Analysis of the Temperform USA Investigation Conducted by the Department of Energy

Prepared by
U.S. Department of Energy
Office of Environment, Safety and Health
Office of Analytical Studies

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The Secretary of Energy, in his August 25, 2003 response to the Defense Nuclear Facilities Safety Board (DNFSB) on suspect/counterfeit items (S/CI), committed the Office of Environment, Safety and Health (EH) to: 1) review the results of the Office of Independent Oversight and Performance Assurance (OA) Special Study of the Department's Management of Suspect/Counterfeit Items, 2) perform a causal analysis of the Temperform USA investigation and the Department's S/CI process, and 3) implement corrective actions as needed.

To fulfill that commitment, EH conducted a detailed set of analyses of the Temperform USA investigation and the S/CI Process to ensure that the Department's S/CI identification, notification, and investigation process is effective. This report documents the results of the causal factor/root cause analysis, change analysis and the review of the OA Special Study recommendations for EH. Questions or comments concerning this report should be addressed to the Team Leader, Frank E. Tooper, at (202) 586-1772 or by e-mail at Frank.Tooper@eh.doe.gov.

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Executive Summary

On August 25, 2003, the Secretary of Energy responded to the Defense Nuclear Facilities Safety Board (DNFSB) on the results of the Department's investigation into the potential use of improperly heat-treated aluminum parts, components or materials supplied by Temperfrom USA or its vendors. This correspondence also committed the Office of Environment, Safety and Health (EH) to review the results of the Office of Independent Oversight and Performance Assurance (OA) Special Study of the Department's Management of Suspect/Counterfeit Items, perform a causal analysis of the Temperform USA investigation and the Department's S/CI process and implement corrective actions as appropriate.

EH conducted an events and causal factor and root cause analysis of the Temperform USA investigation and S/CI process to ensure that the Department's S/CI identification, notification, and investigation process is effective. This report documents the results of this analysis and responds to the OA Special Study recommendations for EH.

Individuals from EH, the Office of Environmental Management (EM), and the National Nuclear Security Administration (NNSA) performed the analysis. The team identified the following root causes in the Department's conduct of the Temperform USA investigation:

1. The Quality Assurance Working Group (QAWG) was responsible for collecting and sharing crosscutting quality assurance information such as S/CI Department-wide. However, DOE through the QAWG lacked a formal process to:
   a. implement the QAWG Charter and Mission requirements,
   b. institutionalize S/CI identification, notification and investigation activities to ensure effective and timely closeout,
   c. incorporate the lessons learned from earlier events such as Solid State Devices, Inc. (SSDI), and
   d. effectively carry out the responsibilities contained in DOE O 414.1A *Quality Assurance* and the QAWG Charter.
2. An informal/non-standard mechanism (e.g., e-mail) was used to communicate significant S/CI information requiring DOE-wide action.
3. The QAWG did not have the authority to ensure a timely investigation of Temperform USA.

The team identified several lessons learned. Corporate-level senior management, rather than a committee, must be accountable with clearly defined roles and responsibilities for S/CI identification, notification, and investigation. A formal process should be used to direct the identification, screening, handling of sensitive or Official Use Only information, and disposition of potential S/CI information for the Department. DOE employees should be actively involved in the process of screening items for potential DOE applicability from the Government-Industry Data Exchange Program (GIDEP) and other databases to ensure that any S/CI data with restricted access are not overlooked. If a Department-wide investigation is warranted, Program Secretarial Officers (PSOs) must issue formal correspondence with detailed lines of inquiry to initiate and guide operating contractor actions. Senior management must also review and

consolidate investigation results to ensure thorough, consistent reporting and closure. This includes reporting results to EH as the corporate S/CI process manager.

The team also found that DOE actions taken over the past several months are adequate to eliminate shortcomings in the Temperform USA investigation. Actions have been or are being taken to address the OA Special Study recommendations for EH to ensure an effective S/CI process.

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1.0 Background

On April 21, 2003, the Secretary of Energy responded to the Defense Nuclear Facilities Safety Board (DNFSB) regarding the Department of Energy's suspect/counterfeit items (S/CI) identification, notification, and investigation process. This response described improvements made to the S/CI process to ensure that items and components installed in safety-related or mission-sensitive applications affecting defense nuclear facilities meet function and operability requirements.

The Deputy Secretary of Energy directed the Assistant Secretary for Environment, Safety and Health (EH-1) to take the lead for the Department in this area. EH-1, working closely with the Assistant Secretary for Environmental Management (EM), the Deputy Administrator for the National Nuclear Security Administration (NNSA), and the Offices of the General Counsel (GC) and Inspector General (IG) completed an investigation of the use of improperly heat-treated aluminum parts and materials from Temperform USA at defense nuclear facilities. EH-1 was also directed to ensure that the Department has an effective process in place to deal with S/CI issues in the future.

In May 2003, EH assumed corporate responsibility for the S/CI process. EH developed a process guide and supporting manual to provide direction on implementing the S/CI process to collect, screen, disposition, and communicate information on S/CI that could potentially impact operations at Department of Energy (DOE) facilities. EH is currently revising DOE Order 414.1A, *Quality Assurance* and supporting guide to include the new S/CI process requirements and consolidate S/CI requirements previously contained in DOE G 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees.* The Order is due to be issued in March 2004. EH has also created an S/CI website for the Department that contains current information on S/CI and defective items.

In August 25, 2003, the Secretary of Energy responded to the DNFSB with the results of the Temperform USA investigation on improperly heat-treated parts and materials. Several S/CI process improvements were committed to as part of a corrective action plan. One such commitment for EH was to: 1) review the results of the Office of Independent Oversight and Performance Assurance (OA) Special Study of the Department's Management of Suspect/Counterfeit Items, 2) perform a causal analysis of the Temperform USA investigation and the Department's S/CI process, and 3) implement corrective actions as appropriate.

This report documents the results of the events and causal factor analysis, root cause analysis, change analysis and the review of the OA Special Study recommendations for EH and presents the team's conclusions in the form of root causes, lessons learned and recommendations.

2.0 Scope and Analytical Methodology

Three separate analyses were conducted: 1) an events and causal factor analysis, 2) a root cause analysis, and 3) a change analysis. The purpose of using both the events and causal factor and the root cause analysis was to determine why the Department's investigation into Temperform

USA was not effective in producing timely and accurate results until approximately fifteen months after receiving the initial notification of the event.

EH established a team to perform the analyses, with the Director of the Office of Analytical Studies (EH-32) as the team leader. The team consisted of individuals from EH, EM, and NNSA. Team members interviewed Headquarters and field staff and management personnel involved in the Temperform USA investigation. The team also reviewed documentation on the original Government-Industry Data Exchange Program (GIDEP) Temperform USA notification and subsequent DOE notifications and investigations, along with DNFSB correspondence. Events and Causal Factor Analysis, Root Cause Analysis and Change Analysis are proven analytical methodologies. Each analysis was conducted was conducted by EH staff trained in the use of these methodologies. Factual information and data for these analyses were gathered through interviews and document reviews. Lines of inquiry (Attachment 1) were developed to assist in evaluating the Department's response to the Temperform USA investigation. A list of personnel interviewed is included in Attachment 2. A list of documents reviewed is included as Attachments 3.

3.0 Causal Factors and Root Causes

The focus of the events and causal factor analysis was to develop a chronological sequence of events for the activities preceding and during the Temperform USA investigation. Next associated conditions for each event were identified and analyzed to determine causal factors. The results of the analysis are displayed in an events and causal factor chart provided in Attachment 4.

Seven causal factors were identified as a result of the events and causal factor analysis. A root cause analysis was then conducted to identify the causal factors that, if corrected, would prevent recurrence of problems associated with the Temperform USA investigation. The root causes identified are:

1. The Quality Assurance Working Group (QAWG) was responsible for collecting and sharing crosscutting quality assurance information such as S/CI Department-wide. However, DOE through the QAWG lacked a formal process to:
    a. implement the QAWG Charter and Mission requirements,
    b. institutionalize S/CI identification, notification and investigation activities to ensure effective and timely closeout,
    c. incorporate the lessons learned from earlier events such as Solid State Devices, Inc. (SSDI), and
    d. effectively carry out the responsibilities contained in DOE O 414.1A *Quality Assurance* and the QAWG Charter.
2. An informal/non-standard mechanism (e.g., e-mail) was used to communicate significant S/CI information requiring DOE-wide action.
3. The QAWG did not have the authority to ensure a timely investigation of Temperform USA.

Additional details regarding the analysis of events that took place during the Temperform USA investigation are provided in Section 5.0, Change Analysis Results.

4.0 OA Special Study Recommendations

At the direction of the Deputy Secretary of Energy, OA conducted a special study of the Department's management of S/CI in May through August 2003. The purpose of the special study was to evaluate the effectiveness of DOE's management of S/CI processes. The special study contained the following four recommendations with amplifying sub-recommendations for EH:

1. Expand the scope of EH's ongoing efforts to enhance the process for capturing, reviewing, and disseminating information about S/CI to Departmental organizations.

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

3. Establish centralized information sources to provide ready and efficient access to information about known S/CI and non-conforming items to Departmental organizations.

4. Develop a structured process for managing the correction of crosscutting issues.

Attachment 5 provides the status of EH's response to the OA Special Study recommendations including actions that have been or are being taken to address each recommendation.

5.0 Change Analysis Results

The purpose of the change analysis was to review the Temperform USA investigation and the Department's S/CI process to ensure that the Department's S/CI identification, notification, and investigation process is effective. The change analysis focused on the following four components of the S/CI process and their impact on DOE's investigation of the Temperform USA issue.

5.1 Temperform USA Issue Identification

In June 2002, GIDEP issued an Agency Action Notice regarding the improper heat-treating of aluminum parts by Temperform USA. The Notice indicated that Temperform USA allegedly provided false certifications of heat-treating processes and quality inspections from 1998 to at least 2000 on numerous Department of Defense (DoD) programs. Although the notice was directed primarily at DoD, the National Aeronautical and Space Administration (NASA), and commercial prime contractors involved with aviation and aeronautical programs, the notice recommended that other organizations "...review all orders or procurements associated with aluminum alloy parts, (especially parts identified as 'flight safety critical') for possible impact..."

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The QAWG, which was chartered in November 1995, was responsible for collecting and sharing crosscutting quality assurance information such as S/CI. The QAWG routinely e-mailed potential S/CI information in the form of Data Collection Sheets to its membership for information and appropriate action.

Analysis

The QAWG support contractor that was tasked with screening items with potential DOE applicability in GIDEP and other databases was denied access to the GIDEP Agency Action Notice on the Temperform USA issue. Only Federal employees were allowed access to the Notice. The support contractor did not notify the QAWG of the access restriction to the GIDEP Notice, and subsequently missed the opportunity for timely QAWG consideration. Subsequent discussions by the QAWG with the support contractor revealed that based on the GIDEP Agency Action Notice entitled, "Improper Heat Treating of Aluminum Aircraft Parts by Temperform USA", it would have been assumed to apply to aircraft and that the Federal Aviation Administration (FAA) would in turn notify DOE aircraft owners directly.

The QAWG Chairman first learned of the June 2002 GIDEP Notice informally in mid-July 2002 through an inquiry from a personal contact outside the Department. The process used by the QAWG and its support contractor to identify S/CI was informal, partially controlled by a flow chart, and did not work to identify the GIDEP Notice. As a result, there was no guarantee that similar events would have been identified and acted on in a timely manner.

Lessons Learned

- A formal process should be used to direct the identification and screening of potential S/CI information for the Department.

- EH Federal employees should be actively involved in screening items in GIDEP and other databases to ensure that any S/CI data with restricted access are not overlooked.

Current Status

Directives are currently being revised to reflect the new S/CI process and the roles and responsibilities of EH and other organizations. An S/CI Process Guide has been developed to provide direction on identifying and screening information on S/CI that could potentially impact DOE facilities. EH Operating Experience Group (EH-32) Federal employees screen items in GIDEP and other databases for potential S/CI. EH-32 conducts weekly meetings to ensure timely consideration of potential S/CI issues. The above actions address in part, the OA Special Study recommendations as shown in Attachment 5.

5.2 DOE Complex Notification

In response to the GIDEP Notice, the QAWG sent an e-mail with instructions to its members in July 2002, requesting information to determine if any weapons systems, support devices, or any other programs contained parts or raw material that may have been heat-treated, supplied, or tested by Temperform USA. Because some locations were slow to respond to the July 2002 e-mail and because some responses were not sufficiently thorough, the QAWG sent a follow-on e-mail to QAWG members in December 2002. This second e-mail provided additional information to clarify the request, along with a separate list of vendors that had done business with Temperform USA. In both cases, e-mail distribution was restricted to Federal employees, and responses were to be sent electronically to the QAWG Chairman or Vice-Chairman.

Analysis

Although DOE O 414.1A, *Quality Assurance,* provided the QAWG with sufficient responsibility and authority under the auspices of the Deputy Secretary, the QAWG did not function in this manner during the Temperform USA investigation. The QAWG served as a committee rather than as a recognized entity that could direct field organizations through the Deputy Secretary. The QAWG had only needed to issue two EH Safety Alerts on significant S/CI events in the past six years. As a result, this process was not frequently used and without a formal process in place, there was little assurance that the QAWG and the Department's response to the investigation would be timely and effective.

Both e-mails the QAWG sent on the Temperform USA investigation had the same appearance as the many previous QAWG informational e-mails. On the surface, nothing distinguished these e-mail messages from other e-mails sent out by the QAWG to distribution. The e-mails were sent to over eighty senior managers and staff. As such, it got the information to a wide array of individuals, but virtually eliminated any direct accountability for action except for the QAWG Chairman and Vice-Chairman.

The July 2002 e-mail contained a very large attachment of over 1,200 pages, consisting of a long list of improperly heat-treated aluminum parts. The size of the attachment and restrictions on its distribution to Federal employees only made it more difficult to conduct detailed procurement searches. It was not until the December 2002 e-mail that information was sent with a separate list of vendors who had done business with Temperform USA. Some sites had not conducted more detailed procurement searches until then.

E-mail is often viewed as an informal means of communication. Because the QAWG e-mail distribution list needed updating, some e-mail messages were delivered to the wrong people, and the flow down of important information such as the Temperform USA investigation was not always timely. The notification process took too long to ensure a

thorough and consistent response. The EH-1 memorandum to PSOs with lines of inquiry established more accountability and involved senior management. Senior line management, in turn, issued memoranda to the field that clarified the information field elements would need to obtain to complete the investigation.

Lessons Learned

- Formal correspondence from PSOs with detailed lines of inquiry must be used for Department-wide S/CI investigations.
- Senior management attention is needed to ensure timely and effective investigations and follow-up.
- The S/CI process must address the handling of sensitive or "Official Use Only" information related to investigations.

Current Status

EH has established a process to ensure that sensitive or "Official Use Only" information is properly handled. This process includes regular meetings with the IG to ensure a safety first approach is used for ongoing investigations. EH has also established a website for posting potential S/CI information and EH Safety Alerts. EH-1 issues Safety Alerts, and Assistant Secretaries (or the NNSA Deputy Administrator) assures significant S/CI are searched for and dispositioned correctly. In addition, field operations will report back to DOE Headquarters whether or not S/CI was found in response to EH Safety Alerts. The above actions address in part, the OA Special Study recommendations as shown in Attachment 5.

5.3 Data Collection and Tracking

Although the QAWG had collected a substantial amount of information, it was not clear that its investigation results were sufficient. In November and December 2002 and January 2003, the QAWG made presentations to the DNFSB staff on the Department's progress with the investigation. On February 11, 2003, EM-1 provided clarification in a memorandum to EM sites on the information needed to complete the investigation.

On February 14, 2003, the DNFSB sent a letter to the Secretary of Energy expressing its concerns with the Department's progress in addressing the Temperform USA issue. The letter requested that the Department issue a report documenting the completion of all actions required to verify that no aluminum parts heat-treated by Temperform USA are in use in safety-related or mission-sensitive applications.

On March 18, 2003, EH-1 sent a memorandum to EM and NNSA requesting that they verify completion of their inquiries into possible use of items heat-treated by Temperform USA. The EH memorandum included lines of inquiry that expanded upon those previously developed by EM. The Defense Criminal Investigative Service gave the

Department permission to release to its contractors the affected part numbers and the identity of the companies that sent parts to Temperform USA. That list of companies was included with the EH and EM memoranda. The part number list, consisting of over 1,200 pages, was again made available to EM and NNSA to support their investigation.

Analysis

Several sites responded back to the QAWG via e-mail within the requested timeframe with their investigation results. Some reported their results three times: in response to the QAWG e-mail messages in July 2002 and December 2002, and the EM and EH memoranda with lines of inquiry. The July 2002 e-mail created confusion over what information could be released to the contractors. At some sites, this delayed the investigation and required some sites to later revise their report to include Temperform USA vendor-related procurements that were missed earlier.

The QAWG lacked the authority and senior management support to ensure that complete and accurate investigation results were reported. Some initial investigation results were incomplete or inconsistent and later required additional effort to complete and provide the necessary information.

When lines of inquiry were forwarded by senior EM and NNSA management to the field, an increased level of attention was applied to the investigation. EM and NNSA Headquarters points of contact were identified to coordinate the collection and review of investigation results from the field prior to forwarding consolidated results to EH.

Lessons Learned

- Senior management at the corporate level rather than a Department-wide committee must be held accountable for S/CI.

- When senior management became involved and specific direction was provided to the field, the necessary data was collected and provided by the requested date. Accordingly, EH working through senior line managers should resolve S/CI investigation issues.

Current Status

The Secretary of Energy has directed EH-1 to take the lead to ensure that the S/CI process is effectively implemented. Under this new process, senior line management, who are accountable for safety, provide direction to the field to ensure that investigation results are sufficiently thorough. The revision to DOE O 414.1B, *Quality Assurance* delineates roles and responsibilities for implementing S/CI requirements. The above actions address in part, the OA Special Study recommendations as shown in Attachment 5.

5.4 Reporting and Closure

EM and NNSA completed their investigations and submitted the results of their reviews to EH. EH performed a corporate review of the reports to ensure complete and accurate analysis by line management. That EH corporate review supported the EM and NNSA conclusions that no heat-treated aluminum materials, parts, components, or equipment supplied by Temperform USA are in safety-related or mission-critical applications at defense nuclear facilities. No new issues requiring corporate action were identified.

On August 25, 2003, the Secretary of Energy provided the DNFSB with the results of the detailed investigations conducted by EH, EM and NNSA for parts and materials from Temperform USA. On November 7, 2003, EH-1 sent a memorandum to the Office of Inspector General with the results of the Temperform USA investigation.

Analysis

The S/CI process developed by EH and described in the Secretary of Energy's April 21, 2003 and August 25, 2003 letters to the DNFSB was used to close out the Temperform USA investigation.

Lessons Learned

- Senior line management must provide direction to the field and must be held accountable for reporting investigation results and reporting closure to EH.
- Investigation results must be reviewed and consolidated to ensure thorough and consistent reporting and closure of S/CI investigations.

Current Status

The S/CI Process Guide developed by EH, provides direction on consolidating results and closing out S/CI investigations. Directives are currently being revised to reflect the new S/CI process and the roles and responsibilities of EH and other organizations. EH is currently working to establish a process to implement the requirements established in the Deputy Secretary's letter regarding crosscutting issues. The above actions address in part the OA Special Study recommendations as shown in Attachment 5.

6.0 Continuous S/CI Process Improvement

The analysis team interviewed individuals on their understanding of the new S/CI process, whether they were aware of recently issued EH Safety Alerts and actions taken as a result of the Alerts, and to obtain feedback on the Department-wide videoconference on the S/CI process held in October 2003. This also provided the team the opportunity to further explore means for improving the Department's S/CI process.

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Results

- Approximately 73% of field interviewees indicated that they attended the October 2003 Department-wide videoconference and/or were knowledgeable of the new S/CI process.
- Approximately 77% of field interviewees indicated that they received the EH Safety Alerts on defective electrical relays and hydrostatic testing of gas cylinders.
- Some sites are now developing a formal internal procedure for addressing EH Safety Alerts based on the Temperform USA investigation experience.
- The current hands-on S/CI training being provided is more appropriate for maintenance staff.
- Training being provided for managers, supervisors, and procurement staff is not job-specific.
- Some sites regularly monitor the S/CI website for newly issued Safety Alerts, while others were unaware of the website postings.

Recommendations for EH

- Provide job-specific (crafts, procurement, receipt inspection, managers, etc.) S/CI training to further improve S/CI identification, reporting and disposition of S/CI in the field. This will activity along with the "site process reviews" discussed below will be used to further improve communication and knowledge of the new S/CI process during 2004.

  Status: S/CI training is scheduled to start in April 2004 and continue over a two-year cycle.

- EH senior managers should be present at the S/CI training given to field personnel and present DOE policy and to conduct "site process reviews" to assure that OA S/CI Special Study recommendations are addressed and that the S/CI process is implemented in the field. The site process reviews should be coordinated with line management.

  Status: S/CI process reviews will be conducted at selected DOE facilities during 2004 to assess S/CI process implementation in the field. OA will be consulted on selecting sites for review based on their experience with OA S/CI Special Study.

- Revise the EH S/CI Process Guide to require both positive and negative findings from line managers in response to EH-issued S/CI or defective item Safety Alerts.

  Status: The EH S/CI Process Guide continues to evolve as EH gains further experience with S/CI and defective items. The S/CI Process Guide will be finalized two months after the DOE directives addressing S/CI are issued.

- Include site, area, and field office managers on distribution for EH Safety Alerts, recognizing that further direction may come from PSOs. These managers are responsible for safety at the working level.

  Status: Complete - Site, area, and field office managers are now on distribution for EH Safety Alerts.

Attachment 1
Lines of Inquiry

Introduction

Lines of inquiry are intended to assist the team in analyzing the Department's handling of the Temperform USA investigation. The lines of inquiry address the basic flow of S/CI notifications and related activities for an investigation. They are not intended to be all-inclusive, nor are they meant to predetermine the results of the change analysis. The change analysis team used the lines of inquiry to conduct an analysis of the S/CI process and Temperform USA issues to ensure that efforts made thus far, and future efforts, to improve the Department's S/CI identification, notification, and investigation process are complete and effective.

The change analysis covered the Department's activities in response to the initial Temperform USA notification during the timeframe from approximately June 2002 through August 2003.

Temperform USA Issue Identification

- How and when was the Department informed of the Temperform USA issue?
- Who was informed, and by what mechanism?
- How does the Temperform USA issue identification process compare to other significant S/CI issues?
- Was this issue identification process documented in procedures or guidance?

DOE Complex Notification

- How and when were personnel in the DOE complex notified?
- Was a verification of receipt of the notification requested or received?
- Who was notified, and why were these individuals selected to receive the notification?
- Were the proper individuals and officials notified?
- Did the individuals notified have the proper authority or responsibility to take action?
- What instructions were provided with the notification?

Data Collection and Tracking

- What actions did the notified individuals take?

- What ongoing communication was conducted during the data collection process?
- How were the investigations conducted and the data collected?
- Were the investigation results and data reviewed to ensure that they were sufficiently thorough and complete?
- Who was responsible for tracking the progress and status of the investigation?

Reporting and Closure

- What reports were provided to DOE management on investigation status and/or results?
- Who received reports on the status and/or results of the investigation?
- What reports were provided to the DNFSB on the investigation status?

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Attachment 2
Interviews Conducted

Interviews were conducted with the following individuals involved in the Temperform USA issue. Individuals were selected for interviews because they received the e-mails from the QAWG on the Temperform USA investigation or because of their association with the QAWG.

Name	Organization		Title
Raymond Hardwick	EH	HQ	Deputy Assistant Secretary for Facility Safety
Larry Vaughan	EM	HQ	Quality Assurance Specialist
Geoff Beausoleil	NE/EM	ID	Quality Assurance Manager
David Brown	EM	ORP	Quality Assurance Engineer
Charles Kasch	EM	RL	Quality Assurance Manager
Paul Gervas	GC	HQ	Attorney-Advisor, Contracts
Xavier Ascanio	NNSA	HQ	Director, Operations and Construction Management
Thomas Rotella	NNSA	HQ	Deputy Director, Emergency Management
Gregory Betzen	NNSA	KCP	Quality Assurance Manager
Paul Chimah	NNSA	AL	Quality Assurance Engineer
Jeffery Crenshaw with Butch Huxford	NNSA	SR	Quality Assurance Manager
Michael Glasman	NNSA	Y-12	Quality Assurance Specialist
Steve Lasell with Adeliza Cordis	NNSA	LLNL	Lead Quality Assurance Engineer
Anita Leivo	NNSA	AL	Physical Scientist
Daniel Pellegrino	NNSA	AL	Quality Assurance Manager
Matt Cole	SC	HQ	Fire Protection Engineer
Leah Dever	SC	HQ	Associate Director, Laboratory Operations and ES&H
Milton Johnson	SC	HQ	Deputy Director for Operations
Roger Christensen	SC	RL	Laboratory Operations Director
Robert Poe	SC	ORO	Assistant Manager for ES&H

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Attachment 3
Documents Reviewed

The following documents will be reviewed as part of the causal factor/root cause analysis and change analysis.

1. June 14, 2002 GIDEP Agency Action Notice regarding Temperform USA
2. July 29, 2002 e-mail from the QAWG to distribution, Subject: Potential QA Issue Requiring Your Attention Re: Temperform USA
3. December 19, 2002 e-mail from the QAWG to distribution, Subject: GIDEP Agency Action Notice Regarding Temperform USA
4. February 11, 2003 memorandum from Jessie Hill Roberson (EM-1) to EM sites, Investigation of the Use of Improperly Heat-Treated Aluminum Supplied by Temperform USA
5. February 14, 2003 letter from John T. Conway, Chairman, DNFSB to Spencer Abraham, Secretary of Energy
6. March 18, 2003 letter from Beverly A. Cook (EH-1) to Jessie Hill Roberson (EM-1) and Everet H. Beckner (NNSA), Investigation of the Use of Improperly Heat-Treated Aluminum Supplied by Temperform USA
7. April 4, 2003 letter from Everet H. Beckner and C. S. Przybylek to NNSA sites, Investigation of the Use of Improperly Heat-Treated Aluminum Supplied by Temperform USA
8. April 21, 2003 letter from Spencer Abraham, Secretary of Energy to John T. Conway, Chairman, DNFSB
9. August 12, 2003 OA Special Study of the Department's Management of Suspect/Counterfeit Items
10. April 25, 2003 letter from John T. Conway, Chairman, DNFSB to Spencer Abraham, Secretary of Energy
11. August 25, 2003 letter from Spencer Abraham, Secretary of Energy to John T. Conway, Chairman, DNFSB
12. November 7, 2003 memorandum from the Assistant Secretary for Environment, Safety and Health to the Office of Inspector General with the results of the investigation of the use of improperly heat-treated aluminum supplied by Temperform USA
13. November 1998 Solid State Devices, Inc. Suspect/Counterfeit Semiconductor Issue Lessons Learned Summary

ATTACHMENT 4

CAUSAL FACTORS IDENTIFIED ON THE EVENTS AND CAUSAL FACTORS CHART

A No formal process to capture lessons learned.

B QAWG did not have the authority to insure a timely investigation and closure of significant S/CI events.

C No formal process for implementing QAWG charter and mission requirements.

D No formal process for implementing DOE Order 414.1A.

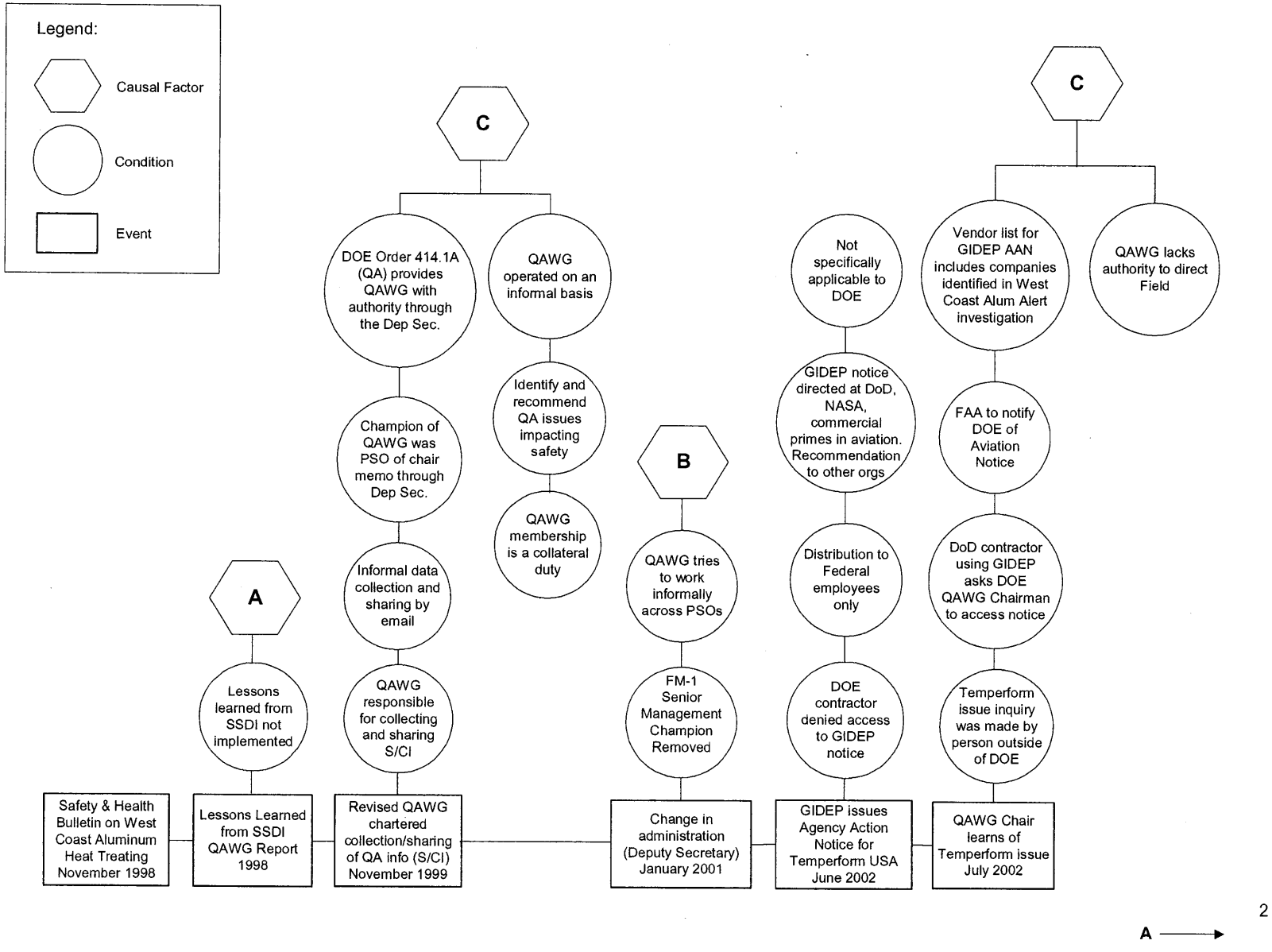
E Uncertainty in how to communicate S/CI information to non-Federal employees.

F The significance of Temperform Investigation was not effectively communicated.

G Previous lessons learned not institutionalized.

1

EVENTS AND CAUSAL FACTORS CHART



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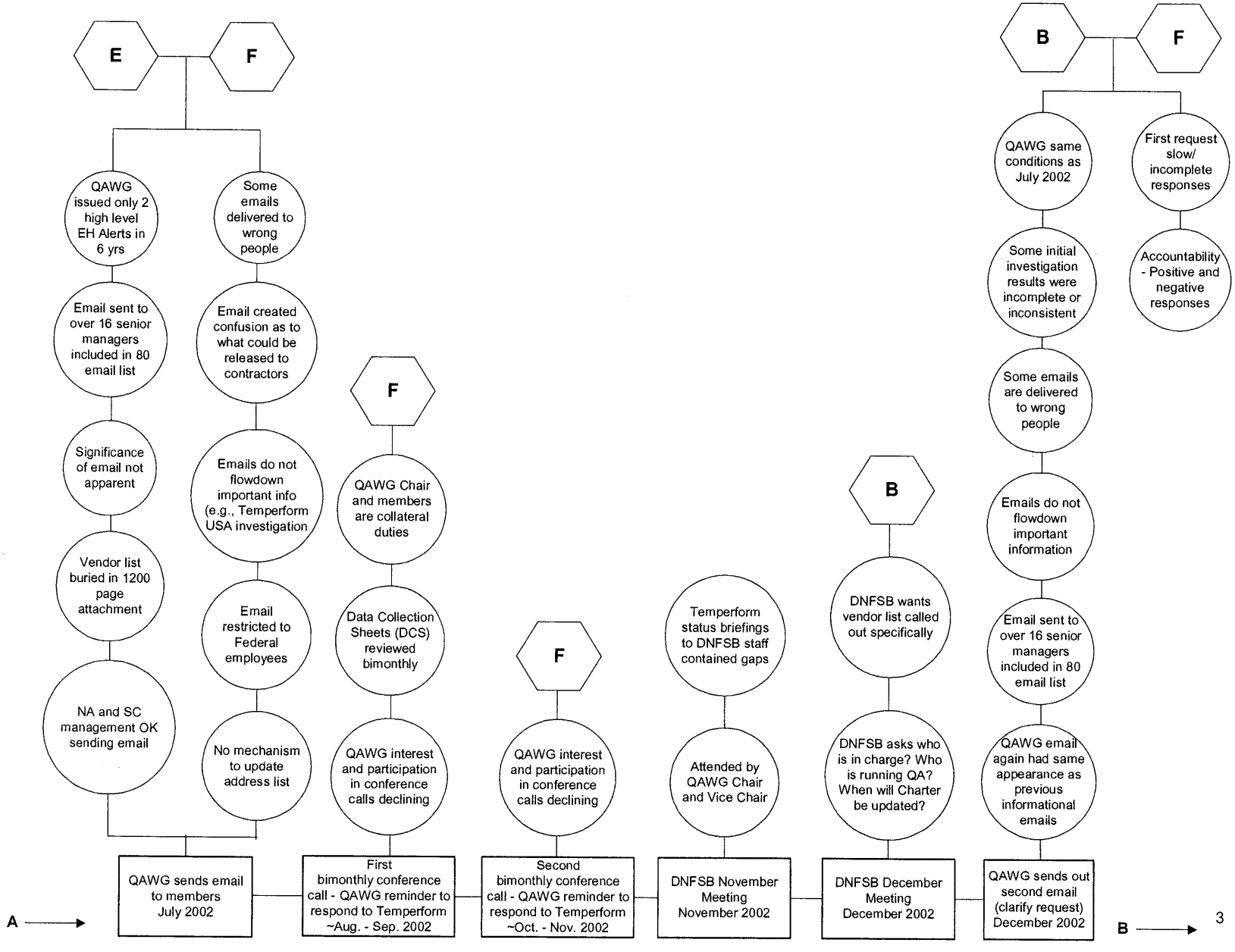
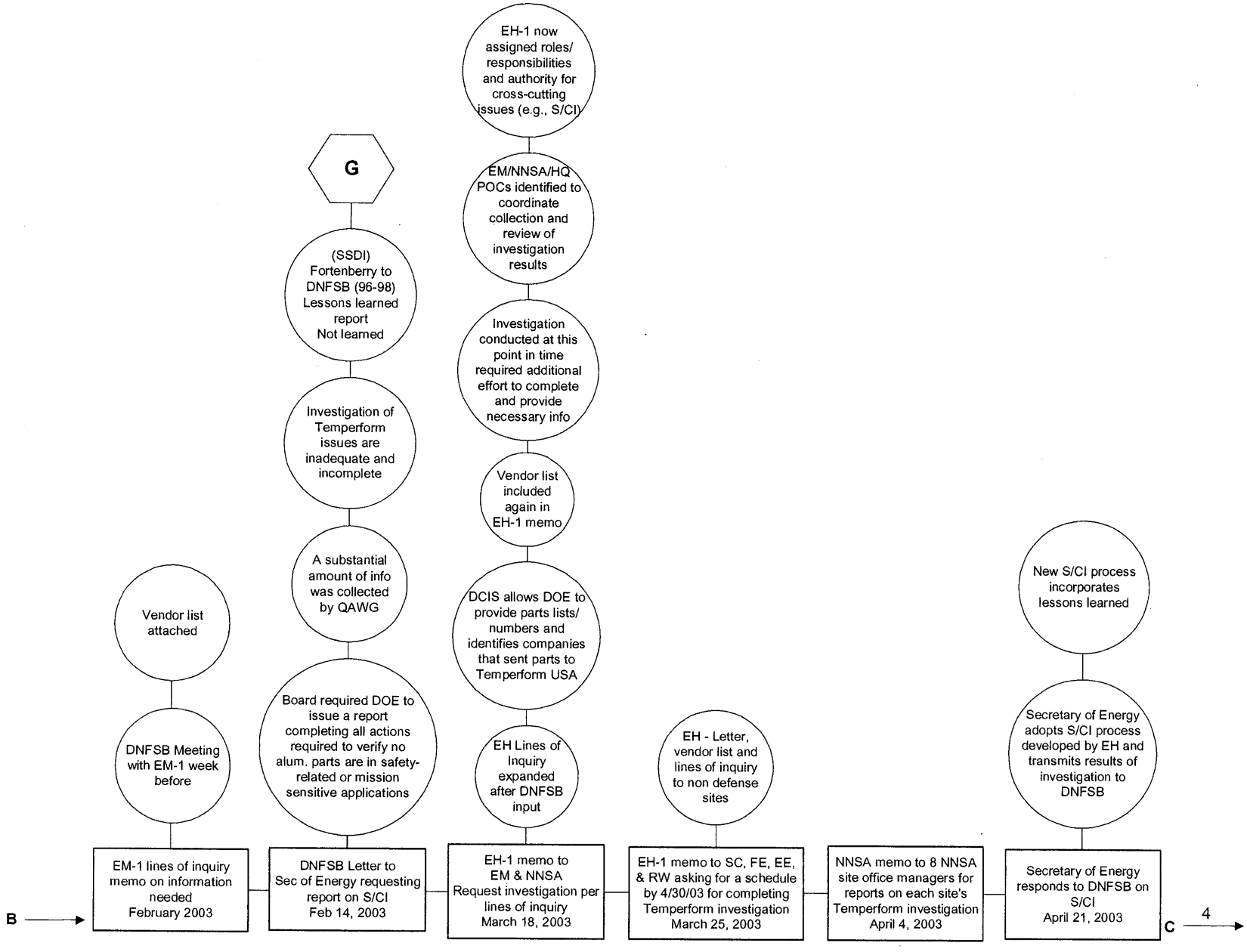
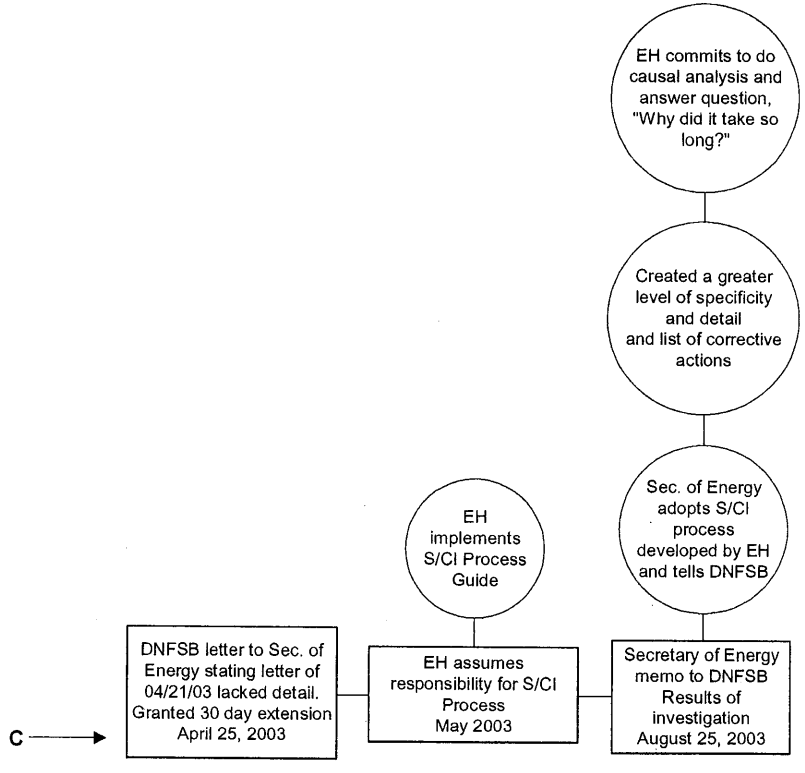


Analysis of the Temperform USA Investigation Conducted by the Department of Energy




EH commits to do causal analysis and answer question, "Why did it take so long?"
Created a greater level of specificity and detail and list of corrective actions
Sec. of Energy adopts S/CI process developed by EH and tells DNFSB
EH implements S/CI Process Guide
C
DNFSB letter to Sec. of Energy stating letter of 04/21/03 lacked detail. Granted 30 day extension April 25, 2003
EH assumes responsibility for S/CI Process May 2003
Secretary of Energy memo to DNFSB Results of investigation August 25, 2003

Attachment 5
Status of OA Special Study Recommendations for EH

OA Special Study Recommendation	EH S/CI Process Status
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 e-mails. The following elements should be addressed:	The current DOE S/CI process does not rely on informal mechanisms, such as conference calls and e-mails to communicate S/CI or potential S/CI to the DOE complex. The process uses website postings, Operating Experience Summaries, EH Safety Alerts and if needed formal investigations with lines of inquiry to ensure the proper information is collected and reported.
o Criteria for determining and utilizing the appropriate communication mechanism, such as an EH Alert, Operations Weekly, or input or input into the Department's lessons-learned database.	The EH S/CI Process Guide includes guidance and criteria to assist the OE Group in making determinations regarding the type of information to send and how best to disseminate the information (e.g., alert, OE Summary, lines of inquiry, website posting, etc.)
o Provisions in the mechanism utilized for significant items for specifying actions, reporting requirements, and milestones for completing actions.	The EH S/CI Process Guide and the proposed revision to DOE G 414.1-3 address significant S/CI items and specify actions, reporting requirements, and milestones for completing actions.
o Guidelines for timelines for processing information, including timelines for urgent action.	Where applicable, the Guide includes timelines and milestones for both EH and for line organizations to take action.
o Provisions for consolidating DOE/NNSA resources for a single, comprehensive lessons-learned database.	EH recognizes the need for a comprehensive lessons-learned database and has developed a revised operating experience/lessons-learned standard. The standard has been given to EFCOG for review. This review is to be completed by March 31, 2004. It is anticipated that the standard will be submitted to RevCom for DOE-wide review by May 31, 2004. The standard will be used to implement a DOE-wide program. EH will maintain the lessons-learned database.
• Establish a process for implementing the OMB	DOE M 231.1-2, *Occurrence Reporting and Processing of*

OA Special Study Recommendation	EH S/CI Process Status
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 putting information in GIDEP.	*Operations Information* requires that S/CI identified in the field are reported in ORPS. The EH Process Guide is being revised to require EH to review S/CI ORPS entries and enter appropriate information into GIDEP as required by OMB Policy Letter 91-3. Proposed revision to DOE G 414.1-3 will also address OMB Policy Letter 91-3 and the IG.
• In coordination with the IG, clarify expectations for reporting information about suspect items to the IG.	Revised DOE O 414.1B and proposed revision to DOE G 414.1-3 clarify expectations for reporting information about suspect items to the IG.
• Ensure that the process is clearly communicated with the 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.	The transition from the QAWG to EH has occurred. EH is performing the functions previously performed by the QAWG. A Department-wide video conference was held in October 2003 to communicate the new S/CI process.
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/CI.	
• Ensure the 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, conduct assessments of the effectiveness of programs, and establish procedures for involving the IG in receipt and dissemination of sensitive information.	The Department is committed to revising the directives associated with S/CI by March 2004 as previously communicated to the Board. DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information* requires that S/CI identified in the field are reported in ORPS. The EH Process Guide is being revised to require EH to review S/CI ORPS entries and enter appropriate information into GIDEP as required by OMB Policy Letter 91-3. Proposed revision to DOE G 414.1-3 will also address OMB Policy Letter 91-3 and the IG.

OA Special Study Recommendation	EH S/CI Process Status
• Ensure the 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.	Revised DOE O 414.1B and proposed revision to DOE G 414.1-3 include roles and responsibilities for implementation of S/CI requirements and address DOE/NNSA Headquarters, field elements, and their contractors.
• 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 applications of S/CI requirements, particularly in their use in nuclear facility, no-nuclear facility, and worker safety applications.	Revised DOE O 414.1B contains consistent definitions.
• Ensure S/CI training 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.	Revised DOE O 414.1B and proposed revision to DOE G 414.1-3 address S/CI training requirements and expectations.
• 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 introduction of S/CI controls for preventing and minimizing the potential for introduction of S/CIs and non-conforming products.	Revised DOE O 414.1B address establishing 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. Performance/Criterion 7 – Procurement and Attachment 3 address these issues as requirements of the quality assurance program. However, revised DOE O 414.1B does not make specific reference to a "controlled products list". Proposed revision to DOE G 414.1-3 provides additional guidance in this area.

OA Special Study Recommendation	EH S/CI Process Status
• 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.	Revised DOE O 414.1B and proposed revision to DOE G 414.1-3 address requirements for conducting trend analysis and issuing lessons learned for use in improving the S/CI prevention program. EH has developed a revised operating experience/lessons-learned standard. The standard has been given to EFCOG for review. This review is to be completed by March 31, 2004. It is anticipated that the standard will be submitted to RevCom for DOE-wide review by May 31, 2004. The standard will be used to implement a DOE-wide program. EH will maintain the lessons-learned database.
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.	The S/CI website contains archived S/CI and defective item information in the form of data collection sheets (DCS). The website also contains bolt head mark lists and actual photos of S/CI and defective items.
• Establish mechanisms for providing information about vendors that have distributed S/CIs.	EH is working with the Office of General Council and procurement to establish a mechanism for providing information about vendors that have distributed S/CIs. EH will provide a briefing to OA on progress in this area by June 30, 2004.
• 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 advise on a particular non-conforming item (e.g., is the non-conforming item within the normal	The EH S/CI process guide states that EH will maintains a list of SMEs. The list of SMEs is also available on the S/CI Website.

OA Special Study Recommendation	EH S/CI Process Status
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 on DOE Headquarters to perform screening and analysis functions).	EH does not envision tailoring the S/CI process to meet the needs of individual DOE sites. EH will continue to perform screening and analysis functions for potential S/CI and defective items as described in the revised DOE O 414.1B and proposed revision to DOE G 414.1-3. Attachment #3 to DOE O 414.1B addresses S/CI program development and implementation as part of each DOE and contractor quality assurance program. S/CI process reviews will be conducted at selected DOE facilities during 2004 to assess S/CI process implementation in the field. This will provide further insight on the need to tailor the S/CI process.
4. Develop a structured process for managing the correction of crosscutting issues. Specific actions to consider include:	
• Ensure that the process addresses identifying causal analysis, determining the extent of condition, clearly establishing deliverables, assigning responsibilities for actions to closure, and measuring effectiveness.	EH has established a process and procedure to implement the requirements established in the Deputy Secretary's March 31, 2003 letter regarding crosscutting issues. The new EH procedure "Defense Nuclear Facilities Safety Board Commitment Management" calls for: 1) commitments to the Board to be identified, assigned to the appropriate Deputy Assistant Secretaries (DAS) and completed on time; 2) actions required to meet commitments to the Board to be tracked and managed so that EH management is kept informed of the status and can make adjustments as necessary to ensure the commitments are met; 3) EH to identify, evaluate, monitor, manage and resolve crosscutting safety issues identified by the Board, and 4) ensuring products developed and actions taken to be technically adequate and accurate. The procedure also addresses the need to determine if a causal analysis is required to

OA Special Study Recommendation	EH S/CI Process Status
	identify the extent of condition.
• 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.	EH has established a process that entails working with two different groups of line managers to deal with crosscutting safety issues. EH will utilize a Crosscutting Safety Issues Board to facilitate communication and management action with the Office of Environmental Management (EM) and the National Nuclear Security Administration (NA). For crosscutting safety issues not related to defense nuclear facilities, the Headquarters ES&H Managers Group has overall responsibility to identify, evaluate, and work with line management to develop a path forward to resolve these issues.
• Expand and 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.	The new EH "Defense Nuclear Facilities Safety Board Commitment Management" procedure describes the process for ensuring that necessary actions in response to crosscutting safety issues are documented, assigned to organizations, tracked, and monitored.