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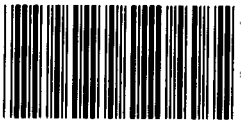
Report to the Chairman, Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives

November 1992

NUCLEAR SECURITY

Improving Correction of Security Deficiencies at DOE's Weapons Facilities



GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-249166

November 16, 1992

The Honorable John D. Dingell
Chairman, Subcommittee
on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

Securing and safeguarding nuclear materials, one of the Department of Energy's (DOE) key responsibilities, is critical to both national and international safety and defense. Yet, between January 1989 and September 1990, routine DOE security inspections identified more than 2,100 security deficiencies at 39 of its contractor-operated weapons-related facilities. These deficiencies lessen assurances about DOE's ability to safeguard nuclear materials.

Concerned about the number and potential effects of such security weaknesses, you asked us in January 1991 to review the efforts of DOE's operating contractors to correct security deficiencies and of DOE in ensuring that the contractors are adequately correcting the deficiencies. Specifically, we evaluated 20 security deficiency cases at four nuclear weapons facilities to determine the adequacy of (1) contractors' compliance with requirements and procedures for correcting security deficiencies and (2) DOE's oversight of contractors' corrective actions.

Results in Brief

The contractors' performances were not adequate in conducting four of the eight procedures considered necessary in meeting DOE's deficiency correction requirements. For 19 of the 20 deficiency cases we reviewed, contractors could not demonstrate that they had conducted three critical deficiency analyses (root cause, risk assessment, and cost-benefit) required by DOE. Additionally, the contractors did not always adequately verify that corrective actions taken were appropriate, effective, and complete. The contractors performed the remaining four procedures (reviewing deficiencies for duplication, entering deficiencies into a data base, tracking the status of deficiencies, and preparing and implementing a corrective action plan) adequately in all 20 cases.

DOE's oversight of the corrective action process could be improved in three areas. The computerized systems used to track the status of security

deficiencies have problems that limit the effectiveness of DOE oversight. Also, DOE's review of contractors' plans to correct deficiencies is sometimes untimely, potentially resulting in prolonged security risks. Finally, some DOE field offices' validation of corrective actions was inadequate.

Background

U.S. nuclear weapons research, development, and production are conducted at 10 DOE nuclear weapons facilities by contractors under the guidance and oversight of 9 DOE field offices. Because these facilities house special nuclear materials used in making nuclear weapons and nuclear weapons components, DOE administers a security program to protect (1) against theft, sabotage, espionage, terrorism, or other risks to national security and (2) the safety and health of DOE employees and the public. DOE spends almost $1 billion a year on this security program.

DOE administers the security program through periodic inspections that evaluate and monitor the effectiveness of facilities' safeguards and security.[1] Security inspections identify deficiencies—instances of noncompliance with safeguards and security requirements or poor performance of the systems being evaluated—that must be corrected to maintain adequate security. The contractors and DOE share responsibility for correcting deficiencies.

Contractors, in correcting deficiencies, must comply with several DOE orders. DOE Security Order 5634.1A contains several requirements for correcting deficiencies. Other DOE orders contain additional requirements. Generally, the requirements are not specific and allow the contractors to determine how to perform corrective actions. Contractors interpret and implement the various requirements somewhat differently. However, at the four sites we reviewed—selected because of the large number of security deficiencies that occurred at these locations during 1989, 1990, and 1991—contractor officials generally considered the following eight procedures as necessary steps in meeting DOE deficiency correction requirements: (1) review identified deficiencies for duplication or other reasons; (2) enter deficiencies into a data base, whether computerized or manual; (3) track the status of deficiencies and advise DOE quarterly of this status; (4) assess the risk associated with each deficiency; (5) determine the underlying, or root, cause of the deficiency to prevent recurrence; (6) analyze the costs and benefits of alternative corrective actions; (7) prepare

[1]DOE conducts, or sponsors, a variety of surveys, inspections, tests, and evaluations, which we will refer to as "inspections" in this report.

and implement a corrective action plan; (8) verify, or test, the corrective action taken.

DOE, primarily through its field offices, monitors its contractors' performance and compliance with DOE orders. The field offices must track the status of deficiencies, report the status to DOE headquarters, review corrective action plans, and validate the corrective actions taken to ensure their effectiveness and completeness.

Contractors Not Adequately Performing All Deficiency Corrective Procedures

At each of the four locations we visited, we selected 5 security deficiency cases—for a total of 20 cases—for review. These cases were selected from the security topical areas (protection program operations, computer security, etc.) where most security deficiencies occurred. (See app. II for a list of the specific cases selected for review.) For the 20 deficiency cases we reviewed, we noted problems in the performance of four of the eight security corrective procedures considered essential. In only 1 of the 20 cases could contractors demonstrate that they had considered three critical DOE-required analyses. In addition, contractors did not always adequately verify that the corrective actions taken were implemented. The contractors were adequately performing the remaining four corrective procedures.

Contractors Lacked Evidence That Three Required Analyses Were Performed

Several DOE orders require contractors to conduct risk assessment, root cause, and cost-benefit analyses for all security deficiencies. DOE considers these analyses critical to ensuring that security deficiencies are adequately and efficiently corrected. Although the contractors we reviewed knew of the DOE requirements to do such analyses and agreed that they are important, the contractors could demonstrate that they had considered these analyses in only 1 of the 20 deficiency cases we reviewed.

According to DOE, risk assessment is essential to determine the risk associated with an identified deficiency in prioritizing its correction. Contractor officials told us that they always consider the risk associated with a deficiency before deciding upon the corrective action, but they perform a detailed, formal risk analysis only when they judge that it is needed. Some contractors said that they would perform risk assessments for deficiencies that would require expensive corrective actions.

Contractors documented that they considered risk assessments in only 1 of the 20 deficiency cases we reviewed. Some contractor officials said that

documentation was lacking because they did not perform formal risk assessments for deficiencies that were easy to correct. Some contractor officials also said that performing a formal risk assessment and documenting it could take longer than fixing the problem. There was no record, however, of their consideration of risks or their justification for a decision not to perform a detailed, formal risk assessment.

DOE requires root cause analysis for all deficiencies because it ensures determination of the fundamental and contributing causes of a deficiency. Contractor officials at the locations we reviewed told us that they consider the root cause of a deficiency before selecting a corrective action, but, again, they could provide evidence of conducting root cause analysis in only 1 of the 20 deficiency cases we reviewed. Officials said that they did not believe it necessary to document analyses in every case and that individual managerial decisions dictate whether to conduct a formal analysis.

DOE considers cost-benefit analysis to be important in determining whether correcting the security risk is worth the cost of the corrective action contemplated. Although contractor officials said that they consider the relative costs and benefits of corrective actions, they could provide evidence that they performed cost-benefit analyses in only 1 of the 20 cases we reviewed. Again, officials said they documented such analyses only when, in their judgment, this seemed necessary. Some Pantex contractor officials said that two of the Pantex cases we examined did not require complex or expensive fixes. Therefore, the officials did not believe that it was necessary to conduct and document cost-benefit analyses for these cases.

Two DOE reviews of activities at (1) its Oak Ridge Field Office and contractors at the Y-12 Plant and (2) the San Francisco Field Office and Lawrence Livermore National Laboratory found similar situations. According to the DOE Oak Ridge review report, key elements of the contractors' activities, as well as DOE's, "do not yet have the desired level of rigor and formality needed to fully ensure that deficiencies and root causes are properly documented and that corrective actions are tracked, implemented, and verified."[2] Similarly, the San Francisco review report

[2]Environment, Safety, and Health Progress Assessment of the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee, U.S. Department of Energy, Washington, D.C. (Feb. 1992).

stated that contractor reports dealing with planned corrective actions were incomplete and did not reflect the full range of actions taken.[3]

Contractor Verification of Corrective Actions Was Inadequate in a Few Cases

Verification involves reviewing, checking, auditing, or otherwise determining that corrective actions are complete and acceptable. DOE Security Order 5634.1A contains no explicit requirement that contractors verify corrective actions. Nevertheless, DOE and contractor officials believe that the requirement for verification is implicit in the order. DOE field office officials said that they require contractors to verify corrective actions. The contractors are responsible for determining how to conduct verifications.

The contractors conducted adequate verification in most cases. However, verification was inadequate for 2 of the 20 cases we reviewed. In one case, a 1989 field office security survey at DOE's Pantex facility found that personnel without a "need to know" could obtain restricted materials from the technical library.[4] To correct the deficiency, Pantex officials implemented a new procedure requiring that the librarian, upon receiving a request for restricted material, call the requester's supervisor to confirm that a need to know existed. To verify the corrective action, contractor officials reviewed and approved the new procedure. However, the officials did not test the new procedure by attempting to obtain restricted materials without the required need to know. According to a contractor official, they did not see a need to actually test the procedure. Had they done so, they may have found that the procedure was not being followed. The same deficiency was found in 1989 and again in a 1991 Albuquerque Field Office security survey of Pantex.

In the second case, inadequate verification occurred at DOE's Oak Ridge facility. Labels affixed to classified computer equipment did not indicate the authorized classification and the restriction levels. The corrective action involved ordering new labels and using them. A contractor official said that he was aware that labels had been received for distribution. The official, however, did not verify that the labels had been received or that the new labels had been affixed to the computer equipment. According to the contractor official, he assumed that the corrective action had been implemented, but he planned to verify it during the next annual inspection.

[3]Readiness Review Report: Safeguards and Security Readiness Review of the DOE Field Office, San Francisco, U.S. Department of Energy, Office of Security Evaluations (June 24-28, 1991).

[4]"Need to know" is approval for access to classified information or materials necessary in the performance of official duties.

DOE Oversight of Security Corrective Actions Was Not Always Adequate

Neither DOE headquarters nor DOE's field offices have reporting systems to effectively track the status of deficiencies or analyze status data to identify trends. Additionally, some DOE field offices were not reviewing corrective action plans in a timely manner. In some cases, DOE's field offices were not timely in validating corrective actions to ensure their effectiveness and completeness, and, at one field office, validations were only performed for selected actions. Some of the DOE field offices are acting to improve their oversight, but, according to DOE officials, staffing shortages hamper their efforts.

DOE Systems Cannot Adequately Track Security Deficiency Status

DOE headquarters requires its field offices to track contractors' security deficiencies and to provide deficiency status data to headquarters for input to the centralized tracking system. DOE Order 5634.1A requires field offices to track deficiencies but does not specify how this is to be performed. In a December 1991 report, we noted that DOE field offices and their contractors had developed, or were developing, automated systems to track safeguards and security weaknesses.[5] However, these systems were incompatible with each other and with the DOE headquarters centralized tracking system. As a result, the field offices and contractors could not electronically share information with the centralized information system. Data had to be manually entered into both the field office and centralized systems each time the systems were updated. The report concluded that manually entering the data was costly and increased the opportunities for data entry errors.

Our current review found that these problems still exist. DOE's Amarillo Area Office and the San Francisco Field Office have automated tracking systems that can provide current deficiency data but cannot retrieve historical information. None of the DOE automated tracking systems at the DOE field offices we reviewed is compatible with their contractors' automated tracking systems because of design differences, and data must still be updated manually.

In another review, we found that the headquarters and some field office and contractor automated systems could not analyze security deficiency data to identify patterns and trends.[6] The report indicated that this capability could help in (1) identifying and correcting the causes of

[5]Nuclear Security: Safeguards and Security Weaknesses at DOE's Weapons Facilities (GAO/RCED-92-39, Dec. 13, 1991).

[6]Energy Information: Department of Energy Security Program Needs Effective Information Systems (GAO/IMTEC-92-10, Oct. 22, 1991).

common problems, (2) overseeing the activities of field offices and contractors, (3) allocating resources, and (4) formulating more effective security policies and procedures. We recommended organization and planning changes to DOE's security information systems that should assist DOE in improving its tracking systems. Our current review found that the DOE field office and contractor tracking systems at some of the sites we visited still could not analyze security deficiency data to identify patterns and trends. Although some offices plan to enhance system capabilities, their present systems were not designed to accommodate such analyses.

In addition, DOE field offices were not always submitting quarterly status reports on deficiencies to update the DOE headquarters centralized tracking system in a timely manner. In some cases, the field offices did not submit the reports at all. The quarterly reports are due to DOE headquarters on the first day of the month following the end of the quarter. Of the four DOE field offices included in our review, only one submitted a report for the quarter ending September 30, 1991, and none of the field offices submitted a report for the quarter ending December 31, 1991. For the quarter ending March 31, 1992, field offices were allowed to submit the report 15 days later than usual to meet a special congressional request. Three of the four field offices submitted the report on time; however, one field office was still late. Field offices said that their workload prevented their meeting reporting deadlines.

Changes are being made to more efficiently report deficiency status. DOE headquarters hopes to improve the timeliness of field offices by enabling them to directly interface with the headquarters central information system. A program to test the feasibility of this action is planned for the Albuquerque Field Office. DOE wants to bring one site on-line before the end of fiscal year 1992 and achieve full operational capability within the first quarter of fiscal year 1993. The direct interface capability, according to a DOE official, will enable DOE to capture more information and eliminate redundant data fields. The capability will also provide users with data retrieval and modeling capability, electronic mail, and full use of the mandatory labeling features of the security system. The benefits are complete, accurate, and current information, according to a DOE official.

DOE Review of Contractor Corrective Action Plans Was Not Always Timely

DOE requires contractors to submit a corrective action plan for each deficiency identified by inspections to the cognizant DOE field office within 30 days.[7] DOE must review the corrective action plan for adequacy and effectiveness and either approve it or return it to the contractor for revision. In two cases we reviewed, DOE's review of contractors' corrective action plans was untimely.

A recurring deficiency—one of the 1989 deficiencies selected for our review—at DOE's Lawrence Livermore National Laboratory concerning the lack of an approved TEMPEST security plan illustrates DOE's untimely review.[8] When the deficiency was first identified, the contractor developed a corrective action plan and submitted it to DOE's San Francisco Field Office in January 1987. When the field office did not respond within 30 days, the contractor implemented the plan. According to a DOE memorandum, DOE responded at least a year later (the date was not documented), disapproving the corrective action plan. As a result, during a 1989 inspection, the same deficiency was again cited. Contractor officials submitted a new plan on May 16, 1989, and DOE approved it the same day.

DOE field office officials said that shortages of safeguards and security personnel—and of the requisite skills—keep them from effectively fulfilling their oversight role. According to field office officials, at one site, requests for additional staff have been refused by the Office of Management and Budget or by DOE headquarters; at another site, hiring limitations have impeded hiring efforts. At some sites, increasing workloads lessen the staff's ability to oversee contractor activities.

According to DOE field office officials, serious consequences can occur without the proper resources. At the San Francisco Operations Office, officials said that without adequate staff they are unable to fully meet their oversight obligations. For example, the field office reviews only a sampling of classified computer systems rather than all systems; thus, the officials cannot confirm that the entire program is in full compliance with the requirements. Appendix I provides additional information on field office staffing.

[7]The 30-day requirement applies only when a survey report gives a facility a composite rating of "satisfactory." For facilities receiving a lesser composite rating, the time frame is shorter—either 15 workdays or 24 hours, depending on the severity of the deficiencies found.

[8]TEMPEST, or Technical Electromagnetic Pulse Emanation Standard Test, concerns the control of potentially compromising, unintentional signals from telecommunications and automated information system equipment.

DOE Validation of Corrective Actions Was Not Always Adequate

Once a contractor notifies its DOE field office that a corrective action has been completed and verified, field office officials are to validate the corrective action. According to DOE, validation includes "the confirmation by testing that an implemented operational system or critical system element meets established requirements."[9] Validation is a critical oversight function because it is the final test to ensure that a security deficiency has been corrected. Recognizing the importance of validation, DOE headquarters issued a February 19, 1991, directive to its field offices to ensure that validation is complete and adequate before a deficiency case is closed.

Some DOE field offices' validation of corrective actions was inadequate. Each field office we visited developed its own validation procedures to implement DOE's requirements. For example, three field offices decided to validate all corrective actions, but DOE's Oak Ridge Field Office validates actions selectively on the basis of whether they are high-, moderate-, or low-impact findings and whether resources are available.

At two sites, field offices did not always adequately document their validation of corrective actions. At the Pantex Area Office, validation documentation was sometimes cursory. For example, for a deficiency concerning an alarm system, the documentation stated only that a new panel had been installed and was operational. The documentation did not describe the test that the field office validator told us she had conducted. At the Oak Ridge Field Office, officials told us that they did not document validations because they were not specifically told when and how to do so. They said, however, that their "audit trail" could be improved.

Field office officials said again that staff shortages, combined with a heavy workload, hamper their oversight efforts. For example, an Oak Ridge Field Office official reported that his office has nine staff members available to validate findings, but that the staff have many other duties to perform in addition to validations. From 1989 through 1991, Oak Ridge was faced with more than 1,100 security deficiencies. Field office officials told us that an increasing number of audits and reviews for which they must prepare and to which they must respond is adding to their workload. For example, according to the San Francisco Safeguards and Security Director's activities schedule, more than 18 audits, reviews, or inspections were conducted or planned for the period of October 1991 through June 1992.

[9]DOE Safeguards and Security Definition Guide, U.S. Department of Energy, Office of Safeguards and Security and Office of Security Affairs (Sept. 26, 1991).

Furthermore, one field office we visited informed us that a shortage of staff with the requisite skills prevented adequate validation of corrective actions. For example, in the case of a computer access deficiency—the sharing of passwords and identification numbers by personnel needing access to the same computer software program—the Amarillo Area Office had no staff with the computer knowledge necessary to validate the corrective action. Accordingly, a general engineer with a limited knowledge of computers was the validating official. Because the engineer was unfamiliar with computer operations, he did not attempt to test the program changes during validation but examined related documentation and listened to contractor explanations to validate that the corrective action was appropriate and complete. Since that time, however, the office has hired a computer expert who performs such validations. (Appendix I discusses similar problems identified in a 1990 DOE report.)

Conclusions

Correcting identified security deficiencies is a crucial part of DOE's role in safeguarding nuclear materials and facilities. DOE's contractors are not adequately conducting four of the eight procedures considered necessary to ensure proper correction of deficiencies. The contractors cannot always demonstrate through documentation that they have performed three critical analyses (root cause, risk assessment, and cost-benefit). In addition, the contractors did not always adequately verify that corrective actions were appropriate, effective, and complete.

DOE oversight of contractor activities is critical to ensuring the safety and security of nuclear defense facilities. DOE's oversight is hampered by computer system incompatibility problems. Also, DOE reviews of contractors' corrective action plans are sometimes untimely, and DOE cannot always demonstrate that it has validated contractors' corrective actions. DOE officials said they are working to resolve the computer problems that hinder the agency's ability to accurately track deficiency status and to analyze data trends. These officials cite staffing insufficiencies—both in number and in requisite skills—as constraints to DOE's oversight efforts.

Recommendations

To improve contractor compliance with DOE requirements for correcting security deficiencies, we recommend that the Secretary of Energy

- ensure that contractors conduct and document the required analyses (root cause, risk assessment, and cost-benefit) or, when contractors have

decided that the deficiency is such that it is unnecessary to conduct one or more of these analyses, that they document the justification for their decision and
- assess the extent of inadequate verification and, if verification is a problem, require that contractors verify and document that corrective actions are complete and adequate.

Additionally, to improve DOE oversight of contractors' deficiency correction activities, we recommend that the Secretary ensure that DOE field offices

- review and respond to contractors' corrective action plans within the DOE-required time and document their review and response;
- validate, through performance testing, that the corrective actions taken are effective and complete and adequately document the validation actions taken; and
- assess field office staffing to ensure that sufficient qualified staff are available to effectively carry out safeguard and security requirements.

Agency Comments

We discussed the information in this report with DOE officials representing the Office of Energy Research; the Assistant Secretary for Environment, Safety and Health; the Assistant Secretary for Nuclear Energy; and the Office of Security Affairs. We also discussed the information contained in this report with officials representing the Lawrence Livermore National Laboratory, Oak Ridge Y-12 Plant, Pantex Plant, and the Rocky Flats Plant. All of these officials generally agreed with the facts presented. The DOE officials stressed that a number of changes have been made to improve DOE's processes for correcting security deficiencies. For example, a new deficiency tracking system is currently being incorporated into a new management information system. Data from the old system was to be entered into the new system in September 1992, and DOE's Albuquerque Field Office will be able to use the system in November 1992. Other DOE field offices will be able to access the system within 1 year.

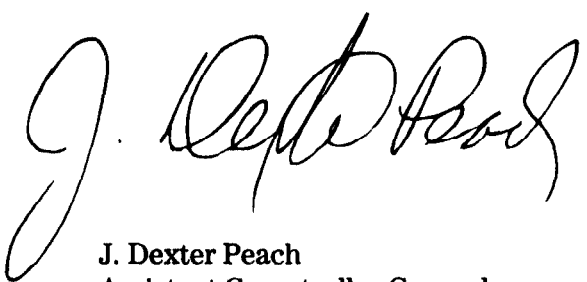
In addition, DOE officials also stated that as of August 1992, standardized safeguard and security training is required, and a safeguard and security professional development program was implemented for security disciplines at all levels. These efforts should ensure that security staff are qualified to perform all safeguard and security functions.

As requested, we did not obtain written agency comments on a draft of this report. We performed our review between June 1991 and June 1992 in accordance with generally accepted government auditing standards. Appendix II describes our scope and methodology.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Secretary of Energy. We will also make copies available to others on request.

This work was performed under the direction of Victor S. Rezendes, Director of Energy and Science Issues, who can be reached at (202) 275-1441. Major contributors to this report are listed in appendix III.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

Contents

Abbreviations

DOE	Department of Energy
FTE	full-time equivalent
GAO	General Accounting Office
OMB	Office of Management and Budget
TEMPEST	Technical Electromagnetic Pulse Emanation Standard Test

DOE Corrective Action Staffing Levels

Department of Energy (DOE) officials at two of the four sites we reviewed (Rocky Flats and San Francisco) reported that staff shortages hampered their corrective action oversight. According to officials at these sites, they have requested additional full-time equivalent (FTE) positions but, as shown in table I.1, have not received all the positions requested.

Table I.1: Staffing Requests by Two DOE Field Offices, Fiscal Years 1992 and 1993

	Fiscal year			
		1992		
	1991			1993
Field office	Staff on board	Additional FTEs requested	Additional FTEs approved	Additional FTEs hired
Rocky Flats	29	7	3[a]	2
San Francisco	33	9	7	7

[a]The three positions were approved, but one was not filled due to staffing limitations.

As shown in table I.1, the San Francisco Field Office did receive additional Safeguards and Security staffing authorizations in fiscal year 1992. According to a San Francisco Field Office official, the office's request for additional fiscal year 1992 positions was part of DOE's budget request to the Office of Management and Budget (OMB). OMB then reduced the approved staffing level, and DOE headquarters further reduced it. The San Francisco Field Office appealed the DOE headquarters reduction and was granted some relief, but a staffing shortage still existed. According to a San Francisco Field Office official, the office's ideal staffing level for fiscal year 1992 is 45, so additional staff are still needed.

Rocky Flats Field Office officials said that DOE headquarters instructed them not to exceed their fiscal year 1992 staffing levels. However, Rocky Flats had already exceeded these staffing limits, which resulted in Rocky Flats reviewing each new staffing requirement before approving it. Because of this constraint in hiring full-time personnel, the field office hired contractors to conduct some security oversight functions.

Oak Ridge officials also said that they have experienced staff shortages that adversely affected their oversight capability. However, staffing data Oak Ridge officials provided to us showed that Oak Ridge actually exceeded its approved staffing level of 29 by 1 position for fiscal year 1992. Oak Ridge officials said that as of March 1992, they have nine staff members available to validate deficiency corrections, but their workload is too great to provide adequate oversight. For example, during the period

from 1989 through 1991, Oak Ridge officials said that they faced more than 1,100 security deficiencies. The officials estimated that it takes one person approximately 8 hours to validate that a deficiency corrective action has been accomplished. On the basis of the average number of deficiency corrections needing validation during the 3-year period, the officials estimated that the field office would need two people working full time to validate each deficiency corrective action, providing those people had the expertise to evaluate corrective actions relating to a variety of disciplines.

In addition to their validation responsibilities, field office staff have numerous other duties to perform, according to field office officials. At Oak Ridge, for example, staff duties (in addition to performing validations) include providing security advice and assistance to field office program managers; reviewing security plans, budgets, and capital improvement projects; and participating in the development of Master Safeguards and Security Agreements.

Additionally, according to field office officials, the number of audits and reviews seems to increase each year, with a resulting increase in staff workloads. To keep up with the increasing number of audits and reviews, Rocky Flats officials said that they had to hire contractors on an as-needed basis to complete security oversight tasks, although they would prefer that in-house experts do these tasks. According to the San Francisco Safeguards and Security Director's activities schedule for October 1991 through June 1992, more than 18 audits, reviews, or inspections of various types were either conducted or planned. In addition to spending more time on the audits and reviews, field office staff must devote additional time preparing for them.

According to DOE's San Francisco budget justification documents provided by a safeguards and security official, serious consequences can occur if the proper resources are not provided. The San Francisco Field Office documents stated that without adequate staff, the office is unable to fully meet its oversight obligations. For example, during security reviews, the field office conducts a sampling of classified computer systems rather than a full review; thus, field office officials cannot state that the program complies with security levels required. A 600-percent increase in classified computer use has occurred and is making the area very susceptible to risk. Additionally, the backlog of personnel clearance cases grew by about 1,700 cases in fiscal year 1991, and similar growth is expected in the coming years. Furthermore, the number of staff dealing with

accountability for foreign visitors and assignments, classified visits, and a Personnel Security Awareness Program is insufficient.

Staffing shortages are especially critical in cases where field office staff lack the appropriate qualifications, or necessary expertise, to validate corrective actions. According to a December 1990 review of DOE's safeguards and security functions requested by the Secretary of Energy,[1] the DOE workforce needs professional development, and the agency lacks standardized, quality training. In addition, according to the review report, inadequate personnel authorizations were a problem at most field offices, and some inspectors were "less than well qualified." An official from the Rocky Flats Office said that, even with full staffing, the office would have to hire contract personnel to work on specialized tasks. A Rocky Flats official believes it is cost-effective to bring in experts on an as-needed basis.

[1]Report of the Secretary's Safeguards and Security Task Force (Major General James E. Freeze, Task Force Head, U.S. Army (Ret.), Dec. 12, 1990).

Objectives, Scope, and Methodology

Our review objectives were to evaluate the adequacy of (1) contractors' procedures for correcting security deficiencies and (2) DOE's oversight of contractors' corrective actions. We performed our work at four nuclear weapons facilities: Lawrence Livermore National Laboratory, California; Oak Ridge Y-12 Plant, Tennessee; Pantex Plant, Texas; and Rocky Flats Plant, Colorado. We selected these facilities because they experienced many security deficiencies during 1989, 1990, and 1991, according to data provided by DOE.

DOE routinely inspects its facilities to assess their effectiveness in eight overall safeguards and security areas. The eight topical security areas are program planning and management, protection program operations, material control and accountability, information security, computer security, operations security, personnel security, and facility survey and approval. Each area is subdivided into several safeguards and security activities. For example, protection program operations includes physical security systems, protective forces (including guards, security inspectors, and other personnel who protect DOE's security interests), system performance tests, and property protection.

Because DOE guidance for correcting security deficiencies is general and contained in numerous DOE orders, we used a four-step process to identify procedural steps that contractors said represented the many DOE requirements. First, we reviewed relevant provisions of the Atomic Energy Act of 1954, as amended, and more than 30 DOE orders to identify the actions DOE requires. Second, we reviewed and analyzed the detailed procedures used by one contractor (EG&G, Rocky Flats Plant) in correcting security deficiencies to comply with DOE orders. To fully understand the steps, we discussed each procedure with the contractor. Third, we verified with a DOE Rocky Flats support services contractor that the EG&G procedures were appropriate and captured the essence of relevant DOE requirements.

Fourth, we met with contractor officials at each site to discuss how they correct security deficiencies. Using EG&G's procedures as guidance, we discussed each contractor's process for correcting deficiencies. In addition to EG&G, we met with contractors at the University of California (Lawrence Livermore National Laboratory); Martin Marietta Energy

Systems, Inc. (Oak Ridge Y-12 Plant); Mason and Hanger-Silas Mason Co., Inc. (Pantex Plant); and Wackenhut Services, Inc. (Rocky Flats Plant).[1]

To determine how DOE oversees the contractors' corrective actions and monitors their compliance with DOE orders, we met with officials representing the Albuquerque Field Office and Amarillo Area Office, Oak Ridge Field Office, San Francisco Field Office, and Rocky Flats Office. We also contacted DOE headquarters officials to clarify DOE oversight requirements and to obtain opinions on the timeliness of deficiency status updates by the various DOE field offices.

To obtain a detailed perspective on contractor and DOE activities, we examined five security deficiencies at each of the four nuclear weapons facilities, for a total of 20 deficiencies. According to a recent GAO report on security deficiencies,[2] the majority of deficiencies at DOE's nuclear weapons facilities occurred in four security topical areas. Accordingly, we judgmentally selected, from 1989, 1990, and 1991 security survey and inspection reports, deficiencies in those four security topical areas.[3] The four areas are information security, material control and accountability, protection program operations, and computer security. Table II.1 shows the total number of deficiencies at each of the four sites in the four topical areas.

Table II.1: Number of Deficiencies at Four DOE Nuclear Weapons Sites by Four Security Topical Areas, 1989, 1990, and 1991

	Number of deficiencies by security topical area			
Facility	Information security	Material control and accountability	Protection program operations	Computer security
Lawrence Livermore	26	27	68	53
Oak Ridge Y-12 Plant	31	42	51	15
Pantex	17	9	72	24
Rocky Flats	43	44	151	79

We interviewed contractor and DOE officials to identify what was done to correct case deficiency problems, ensure their correction, and comply

[1]Wackenhut Services, Inc., and EG&G are both Rocky Flats Plant contractors. Wackenhut is responsible for protective force activities and for security badge and visitor control activities; while EG&G has overall contractor responsibility for Rocky Flats Plant protection policy, requirements, and programs.

[2]Nuclear Safety: Safeguards and Security Weaknesses at DOE's Weapons Facilities (GAO/RCED-92-39, Dec. 13, 1991).

[3]Because the deficiencies were selected judgmentally, our results cannot be generalized to the universe of deficiencies.

with DOE guidance. We also reviewed supporting documentation when it was available. To determine if the corrective action was effective, we tested at least two deficiencies at each site. In all tested cases, we tried to duplicate the test DOE performed to validate the deficiency corrective action. We conducted performance tests to determine if the actions had corrected the deficiency. The cases we tested involved matters such as the functioning and monitoring of alarm systems, physical security measures against entering secured areas with prohibited articles and substances, software security against unauthorized computer access, and protection of classified parts from those without a need to know.

Table II.2 provides a brief, general description of the 20 deficiencies we selected for review. Due to the classified nature of some of these cases, we have not fully detailed them.

Table II.2: Description of Deficiencies Reviewed at Four DOE Facilities

	Deficiency reviewed by security topical area			
Facility	**Computer security**	**Information security**	**Material control and accountability**	**Protection program operations**
Lawrence Livermore National Laboratory	Unauthorized access to secret data	No "need to know" for access to classified parts	Inventory verification flaws	Unauthorized alarm shut-down Unauthorized entry
Pantex	Shared passwords and identification numbers	No "need to know" for access to classified material	Measurements of special nuclear materials not within time requirements	Improper siting of weapons Guard force not monitoring some portals
Rocky Flats Plant	Unauthorized access to certain security systems	Lack of accountability for classified material	Prevention/ detection of unauthorized transfer of nuclear materials	No approved security force training plan Inability to identify some alarms
Oak Ridge Y-12 Plant	Improper labeling of classified computer equipment	Secret documents not entered in accountability record	Undocumented transfer of depleted nuclear materials	Unreliable perimeter alarm system Improper search procedures

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