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United States Government **Department of Energy**

Memorandum

DATE: June 8, 2011 Audit Report Number: OAS- L-11-04

REPLY TO ATTN OF: IG-36 (A10LV009)

SUBJECT: Audit Report on the "Follow-up Audit of National Nuclear Security Administration's Nuclear Explosive Safety Study Program"

TO: Manager, Pantex Site Office

INTRODUCTION AND OBJECTIVE

One of the primary missions of the Department of Energy's (Department) National Nuclear Security Administration (NNSA) is to maintain the safety, security, and reliability of the nation's nuclear weapons stockpile. Many of the nuclear explosive operations related to this mission, including assembly, disassembly, surveillance, refurbishment, and dismantlement of nuclear weapons, are performed at the Pantex Plant (Pantex) near Amarillo, Texas. Pantex also develops and tests the high explosives used to detonate the nuclear materials. Since 2001, Babcock & Wilcox Technical Services Pantex, LLC (B&W Pantex) has managed and operated Pantex under contract with the Department.

The Department requires that a Nuclear Explosive Safety (NES) study be conducted and approved before nuclear explosive operations are performed due to the unacceptable consequences of an accident. NES studies are formal evaluations of proposed nuclear explosive operations to determine the adequacy of controls to prevent inadvertent or accidental detonations or fissile material dispersals. The Department also requires that a NES study be conducted every 10 years for ongoing nuclear explosive operations. In between studies, an operational safety review (OSR) is conducted to observe actual nuclear explosive operations. The Nuclear Explosive Safety Study Group (NESSG) which consists of nuclear safety experts performs the NES studies and the OSRs.

In January 2003, the Office of Inspector General (OIG) issued *National Nuclear Security Administration's Nuclear Explosive Safety Program* (DOE/IG-0581), and reported that comprehensive NES studies had been delayed for six of the nine nuclear weapon types that were active in the nation's stockpile. We initiated this follow-up audit to determine whether NES studies and evaluations of nuclear explosive operations were timely and complete.

CONCLUSIONS AND OBSERVATIONS

Our review disclosed that all appropriate required NES studies and OSRs were completed and approved by NNSA. However, we noted that most NES studies and OSRs included

issues of concern that were designated as "post-start findings" that remained unresolved for periods ranging from 5 months to nearly 12 years. According to nuclear explosive safety experts we spoke with, post-start findings are not considered critical enough to suspend operations, but do serve to enhance nuclear explosive safety.

NES Studies and OSRs

There are two kinds of NES studies; an operation-specific NES study, and a master study. Operation-specific NES studies evaluate the procedures, tooling, equipment, testers, facility interfaces, and controls specific to a weapon type. Master NES studies evaluate facilities, equipment, tooling, processes and management programs that may be common to multiple nuclear explosive operations. As of April 14, 2011, the NESSG had completed and NNSA had approved NES studies and OSRs for eight weapons programs in the enduring stockpile and for one dismantlement program. Scheduled OSRs had been completed, approved, and were current for all operating processes. The table below summarizes the status of operation-specific NES studies and operations.

Weapon Type	Most Recent NES Study	Most Recent OSR	Activity/Purpose
B53	7/10		Onsite Transportation and Dismantlement
B61-3/4/10 B61-7/11	4/06	1/11	Disassembly, Inspection, Rebuild, and Command Disable Test Disassembly and Inspection
W76-0 W76-1	8/00 4/07	12/05[1]	Disassembly and Inspection Assembly, Disassembly and Inspection
W78	4/04	12/09	Disassembly and Inspection
W80	8/07		Disassembly and Inspection
B83	5/05[2]		Disassembly, Inspection and Rebuild
W84	7/10		Disassembly and Inspection
W87 W87 (Addendum)	3/06[3] 5/08		Disassembly, Inspection, and Assembly In-Situ Mechanical Safe and Arm Detonator
W88 (Bay, Satellite) W88 (Addendum) W88 (Cell)	1/08 1/09 11/08		Assembly, Disassembly and Inspection Determine Mass Properties (weight, inertia) Disassembly, Inspection and Rebuild

Our review of NESSG reports and NNSA's approval letters also disclosed that the NESSG completed and NNSA approved the seven NES master studies affecting current operations. For example, NES master studies for the code management system; approved equipment program; bays and cells; onsite transportation and staging; special purpose

[1] Based on the similarities between the W76-0 and W76-1, the NESSG recommended and NNSA approved that future NES evaluations be concurrent and scheduled based upon the approval date for the W76-1 NES study.

[2] No ongoing operations for the B83. The B83 is undergoing a tooling upgrade. A NES study is scheduled in Fiscal Year 2012 in lieu of an OSR to analyze the tooling upgrade.

[3] The W87 OSR is in process. The NESSG completed most of the observations and deliberations in April 2011. Some operations that the NESSG will observe will not be performed until after May 2011.

facilities; and support activities had been completed and approved within the last five years. Additionally, the NESSG conducted an OSR to reevaluate Pantex security and NNSA approved the OSR report in April 2008.

Post-Start Findings

While these studies were current as the date of our report, we observed that a number of post-start findings designed to enhance nuclear explosive safety and identified in the current NES studies and OSR had not been resolved in a timely manner or missed the original closure dates. As of December 31, 2010, there were 32 open post-start findings; 11 of which were related to operational impacts caused by lightning. Of the 11 lightning related post-start findings, 9 had missed the original closure dates. The elapsed time that the lightning related post-start findings had remained open ranged from 31 to 143 months.

According to an NNSA official, the lightning-related findings are technically complex and a lightning committee has been working for several years to find a resolution to the lightning related issues. A Pantex Site Office official stated that the site office planned to close the lightning-related post-start findings because the current controls used for lightning protection are adequate (one of which was to suspend certain nuclear explosive operations during lightning warnings) and the Lightning Protection Project Plan would be used to complete the remaining research and work. As of April 28, 2011, B&W Pantex had submitted to the Pantex Site Office a proposal to close the lightning-related post-start findings and also submitted a Lightning Protection Project Plan to disposition the lightning-related findings. The Pantex Site Office is currently reviewing the closure request.

Of the 21 post-start findings that are not related to lightning, 19 had missed the original closure dates and had been open and unresolved from 17 to 63 months. We noted that Pantex requested numerous extensions for completing the corrective actions for the 19 post-start findings. For example, a finding identified in a W87 NES study had an original closure date of December 2006. In that case, the completion of the corrective actions had been extended at least five times. Pantex currently estimates that the corrective action will be completed by September 2011.

Other than a brief explanation of the due date extensions in the post-start findings quarterly status reports, Pantex could not provide documentation to show why the requested extension due dates were not met, how the activity was prioritized, or how the extended due dates were determined. Pantex's process for assigning, tracking, and closing findings from NES evaluations require functional managers to notify program managers if the corrective actions cannot be completed as originally planned and to provide justification when requesting an extension to the completion date for corrective actions. Although such justifications for requested extensions were not documented, according to a Pantex official, the justifications were communicated informally. A Pantex Site Office official responsible for coordinating the findings from the NES studies and OSRs for resolution and tracking confirmed that Pantex had informally communicated the justifications to the Pantex Site Office.

Suggested Actions

Given that, for the most part, required NES studies and OSRs were completed and approved by NNSA, we are not making any formal recommendations. However, given the emphasis of the Department and NNSA on enhancing nuclear explosive safety, we suggest that the Manager, Pantex Site Office direct Pantex to improve its processes regarding post-start findings by:

- Documenting the basis for requests for due date extensions; and,

- Reviewing the reasons why the extended due dates were not met.

Since no recommendations are being made in this report, a formal response is not required. We appreciate the cooperation of your staff during the audit.

David Sedillo, Director
NNSA & Science Audits Division
Office of Inspector General

Attachment

cc: Director, Internal Controls Management, NA-66
Director, Office of Risk Management, CF-80
Team Leader, Office of Risk Management, CF-80
Audit Resolution Specialist, Office of Risk Management, CF-80
Audit Liaison, Pantex Site Office

SCOPE AND METHODOLOGY

We performed the audit between September 2010 and May 2011. We conducted our work at the National Nuclear Security Administration Service Center (Service Center) in Albuquerque, New Mexico; the Pantex Plant (Pantex) near Amarillo, Texas; and the Nevada Site Office in North Las Vegas, Nevada.

To accomplish the audit objective, we:

- Interviewed federal and contractor personnel at the Service Center and Pantex;
- Reviewed Department of Energy (Department) guidance, federal regulations, and policies and procedures pertinent to Nuclear Explosive Safety (NES) studies and evaluations of nuclear explosive operations; and,
- Reviewed reports on the NES studies and the operational safety reviews, prior audit reports, and other documents related to the NES study program.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We also assessed performance measures in accordance with the Government Performance and Results Act of 1993 and found that the Department had established performance measures related to the NES study program. We did not rely on computer-processed data to satisfy our audit objective.

Management waived an exit conference.

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