

SPECIAL STUDY

Independent Oversight Special Study of The Department of Energy's Management of Suspect/Counterfeit Items

August 2003



Office of Independent Oversight and Performance Assurance
Office of the Secretary of Energy

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Abbreviations Used in This Report

CY	Calendar Year
DCIS	Defense Criminal Investigative Service
DOE	U.S. Department of Energy
EM	DOE Office of Environmental Management
ES&H	Environment, Safety, and Health
GIDEP	Government Industry Data Exchange Program
IG	Office of the Inspector General
NCR	Non-Conformance Reporting
OA	Office of Independent Oversight and Performance Assurance
OMB	Office of Management and Budget
ORPS	Occurrence Reporting and Processing System
QAWG	Quality Assurance Working Group
S/CI	Suspect/Counterfeit Item



FOREWORD

After the Defense Nuclear Facilities Safety Board raised some issues of potential safety concerns associated with improperly heat-treated aluminum, the Secretary of Energy and I commissioned the Office of Independent Oversight and Performance Assurance (OA) to conduct a special study of the Department of Energy's management of suspect/counterfeit items (S/CIs). As OA's report demonstrates, the Department's investigation of the aluminum issue was not timely, and there are a number of weaknesses in the Headquarters and site processes for managing S/CIs.

It is a distressing but undeniable fact that there are unscrupulous vendors throughout the world that distribute defective products. There are also many instances where legitimate vendors unknowingly distribute items that do not conform to specifications because of deficiencies in design or manufacturing. These S/CIs and non-conforming items could break or fail in a way that could injure our workers or cause a safety system to fail.

Therefore, it is important that the Department's S/CI program effectively preclude the use of S/CIs in safety-related applications. At the Headquarters level, we need effective processes for disseminating S/CI information and providing clear directions when actions are needed to address S/CI issues. At the site level, we need to integrate effective S/CI controls into site processes, including design, procurement, maintenance, inspections, and operations. We also need to ensure that we regularly assess our performance and have effective processes to share information when S/CIs or non-conforming items are found.

This OA report will be useful in improving the Department's safety posture with respect to S/CIs. All DOE program offices, field elements, and contractors should use this report as a baseline for conducting self-evaluations of the effectiveness of their S/CI controls and making any needed improvements in their S/CI processes. The Office of Environment, Safety and Health is leading DOE efforts to make the needed improvements in the Headquarters processes.

A handwritten signature in blue ink, appearing to read "K. McSillarow".

Kyle McSillarow
Deputy Secretary of Energy

Executive Summary

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA) conducted a special study of the U.S. Department of Energy's (DOE) management of suspect/counterfeit items (S/CIs) in May-August 2003. The purpose of the special study was to evaluate the effectiveness of DOE Headquarters and field element management of S/CI processes. The Deputy Secretary directed OA to conduct this study after the Defense Nuclear Facilities Safety Board raised issues about the effectiveness of the DOE investigation of potential safety concerns associated with aluminum that was allegedly improperly heat-treated by Temperform, USA (an aluminum heat treating company).

Some aspects of S/CI processes are effective. DOE S/CI policies and guidance identify many elements of an effective S/CI process. Some sites have well-structured and generally effective processes for integrating S/CI provisions into site procurement and maintenance programs. For example, some sites have established an S/CI coordinator position to ensure that S/CI requirements are implemented by the multiple site organizations that have S/CI responsibilities, such as engineering, facility maintenance, and procurement.

However, weaknesses in Headquarters, DOE field element, and site contractor processes reduce the likelihood that DOE sites will reliably preclude S/CIs or other non-conforming parts from being used in safety-related applications at DOE sites. S/CIs received considerable attention within DOE and by the Defense Nuclear Facilities Safety Board in the mid 1990s but have received limited attention in the past several years, contributing to gradual degradation of the effectiveness of S/CI controls (e.g., S/CI responsibilities were not realigned following reorganizations). S/CIs are still being discovered in DOE facilities, clearly indicating that current controls (e.g., procurement receipt inspections) are not fully effective in preventing the introduction of S/CIs.

At DOE Headquarters, the S/CI communication and information exchange processes lack sufficient structure and rigor to

ensure consistent and effective dissemination of information and tracking of needed actions. In addition, current DOE Headquarters S/CI policies and directives do not adequately address some aspects of Office of Management and Budget Policy Letter 91-3, which established national policies for addressing non-conforming items, such as S/CIs. Further, roles and responsibilities are not defined in sufficient detail to ensure effective performance and ascertain accountability. OA tracked information about selected non-conforming items, including S/CIs, to determine whether the information was adequately disseminated to and used by the field to address potential concerns; in most cases, the information had not been effectively communicated to or acted on at the site level. The DOE Assistant Secretary for Environment, Safety and Health had previously recognized some of these shortcomings.

Based on OA's review of seven DOE sites, implementation of DOE S/CI requirements varies in rigor, level of formality, and effectiveness. Some sites do not have structured S/CI processes and lack adequate processes for implementing S/CI requirements. For example, requirements do not always flow down to the working level and to subcontractors, and in one case, DOE order provisions that address S/CIs were eliminated from the contractual requirements through the Work Smart Standards process. Deficiencies were also identified in several aspects of procurement, disposition, and reporting functions. For example, reporting requirements are not clearly specified at many sites, and in some cases, procurement inspections identified S/CIs but no report was generated. There were instances in which S/CIs were held in a warehouse for several years without a report being generated, and other instances where S/CIs were not adequately segregated to preclude their use. Weaknesses in roles and responsibilities and training programs contributed to the observed deficiencies. Further, only one of the seven sites reviewed during this study has performed assessments of S/CI requirements and their implementation.

The Headquarters and site weaknesses contributed to deficiencies and delays in performing investigations of potential safety concerns associated with the Temperform aluminum issue. Weaknesses in the Headquarters requirements and processes contributed to breakdowns in communicating information and expectations related to Temperform aluminum. For example, information was sent out informally and was not received by some organizations because the distribution list was not maintained. In addition, the use of aluminum in aircraft—a major concern relative to Temperform aluminum—was not emphasized in Headquarters direction; some DOE organizations and contractors that own or lease aircraft did not perform adequate investigations. The initial investigations performed by some sites were based on incomplete information and were not comprehensive or rigorous. Subsequently, clear direction was provided by the Office of Environment, Safety and Health (EH) and program offices, and sites conducted more rigorous investigations.

EH, program offices, and sites have taken a number of actions to address the specific problems noted in the response to the Temperform issue. Site investigations of the possible presence or safety impact of aluminum, which were initiated almost one year ago, are now complete at major sites under the cognizance of the National Nuclear Security Administration and the DOE Office of Environmental Management. However, there are a few gaps in the scope of investigations (e.g., omission of a few subcontractors, or purchase card

items). Some non-defense sites have not completed investigations. EH indicated that the final report for defense nuclear sites is to be completed and submitted in the near future.

EH has developed an action plan to enhance Headquarters management of S/CIs that identifies the areas (e.g., revisions to directives) that need to be enhanced. Sustained management attention will be needed to ensure that the action plan is finalized and that the needed improvements are further defined and effectively implemented. Further, EH needs to develop an effective process for systematically addressing cross-cutting issues and ensuring effective communication and completion of required actions.

Most sites evaluated during this special study have begun to take action to enhance their S/CI processes. DOE program offices need to ensure that these efforts are sustained and effectively address the identified weaknesses. DOE program offices also need to direct their sites that were not included in this special study to evaluate their S/CI processes to ensure that weaknesses are identified and addressed.

Overall, the current processes for managing S/CI issues at DOE Headquarters and most DOE sites need improvement. The ongoing and planned initiatives are appropriate, but most are in development or the early stages of implementation. Sustained management attention and increased coordination between EH, DOE program offices, and DOE sites will be needed to ensure that these initiatives are implemented and verified to be effective.

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA) conducted a special study of the U.S. Department of Energy's (DOE) management of suspect/counterfeit items (S/CIs). This special study is responsive to the Deputy Secretary of Energy's March 2003 memorandum directing OA to increase independent oversight attention on cross-cutting safety issues raised by the Defense Nuclear Facilities Safety Board (DNFSB). The special study was performed by the OA Office of Environment, Safety and Health Evaluations from May to August 2003.

The purpose of the special study was to evaluate the effectiveness of DOE Headquarters and field element management of S/CI-related processes and ongoing actions to enhance those processes. The special study focused primarily on the safety implications of S/CIs but also examined selected aspects of processes for reporting information needed for criminal investigations and cost recovery efforts. To evaluate safety implications, OA evaluated DOE processes for disseminating S/CI information and ensuring that S/CIs are not installed in safety-related applications, which include systems, components, or structures whose failure could adversely affect the environment or the health or safety of workers or the public.

The scope of the study encompasses the DNFSB's concerns about DOE actions to address information about suspect aluminum items. However, the special study addresses the broader subject of management of S/CIs and includes items that do not conform to requirements because of fraudulent activities (e.g., deliberate misrepresentation or fabrication of test results) or other reasons (e.g., discovery of unintended manufacturing defects that could pose safety concerns).

OA focused on selected Headquarters organizations with S/CI responsibilities and selected DOE sites. DOE Headquarters organizations, such as the National Nuclear Security Administration (NNSA), the Office of Environmental Management (EM), and the Office of Science

(SC), have line management responsibility and provide direction to DOE field elements. The Office of Environment, Safety and Health (EH) is responsible for S/CI policy and requirements and was recently assigned responsibility for management of the DOE S/CI process. Until recently, the Quality Assurance Working Group (QAWG) was responsible for management of the DOE S/CI process and was involved in the screening and dissemination of information during the timeframe of this review; EH will perform these functions in the future. The DOE Office of the Inspector General (IG) is responsible for processes for handling sensitive information and for implementing certain DOE responsibilities related to possible waste, fraud, and abuse (e.g., maintaining evidence). The DOE General Counsel is responsible for providing legal opinions on various matters, including S/CI issues. The DOE Office of Management, Budget, and Evaluation supports DOE line management in such areas as budgets and procurement policies.

Background

S/CIs are a longstanding area of interest to DOE and other government agencies, primarily because of the potential safety and mission impacts of non-conforming parts. The Government Industry Data Exchange Program (GIDEP) was established as a cooperative activity between government and industry participants to share technical information, including information related to items that may be defective. In accordance with the Executive Office of the President's Office of Management and Budget (OMB) Policy Letter 91-3, agencies are required to establish policies and procedures for using GIDEP to exchange information, examine GIDEP information and promptly disseminate safety-related information, conduct assessments of the effectiveness of their programs, and establish procedures for involving the IG in S/CI issues, including receipt and dissemination of sensitive information.

In the mid-1990s, a number of occurrences of S/CIs in DOE facilities (e.g., non-conforming nuts

and bolts) prompted DOE to take a number of actions to enhance its program for managing S/CIs. DOE site contractors were directed to review procurement processes and perform facility walkdowns to identify and correct S/CI problems. Also, numerous personnel at DOE sites were trained on S/CI requirements and recognizing suspect items. At Headquarters, DOE established the QAWG in 1996 to support line management in the communication and resolution of cross-cutting quality assurance issues (e.g., developing training courses and S/CI guidance).

On June 14, 2002, GIDEP issued an Agency Action Notice transmitting a Department of Defense Inspector General “Notification of Potentially Defective Product” that addressed quality issues concerning aluminum that was allegedly improperly heat-treated by an aluminum heat treating company—Temperform, USA (Temperform). Improper heat treating could result in decreased strength, increased susceptibility to corrosion and cracking, and reduced fatigue life. The use of such suspect parts in DOE facilities could adversely impact safety. For example, improperly treated aluminum parts used in hoisting and rigging applications could fail and cause injuries to workers. The Notice provided a Department of Defense Inspector General report on alleged falsified heat treatment and inspection processes at Temperform that included a list of Temperform customers (vendors) that may have used their aluminum heat treating services during the period in question. The Notice also included a cautionary note requiring prior consent of the Defense Criminal Investigative Service (DCIS) prior to release of the notice to nongovernmental personnel.

On July 29, 2002, the QAWG disseminated an email forwarding the GIDEP Notice on Temperform aluminum. The QAWG email included some suggested actions and noted the restrictions on distribution to non-Federal personnel. The email requested a response from DOE elements by August 19, 2002. Subsequently, the QAWG determined that the initial email did not provide

sufficient direction to ensure that the potential concerns were identified and addressed. On December 19, 2002, the QAWG disseminated a second email, which included the vendor list as a separate attachment and indicated that it was imperative that DOE contractors determine whether they had done business with the listed vendors and purchased heat-treated aluminum parts for use in safety applications.

In a February 2003 letter to the Secretary of Energy, the DNFSB expressed concerns about the adequacy and timeliness of the DOE actions to address the GIDEP notification and determine whether non-conforming aluminum parts were installed in safety-related or mission-critical applications. After various meetings and memoranda between DOE and the DNFSB, DOE issued a letter on April 21, 2003, describing the status of DOE’s investigation into parts and materials from Temperform and the actions DOE was taking to enhance its processes. The DNFSB, in an April 25, 2003, letter to DOE, indicated that DOE’s response did not provide adequate information and requested that DOE provide a more detailed assessment and corrective action plan to ensure adequate disposition of future issues involving S/CIs. As part of DOE’s response to the DNFSB concerns, in May 2003 the Deputy Secretary of Energy directed OA to evaluate DOE’s management of the S/CIs and recommend improvements.

Figure 1 shows a timeline with some key events related to DOE’s investigation of the Temperform issue.

Organization of the Report

The OA special study included two major components: a review of DOE Headquarters management of the S/CI processes, which is discussed in Section 2; and a review of implementation of S/CI processes by selected DOE sites, which is discussed in Section 3. Section 4 presents conclusions and recommendations for management consideration. Appendix A provides supplemental information, including review team composition and the dates of the key review activities.

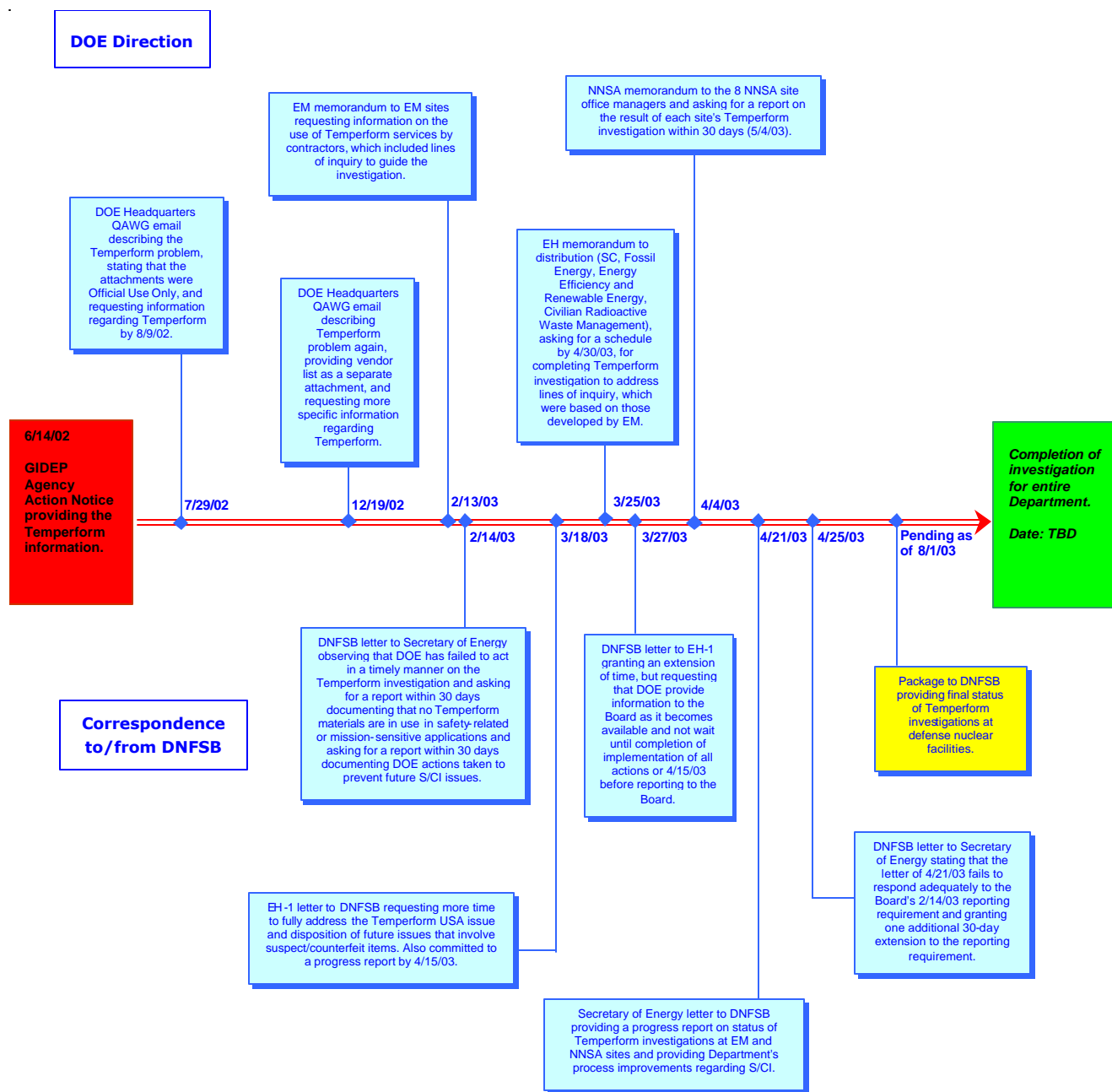


Figure 1. Temperform Investigation Timeline

In examining Headquarters processes, OA evaluated:

- Policies and directives, to determine whether DOE can ensure effective and sustained response to S/CI information
- Roles and responsibilities, to determine whether responsibilities, authorities, accountability, and interfaces for Headquarters functions are appropriately established and understood
- Communication and information exchange, to determine the adequacy of DOE Headquarters processes for providing timely and relevant information to DOE field elements and collecting information from the field
- Headquarters actions relating to the GIDEP Notice, to determine the process weaknesses that led to delays in adequately assessing the potential safety implications of suspect aluminum materials
- Ongoing EH and program office enhancements, to determine whether the enhancements will address current deficiencies and result in an effective program.

2.1 Policies and Directives

Applicable rules or DOE directives (e.g., 10 CFR 830 Subpart A, *Quality Assurance*, and DOE Order 414.1A, *Quality Assurance*) require a comprehensive quality assurance program for safety-related activities. The *DOE Quality Assurance Management Systems Guide for Use with 10 CFR 830.120 and DOE Order 414.1A* explicitly identifies S/CIs as a type of quality problem that needs to be considered in DOE sites' quality assurance plans and establishes expectations for relevant site processes, such as procurement and inspections, to ensure the quality of items. As a complement to the quality assurance

requirements and to address worker safety concerns (e.g., maintaining evidence for investigations and disseminating information to other agencies), DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, establishes requirements specific to S/CIs. A detailed guide (DOE Guide 440.1-6, *Implementation Guide for Use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10CFR820; and DOE 5700.6C, Quality Assurance*) establishes specific expectations for implementing the S/CI requirements. DOE policies, directives, and guidance adequately address many S/CI elements. However, a number of weaknesses in the current DOE policies were identified, as discussed in the following paragraphs.

Although referenced in DOE guidance, DOE directives do not explicitly establish requirements and responsibilities for implementing OMB Policy Letter 91-3. This Policy Letter requires agencies to establish policies and procedures for using GIDEP to exchange information, examine GIDEP information and promptly disseminate safety-related information, conduct assessments of the effectiveness of their programs, and establish procedures for receipt and dissemination of sensitive information. The fact that neither the directives nor guidance establishes clear expectations for dealing with sensitive information contributed to the delays in disseminating information and ensuring an adequate investigation of aluminum heat-treated by Temperform (see Sections 2.4 and 3). The directives do not provide for reporting information to GIDEP as specified in the Policy Letter. Because the reference to GIDEP is in the Guide and not the Order, DOE sites are not contractually required to address the GIDEP provisions. Consequently, none of the evaluated sites has entered information on suspect and non-conforming products into the GIDEP failure experience database, which was established to promote information exchange among agencies. Further, none of the evaluated sites has established specific procedures and processes for inputting, receiving, and disseminating sensitive information into GIDEP as required by the Policy Letter.

The requirements for DOE organizations are included in Attachment 1 to DOE Order 440.1A and are basically the same as those imposed on site contractors. However, two additional requirements that apply to DOE are delineated (i.e., pursuing legal remedies and disseminating S/CI information to other Federal agencies and private industry); these two unique requirements are not clearly assigned to a specific DOE organization. Neither the Order nor the Guide has been updated to reflect changes in the DOE organization (e.g., creation of NNSA), and the Guide references DOE directives that have been cancelled (such as DOE Order 5700.6C, *Quality Assurance*).



Tampering With a Swaged Lifting Sling Hook (raised casting mark for load limit was ground off and stamped to indicate a 2-ton limit)

The definitions of the terms “suspect” and “counterfeit” are not specified in the Order, but are discussed in the Guide. This situation has led to the use of different definitions at some sites. One site developed a very narrow, site-specific definition of S/CIs that could result in under-reporting of S/CIs and preclude notification of the IG. In addition, the scope of application of the term S/CI provided in the Guide has led to some confusion in application in the field. The term “safety system”—defined in the Guide to include non-nuclear safety applications—has been interpreted by some sites as synonymous with the definition of a safety system specifically for nuclear facilities. This interpretation can result in an overly narrow application of S/CI controls.

As discussed in Section 3.3, some DOE sites have not established effective processes for implementing DOE Order 440.1A requirements. In addition, most of the specific expectations for implementing an S/CI process are provided in non-mandatory guidance. Some

sites have not adopted DOE guidance and have not developed comparably effective alternatives. As discussed in Section 3.1 and 3.7, S/CI information was not always communicated effectively, reporting requirements were not always met, and informal processes for disseminating information and tracking actions were not effective. Such deficiencies could be addressed by strengthening DOE requirements for communicating and tracking lessons learned.

Overall, DOE policies and guidance address many elements of an effective S/CI process, but some areas need further clarification. As part of its plan to improve the process for management of S/CI, EH plans to revise Department directives to support changes in responsibilities and processes. These revisions need to reflect the above weaknesses. EH actions to clarify DOE S/CI and non-conforming item reporting requirements, including definitions of suspect and counterfeit items, are currently being addressed in the ongoing revisions to DOE Manual 231.1-2X, *Occurrence Reporting and Processing of Operations Information*. These changes also need to be reflected in other DOE directives and guides that address control of S/CIs.

2.2 Roles and Responsibilities

DOE safety-related roles, responsibilities, authorities, and accountability are delineated in the *Safety Management Functions, Responsibilities, and Authorities Manual* (DOE Manual 411.1-1B) and in the “Responsibilities” sections of various DOE orders (e.g., DOE Order 440.1A and DOE Order 414.1A). These documents adequately establish responsibilities for Headquarters line management organizations with respect to the directives that include S/CI-related requirements (e.g., DOE Order 440.1A worker protection requirements and DOE Order 414.1A quality assurance requirements). However, they delineate only general areas of responsibility and contain little specific information on S/CI responsibilities.

DOE directives do not adequately delineate responsibilities, authorities, accountability, and interfaces for some important Headquarters S/CI support functions, such as information analysis, dissemination, and reporting. In general, the directives lack specificity in the assignment of S/CI responsibilities, hindering any efforts to hold individuals and organizations accountable for performance. The responsibilities of the QAWG related to S/CIs were not explicitly addressed in DOE directives, and the QAWG did not have documented procedures to govern its operations and clear

responsibilities for individuals and organizations. For example, responsibilities for basic administrative functions, such as maintaining a current list of QAWG members and field points of contact, were not established and assigned. Further, the interface between the QAWG and line management organizations was not adequately defined and thus did not ensure that information was always adequately communicated through the line management chain.

Overall, DOE lacks a structured program, with clear responsibilities and authorities, for implementing Headquarters S/CI functions. These weaknesses contributed to the inadequate communication of the GIDEP Notice on Temperform, as discussed in Section 2.4. The recent assignment of responsibility for the Department's management of S/CIs to EH has established a mechanism for achieving accountability for overall program implementation. Further efforts by EH to improve the Department's S/CI process are needed to ensure clear assignment of responsibilities for Headquarters and field organizations as well as those within EH.

2.3 Communication and Information Exchange

As noted previously, EH is restructuring its organization; the QAWG has been discontinued and its functions are performed by an EH office. Until this recent change, the QAWG performed most DOE Headquarters communication and information exchange functions, and DOE used a support contractor to perform many of the analysis functions, such as reviewing GIDEP Notices and other sources of information. Contractor personnel performing screens would not have had access to the GIDEP Notice on Temperform. The QAWG typically disseminated information via regular teleconferences, databases, email, and, in some significant cases, Quality Alerts. Screeners captured information from review of various data sources (GIDEP, Institute for Nuclear Power Operations, Nuclear Regulatory Commission, and Occurrence Reporting and Processing System) on data collection sheets. A subcommittee reviewed these sheets in order to determine their disposition, and the results of these reviews were items for discussion at QAWG meetings. In many cases, the section of the data sheets describing the disposition of the items was incomplete. For most data sheets, the information was passed to various contacts and committees for action as appropriate.

Although operating without procedures, the QAWG included numerous knowledgeable and conscientious individuals who demonstrated individual initiative in many cases. On numerous occasions, the QAWG disseminated timely and relevant information through its teleconferences. It also provided a good forum for DOE-wide discussion of S/CI issues, sharing information and lessons learned among DOE personnel, and raising awareness of S/CI issues. For example, the QAWG was instrumental in developing and updating S/CI training materials.

However, the QAWG was not a fully effective, structured process. As discussed above, it had no documented procedures for its operations (beyond a description and flow diagram in the guide). Specific weaknesses in the communication and information exchange functions include:

- Processes for disseminating information were not formalized or effective. The QAWG lacked adequate documented criteria, thresholds, or timeframes for prioritizing, categorizing, analyzing, and disseminating information to the field. The Headquarters screening and analysis process has been inconsistent and does not effectively filter irrelevant information. Some of the data collection sheets did not include adequate information to be of value to sites, and some sites were no longer receiving or utilizing the information. Sometimes relevant and potentially important information (e.g., the Temperform notice) was not addressed with a higher degree of urgency, such as with a Quality Alert.
- Information was not disseminated in a timely manner. Feedback regarding QAWG interaction with the leadership of DOE professional committees, such as fire protection and hoisting and rigging, and field personnel indicated that the QAWG information was often not timely or significant, and that feedback from working groups regarding significance or applicability was not solicited.
- There were no formal training programs or qualification requirements for personnel who performed screening and analysis of incoming S/CI information.
- Interfaces between line management and support organizations were not defined. Line management

organizations had not established processes for interfacing with the QAWG to ensure that information was effectively communicated and acted on as appropriate. As a working group supporting line management, the QAWG could suggest action but had no authority to direct DOE field elements or sites to take action. Such authority is appropriately reserved for line management. Until 1998, the QAWG worked through the DOE field management organization, but DOE reorganizations eliminated this mechanism. Participation in QAWG conference calls—a mechanism for sharing information—was voluntary and inconsistent. The conference calls were not well structured to provide information in a categorized and prioritized manner. There was no systematic process for ensuring that sites received information or that the site point-of-contact list was accurate. Some personnel on the email address list (used for communication to QAWG personnel and points of contact) had retired or were on other long-term assignments and did not respond to emails from the QAWG. There were no provisions for verifying receipt or updating distribution lists.

- Sensitive information was not adequately handled. There were no documented procedures for dealing with sensitive information (e.g., information that cannot be shared with contractors). DOE did not seek approval to release sensitive information so that a timely and effective investigation could be conducted by contractors. The lack of procedures may have impacted the screening process; as noted, the GIDEP Temperform information was not to be provided to non-Federal personnel (who were performing the screening function), and there were no established processes for dealing with sensitive information.
- Headquarters had not established a process for sharing information from DOE sites with other agencies through GIDEP as required by the OMB Policy Letter.
- There were no established provisions for self-assessments of the Headquarters processes for managing S/CIs, and no assessments had been performed.

Recently, EH began implementing improvements to the S/CI process and has developed a draft process description. EH has also conducted training for

individuals involved in screening of information. Observation of initial screening of information indicated that further improvement is needed to ensure that useful information is provided to the sites. EH has also disseminated some recent information on S/CIs in their operating experience reports (e.g., suspect/counterfeit fasteners found in ratcheting tie-down straps). The draft EH S/CI process description addresses some, but not all, of the weaknesses noted above.

Overall, historical practices for communication and information exchange were not well structured and were not always effective. Improvements have been initiated but need additional attention to ensure that all identified weaknesses are addressed.

2.4 Headquarters Actions Relating to the Temperform Notice

Weaknesses described in Section 2.3 contributed to unnecessary delays in disseminating sufficient information and clear direction to the field with regard to Temperform aluminum. As a result, the initial investigations at many DOE sites were not timely or effective in determining whether suspect aluminum represented a safety concern. Specific weaknesses in the initial Headquarters handling of Temperform information include:

- Some sites did not receive and respond to the information because the emails were sent to the wrong email address or went to personnel who were no longer at the site or were not engaged in S/CI activities.
- DOE Headquarters did not take action to address the restrictions on providing information to contractors (e.g., coordinating with the DCIS to get permission to disseminate the information to selected contractor personnel) so that an effective investigation could be conducted. The initial (July 19, 2002) email indicated some restrictions on providing information to contractors but did not provide an acceptable path forward for conducting an effective investigation in the absence of such critical information. The suggested actions in the December 2002 email emphasized the importance of a thorough investigation at contractor sites but did not resolve the restrictions on contractor access. The unclear instructions in both emails contributed to several field elements disseminating the restricted

information to their contractors without the requisite permission from DCIS.

- The QAWG did not initially interact with DOE Headquarters program offices to ensure that the sites recognized the priority and importance of the investigations, and to ensure that line management endorsed and supported the investigations. Consequently, some sites initially performed only cursory examinations.
- Contractors did not initially provide DOE with some information (e.g., costs of investigations) requested by GIDEP.

The initial Headquarters actions with regard to the Temperform issue were insufficient to ensure a timely and effective investigation at all DOE sites. The weaknesses in the processes discussed in Sections 2.1 through 2.3 manifested themselves in inadequate direction and follow-up by DOE Headquarters.

Similar problems were evident in past events, as documented in a 1996 independent oversight report and a 1998 QAWG lessons-learned report. However, the corrective actions resulting from these reports were not sufficient to prevent recurrences. For example, the 1998 report identified a problem with multiple requests for information coming from multiple DOE organizations. The 1998 report also identified the lack of a mechanism for disseminating sensitive S/CI information; such a mechanism is needed to ensure that sites have sufficient information to conduct effective investigations while criminal investigations are ongoing. These same problems adversely impacted DOE's response to the GIDEP Notice on Temperform aluminum.

After the initial communications and responses were determined to be inadequate, EH and DOE program offices increased their involvement and direction. Line management has now directed sites to ensure that their investigations are thorough and rigorous. EM directed sites to conduct investigations utilizing specific lines of inquiry. (Errors in the initial EM lines of inquiry have been corrected.) EH provided the lines of inquiry to NNSA and other Headquarters line organizations to begin their investigations. However, as a result of the uncoordinated and differing instructions and requests among the different Headquarters programs, the comprehensiveness of field organization investigations and responses has varied, as further described in Section 3.1. Also, the

interim reports were not well organized and some sites did not complete all needed actions, such as investigations of subcontractors and credit card purchases. Some non-defense offices have not yet completed their investigations, and there are no clear timelines for completion.

DOE Headquarters actions also did not encompass a few potentially important DOE activities. For example, the Headquarters instructions did not address such DOE Headquarters-managed functions as the Office of Safeguards Transportation (OST) and the nuclear emergency search team, which report to NNSA Headquarters. However, OST and the nuclear emergency search team use aircraft, and the use of Temperform aluminum in aircraft was a particular concern raised in the GIDEP Notice. Further, the line of inquiry did not emphasize the importance of evaluating aircraft owned or leased by DOE. In addition, a protective force contractor that uses helicopters did not complete an evaluation and was not directed to perform one by the DOE line management chain.

Overall, DOE Headquarters actions with respect to the GIDEP Notice on Temperform aluminum were not sufficient to ensure a timely and comprehensive initial investigation. Subsequent actions were taken by EH and DOE line management to address recognized deficiencies. However, some potentially important activities were not investigated, and some non-defense sites have not completed investigations. The communication weaknesses contributed to significant delays in the investigative process at many DOE sites.

2.5 Ongoing EH and Program Office Enhancements

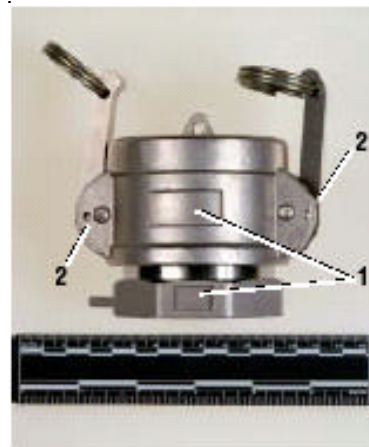
EH is developing an action plan to address recognized weaknesses in the current processes for managing S/CI issues. The action plan identifies the appropriate general areas (e.g., directives) that need to be enhanced. Sustained management attention will be needed to ensure that the action plan is finalized and that the general areas of needed improvement identified in the draft action plan are translated into a detailed set of actions that fully address the weaknesses identified in this report. In addition, effective coordination between EH and line management will be needed to ensure that the new processes are effectively communicated to all DOE sites and are understood and accepted in the field. Sustained EH management attention is also needed to ensure that the new

processes are effectively implemented, evaluated after implementation, refined as needed, and verified to be effective in addressing the complex and diverse needs of the various DOE organizations.

However, the ongoing actions are not sufficiently comprehensive to address all weaknesses. Areas that warrant additional attention include:

- Continued attention is needed to developing adequate procedures to ensure effective, consistent, and timely analysis and dissemination of information, as well as effective management of issues that warrant priority management attention and responses from line management. Such procedures need to address sensitive information and reporting, as well as the interface between EH and line management.
- Provisions for self-assessments of Headquarters functions are not yet established.
- EH needs to assure that revisions to directives adequately capture requirements and responsibilities for DOE line organizations and that the scope and definitions associated with S/CIs are clearly established.
- The QAWG has been disbanded, and EH has assumed responsibility for cross-cutting quality assurance issues. However, EH has not yet informed the field elements about the change in approach, and most field elements are not aware of the change in points of contact or communication lines.

EH has been recently assigned to address cross-cutting environment, safety, and health (ES&H) issues for the Department. EH has applied some effort to understand the causes of the deficiencies related to the Temperform investigation, and has developed actions to improve the management of S/CIs. However, EH has not utilized a structured approach to evaluate the conditions, determine the causes and extent of conditions, develop a corrective action plan that clearly assigns responsibility and deliverables, and identifies measures of effectiveness. More fundamentally, EH has not performed a rigorous and systematic needs assessment to determine other needed actions to ensure timely and effective responses to future issues involving non-conforming items. In addition, the corrective action plan developed by EH addresses the Temperform issue



Suspect/Counterfeit Stainless Steel Hose Connector (missing manufacturer's identification, improperly placed locking holes, magnetic properties inconsistent with marking indicating 316 stainless steel)

only and does not address the underlying lack of structured processes for managing cross-cutting issues, which contributed to deficiencies and delays in the initial DOE efforts to investigate the Temperform issue.

2.6 Summary

Current DOE Headquarters S/CI policies and directives, roles and responsibilities, training, and communication and information exchange processes have weaknesses that need to be addressed. Policies and directives do not adequately address some aspects of the Policy Letter. Roles and responsibilities are not defined in sufficient detail to ensure effective performance and accountability, and Headquarters personnel who perform S/CI functions did not participate in a formal training program. Also, the Headquarters S/CI communication and information exchange processes lack the structure and rigor needed to ensure consistent and effective performance. These process weaknesses contributed to delays and deficiencies in the effectiveness of the DOE response to the GIDEP Notice on Temperform.

Subsequent actions by EH and program offices have addressed most of the specific problems in the response to the GIDEP Notice, and formal investigations have been performed or initiated at most sites. However, additional attention is needed to prevent future recurrence of similar problems. Particular attention is needed in the areas of directives, program management (including a structured and documented program), operating procedures (with clear thresholds, criteria, and timelines), interface between EH and line management, clarity of responsibilities and authorities, and self-assessments. A systematic needs analysis is a requisite step for ensuring that program enhancements are sufficient to establish and maintain an effective Headquarters program for managing S/CIs. Periodic

self-assessments are also critical to ensure that enhancements are effectively implemented and achieve the desired objectives. In addition, EH needs to develop a process for managing cross-cutting issues, such as

the S/CI issue, to ensure that information is disseminated in an effective manner and that actions required by the field are formally communicated through appropriate channels and responses are tracked.

3.0 Implementation of Suspect/Counterfeit Item Requirements at DOE Sites

OA evaluated DOE field element and site contractor processes against DOE requirements and expectations in the following areas: investigations of suspect aluminum items in response to the GIDEP Notice on Temperform; roles and responsibilities; flowdown of requirements; training; procurement, inspection, and acceptance; disposition of installed items; reporting and information exchange; and assessments.

The evaluation is based on a review of DOE field element and site contractor implementation of DOE S/CI processes at seven selected sites that provide a cross-section of line management organizations and missions. Three NNSA sites were included: Los Alamos National Laboratory, the Pantex Plant, and the Kansas City Plant. These NNSA sites include a weapons laboratory and nuclear and non-nuclear production/operations facilities. Los Alamos had confirmed instances of procurement of Temperform-treated aluminum parts, providing OA an opportunity to review the effectiveness of the site investigation and response. Three EM sites were evaluated: the Savannah River Site, the Hanford Site, and the Office of River Protection. One SC site, the Oak Ridge National Laboratory, was also included.

3.1 Response to GIDEP Notice on Temperform

As discussed in Section 2.4, many Headquarters factors have contributed to the lack of timeliness and comprehensiveness of the Temperform investigation. The Temperform investigation also revealed problems at the DOE field office and contractor levels. Within DOE field organizations, communications are sometimes informal and uncoordinated. For example, the QAWG communications generally came to the ES&H or quality assurance support organization within the DOE field or support offices. In some cases, these organizations informally requested (via telephone or email) Temperform information from the contractor's ES&H or quality assurance support organizations without the involvement of

either DOE or contractor line management or the contracting officer.

When Headquarters issued more formal direction (memoranda), this direction flowed directly from the field DOE line management to the contractor line management, in some cases informally and without the involvement of the DOE ES&H or quality assurance support organizations. The lack of formal communication and clear assignment of S/CI responsibilities within some DOE field offices and between site and support offices results in multiple, differing, and/or incomplete requests to the contractors. Consequently, some contractors performed separate, but concurrent, Temperform investigations or performed investigations that varied in scope, depth, and quality.

After receiving formal direction from their respective line management in early 2003, in most cases contractors performed timely, comprehensive, and complete investigations. Two of the seven evaluated sites found confirmed or suspected Temperform-treated material, and in both cases the material was appropriately evaluated and dispositioned.

Although most of the investigations were adequate, specific weaknesses in investigation scope or processes include:

- Two of the evaluated sites did not review credit card purchases. At one of these sites, controls are in place to exclude the use of the credit card system when procuring critical materials, so purchase of Temperform-treated aluminum via this system was unlikely. At the other site, however, credit cards are used extensively for purchases below \$2500. Credit card purchases include safety-related components at nuclear facilities, including a reactor that uses heat-treated aluminum in core components and in other safety-related applications.
- In several cases, prime or subcontractors that might have used Temperform materials were not included in the investigations. These

included a site security force contractor that operates aircraft at one site, and all subcontractors at two other sites.

- Most sites had not established a mechanism that effectively captured and maintained information on non-conforming items. Therefore, for these sites the Temperform investigation was a one-time activity and did not preclude Temperform-treated materials from being procured in the future.
- Occurrence Reporting and Processing System (ORPS) reporting of the Temperform material discoveries was not timely at one site (a three-month delay following discovery) and was not performed at the other site that discovered and dispositioned aluminum that might have been treated by Temperform.

These problems were exacerbated by delayed and erroneous communications at all levels regarding Temperform before and throughout the formal investigations.

Overall, the investigations of the Temperform issue were delayed by communication weaknesses. Subsequent investigations performed after line management provided direction were more rigorous but have some specific weaknesses. DOE and contractor management attention is needed to ensure that processes and corresponding responsibilities and authorities addressing these deficiencies are effectively developed and implemented.

3.2 Roles and Responsibilities

DOE program offices and field elements have typically assigned responsibilities for broad safety areas, such as quality assurance, to organizational elements and/or individual staff members. In some cases, individual DOE staff members have been tasked to perform S/CI functions, such as participation in QAWG activities. Some DOE individuals are knowledgeable and proactive in performing these functions.

However, in most cases, DOE program offices and field elements have not established or documented clear and specific expectations and responsibilities for performing DOE line management functions specific to S/CI requirements. Responsibilities for such functions as line management oversight of S/CIs, reporting S/CI issues, monitoring information sources (e.g., GIDEP), and ensuring that S/CI requirements

flow down from contracts to operating procedures are rarely defined and documented. At one site, the recent NNSA reorganization and corresponding realignment of responsibilities between the site office and the support center contributed to unclear direction to the contractor. In addition, DOE field elements are not using performance objectives or measures to promote effective contractor performance.

Requirements governing S/CI processes are defined in rules and DOE directives (e.g., quality assurance and worker safety directives) that are incorporated into the site operating contracts. At some sites, DOE line management and site contractors have translated the contractual requirements into institutional S/CI processes and procedures. However, at other sites, the contractual requirements have not been effectively captured in institutional program plans, institutional or facility procedures, or working-level procedures/instructions (see Section 3.3) so that responsibilities can be readily assigned and organizational elements and individuals can be held accountable.

DOE contractors generally have well-established responsibilities for such site processes as quality assurance, engineering, and procurement. Many aspects of S/CI management fall within the scope of these processes. For example, site procurement processes typically have appropriate measures (e.g., approved vendors, receipt inspections) to assure the quality of procured materials. However, effective management of S/CI issues requires effective coordination among many site organizational elements and processes to address concerns unique to S/CIs. For example, clear processes and responsible individuals need to be established to handle sensitive information and maintain records and materials that may be needed for government investigations or prosecution of fraudulent vendors.

OA's review indicates that the rigor and specificity in defining responsibilities for unique S/CI concerns varied considerably across the inspected sites. Three of the evaluated contractors have appropriately defined and documented specific responsibilities for most aspects of S/CI management. For example, a few contractors have formally assigned individuals to serve as S/CI coordinators. The coordinator positions have defined responsibilities and authorities to coordinate the numerous organizational interfaces and ensure that S/CI processes are effectively implemented. However, at other evaluated sites, responsibilities, authorities, and accountabilities for S/CIs are not as clearly and specifically defined and documented. Some sites have

no S/CI coordinator or have informally assigned the responsibilities. In addition, expectations and responsibilities for certain functions are not well defined or communicated at some sites. For example, expectations and responsibilities for performing receipt inspections have not been established for credit card purchases at some sites.

Areas where weaknesses were noted in responsibilities and accountability for S/CI management at multiple sites include:

- Non-conformance reporting (NCR) systems—the primary means for reporting non-conforming items, including SC/Is—do not include clear S/CI responsibilities and expectations for properly documenting S/CIs, complying with ORPS and IG reporting requirements, and facilitating communication of S/CI information.
- Interfaces between procurement organization and users are not well defined. Procurement elements that develop and maintain lists of approved or qualified suppliers do not receive routine feedback from the users on the performance of items they have acquired. As a result, information necessary for holding the vendors accountable is not always comprehensive.

Overall, most DOE field elements and several sites have weaknesses in the definition of S/CI responsibilities, authorities, and accountabilities. These weaknesses contributed to implementation deficiencies discussed throughout this section.

3.3 Flowdown of S/CI Requirements

As discussed in Section 2.1, DOE requirements and guidance address many aspects of an effective S/CI process. However, as discussed below, some DOE requirements did not adequately flow down to the working level.

Two of the seven sites did not adopt the S/CI provisions of the worker safety order and did not develop suitable alternatives. In accordance with DOE policies, DOE field elements and contractors may apply approved DOE processes, such as the Work Smart Standards process or the standards/requirements identification document (S/RID) process, to tailor requirements to site-specific hazards and activities. At one site, the DOE field element and prime contractor

applied the Work Smart Standards process and did not incorporate the S/CI provisions of DOE Order 440.1A into the contract. At another site, the S/CI requirements were incorporated into the Work Smart Standards set but were not addressed in the site policy or implementing documents. These two sites are still required to implement a quality assurance program but have not implemented DOE-specific controls in important areas, such as S/CI training, systems for disseminating S/CI information, mechanisms for identification and disposition of installed S/CIs, procurement, inspection, testing, and reporting. There are no national or industrial standards that encompass S/CIs, and these two sites did not establish or implement comparably effective S/CI controls as part of their quality assurance program. The absence of the DOE Order 440.1A S/CI provisions (or comparably effective site-specific measures) contributed to poorly documented and fragmented S/CI controls at these two sites. The effectiveness of the S/CI controls at these sites depends primarily on the training and expertise of individuals, and implementation of controls at these two sites was not consistently effective. Further, because the specific S/CI requirements were not in the prime contract, they did not flow down to subcontractors, and subcontractor employees did not always receive the appropriate S/CI training.

At other sites, the effectiveness of flowdown of S/CI requirements to the working level varied. Some sites had effective programs for flowdown of requirements, with only a few deficiencies. The S/CI provisions of DOE Order 440.1A were included as contractual requirements in the Savannah River S/RID and were appropriately addressed in institutional-level and lower tier procedures. This formal approach provided the workforce with a clear understanding of responsibilities and performance expectations and resulted in effective dissemination of S/CI information from internal and external sources. The other sites adopted the S/CI provisions and established a formal S/CI process and mechanisms (e.g., procedures) for implementing some S/CI requirements at the working level, but these mechanisms were not always comprehensive or effectively implemented.

Specific weaknesses in flowdown of requirements that reduce the effectiveness of S/CI controls at one or more sites include:

- S/CI requirements were not imposed on some subcontractors. The two sites that did not adopt the DOE Order 440.1A S/CI requirements, as well

as one other site contractor, did not transmit the S/CI requirements of DOE Order 440.1A to subcontractors.

- Receipt inspection procedures and testing requirements did not have adequate provisions for inspecting lifting and rigging items for S/CIs at three sites.
- Most sites have not fully delineated requirements and responsibilities for dissemination of S/CI information in implementing procedures, contributing to instances where information regarding S/CI events was not adequately disseminated on site or reported off site to other agencies and sites.
- Most sites have not translated the DOE Order 440.1A S/CI training requirements for site-specific use, with clear expectations for attendance at training and frequency of training/retraining. As a result, some individuals who need training have not been trained or are not current in their training (see Section 3.8).
- Most sites have not developed specific provisions for assessments of S/CI processes as part of their quality assurance plans or self-assessment programs. Only one site performs regular assessments (see Section 3.7).

DOE Order 440.1A also specifies S/CI requirements applicable to the Federal staff, such as dissemination of S/CI information to other Federal agencies and private industry. None of the DOE/NNSA field elements have established formal processes for implementing these requirements. The poorly defined processes for communicating S/CI information to contractors have contributed to delays in responding to the Temperform issue.

Overall, flowdown of requirements varies in effectiveness. Although some deficiencies in implementation of S/CI controls were identified at all sites, implementation is more effective at sites that have adopted the S/CI provisions of DOE Order 440.1A and that have robust mechanisms for translating the contractual requirements into working-level instructions. Sites that have not adopted DOE Order 440.1A provisions or that have incomplete flowdown of requirements to the working level are less effective in implementing controls, and their programs lack the

defense-in-depth that full and effective implementation of DOE directives would provide.

3.4 Training

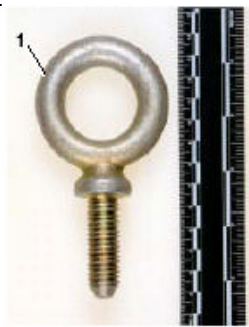
Most DOE sites have provided S/CI training to many site individuals who perform S/CI functions (e.g., warehouse personnel who perform receipt inspections) or may encounter S/CIs during their normal work activities (e.g., maintenance personnel). For example, at one site, nearly 900 contractor employees have received site S/CI awareness training, and procurement personnel have received additional training. Another site has held initial and refresher training classes every two to three years for large groups of personnel, including managers, supervisors, procurement personnel, and workers. Another site provides initial and refresher training and plans to conduct knowledge-based and performance-based surveys to evaluate S/CI training effectiveness. The large number of trained individuals at DOE sites increases the likelihood that S/CIs will be identified during normal operations.

OA team personnel attended training classes at Headquarters and several sites and determined that the courses were effective in raising awareness of S/CI issues and the associated safety implications. Hands-on instruction and samples of S/CIs were used effectively to train individuals to identify S/CIs. Several sites had effectively divided S/CI training into two parts: a hands-on training section provided by a knowledgeable subcontractor, and a second part addressing the site's specific S/CI process, procedures, requirements, and implementation.

However, weaknesses were identified in S/CI training programs and implementation of those programs at most sites. While a large number of personnel have received training, some of the training was provided on a reactive basis and not driven by an institutional training program. Most sites have not established formal S/CI training programs or qualification requirements for personnel who perform S/CI-related functions. Most sites have not established formal training requirements defining the type of training needed, who should receive that training, the basis for selecting those individuals designated to receive training, the content of initial training, or the frequency and content of refresher training. At many sites, there are limited or no requirements that subcontractors involved in the procurement or handling of potential S/CI materials receive training. In most instances, there are no requirements for personnel to attend training prior to performing duties, such as receipt inspection, that are

critical to recognizing and preventing the introduction of S/CIs into critical systems and components. At one site, S/CI training is not a requirement for any position, and attendance at S/CI training is voluntary. At some sites, S/CI training is not effectively integrated into the site training program because the S/CI process does not have a clear owner.

Such weaknesses in S/CI training processes have contributed to deficiencies in the application of training to the workforce. At most sites, some personnel with responsibilities related to S/CIs—for example, personnel who perform receipt inspection, purchasing,



Suspect/Counterfeit Eyebolt
(no manufacturer's markings to verify rated load capacity)

quality assurance, system engineering, and maintenance—have not received training or are not current on their refresher training. This is of particular concern in the case of system engineers who are involved in design, procurement, and inspection activities, where properly trained personnel can prevent the introduction of S/CIs. The recent DOE initiative to establish a system engineering program in

response to DNFSB 2000-2 further underscores the important role of system engineers and the need for them to receive S/CI training.

Overall, although S/CI training for administrative and management personnel generally addresses examples of the hardware aspects of S/CIs, in many instances it does not adequately address site-specific processes for identifying, dispositioning, and reporting S/CIs. For example, the processes for reporting S/CIs to the IG vary from site to site, and site-specific reporting and working interfaces with the IG are not integrated into S/CI training.

3.5 Procurement, Inspection, and Acceptance

DOE Order 440.1A requires line management to establish and implement procurement process controls to prevent the unintended introduction and use of S/CIs in safety systems and other applications that can create potential hazards to workers. All evaluated site contractors have incorporated some S/CI control elements into procurement and quality programs, but

the processes have been established and implemented with varying degrees of rigor, integration, consistency, and effectiveness.

The evaluated sites have mature and well-established formal processes for procurement of materials, particularly for safety system procurement. S/CI controls have generally been formally incorporated into procurement processes, from design input through receipt inspection and installation. In many instances, these controls are appropriately designed to identify and prevent the introduction or use of non-conforming material, including S/CIs, that could affect critical equipment and processes, the safety of workers or the public, or the environment. Typically, various controls are incorporated into different processes and procedures, thus providing defense-in-depth and multiple opportunities to identify and prevent the introduction of S/CIs into safety-affecting installations or applications. Although not specifically directed toward S/CIs, the rigorous quality controls used for nuclear weapons stockpile procurement processes pose additional barriers to exclude non-conforming materials from weapon production and support activities.

Most sites that were reviewed have established well-defined, graded approaches to classifying items, or categories of items, according to the level of safety or quality risk in their intended applications, such as safety-class and safety-significant systems, structures, and components (SSCs); SSCs that are important to safety or defense-in-depth; and workforce personnel safety items. Appropriate quality acceptance criteria, including S/CI considerations, are typically specified to suppliers in procurement documents and inspected by the site during source or receipt inspections. Site contractors have incorporated terms and conditions related to S/CIs into many procurement contracts, typically for items historically identified as S/CIs. All evaluated sites had qualification processes to evaluate selected vendors' quality programs and past performance to establish that suppliers were reliable, and to provide assurance that procured material would meet specifications. All evaluated sites have established multiple, graded purchasing methods based on cost, type of material, and the safety or quality level required for its end use. These range from user-controlled purchasing systems (e.g., credit cards, sometimes referred to as purchase cards or P-cards) for low-cost consumables, with few institutional controls for purchases that have no safety or quality requirements, to formal, well-documented processes for weapons components and special fabrication of safety-affecting materials.

At some sites, certain types of items (e.g., threaded fasteners, valves, circuit breakers, and lifting gear) are inspected for S/CIs on receipt because there have been a significant number of past instances where vendors have distributed counterfeit or non-conforming versions of these items. When specified, receipt inspections are generally performed effectively by experienced, trained, and knowledgeable quality control inspectors. However, at several sites, receipt inspections are performed by technical personnel who do not have the same level of training and certification as quality control inspectors.

In general, the controls for S/CIs in procurement and inspection documents are more rigorously established and adhered to for weapons production and support programs than for items intended for installation in facilities or for general uses, such as hoisting and rigging. In most cases, controls for the identification of non-conforming S/CIs, the labeling/tagging of accepted material, and procedures for issue and use are adequately defined and implemented. However, OA identified weaknesses in some elements of these processes at all evaluated sites and in many elements at a few sites. Areas of weakness identified at multiple sites include:

- **Site contractors do not ensure that subcontractors have established and implemented sufficient S/CI controls.** Several sites lack controls to ensure that procurement processes and equipment brought on site by subcontractors provide sufficient protection from the introduction and use of S/CIs that could affect worker safety.
- **S/CI controls for items that could affect worker safety are not always sufficient or effectively implemented.** Items that could affect worker safety, such as equipment for high-pressure steam, air, gas systems, and lifting gear, are not always identified or designated to be receipt-inspected for safety or quality attributes, including those for S/CIs. Some sites appropriately perform receipt inspections for S/CIs on all hoists, cranes, hooks, and below-the-hook lifting gear. Other sites procure this material from their qualified vendors as just-in-time items without inspection for S/CIs before use. For research projects, S/CI inspections are not consistently required by procurement procedures or specified in procurement documents.
- **Processes for requisitioning safety-affecting items lack sufficient controls.** At several sites, S/CI clauses in procurement contract terms and conditions are not consistently applied to all types of items with a history of S/CIs. In some cases, S/CI clauses are not included in requisitions or purchase contracts for items that could affect worker safety. Several sites have inadequate limitations on the use of procurement credit cards to purchase items affecting safety. For some just-in-time programs, no additional quality inspections, including S/CIs, are specified, even on a sampling basis, for such items as threaded fasteners and electrical equipment that have a documented history of being S/CIs. In those cases, total reliance is placed on vendors not to supply S/CIs based on prior vendor qualification, or on the inclusion of S/CI information clauses in requisitions or contracts. At one site, the end users (maintenance craft), who are trained to identify S/CIs, perform the only review for S/CIs at the time they obtain the facility maintenance material (e.g., fasteners, breakers, and valves) from stores. Most sites have not established or maintained an updated formal listing of products that have historically been identified as S/CIs; such a listing could help preclude the procurement of known S/CIs or provide a handy resource for the identification of installed or warehoused S/CIs.
- **Supplier evaluations and performance monitoring are not always adequate.** The establishment and maintenance of a listing of qualified vendors pose problems at several sites. The process and results of conducting supplier quality audits, including specification of S/CI criteria, are generally well established and performed. However, except for weapons procurement, the criteria for determining when a supplier needs qualification and to what level of detail are not always clear, and the frequency and processes for re-inspection or re-qualification are not always defined. Several sites lack effective methods for routinely collecting and evaluating quality-related performance data (e.g., receipt-inspection results) or performing formal, periodic reviews of vendor performance. In instances where S/CIs are identified during receipt inspections, sites typically do not formally communicate relevant information to the vendor so that vendors can take corrective action to preclude recurrence.

- **There is insufficient rigor in identifying and dispositioning non-conforming items and S/CIs during storage and receipt inspections.**

Most sites do not consistently and effectively document and evaluate non-conforming items, including S/CIs, to ensure that the extent of condition and root causes are identified and addressed. In addition, sites do not typically document on the NCR system or other corrective action documents or procedures that potential S/CIs are to be reported through ORPS and to the IG. Other weaknesses include the failure to evaluate the potential for identified S/CIs to be installed or located elsewhere on site, inadequate root cause analysis, and allowing scrapping of S/CIs valued at less than \$3000 without an NCR or reporting. Failure to determine the source and cause of suspect/counterfeit fasteners and circuit breakers found during inspections at material issue stations at one site resulted in the introduction of additional S/CIs, which were identified several years later during inspections at the same locations. In another case, S/CI material identified during receipt inspection had not been documented on NCRs or reported through ORPS or to the IG for over three months after identification.

Overall, contractors at the evaluated sites have incorporated many S/CI control elements into procurement and quality programs, and the rigor of controls appropriately reflects the safety significance of the items in most cases. However, processes have been established and implemented with varying degrees of rigor, consistency, and effectiveness. The procurement process weaknesses identified during this review typically result from inadequate definition of responsibilities (see Section 3.2) and inconsistent or incorrect application of S/CI controls.

3.6 Disposition of Installed Items

Although procurement and receipt inspection processes provide some assurance that S/CIs will be identified prior to being installed, S/CIs are still found. The S/CIs being found at sites today could have been introduced before controls were implemented and could have remained undetected in previous walkdowns. S/CIs could also have been introduced because of weaknesses in the current controls or ineffective implementation of the controls. Therefore, DOE Order

440.1A requires sites to develop and implement procedures for inspection, identification, evaluation, and disposition of S/CIs installed in safety systems. All the evaluated sites have established processes that support the identification and disposition of installed items; however, the detail, rigor, and effectiveness of these processes vary.

All evaluated sites perform inspection and maintenance of safety-affecting equipment, such as hoisting and rigging equipment and nuclear-safety-related components. These inspection and maintenance activities provide opportunities to look for S/CIs, and some site procedures specifically direct maintenance personnel to look for S/CIs. In addition, some sites provide maintenance personnel with badges/cards portraying suspect bolt head markings to facilitate identification of S/CIs during inspection and maintenance activities. Furthermore, as discussed in Section 3.4, many site maintenance personnel have attended S/CI training, which has increased their awareness of S/CIs and their ability to identify S/CIs.

However, S/CI provisions have not been integrated with existing sites processes (e.g., routine or special maintenance inspection activities) at some sites. For example, sites often rely on maintenance personnel to look for S/CIs as part of maintenance activities and have trained them to recognize S/CIs. However, the site processes (e.g., maintenance procedures) usually do not prompt individuals to look for S/CIs and do not include links to tools (e.g., lists of S/CIs and non-conforming items) that could be useful. Similarly, some sites' processes do not have links to S/CI reporting provisions and do not provide clear instructions for actions to take when S/CIs are identified or suspected. In most instances, S/CI requirements can be effectively addressed by integrating the S/CI provisions into existing site processes, such as routine and preventive maintenance, procurement processes, system and equipment inspections/walkdowns, ORPS, NCRs, and lessons learned.

Another mechanism for identifying S/CIs is to perform targeted inspections to look for a certain type of S/CI in installed equipment or storage areas. Typically, such targeted inspections would be prompted by reports of the discovery of S/CIs at other DOE, government, or industry sites, and would be conducted where warranted based on an evaluation of potential safety impacts. However, as discussed in Section 3.7, most sites have not established a fully effective system for S/CI reporting and information exchange. In addition, most sites do not have documented processes for reacting to information and performing targeted

inspections. The variation in the effectiveness of site processes is evident in the response to information about non-conforming tie-downs, which was disseminated through the QAWG and other sources. Some sites appropriately evaluated the information, performed targeted inspections, and identified and dispositioned non-conforming items. However, other sites were not aware of the potential problem or took no action when they received the information.

If an S/CI is identified in installed equipment, sites are required to evaluate its impact and disposition. Most of the evaluated sites use the NCR system as the primary vehicle for evaluating and dispositioning S/CIs. At most evaluated sites, the NCR systems appropriately include provisions for removing equipment from service until the impact of the S/CI is determined, involving engineering in determining the impact and ultimate disposition of the S/CI, and documenting and reporting resolution of non-conformances. In addition, several sites have established S/CI control procedures that provide specific provisions for controlling and evaluating S/CIs in installed equipment. For example, several site contractors have established an S/CI control procedure that requires S/CIs to be color-coded if they are determined to be acceptable to remain in place.

However, weaknesses in the S/CI disposition processes or their implementation were identified at most sites evaluated:

- Most site NCR procedures do not include directions for evaluating whether non-conforming items might be S/CIs.
- Most site NCR procedures do not establish expectations for the timeliness of evaluating and disposition of potential S/CIs.
- In some instances, items that could have been S/CIs were removed from equipment, but NCRs were not developed as required by site procedures.
- Some S/CI control procedures are too limited in scope (e.g., only addressed fasteners).



Suspect/Counterfeit Circuit Breaker
(factory seals missing, amperage not stamped on toggle switch, epoxy filler missing)

These weaknesses, combined with the NCR weaknesses discussed in Sections 3.5 and 3.7, reduce the level of assurance provided by site S/CI processes. No instances were identified where sites had identified a potential S/CI in installed equipment and allowed it to remain in service without formal engineering review and disposition. However, some inspection processes are limited in scope (e.g., focusing on fasteners), and potentially relevant information is not always formally evaluated through the NCR process and is not always shared.

Overall, most evaluated sites have formal or informal processes for identifying and dispositioning installed S/CIs. However, most sites' maintenance and inspection procedures do not specifically address inspection for S/CIs. In addition, some weaknesses in site processes for dispositioning installed S/CIs degrade the timeliness and formality of dispositioning potential S/CIs.

3.7 Reporting and Information Exchange

As part of OA's evaluation of the effectiveness of management systems and controls for timely reporting and exchange of information, OA reviewed the implementation of ORPS and IG reporting requirements and their integration into contractor processes for disposition of non-conforming items, including S/CIs. OA also followed up on actions taken by the field in response to the GIDEP Notice on Temperform, with emphasis on the identification of lessons learned from processes and mechanisms used to communicate Headquarters direction and expectations to the field. In addition, the OA special study selected ten case study examples of potentially safety-significant non-conforming item concerns, including S/CIs that had been identified from both external and internal sources. The case studies provided further insight into the effectiveness of the overall communication flow between Headquarters and the field. Case study examples were specifically selected to ensure that they were safety-significant; had wide, generic applicability to the DOE complex; and had been previously screened and disseminated by the QAWG.

Of the seven DOE field organizations that were evaluated, none of the Federal organizations has a documented process in place to ensure timely communication of information about S/CIs to their contractors or to monitor associated contractor actions. However, some DOE field elements have designated

a Federal employee to be responsible for line oversight of the S/CI process; these field elements generally communicate external information received by the field office to the contractor.

Some sites do not effectively integrate requirements for reporting to the IG into NCR or other such site reporting processes. In some instances, sites did not provide reports to the IG before destroying or disposing of S/CIs. At one site, NCRs are not required for non-conforming items that are to be scrapped if the value is less than \$3000, whether S/CI-designated or not. The effectiveness of S/CI reporting processes and NCR systems is also hindered by poorly defined roles and responsibilities and interfaces (see Section 3.2) and insufficient institutional expectations and requirements (see Section 3.3). In addition, as discussed in Section 2.1, none of the reviewed sites are reporting to the GIDEP database as required by the Policy Letter.

At several sites, contractor procedures include appropriate provisions for reporting, but those procedures are not always effectively implemented. Sites have successfully identified and reported S/CIs on a number of occasions, but on other occasions, weaknesses in NCR process implementation have impacted timely identification and communication of S/CI information. For example, at several evaluated sites, S/CIs identified during receipt inspection were not always reported in ORPS or to the IG as required by site procedures. At one site, identified S/CI parts were held in a warehouse for several years but were not reported in ORPS or to the IG. At several sites, NCRs were not always issued after S/CIs were identified, as required by site procedures; S/CI reporting requirements were then not met because the NCR (which was the only applicable reporting mechanism) was not generated. In some cases, no evaluation of the potential for the identified S/CIs to be installed or at other locations was documented on NCRs. The source and cause of S/CI material (fasteners and circuit breakers) found during inspections of warehouses and issue stations at one site were not determined during the disposition of the resulting NCRs, and subsequent inspections at the same locations several years later identified that additional S/CIs had been introduced. In addition to failure to follow existing site procedures, other factors discussed elsewhere in this report (e.g., differing interpretations of ORPS reporting requirements, a lack of S/CI training, insufficient S/CI assessments, and insufficient site awareness of S/CI issues) contributed to reporting weaknesses. DOE

sites generally do not adequately evaluate the extent of condition and root causes as part of the analysis and reporting processes.

With some exceptions, most evaluated sites have established processes for receipt and dissemination of external information about S/CIs and other non-conforming items. Most sites use their lessons-learned program as the principal mechanism for screening external information about S/CIs and other non-conforming items and disseminating that information to site organizations. The Savannah River Site has a detailed and rigorous lessons-learned program that is used effectively to communicate and document S/CI information. Also, most sites routinely receive and screen information from the DOE Society for Effective Lessons Learned Sharing (SELLS) database, DOE Operating Experience Weekly Reports, the Consumer Product Safety Commission website, and internal site-specific lessons-learned sources, such as occurrence reports.

Some site contractors have also developed additional mechanisms. For example, the Savannah River Site developed and uses a Controlled Products List to capture and consolidate all S/CI and non-conforming item information from the site lessons-learned program. Field procurement engineers use this list to ensure that S/CI and non-conforming items are not included in requisitions. The consolidation of S/CI information and non-conforming items on a single list increases awareness and facilitates the use of S/CI information by responsible site personnel.

Although the framework for an effective communications process is in place at most reviewed sites, process and performance weaknesses have resulted in untimely or ineffective evaluation and dissemination of S/CI and non-conforming item information. Only three sites that were evaluated were familiar with and able to show evidence of receipt and dissemination of seven or more items from the ten selected case studies. Other sites that were reviewed demonstrated awareness of less than half of the ten case study items and typically could provide only anecdotal evidence of dissemination. As a result of awareness created by the OA review, several sites have initiated formal communication and investigation for some case study items.

Most site lessons-learned processes lack rigor and formality in documenting the applicability of lessons learned, actions required or taken in response to lessons learned, and follow-up and closure of actions taken. Key deficiencies that reduce the effectiveness of lessons-learned processes include:

- Lessons-learned procedures typically lack sufficient requirements for formally documenting feedback on applicability reviews, needed actions, or actions taken. Established, formal feedback mechanisms are rarely used. As discussed in Section 3.1, weaknesses in lessons-learned program feedback processes contributed to untimely and ineffective initial investigative efforts for Temperform aluminum at one site.
- Distribution lists for communication of lessons learned are not formally documented, maintained, and controlled to ensure that appropriate organizations and individuals receive S/CI and non-conforming item information in a timely manner.
- Established, formal lessons-learned processes are often not used. Instead, information is disseminated informally (e.g., by email), thus bypassing formal applicability and priority determinations, development of needed actions, and formal tracking and feedback mechanisms.
- Not all available information sources, such as the GIDEP failure database, the NNSA lessons-learned database, and the QAWG data collection sheets, are routinely screened for lessons-learned applicability. Participation in the GIDEP failure database is voluntary, and most sites are unaware of this information resource. As discussed in Section 2.3, the QAWG had no systematic process for ensuring that sites received information or that the site point-of-contact list was accurate.
- Several sites indicated that multiple Headquarters efforts (i.e., establishing additional, duplicative lessons-learned databases) complicated site efforts and drained limited site resources.

The failure to identify and document the applicability of lessons learned, needed actions, or actions taken was previously identified as a recurring deficiency on OA inspection activities (see the March 2003 *Independent Oversight Lessons Learned Report*).

DOE does not have a formal institutional driver to ensure that sites establish rigorous lessons-learned programs. DOE expectations for the generation and application of lessons learned are defined in a DOE standard; general expectations are expressed in other policies but are not codified in a mandatory DOE order.

Several sites evaluated in this special study had ongoing initiatives to further strengthen the formality of their lessons-learned processes. However, this OA review demonstrates a need for additional DOE-wide actions to strengthen lessons-learned requirements to ensure timely communication, analysis, and closure of safety-significant information that requires line management action.

OA's review indicates that S/CIs are still being discovered during receipt inspections and maintenance/operations of facilities. These continued discoveries indicate that S/CIs are still being supplied to DOE sites, and that vendor controls cannot be relied on exclusively. Comprehensive and robust S/CI programs are still needed. At the seven sites, OA determined that contractors with robust S/CI processes have, in general, identified and reported a larger number of S/CIs than sites with less robust programs. When DOE management attention was directed at S/CIs in the 1995 timeframe, a large number of S/CIs were reported via ORPS, many identified as a result of directed inspections of installed equipment. Since then, for many sites, there have been very few reports of S/CIs through ORPS until the recent attention resulting from the Temperform issue. Reporting on the identification of both installed and procured S/CIs has dramatically increased throughout the DOE complex in 2003.

Overall, the effectiveness of management systems and controls for timely reporting and exchange of information varies widely for the seven evaluated sites, and improvements are needed at most sites. Contractor NCR systems provide a viable mechanism but have not always been used effectively to properly document S/CIs, comply with ORPS and IG reporting requirements, and facilitate communication of S/CI information. Ongoing EH and planned program office enhancements should improve the consistency in site reporting of S/CIs and non-conforming item information, but additional strengthening of lessons-learned requirements is warranted.

3.8 Assessments

Various DOE directives (e.g., worker safety order, quality assurance order/rule, the integrated safety management policy, and the line management oversight policy) require line management to perform assessments of safety-related systems and processes. S/CI processes are one of the many safety system functional areas that are to be assessed by DOE line management oversight programs and contractor

assurance programs. DOE directives do not specify minimum frequencies for assessments of specific safety systems, such as S/CI processes. Rather, DOE field elements and contractors are required to develop site-specific assessment priorities and plans, such as site quality assurance plans.

Of the seven sites reviewed, only the Pantex Plant has devoted significant attention to S/CI processes in its site-specific assessment program. Although a few weaknesses were noted, the Pantex Plant contractor assessment program includes regular self-assessments and independent assessments of S/CI processes. For example, the contractor's assessment organization performed an independent assessment of compliance with the S/CI requirements in July 2002, and the quality organization performed assessments of the S/CI processes in August 2000 and in June 2003. These assessments identified opportunities for improvement, and several enhancements are under way or planned. In addition, NNSA's Pantex Site Office routinely conducts quality assurance surveys, which occasionally address elements of S/CI processes.

At the other sites reviewed, DOE field element and site contractor assessment programs do not have provisions for regularly assessing the effectiveness of S/CI processes. In a few instances, portions of S/CI-related processes (e.g., procurement) were assessed as part of a review of other safety programs, but most sites have not performed recent assessments focusing on the effectiveness of their S/CI processes. With few exceptions, DOE contractors do not assess S/CI processes as a regular part of their line management self-assessments. Similarly, DOE line and contractor independent assessments (e.g., assessments by quality assurance organizations or audit organizations) rarely address S/CI elements, even when related processes (e.g., procurement or maintenance) are assessed.

Overall, based on OA's sample of seven sites, assessment programs at most DOE sites do not adequately assess the effectiveness of S/CI processes. The S/CI process and implementation deficiencies noted at several sites result at least partially from the lack of effective assessments by DOE line management and site contractors.

3.9 Summary

S/CIs are still being discovered in DOE warehouses and facilities, indicating a need for improvement in S/CI controls and increased management attention. Increased attention is needed to ensure that information about S/CIs and non-conforming items is effectively communicated and readily accessible. Effective assessments by DOE line management and site contractors are also essential to ensure that programs are improved and sustained.

Based on a sample of seven DOE sites, the implementation of DOE S/CI requirements varies in rigor, level of formality, and effectiveness. Some sites have mature programs with well-documented processes and clear responsibilities, with only a few weaknesses. Other sites and most DOE field elements do not have structured programs and rely extensively on individual training and initiative to identify and disposition S/CIs. In general, the sites with structured programs and designated S/CI coordinators are more effective in implementing controls and discovering S/CIs. Although the effectiveness of S/CI processes varied considerably, all sites had some weaknesses in procurement, disposition, reporting functions, assessments, flowdown of requirements, roles and responsibilities, or training programs. The weaknesses in S/CI processes have, in turn, contributed to delays in performing effective investigations in response to the GIDEP Notice on Temperform.

Conclusions

Weaknesses in the DOE Headquarters and site S/CI processes resulted in delays and deficiencies in DOE's initial investigations of the Temperform issue. Improvements are needed to preclude recurrence of similar problems. The ongoing and planned actions by EH and some sites are generally appropriate but need to be expanded and applied across the DOE complex as follows:

- EH should expand their draft action plan to address the applicable recommendations listed below. EH also needs to ensure that the general areas of needed improvement identified in the draft action plan are translated into a detailed set of actions that fully address the weaknesses identified in this report. Further, EH needs to communicate the new processes to DOE sites, including expectations for field interfaces and feedback on the new processes and information systems.
- All DOE program offices (including those not evaluated in this special study) need to direct their field elements and contractors to review this OA report and conduct an applicability review for each of the recommendations. This applicability review should critically examine current processes at each site to determine whether the recommendations are applicable to their programs and facilities and take appropriate actions to enhance their processes.
- EH also needs to coordinate and monitor DOE Headquarters efforts to address the recommendations that apply to DOE Headquarters, in accordance with their responsibilities for monitoring and tracking line management progress in addressing cross-cutting issues, as described in the Deputy Secretary of Energy's memorandum of March 31, 2003.



Ratchet Tie-Down and Suspect/Counterfeit Bolt

Recommendations

This OA evaluation identified the following recommendations. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible line management and modified as appropriate, in accordance with programmatic objectives and priorities. The recommendations for DOE field elements and contractors are based on the review of a sample of DOE sites. However, all DOE field elements and contractors should examine the recommendations and the associated underlying weaknesses in Sections 2 and 3 to determine applicability to their facilities and activities.

Headquarters Line Organizations

1. For all sites under each program office's jurisdiction, ensure that the provisions of DOE Order 440.1A, Attachment 2, Section 22 (or comparably effective standards) are addressed and that S/CI processes are effectively implemented. Specific actions to consider include:

- Ensure that S/CI processes and other S/CI-related processes (e.g., quality assurance and procurement) are assessed by the responsible field element (or other suitable means) to determine their effectiveness in addressing safety-related aspects of S/CIs.
- Ensure that the provisions of DOE Order 440.1A, Attachment 2, Section 22 (or comparably effective alternative site-specific requirements) have been established in the site

contract and Work Smart Standards or S/RIDs and flow down to the working level.

- Ensure that unique aspects of S/CI, such as reporting requirements and interfaces with the IG, are fully addressed.
- Evaluate reporting processes and their implementation to determine whether reporting and sharing of information meet DOE expectations.
- Ensure that DOE field elements and contractors have adequate provisions for regular assessments of S/CI processes or regularly address S/CI as part of self-assessments of facilities.

2. Ensure that processes are established to provide reliable and formal communications with site organizations. Specific actions to consider include:

- Coordinate with other line organizations for sites where multiple programs are present to ensure that all appropriate operations are included and to avoid redundant requests.
- Review distribution lists for future correspondence regarding S/CIs to ensure that all appropriate organizations are included.
- Develop processes for regularly updating interfaces and points of contact, including clear responsibilities for updates.
- Ensure that processes are established for providing formal line management direction to contractors (including involvement of the contracting officer where applicable) when DOE requires a formal report or actions in response to an S/CI or non-conforming item issue.

Office of Environment, Safety and Health

1. Expand the scope of EH's ongoing efforts to enhance the process for capturing, reviewing, and disseminating information about S/CIs to Departmental organizations. Ensure that the following items are considered:

- Ensure that the revised process communicates all appropriate information by a structured process to

responsible individuals and avoids reliance on informal mechanisms, such as conference calls and emails. The following elements should be addressed:

- Criteria for determining and utilizing the appropriate formal communication mechanism, such as an EH Alert, Operations Weekly, or input into the Department's lessons-learned database
- Provisions in the mechanism utilized for significant items for specifying actions, reporting requirements, and milestones for completion of actions
- Guidelines for timelines for processing information, including timelines for urgent actions
- Provisions for consolidated DOE/NNSA resources for a single, comprehensive lessons-learned program and database.
- Establish processes for implementing the OMB requirements for exchange of information regarding non-conforming items, including a process for handling sensitive information obtained from GIDEP and expectations and assignment of responsibilities for inputting information into GIDEP.
- In coordination with the IG, clarify expectations for reporting information about suspect items to the IG.
- Ensure that the process is clearly communicated with line organizations, including expectations for types of information to be provided by the various mechanisms (e.g., Departmental lessons-learned process) and disposition of information from various sources. Consider issuing a transition plan that describes how and when EH will perform functions previously performed by the QAWG.

2. Expand the scope of EH's ongoing efforts to revise applicable DOE directives to improve the processes for the Department's management of S/CIs.

- Ensure that Departmental policies and directives effectively establish requirements and

responsibilities for implementation of OMB Policy Letter 91-3, *Reporting Nonconforming Products*. Departmental policies and directives need to clearly delineate requirements and responsibilities for both DOE and its contractors to use the GIDEP failure database to exchange information, examine GIDEP information and promptly disseminate safety-related information, conduct assessments of the effectiveness of programs, and establish procedures for involving the IG in receipt and dissemination of sensitive information.

- Ensure that roles and responsibilities for implementation of S/CI requirements are clearly defined in DOE directives. These requirements should clearly address DOE/NNSA Headquarters, field elements, and their contractors, and should be appropriately tailored based on the current overall missions and functions of each major organizational element.
- Ensure that key terms, such as “suspect” and “safety systems,” are clearly and consistently defined in DOE directives. Ensure that key definitions and terms used in directives clearly establish and maintain the intended broad scope of application of S/CI requirements, particularly in their use in nuclear facility, non-nuclear facility, and worker safety applications.
- Ensure that S/CI training program requirements and expectations are clearly delineated and addressed in applicable DOE orders and supporting guides. The guidance documents should address the types of individuals (positions) that should receive training and the type of training. It should also provide examples of training on site-specific processes and procedures for identifying, dispositioning, and reporting S/CIs, including how each site interfaces with the IG as part of the reporting process.
- Review and evaluate the need for establishing additional S/CI requirements for sites to formally establish a mechanism that captures and maintains current and accurate information on S/CIs and non-conforming products. Such a mechanism (e.g., a controlled product list) is essential to ensure effective implementation of S/CI controls for preventing and minimizing the potential for introduction of S/CIs and non-conforming products.

- Review and evaluate the need for establishing requirements for minimum performance expectations to ensure that sites establish rigorous lessons-learned programs. Departmental expectations for the generation and application of lessons learned are defined in a standard and manual, and general expectations are expressed in other policies, but they are not codified in a mandatory DOE directive. Failure to identify and document the applicability of lessons learned, needed actions, and actions taken has been identified as a recurring deficiency in OA inspection activities, previous Type A and B incident investigations, and this special study.

3. Establish centralized information sources to provide ready and efficient access to information about known S/CIs and non-conforming items to Departmental organizations . Ensure that the following items are considered:

- In the website for S/CI information being established by EH, consider including and maintaining a list of known S/CI items for reference.
- Establish mechanisms for providing information about vendors that have distributed S/CIs.
- Consider identifying individual subject matter experts in various areas (e.g., electrical, fasteners, fire protection) to serve as DOE-wide points of contact on technical aspects of S/CI decisions. For example, sites could call an individual to obtain advice on a particular non-conforming item (e.g., is the non-conforming item within the normal range of defects, or is it indicative of deliberate fraud that needs to be reported?).
- Tailor Headquarters S/CI processes to meet the needs of DOE sites, which have a wide range of resources and capabilities (e.g., some of the larger DOE field elements and large sites are essentially self-contained with respect to S/CI management and are capable of performing screening and analysis functions with little or no support from Headquarters, whereas other sites have fewer resources and expertise in the area of S/CI and must rely heavily on DOE Headquarters to perform screening and analysis functions).

4. Develop a structured process for managing the correction of cross-cutting issues. Specific actions to consider include:

- Ensure that the process addresses identifying causal analysis, determining the extent of condition, clearly establishing deliverables, assigning responsibility for actions, tracking actions to closure, and measuring effectiveness.
- Establish processes for interacting and coordinating with program offices and sites to ensure effective and efficient dissemination of information while ensuring that formal direction is provided through line management channels, including the contracting officers where appropriate.
- Expand or modify existing processes (e.g., lessons learned, corrective action management) to provide a mechanism for ensuring that necessary actions in response to non-conforming item issues are documented, assigned to organizations, tracked, and monitored.

DOE Sites (Field Elements and Contractors)

1. Ensure that appropriate requirements, limitations, and S/CI controls are clearly prescribed for the use of all established methods of procurement and that implementation of these requirements is periodically monitored. Specific actions to consider include:

- Ensure that formal supplier qualification and re-qualification processes are established and implemented, including routine collection and evaluation of feedback on vendor performance. Ensure that alternative mechanisms, such as commercial item dedication processes, provide comparably effective controls.
- Ensure that appropriate S/CI controls, including receipt inspection criteria, are applied to both safety-related and important-to-safety (e.g., emergency power, life safety, and boilers) infrastructure SSCs and to other equipment that could affect worker safety (e.g., lifting gear). Establish these controls on a graded basis that considers the risks involved and historical experience with S/CIs.

- Ensure that adequate controls are implemented for segregation and separate storage of material identified as suspect/counterfeit, to be inspected, on quality assurance hold, inspected, and accepted.
- Ensure that subcontractors establish and implement sufficient controls to preclude the introduction or use of S/CIs. These controls should address construction materials, maintenance or modification equipment and components, and the use of subcontractor-owned or rental equipment (cranes, hoists, etc.) on site.
- Fully integrate S/CI processes, requirements, and controls into integrated safety management and quality assurance programs and procedures (e.g., training, procurement, maintenance, and assessment) to ensure adequate linkage to S/CI elements.

2. Evaluate the processes in place for identifying and dispositioning installed S/CIs to ensure that they provide assurance that installed S/CIs will be identified and appropriately dispositioned. Specific actions to consider include:

- Establish expectations for timeliness in determining whether non-conforming items are S/CIs.
- Establish protocols for clearly identifying S/CIs that are determined to be acceptable for use.
- Incorporate inspections for S/CI material into routine maintenance activities, and provide clear guidance for the disposition of installed S/CI materials identified during routine inspections and maintenance activities. Integrate expectations for S/CI controls within existing processes, such as routine and special inspections for S/CIs, in site procedures and provide guidance for performing such inspections.

3. Evaluate and enhance current management systems and processes for reporting and information exchange to ensure that they are capable of maintaining current, accurate information on S/CIs and associated suppliers, use all available sources, and ensure dissemination of relevant information on S/CIs. Specific actions to consider include:

- Evaluate the need for a documented process that formalizes roles and responsibilities and interfaces for management of S/CIs, including provisions for the handling of sensitive information and interfacing with the local DOE IG to ensure effective, consistent, and timely communication of S/CI information.
- Consider establishing S/CI coordinator positions to ensure that the multiple site organizations work together to perform S/CI functions effectively.
- Ensure that appropriate S/CI reporting requirements are effectively integrated into site contractors' processes for disposition of non-conforming items, such as site NCR processes, as required by appropriate DOE directives.
- Evaluate lessons-learned processes to determine whether all available and relevant information resources, such as GIDEP, are being utilized for screening S/CIs and other relevant information for potential applicability to site activities.
- Evaluate the rigor and formality of lessons-learned processes and ensure that sufficient requirements and performance expectations have been established for the documentation of applicability reviews, needed actions, and actions taken for lessons learned that require line management attention and action. Lessons learned requiring line management action should be integrated with the site's corrective action management processes to ensure formal tracking, feedback, and closure of actions taken.
- Ensure that corrective action and issues management procedures include formal linkage to S/CI reporting requirements for DOE site offices, ORPS, contractor general counsels, and the IG. Improve documentation of procurement information related to non-conforming material, including S/CIs.

4. Establish sufficient site mechanisms, such as a controlled product list, to maintain current and accurate information on S/CIs. Include provisions for making this information readily available to site personnel who have S/CI responsibilities for procurement, inspection, and other areas associated with the implementation of S/CI controls.

5. Evaluate S/CI training programs and make necessary revisions as needed. Specific actions to consider include:

- Formalize S/CI training programs to include the identification of positions and associated personnel required to receive training, the processes for designating those personnel who must receive initial and refresher training, and the required frequencies for refresher training.
- Ensure that all personnel involved in design, system engineering, procurement, inspection, maintenance, or other functions involving potential S/CI materials receive S/CI process and hands-on training. Place special emphasis on ensuring that system engineers involved in the design, procurement, and inspection of materials and components with the potential for S/CIs receive such training.
- Ensure that subcontractors involved in the procurement or handling of potential suspect/counterfeit materials and components receive initial and refresher training and are knowledgeable of site S/CI processes, procedures, requirements, and controls.
- Ensure that S/CI training addresses site-specific processes and procedures for identifying, dispositioning, and reporting S/CIs, including reporting to the IG.

6. Ensure that S/CI process assessments are performed by both DOE and the contractor to provide management with adequate information on S/CI processes and implementation of S/CI requirements. Specific actions to consider include:

- Ensure that S/CI processes are subject to regular self-assessments, consistent with site self-assessment protocols.
- Perform assessments of S/CI processes to evaluate significant changes to S/CI processes and establish a baseline for implementation where appropriate. Based on the baseline reviews, tailor further assessments to the maturity of the S/CI processes.
- During assessments of areas that interface with S/CI processes (procurement process, NCR

process, etc.), consider and evaluate S/CI lines of inquiry as appropriate.

- Perform DOE line management assessments of contractors' S/CI processes within the range of

assessment activities, based on the maturity and/or level of activity of the S/CI processes or when significant changes to the processes have been implemented. Assessments in related areas, such as procurement, should consider S/CI interfaces.

APPENDIX A

SUPPLEMENTAL INFORMATION

A.1 Dates of Review Activities

Headquarters Review May 12 - June 6, 2003

Site Reviews

Los Alamos National Laboratory	June 9 - 13, 2003
Savannah River Site	June 9 - 13, 2003
Kansas City Plant	June 23 - 27, 2003
Hanford Site	June 23 - 27, 2003
Office of River Protection	June 23 - 27, 2003
Oak Ridge National Laboratory	July 7 - 11, 2003
Pantex Plant	July 7 - 11, 2003

Report Writing and Validation July 14 - 31, 2003

A.2 Review Team Composition

A.2.1 Management

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