

John T. Conway, Chairman  
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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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February 14, 2003

The Honorable Spencer Abraham  
Secretary of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-1000

Dear Secretary Abraham:

The Defense Nuclear Facilities Safety Board (Board) recently reviewed the Department of Energy's (DOE) actions in response to a June 14, 2002, notification by the Government-Industry Data Exchange Program (GIDEP) of quality issues concerning aluminum parts heat-treated by Temperform USA. This review was undertaken in the context of ongoing concerns regarding DOE's programs to both prevent the introduction of and remove suspect/counterfeit items in safety-related applications.

Improper heat-treating of aluminum parts by Temperform has resulted in decreased strength, reduced corrosion resistance, increased susceptibility to cracking, and reduced fatigue life of affected parts. The GIDEP notification requested that its recipients review all orders or procurements associated with aluminum parts for possible impact due to this problem, and report to the Defense Criminal Investigative Service any products identified as being heat-treated by Temperform, as well as costs associated with inspection, retesting, repair, and replacement. Cost information is required to support actions by the government to recover costs from Temperform.

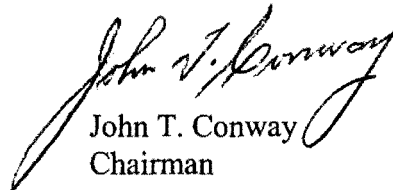
As discussed in the enclosed report, the Board has observed that DOE has failed to act in a timely manner to determine whether potentially nonconforming aluminum parts heat-treated by Temperform are installed in safety-related or mission-critical applications affecting defense nuclear facilities. This issue regarding suspect/counterfeit parts remains open more than 7 months after having been raised. Furthermore, it appears that DOE has repeated several of the missteps that occurred in response to a similar 1995 GIDEP notification of quality issues, affecting semiconductors supplied by Solid State Devices, Incorporated. The lessons learned as a result of the review for potentially deficient semiconductors were documented in a report by DOE's Quality Assurance Working Group in November 1998.

DOE still needs to adequately assess whether potentially discrepant items heat-treated by Temperform have been installed in safety-related or mission-sensitive applications affecting defense nuclear facilities. To do this, DOE and each contractor needs to review records pertaining to parts, components, and equipment for such applications procured since 1998 to determine

whether they contain heat-treated aluminum parts supplied directly or indirectly by subtier vendors who used Temperform USA. This has not been done. Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests the following:

- Within 30 days of receipt of this letter, a report that documents implementation of the complete set of actions required to verify that no aluminum parts heat-treated by Temperform USA are in use in safety-related or mission-sensitive applications.
- Within 60 days of receipt of this letter, a plan that outlines the corrective actions to be taken by DOE to ensure adequate disposition of any future issues that involve suspect/counterfeit items.

Sincerely,



John T. Conway  
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

## Staff Issue Report

January 24, 2003

**MEMORANDUM FOR:** J. K. Fortenberry, Technical Director

**COPIES:** Board Members

**FROM:** D. Burnfield, J. R. Schapira

**SUBJECT:** Department of Energy's Actions Concerning Potentially Discrepant Heat-Treated Aluminum Parts

This report presents observations of the staff of the Defense Nuclear Facilities Safety Board (Board) resulting from a review of the Department of Energy's (DOE) actions concerning suspect/counterfeit items. Specifically, the staff's review focused on DOE's actions in response to a June 14, 2002, Government-Industry Data Exchange Program (GIDEP) notification of quality issues concerning aluminum parts heat-treated by Temperform USA. This review was conducted by staff members D. Burnfield, R. Schapira, and N. Slater-Chandler.

**Background.** The Board reviewed DOE's program to prevent the introduction of suspect/counterfeit items into safety-related applications in defense nuclear facilities in early 1995. As a result of issues raised by the Board, DOE took several corrective actions, including establishment of a Quality Assurance Working Group (QAWG). The QAWG's charter included a responsibility to identify and recommend means of resolving cross-cutting quality assurance issues impacting the safety of workers, the public, and the environment. The QAWG subsequently took the lead in addressing and coordinating DOE-wide actions in response to a 1995 GIDEP notification of quality issues affecting semiconductors supplied by Solid State Devices, Incorporated (SSDI). Lessons learned as a result of the review for potentially discrepant semiconductors were documented in a 1998 report prepared by the QAWG. However, these lessons learned were never incorporated into DOE directives.

On June 14, 2002, GIDEP issued an Agency Action Notice concerning improper heat-treating of aluminum parts by Temperform USA. Improper heat-treating has resulted in decreased strength, reduced corrosion resistance, increased susceptibility to cracking, and reduced fatigue life of affected parts. The Agency Action Notice requested addressees to identify to the Defense Criminal Investigative Service (DCIS) any findings and costs associated with the ensuing reviews and corrective actions. The notice also contained a cautionary note requiring prior consent of DCIS prior to release of the notice or attachments to nongovernment personnel.

On July 29, 2002, the QAWG circulated by e-mail the GIDEP Agency Action Notice and

the DCIS report of quality problems affecting Temperform. The e-mail noted that the GIDEP and DCIS information could not be distributed to nonfederal employees without permission from DCIS. It also contained a suggested path forward for determining whether affected parts had been used by DOE and requested that findings be reported to the QAWG by August 19, 2002.

On December 19, 2002, the QAWG circulated by e-mail that portion of the June 14, 2002, GIDEP Agency Action Notice listing vendors whose parts had been processed at Temperform or who had approved Temperform as a vendor. This e-mail also stated that it was imperative for DOE contractors to determine whether they had done any business with the listed vendors and if so, whether they had purchased heat-treated aluminum parts for applications used to ensure safety.

**Discussion.** The Board's staff analyzed the actions taken by DOE in response to the GIDEP Agency Action Notice regarding parts heat-treated by Temperform. The staff's conclusions are summarized below.

Although the QAWG's July 19, 2002, e-mail included the GIDEP Agency Action Notice as an attachment, the text of the e-mail stated that (1) GIDEP documents were not to be provided to DOE contractors, and (2) information contained in the GIDEP documents could not be distributed to nonfederal employees without permission from DCIS. As a consequence of these cautionary statements, several major DOE contractors were not provided with complete or consistent information with which to conduct reviews for the presence of Temperform-treated parts. As an example, one contractor was tasked by the local DOE field office to determine whether it had procured heat-treated aluminum for safety-related applications. This review did not address whether the contractor had procured equipment for safety-related applications that contained aluminum components or parts heat-treated by Temperform. Another contractor limited its review to questioning that subset of its vendors located in California, plus selected major mechanical vendors, as to whether they did business with Temperform. The scope of this review was incomplete in that Temperform supplied heat-treating services to firms located in several states, and the inquiry did not consider whether subtier vendors used Temperform heat-treating services.

Among the lessons learned documented by the QAWG in 1998 was the need for DOE to clarify what information concerning potentially discrepant items could be sent out to the field. The QAWG did not contact DCIS to obtain the release of specific clarifying information that would have ensured an adequate response by the field. The QAWG's report on lessons learned during the SSDI review also stated that the operating process used by the QWAG would specifically include a requirement to interface with and seek counsel from DOE's Office of Inspector General (DOE-IG) and Office of General Counsel (DOE-GC), when necessary, concerning the content of documents to be disseminated to the DOE complex. The QAWG did not contact either office before disseminating the GIDEP Agency Action Notice regarding Temperform to the field (see Table 1).

As a consequence of not coordinating the release of complete information to DOE

contractors, contractor reviews varied in their scope, and DOE still cannot provide assurance that aluminum parts heat-treated by Temperform are not installed in safety-related or mission-sensitive applications. Assurance that affected items were not procured for safety-related or mission-sensitive applications could be provided by reviewing the Temperform vendor list against vendors and subtier vendors that provided items for safety-related or mission-sensitive applications between 1998 and the present.

Additionally, the QAWG's e-mails did not request that DOE contractors collect and report costs associated with the search for Temperform-treated parts. The GIDEP Agency Action Notice requested this information for possible use by the government in recovering costs from Temperform. It is likely that the required cost information would have been requested had the QAWG coordinated its actions with the DOE-IG and DOE-GC.

Table 1	
Lessons Learned from Solid State Devices, Incorporated (SSDI) Review that are Potentially Applicable to Temperform Event	
SSDI Lessons Learned Problem Statement	Potentially Applicable to Temperform Event
1.1 The initial letter from the Department of Defense took an inordinate amount of time to get to the Department of Energy Headquarters (DOE-HQ) office that took action.	✓
1.2 A subteam comprised of Quality Assurance Working Group (QAWG) members and the appropriate DOE-HQ and field personnel responsible for developing a path forward was not formed upon initial notification.	✓
1.3 The scope of the issue was not well defined until 8 months after initial notification.	✓
1.4 The DOE Albuquerque Field Office (DOE-AL) needed to prove that SSDI components in the nuclear war reserve met their original requirements.	
2.1 The field received conflicting guidance regarding the scope and time of the investigation.	✓
2.2 Because of the need to safeguard information regarding the legal implications of the investigation, notification information was not formally provided to all DOE contractors until the matter had been clarified.	✓
2.3 The direction received by the field not to procure material from SSDI before contacting the Department of Justice was not specific enough to prevent field organizations from procuring additional material from SSDI. As a result, the message was muddled and was not as clear as it perhaps could have and should have been.	
2.4 The May 22, 1996, notification letter was received only by DOE Defense Programs (DOE-DP) field organizations.	

Table 1

Lessons Learned from Solid State Devices, Incorporated (SSDI) Review that are Potentially Applicable to Temperform Event

SSDI Lessons Learned Problem Statement	Potentially Applicable to Temperform Event
3.1 Field organizations received requests for information from several organizations, including the QAWG, DOE-DP, DOE-AL, and the Defense Nuclear Facilities Safety Board.	
3.2 DOE's Office of General Counsel was not initially consulted to clarify what information could be sent out to the field.	✓
3.3 More than one point of compliance (or organization) at DOE-HQ was requesting an update on the status and results of field investigations.	
3.4 At the start of DOE-AL's suspect/counterfeit items investigation, DOE-DP lacked a coordinator to oversee issues concerning suspect/counterfeit items related directly to nuclear explosives.	
4.1 DOE-DP did not initially have a person responsible for ensuring resolution and closure reporting for the weapons aspects of the issues.	
4.2 A process and format for reporting issue closure of issues was not formally established.	✓
5.1 DOE's Nevada Operations Office needed to prove that adequate policies and procedures had been established to prevent the entry of components containing suspect/counterfeit items into the Underground Nuclear Test Program.	
6.1 The QAWG does not have representatives from all DOE organizations and contractors.	
6.2 Coordination between DOE and other agencies, (e.g., the National Aeronautics and Space Administration, the Department of Defense, and the Nuclear Regulatory Commission) could be improved.	✓
6.3 A document containing classified information was not properly classified or controlled.	
6.4 Before the Department of Defense notified DOE of the SSDI criminal investigation, DOE-DP made no active effort to seek information on suspect/counterfeit items from non-DOE entities for possible action within the DOE complex.	