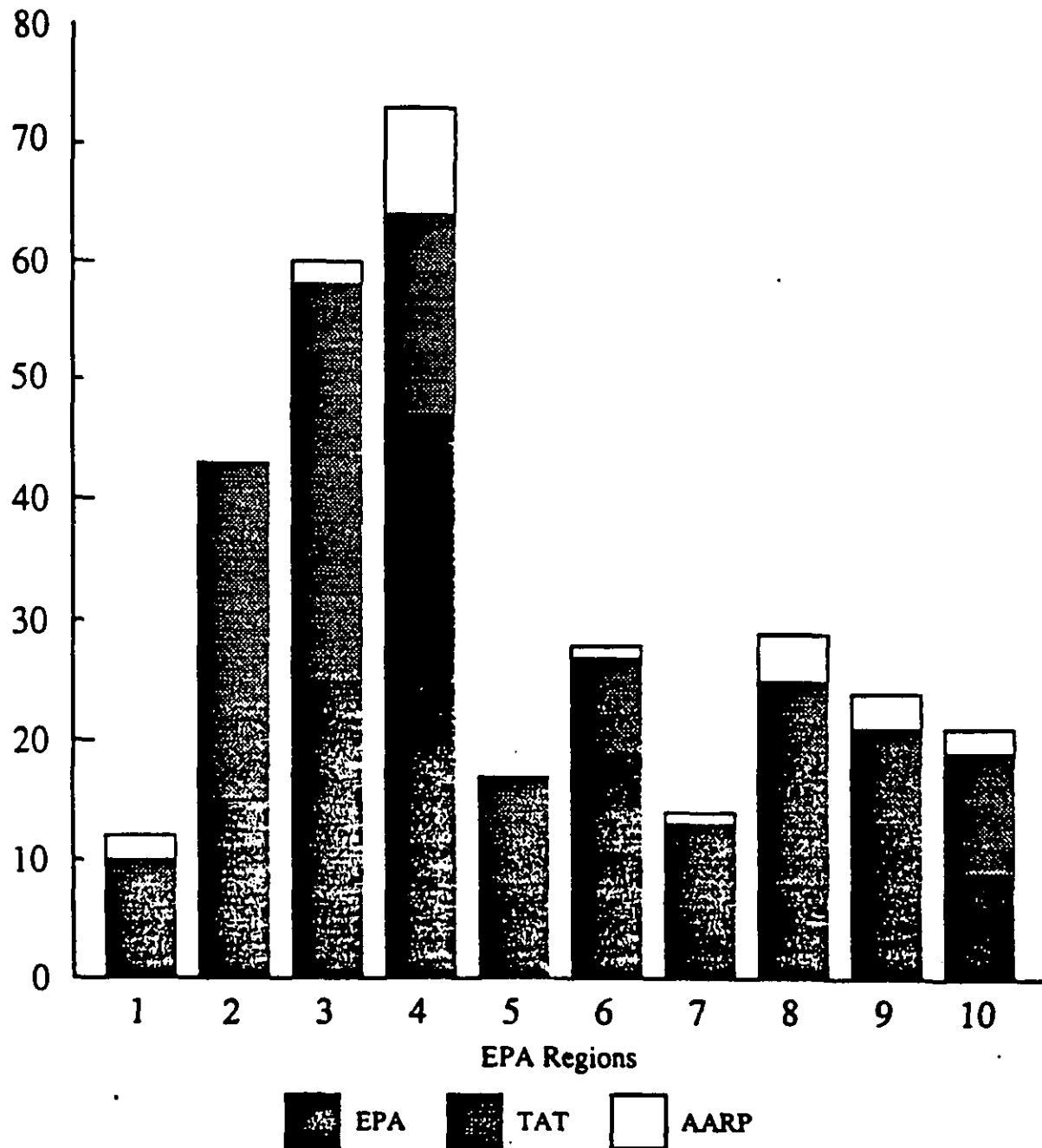


FY 93



* Other includes personnel from EPA HQ and HQ contractors.

Exhibit 7
Chemical Safety Audit Workshops
Number of Persons Trained by EPA Regions*
FY 89 Through FY 93



* Totals include EPA Regional personnel, AARPs, TAT and other contractor personnel, but do not include state and local officials, EPA HQ personnel, EPA HQ contractors, and other Federal agency officials who receive training.

APPENDIX B
LIST OF CHEMICAL SAFETY AUDITS

LIST OF CHEMICAL SAFETY AUDITS

as of October 1, 1993

REGION	DATE OF AUDIT	REPORT STATUS	NAME OF FACILITY
1	03/22/89	X	Polysar, Inc., Indian Orchard, MA
	04/10-14/89	X	W.R. Grace, Nashua, NH
	08/03/89	X	Fall River Treatment Plant, Fall River, MA
	08/07-11/89	X	Upjohn Co., North Haven, CT
	11/29/89	X	Bradford Soap Works, W. Warwick, RI
	03/20/90	X	Jones Chemicals, Merrimac, NH
	06/20-21/90	X	Monet Crystal Brands, Pawtucket, RI
	09/12-13/90	X	LCP Chemicals, Orrington, ME
	12/17-18/90	X	Hercules, Inc., Chicopee, MA
	05/13-14/91	X	Pacific Anchor, Cumberland, RI
	07/24-25/91	X	Rising Paper Company, Housatonic, MA
	12/18/91	X	Johnson Controls, Benington, VT
	01/27-30/92	X	Hoechst Celanese, Coventry, RI
	06/25-26/92	X	Pratt & Whitney, Southington, CT
	10/28-30/92	X-D	James River, Old Town, ME
2	05/11-14/93	X-D	Monsanto, Springfield, MA
	08/24-25/93		Daveall, Cranstain, RI
	08/21-24/89	X	BASF, Rensselaer, NY
	09/11/89		Xerox Corporation, Webster, NY
	01/09-10/90	X	Du Pont Agrichemicals, Manati, PR
	01/11-12/90	X	Bacardi Rum, San Juan, PR
	07/31 - 08/01/90	X	Goodyear, Niagara Falls, NY
	09/10-11/90	X	BASF, Washington, NJ
	03/11-13/91	X	C.P. Chemicals, Sewaren, NJ
	06/03-05/91	X	3M/O-Cell-O, Tonawanda, NY
	08/05-07/91	X-D	Schenectady Chemicals, Schenectady, NY
	03/25-26/92	X	CPS Chemical Company, Old Bridge, NJ
	06/22/92	X	Caguas WWTP, Caguas, PR
	06/23/92	X	Puerto Nuevo WWTP, San Juan, PR
	06/24/92	X-D	Bayamon WWTP, Catano, PR
3	11/11-12/92	X-D	Witco Corporation, Brooklyn, NY
	6/21-23/93	X-D	ArsynCo, Carlstadt, NJ
	06/28-30/93		International Paper, Ticonderoga, NY
	07/30-08/03/89	X	Rhone-Poulenc, Charleston, WV
	08/14-16/89	X	LCP Chemicals, Inc., Moundsville, WV
	09/11-12/89	X	Purolite Company, Philadelphia, PA
	09/25-26/89	X	Carl Falkenstein, Philadelphia, PA
	01/31 & 02/02/90	X	Automata, Sterling, VA
	02/12-16/90	X	Mobay Chemical, New Martinsville, WV
	03/26-28/90	X	Olin Chemical, Charleston, WV
	08/20-22/90	X	Occidental Chemicals, Delaware City, DE
	01/07-10/91	X	Rohm & Haas, Bristol, PA
	04/15-16/91	X	Anzon Lead, Philadelphia, PA
	04/23-25/91	X	DuPont Textile Fibers, Waynesboro, VA
	05/21-23/91	X	SCM Chemicals, Baltimore, MD
	11/19-22/91	X	Vista Chemicals, Baltimore, MD
	02/03-07/92	X	Allied-Signal, Hopewell, VA
	04/27-29/92	X	BP Oil Refinery, Marcus Hook, PA
	07/07-10/92	X	Huntsman Chemical Corp., Chesapeake, VA
	07/28-29/92	X-D	Beatrice Cheese, Whitehall, PA
	11/09-11/92	X-D	Allied-Signal, Philadelphia, PA
	01/12-14/93	X-D	Weirton Steel, Weirton, WV
	03/09-11/93	X-D	Koppers Industries, Follansbee, WV
	05/18-20/93	X-D	Merck and Company, Riverside, PA
	06/22-23 & 07/14 1993	X-D	Konsyl/Trinity, Easton/Salisbury, MD

<u>REGION</u>	<u>DATE OF AUDIT</u>	<u>REPORT STATUS</u>	<u>NAME OF FACILITY</u>
4	03/20-24/89	X	Royster Phosphate, Piney Point, FL
	05/01-05/89	X	Olin Corporation, Charleston, TN
	07/11/89 & 08/03-04/89	X	Armco Steel, Ashland, KY
	07/18-20/89	X	Kerr McGee, Hamilton, MS
	08/17/89 & 09/11-15/89	X-D	Texas Gulf, Aurora, NC
	02/12-13/90	X	Photocircuits Atlanta, Peachtree City, GA
	02/26-03/02/90	X	Kemira, Savannah, GA
	04/04-05/90	X	Astrotech, Titusville, FL
	05/08-11/90		Cardinal Chemical Co., Columbia, SC
	09/11-13 & 24-27/90	X-D	Tennessee Chemical Co., Copper Hill, TN
	10/26/90	X	Kason Industries, Newnan, GA
	11/29/90	X	C & S Chemical Company, Austell, GA
	12/4-5/90	X	Carolina Solite, Norwood, NC
	12/4-5/90	X	Oldover Corporation, Albemarle, NC
	12/12/90	X	Tull Chemical Company, Oxford, AL
	01/07-10/91	X	Peridot Chemical Company, Augusta, GA
	01/22-25/91	X	Aqua Tech/Groce Labs, Duncan, SC
	01/30-31/91	X	Virtex Chemicals, Bristol, TN
	02/20-21/91	X	Water Treatment Plant, Cape Coral, FL
	02/25-26/91	X	Canal Pumping Station, Cape Coral, FL
	03/04-08/91	X	Kentucky American Water, Lexington, KY
	03/19/91	X-D	Drexel Chemical Co., Tunica County, MS
	03/27/91	X	Columbia Organics, Camden, SC
	04/02/91	X	Armstrong Glass, Atlanta, GA
	08/26-29/91	X-D	B. F. Goodrich, Calvert City, KY
	11/12-14/91	X	West Lake Monomers, Calvert City, KY
	01/21-24/92	X-ND	Piney Point Phosphates, Piney Point, FL
	03/24-26/92	X	Reichold Chemicals, Kensington, GA
	04/28-05/01/92	X	G.E. Lighting Systems, Hendersonville, NC
	07/20-21/92	X	Jones Chemicals, Charlotte, NC
	08/25-26/92	X-ND	Peridot Chemical Company, Augusta, GA
	08/03-07/92	X-D	Velsicol Chemicals, Chattanooga, TN
	11/16-20/92	X-D	Mississippi Chemicals, Yazoo City, MS
	01/04-08/93	X-D	DuPont, Louisville, KY
	02/01-02/93	X-D	IMC Fertilizer, Tampa, FL
	02/02-03/93	X-D	Seminole Fertilizer, Tampa, FL
	02/04-05/93	X-D	CF Industries, Tampa, FL
	03/29-04/02/93	X-D	Jones Chemicals, Mobile, AL
	03/29-04/02/93	X-D	Occidental Chemicals, Mobile, AL
	07/12-13/93	X-D	Trojan Battery, Lithonia, GA
	08/02-06/93	X-D	Ciba-Geigy, McIntosh, AL
5	07/25-28/89	X	Koppers, Cicero, IL
	08/08-11/89	X	Best Foods, Chicago, IL
	09/15/89		Shell Oil, Wood River, IL
	03/05/90		Eli Lilly, Clinton, IN
	03/26-30/90		Anderson Development, Adrian, MI
	04/14-18/90	X	General Electric Plastics, Mt. Vernon, IN
	06/11-15/90		Tremco, Inc., Cleveland, OH
	07/16-19/90		Flexel, Inc., Covington, IN
	03/18-20/91	X	Detroit Edison, River Rouge, MI
	05/20-22/91	X	Nalco Chemical Company, IL
	08/12-14/91	X	SCM Chemicals, Ashtabula, OH
	03/10-12/92	X	Elf Atochem, Riverview, MI
	04/21-23/92	X-D	BASF Corporation, Wyandotte, MI
	06/02-04/92	X-D	G.E. Superabrasives, Worthington, OH
	11/03-05/92	X-D	Yenkin-Majestic Paints, Columbus, OH
	12/15-17/92	X-D	Allison Gas Turbine, IN
	04/13-15/93	X-D	Lomac Corporation, Muskegon, MI
	06/15-17/93	X-D	Specialty Chem, Marinette, WI

<u>REGION</u>	<u>DATE OF AUDIT</u>	<u>REPORT STATUS</u>	<u>NAME OF FACILITY</u>
6	06/13/89	X	Western Extrusion, Carrollton, TX
	08/30-31/89	X	Great Lakes Chemical Co., El Dorado, AR
	08/15-16/89	X	Farmland Industries, Enid, OK
	09/12-13/89	X	Fermenta ASC Corporation, Houston, TX
	10/16-17/89	X	Chief Supply, Haskell, OK
	11/06-07/89	X	Phillips Petroleum, Pasadena, TX
	11/14/89	X	Texas Instruments, Dallas, TX
	01/17-18/90	X	Exxon Refinery, Baton Rouge, LA
	04/17-19/90	X	Olin Chemicals, Lake Charles, LA
	03/05-06/91	X	Sid Richardson Carbon Co., Borger, TX
	03/20-22/91	X-D	ARCO Chemical, Channelview, TX
	05/01-03/91	X	Citgo Refinery, Lake Charles, LA
	07/09-11/91	X-D	International Paper, Pine Bluff, AR
	08/27-29/91	X	Agricultural Minerals, Catoosa, OK
	02/25-26/92	X	Safety-Kleen Corporation, Denton, TX
	06/09-10/92	X	Halliburton Services, Caldwell, TX
	08/17-18/92	X-D	Houston Woodtech, Houston, TX
	08/24/92	X	Allied-Signal, Geismar, LA
	11/17-18/92	X-D	CPS Chemicals, West Memphis, AR
	03/16-17/93	X-D	Labco, Inc., Slidell, LA
	08/31-09/03/93	X-D	Chevron USA, El Paso, TX
	09/08-09/93	X-D	Harcross Chemicals, Dallas, TX
7	10/25/90	X	ICI Americas, Omaha, NE
	11/20/90	X	Jacobson Warehouse, Des Moines, IA
	05/01/91	X	ABB Power Transformers, St. Louis, MO
	07/31/91	X	Hydrozo, Inc., Lincoln, NE
	12/04/91	X-D	Rhone-Poulenc, Sedalia, MO
	05/06-07/92	X-D	American Cyanamid, Hannibal, MO
	06/15-16/92	X-D	Proctor and Gamble, Kansas City, KS
	06/22-23/92	X	Hercules Aqualon Company, Louisiana, MO
	07/15/92	X-D	Cotter and Company, Kansas City, MO
	08/17-18/92	X-D	Cornbelt Chemical Company, McCook, NE
	08/31/92		Eagle Lithographing, Kansas City, MO
	09/03/92	X-D	Independence WWTP, Sugar Creek, MO
	09/30/92	X	Flexel, Inc., Tecumseh, KS
	12/16/92	X-D	Arcadian Fertilizer, Clinton, IA
	12/18/92	X-D	Rock Creek WWTP, Independence, MO
	04/26/93	X-D	Rhone-Poulenc AG, St. Louis, MO
	05/13/93	X-D	LaRoche Industries, Crystal City, MO
	05/11/93	X-D	Golden Valley Cheese, Clinton, MO
	06/03/93	X-D	Total Petroleum, Arkansas City, KS
	06/29/93	X-D	Farmland Industries Petro, Coffeyville, KS
	07/08/93	X-D	AG Processing, Eagle Grove, IA
8	05/02-04/89	X	Phillips Refinery, West Bountiful, UT
	06/13-15/89	X	Chevron Chemical, Rock Springs, WY
	08/15-17/89	X	Western Forge, Colorado Springs, CO
	03/27/90	X	Koppers Industries, Denver, CO
	05/15-17/90	X	Amoco Production Company, Powell, WY
	06/26-29/90	X	Amoco Casper Refinery, Casper, WY
	08/27-31/90	X	Western Zirconium, Ogden, UT
	11/01/90	X	Jemm Plating, Co., Denver, CO
	02/06-07/91	X	SAS Circuits, Littleton, CO
	02/19-21/91	X	Kodak-Colorado Division, Windsor, CO
	04/30-05/03/91	X	Col. Falls Aluminum, Columbia Falls, MT
	05/29-31/91	X	Syncom Technologies, Mitchell, SD
	09/29-30/91	X	LaRoche Industries, Orem, UT
	11/12-13/91	X	T.G. Soda Ash, Granger, WY
	02/18-20/92	X	Coastal Chemical, Cheyenne, WY
	02/25-27/92	X	Chevron Refinery, Salt Lake City, UT
	05/27-29/92	X	Rhone-Poulenc, Butte, MT

<u>REGION</u>	<u>DATE OF AUDIT</u>	<u>REPORT STATUS</u>	<u>NAME OF FACILITY</u>
8 (cont'd)	08/18-19/92	X-D	ALCHEM, Ltd., Grafton, ND
	02/09-12/93		Stone Container Corp., Missoula, MT
	05/18-21/93		Magnesium Corp., Salt Lake City, UT
	06/15-18/93		Frontier Refining, Cheyenne, WY
	09/08-10/93		Koch Sulfur Products, Riverton, WY
9	05/12-13/89	X	Nunes Cooling, Salinas, CA
	07/25-27/89	X	Unocal Chemical, Brea, CA
	08/16-17/89	X	Eticam of Nevada, Fernley, NV
	09/07-08/89	X	Coronado Generator, St. Johns, AZ
	04/17-20/90	X	Ultramar Refinery, Wilmington, CA
	06/19-22/90	X	Magma Copper, San Manuel, AZ
	07/17-20/90	X	Pioneer Chlor-Alkalai, Henderson, NV
	09/10-16/90	X	Dole Packaged Foods, Honolulu, HI
	04/09-12/91	X	Motorola, Phoenix, AZ
	07/16-19/91	X	Dow Chemicals, Pittsburg, CA
	08/20/91	X-ND	Pioneer Chlor-Alkalai, Henderson, NV
	08/21-23/91	X	Timet Corporation, Henderson, NV
	02/11-14/92	X-D	Brewer Environmental Services, Honolulu, HI
	06/08/92	X-D	General Chemical Corporation, Pittsburg, CA
	07/14-17/92	X-D	Chevron Refinery, Richmond, CA
	08/24-27/92	X-D	Shell Oil Refinery, Martinez, CA
	02/23-24/93	X-D	Brewer Environmental Services, Honolulu, HI
	05/03-05/93		Union Pacific Railroad, Stockton, CA
	07/27-30/93		Louisiana Pacific Pulp Mill, Samoa, CA
10	07/27/89	X	All Pure Chemical Company, Kalama, WA
	08-10/89	X	ITT Rayonier, Port Angeles, WA
	09/12-15/89	X	McWhorter Northwest, Portland, OR
	03/19-23/90	X	BP Oil Company, Ferndale, WA
	04/23-27/90	X	FMC Corporation, Pocatello, ID
	05/14-18/90	X	Neste Resins, Springfield, OR
	09/24-28/90	X	Unocal Chemicals, Kenai, AK
	01/08/91	X	Occidental Chemicals, Tacoma, WA
	01/15-18/91	X	Chevron USA, Seattle, WA
	03/18-22/91	X	James River Corporation, Clatskanie, OR
	04/22-26/91	X	Pottlatch Corporation, Lewiston, ID
	07/23-26/91	X	Great Western Chemical Co., Nampa, ID
	08/05-09/91	X-D	Boise Cascade Mill, Wallula, WA
	02/24-28/92	X-D	Georgia-Pacific Paper Division, Toledo, WA
	03/23-27/92	X-D	SEH America, Vancouver, WA
	04/28-05/01/92	X-D	Amalgamated Sugar Company, Twin Falls, ID
	07/27-31/92	X-D	ALCOA, Wenatchee, WA
	11/16-20/92	X-D	Weyerhaeuser Company, Springfield, OR
	01/25-29/93	X-D	Wacker Siltronic, Portland, OR
	04/12-16/93	X-D	Ponderay Newsprint, Usk, WA
	07/26-27/93		Darigold, Caldwell, ID
	07/28-30/93		Simplot, Caldwell, ID

Notes:

1. "X" indicates that the final report has been received, and the profile has been entered into the database.
2. "X-D" indicates that the final report has been received, and the profile is being completed.
4. "X-ND" indicates that the final report has been received, but no profile has been prepared because the audit was a follow-up visit, rather than a new audit.
5. Bold text indicates that the final report has not yet been received.
6. The audit conducted by Region 10 at ITT Rayonier in Port Angeles, WA, occurred over a period of several months.