OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

INSPECTION REPORT

DOE-OIG-21-06

December 2020

EVALUATION OF THE AIRCRAFT MONITOR AND CONTROL SYSTEM'S NUCLEAR CERTIFICATION

Department of Energy
Washington, DC 20585

December 9, 2020

MEMORANDUM FOR THE ACTING ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION

FROM: Teri L. Donaldson
Inspector General

SUBJECT: INFORMATION: Inspection Report on "Evaluation of the Aircraft Monitor and Control System's Nuclear Certification"

RESULTS IN BRIEF

The National Nuclear Security Administration (NNSA) and the Department of Defense have a long-standing agreement of joint responsibilities for design and testing requirements of the Aircraft Monitor and Control (AMAC) system. The AMAC system is the hardware and software installed in the aircraft to monitor and control nuclear weapon functions from the cockpit. While NNSA was aware of and engaged in addressing the challenges posed with AMAC system testing requirements for nuclear weapons delivery, we found opportunities to strengthen NNSA's oversight. Specifically, NNSA's oversight was impacted by disagreements with the Air Force. There was discord between the two Federal entities concerning the number of aircraft to test, as well as changes to test requirements made by the Air Force outside of the AMAC Project Officers Group, which is a joint Air Force and NNSA group that is responsible for defining AMAC system specifications and test criteria. The challenges to NNSA's oversight occurred because NNSA's process for resolving interagency differences did not have specified timeframes, which resulted in some delays for resolution of issues between the two Federal agencies where agreement could not be reached. In addition, NNSA and Sandia National Laboratories accepted the final versions of test requirements documents in good faith and did not always perform follow-up reviews. Finally, there are fundamental inconsistencies between the documents that govern the AMAC Project Officers Group. We made recommendations to address these issues.

BACKGROUND

The National Nuclear Security Administration (NNSA) is a semi-autonomous agency within the Department of Energy responsible for maintaining the safety, security, and effectiveness of the U.S. nuclear weapons stockpile. NNSA and the Department of Defense (DoD) have agreed on a division of responsibilities for the Aircraft Monitor and Control (AMAC) system dating as far back to the 1960s. The AMAC system is the hardware and software installed in the aircraft to monitor and control nuclear weapon functions from the cockpit. AMAC system tests support

nuclear compatibility certification for aircraft and air-launched weapon systems to ensure that capability exists between the weapon and the delivery platform before operations with war reserve materiel can be undertaken. AMAC testing is 1 area of the 13 compatibility certification tasks, undertaken by NNSA in support of the Air Force effort, to nuclear certify all materiel and personnel associated with its nuclear mission.

The agreement between NNSA and the Air Force is memorialized in a Memorandum of Understanding (MOU). The current MOU was established in November 2001. Its objective is to delineate the responsibilities of the parties regarding the design requirements, test requirements, and documentation of the AMAC system. The MOU also implements the AMAC Project Officer's Group (POG), which is a joint Air Force and NNSA group responsible for defining AMAC system specifications, test criteria, and products to ensure compatibility between NNSA-developed nuclear weapons (bombs and warheads), DoD-developed nuclear weapon components, and aircraft/air-launched delivery systems. The AMAC POG Charter (Charter) defines roles, responsibilities, and operating procedures. NNSA and Sandia National Laboratories (SNL) are members of the AMAC POG, as SNL tests weapons with DoD delivery platforms to establish and maintain compatibility on behalf of NNSA.

While the AMAC POG is a joint group between the Air Force and NNSA, the POG structure is governed by DoD Manual 5030.55_Air Force Manual 63-103, *DoD Procedures for Joint DoD-Department of Energy/National Nuclear Security Administration (DOE/NNSA) Nuclear Weapon Life-Cycle Activities* (DoD/Air Force Manual). Per the MOU, and consistent with the DoD/Air Force Manual, the Air Force Nuclear Weapons Center is the lead of the AMAC POG. The DoD/Air Force Manual also specifies that the Air Force Nuclear Weapons Center will manage the Air Force Nuclear Certification Program, which includes providing nuclear compatibility certification for aircraft and air-launched weapon systems.

In November 2019, the Department of Energy and DoD Offices of Inspector General (OIG) announced a joint evaluation of the AMAC system's nuclear certification. The DoD OIG's objective was to determine whether testing conducted on the AMAC system for DoD nuclear weapon capable delivery aircraft meets the DoD and Department of Energy nuclear certification requirements. Our objective was to determine the extent to which the Department of Energy provided oversight of the AMAC system testing requirements for nuclear weapons delivery.

RESULTS OF INSPECTION

While NNSA was aware of and engaged in addressing the challenges posed with AMAC system testing requirements for nuclear delivery, we found opportunities to strengthen NNSA's oversight. Specifically, NNSA's oversight was impacted by disagreements with the Air Force. There was discord between the two Federal agencies on the number of aircraft to test, as well as changes to the test requirements made by the Air Force outside of the AMAC POG. Disagreements between NNSA and the Air Force on AMAC tests to establish compatibility between the delivery aircraft and the nuclear weapon have occurred since at least 2008. These disagreements resulted in NNSA and the Air Force engaging in prolonged exchanges that delayed aircraft tests needed to establish or reaffirm compatibility, weapon reliability, and nuclear safety.

Aircraft Sample Size

NNSA and the Air Force had differing opinions on the number of AMAC system tests needed to support nuclear compatibility certification for aircraft and air-launched weapon systems. In July 2018, the AMAC POG established the AMAC System 2[1] test requirements agreed upon by stakeholders (including NNSA, SNL, and various Air Force organizations). Despite this agreement, the Air Force continued to challenge the number of necessary aircraft to complete testing. According to the MOU, the AMAC system's design takes into account the design and test requirements established by the AMAC POG. The specifications reflect existing or agreed upon requirements for aircraft-delivered nuclear weapons and the delivery aircraft interfaces. The AMAC test requirements document states that a minimum sample size of five aircraft is needed to certify new platforms or new weapon systems.

Although these requirements were already stipulated, the Air Force later questioned the number of necessary aircraft to complete testing. For example, in June 2019, the Air Force committed to providing fewer than the required five aircraft for certification of the B-2 stealth bomber (bomber) and the upcoming B61-12 nuclear gravity bomb due to, among other things, aircraft availability. However, NNSA and SNL officials are steadfast in utilizing the number of aircraft agreed to in the approved AMAC test requirements document.

The interagency disagreement in the number of aircraft to test is disconcerting since the testing of five aircraft is a critical task required to assure nuclear weapons and nuclear weapon systems safety, security, and control for certification of the entire B-2 bomber fleet. Without meeting the testing requirements, SNL may not issue full certification of the B-2 bomber as a carrier of the B61-12 weapon until after the fifth aircraft is tested. In efforts to obtain agreement from the Air Force to test the fifth B-2 bomber, SNL proposed testing that aircraft at a later date. In a March 2020 letter to the Air Force, NNSA agreed with SNL's proposed path forward to accomplish testing of the fifth B-2 bomber in late 2020 or early 2021. Upon successful completion of that test, SNL will confirm the full B-2 bomber fleet as a certified carrier of the B61-12 weapon. Until then, certification will be limited to the B-2 bomber's tail numbers that were tested. In June 2020, an NNSA official told us that NNSA informed the Air Force that it will review the data from the tested aircraft and then make an informed decision about the possibility to waive the fifth aircraft requirement.

Air Force officials often cited aircraft availability and resource constraints as challenges to meeting the testing requirements. For example, one Air Force official told us that for the B-2 bomber, it is a challenge to support the requirement for testing 5 aircraft because of the small B-2 bomber's fleet size of 20. In addition, various Air Force officials questioned the previously agreed upon aircraft sample size requirement. Air Force officials believed that SNL was trying to gather data to prove reliability instead of certifying design compliance of weapon systems. Numerous Air Force officials stated that they would like to know how the number of aircraft specified in the AMAC test requirements document was determined. Officials at the Air

[1] The AMAC System 2 is a new system that includes digital aspects, unlike the previous System 1 that used an analog interface.

Force Global Strike Command, which is responsible for the Air Force's entire bomber fleets, wanted SNL to explain why the designated number of aircraft are needed since it is difficult to pull that many aircraft.

According to SNL, compatibility, or the assurance that the weapon will receive proper input from the Air Force system and will not experience environments outside of design, was a "given" condition prior to weapon system reliability calculations. Without the assurance of compatibility, reliability may be inaccurately stated or calculated. SNL's compatibility testing also reaffirmed nuclear safety, including unique signal generation and monitoring, as stated in the nuclear weapon system safety rules. SNL officials acknowledged that a statistically relevant sample would likely result in more than the five aircraft currently required to certify new platforms or weapon systems. However, SNL officials stated that they can defend the sample size of five aircraft from an engineering and judgment basis.

SNL officials have begun the planning process for a comprehensive study that will provide justification and the technical rationale for the AMAC test requirements to provide assurances that the AMAC operates, as required. However, the officials informed us that SNL would like the Air Force to also participate in the comprehensive study. In March 2020, NNSA acknowledged SNL's interest in a statistical study and informed the Air Force Nuclear Weapons Center that it supported such a study. An Air Force Nuclear Weapons Center official stated that the Nuclear Weapons Center would welcome a study. The Commander of the Air Force Global Strike Command informed us that the Air Force, NNSA, and SNL need to be able to work together and that the stakeholders need to agree on their approach as a team. We agree with this assessment.

Changes to Test Requirements

NNSA and the Air Force also disagreed on other changes to the AMAC test requirements. We determined that longstanding disagreements between NNSA and the Air Force on electrical load tests to apply worst-case power loads on delivery aircraft have occurred since at least 2008. Specifically, completion of the AMAC tests on the F-16 fighter aircraft took over 9 years to resolve and complete. In February 2008, SNL began coordinating with the Air Force to conduct required AMAC tests for the F-16 aircraft. SNL also requested that the Air Force conduct electrical load tests to address AMAC system load changes, so SNL could evaluate proper AMAC system functionality to verify that aircraft-to-weapon interface electrical parameters met required interface specifications. However, the Air Force believed that the load bank tests were "highly intrusive" and that there was enough data already available from prior tests. The prolonged exchanges between NNSA, SNL, and the Air Force contributed to the required AMAC tests not being completed in accordance to required timelines, as they were ultimately completed in May 2017.

In addition, the Air Force revised AMAC test requirements outside of the AMAC POG by changing requirements contained in the Certification Requirements Plan (CRP). The CRP defines requirements, assigns the roles and responsibilities, and defines the activities and tasks required for the Air Force's nuclear certification process. Each CRP is tailored to meet the needs of a particular certification effort, including compatibility certification for a specific

aircraft/weapon system. While the Air Force Nuclear Weapons Center Surety and Certification Division managed and approved the CRP for implementation, the CRP also identified non-Air Force process owner responsibilities, which included NNSA and SNL, along with regulatory authority, action agency, and necessary objectives to describe tasks.

We found that the Air Force changed previously agreed upon test requirements in the CRPs for various aircraft and weapon systems. For example, the Air Force changed the number of previously agreed upon aircraft to perform compliance testing under worst-case electrical loads in the CRP for the F-15 Strike Eagle fighter aircraft/B61-12 weapon. However, SNL was unaware of the change made after they reviewed the CRP draft version, and therefore signed the final CRP in good faith that it was the same as the last revision reviewed. According to SNL, it did not receive any notice of this major change. In February 2019, SNL issued a memorandum to NNSA, where it provided technical justification to reinstate the prior number of agreed upon aircraft to undergo worst-case electrical load testing to ensure that the aircraft is compliant with the limits of the AMAC system specifications. In particular, SNL cited a case study where it concluded that testing fewer than the previously agreed upon number of aircraft would result in a decreased confidence level, which would exceed the risk that SNL is willing to recommend to NNSA.

In July 2019, NNSA subsequently issued a memorandum to the Air Force outlining its commitment to support AMAC testing for the F-15 aircraft/B61-12 weapon, among other things, and endorsing SNL's technical position to revert electrical load testing to the prior agreed upon number of aircraft. According to an NNSA official, an Air Force representative informed the official that the change to the load bank test requirements was an unintentional oversight, as the development of a CRP involved many people. An SNL official told us in February 2020 that the issue was eventually resolved, as the Air Force agreed to perform the electrical load tests on the previously agreed upon number of aircraft. However, the F-15 aircraft/B61-12 weapon AMAC testing that was planned for August 2019 was delayed, and tests were incomplete until March 2020. An NNSA official informed us that while the electrical load tests were not the primary driver for testing delays, they were a contributing factor.

The Air Force also made other changes to CRP test requirements. We found that a similar issue occurred where the Air Force altered the previously agreed upon aircraft sample size in another CRP. NNSA signed off on the October 2019 CRP for the B-52 Stratofortress bomber/Long Range Stand-off cruise missile, unaware that the Air Force removed the specific number of aircraft to undergo functional ground and flight tests, which ensure compatibility between the weapon and the aircraft. As of March 2020, an SNL official informed us that no progress had been made to resolve the issue.

Air Force Nuclear Weapons Center officials stated the CRPs are not considered DoD/NNSA joint test requirements documents and that coordination between the Air Force Nuclear Weapons Center and NNSA has varied by weapon system/aircraft. However, an NNSA official informed us that the official viewed the CRP as an agreement of resources and organization position, as well as a means for all organizations to obtain the necessary information to be successful for the tests.

Contributing Factors

These challenges to NNSA's oversight of the AMAC system testing requirements for nuclear weapons delivery occurred because NNSA's process for resolving interagency differences did not have specified timeframes, which resulted in some delays for resolution of issues between the two Federal agencies where agreement could not be reached. In addition, NNSA and SNL accepted the final versions of the CRPs in good faith and did not always perform follow-up reviews. Finally, there are fundamental inconsistencies between the MOU, the Charter, and the DoD/Air Force Manual.

Elevating Issues to NNSA Senior Management in a Timely Manner

We found that NNSA's process for resolving interagency differences did not have specified timeframes, which resulted in some delays for resolution of issues between the two Federal agencies where agreement could not be reached. Specifically, NNSA officials informed us that when consensus cannot be reached between the two agencies, they use the chain-of-command process to resolve issues between NNSA and the Air Force. The officials said that they try to resolve interagency issues at the AMAC POG level, if possible, and only elevate issues up to senior NNSA management for action when the Air Force decides to take matters up its chain of command.

For example, we identified an instance where both agencies elevated issues to higher management involving the B-52 bomber and the W80 warhead. The Air Force stated that it could not support a flight test with a specific number of missiles for a comprehensive AMAC test,[2] which was required by October 2019. This test was to satisfy the conditional certification for the B-52 aircraft as a carrier of the W80 warhead. The previous B-52 comprehensive AMAC test was last conducted in February 2006. It had been over 14 years since the last comprehensive test, and the B-52 aircraft was past due the required 5-10 year timeframe.

According to NNSA officials, this issue was elevated to the attention of NNSA Headquarters and Air Force officials, and the comprehensive AMAC test was eventually scheduled for completion by March 2020.[3] There were no formal processes or procedures in place that triggered a timely elevation of these discussions; however, NNSA and the Air Force were able to agree on a path forward. While NNSA officials informed us that this was the only example where an AMAC/aircraft compatibility-related issue was elevated up through NNSA's senior management for action, NNSA officials are confident in their abilities to resolve other interagency issues. The officials expressed support for staff in elevating these issues.

[2] Comprehensive tests are performed to determine electrical degradation resulting from age-related issues. These tests are conducted on platforms that have not been exposed to a major life extension program or a major sustainment activity. They are typically conducted every 5 years but at a minimum of every 10 years.
[3] In March 2020, NNSA officials informed us that the comprehensive test was not completed due to issues with, among other things, winter weather conditions. An SNL official notified us that the test was completed in August 2020.

Limited CRP Reviews

NNSA and SNL did not always perform reviews of the final versions of the CRPs. The review process for the CRPs included marked versions to track changes and a comment resolution matrix to disposition stakeholder comments, rationale, and decisions. As stated earlier, NNSA and SNL signed final versions of the F-15 aircraft/B61-12 weapon and the B-52 bomber/Long Range Stand-off cruise missile CRPs only to find out afterwards that certain test requirements changed. According to NNSA and SNL officials, they did not receive notifications from the Air Force of those additional changes. Therefore, the officials signed the final CRPs unaware that the Air Force had changed test requirements. Both NNSA and SNL officials acknowledged the importance of performing additional reviews of the final CRPs before signing them.

Inconsistencies Between the MOU, the Charter, and the DoD/Air Force Manual

The MOU is the only document binding the collaborative relationship between NNSA and the Air Force Nuclear Weapons Center for AMAC systems. In addition, there is no authoritative joint document that exists governing the management of the broader set of compatibility certification tasks that NNSA completes to support Air Force nuclear certification. As already mentioned, the MOU requires that AMAC system's design be based on the AMAC POG's design and test requirements. While the MOU established the Air Force Nuclear Weapons Center to chair the AMAC POG, it did not delineate who the decision-making authorities are when the two Federal agencies cannot resolve differences or how to resolve these issues.

In contrast to the MOU's provisions, which do not assert one Federal agency's authority over the other, the Air Force's AMAC POG Charter is strikingly different. While the MOU implements the AMAC POG, the Charter defines AMAC POG roles, responsibilities, and operating procedures, and does not require signature approvals from other stakeholders, like at NNSA and SNL. According to the Charter, the Air Force Nuclear Weapons Center has the ultimate authority and responsibility for the AMAC POG, POG deliverables, and acceptance of the AMAC system certifications. In addition, the Charter states that if consensus on issues cannot be reached, the issue will be elevated to the Air Force Nuclear Weapons Center/Nuclear Technology and Interagency Directorate Director for resolution.

However, the Charter's direction to elevate issues to the Air Force Nuclear Weapons Center/Nuclear Technology and Interagency Directorate Director for ultimate resolution contradicts the DoD/Air Force Manual. Specifically, the DoD/Air Force Manual requires POGs to report in a timely fashion any issue affecting safety, cost, performance, or other significant matters that cannot be resolved at the POG level to the Nuclear Weapons Council[4] (NWC), its subordinate committees, DOE/NNSA, or the cognizant Military Department. In addition, the NWC's procedural guideline for nuclear weapon activities, as well as NNSA's corresponding procedure, requires the POG to prepare joint reports and present coordinated status reports, results, and recommendations to the NWC Standing and Safety Committee,[5] or the NWC, as appropriate.

[4] The NWC is a senior executive body established in accordance with Title 10 U.S.C. Section 179, *Nuclear Weapons Council*, and the 1997 Memorandum of Agreement between DoD and the Department of Energy to provide high-level approval, oversight, coordination, and guidance to nuclear weapons stockpile activities.
[5] The NWC Standing and Safety Committee is the primary subordinate organization formed to support the NWC in handling day-to-day matters affecting the stockpile but not requiring the level of oversight of the NWC.

Nevertheless, NNSA and Air Force Nuclear Weapons Center officials informed us that AMAC POG issues have neither been routed to the NWC or its subordinate committees, nor have any reports been submitted to the NWC.

Impact

The AMAC system is the electrical means to communicate between NNSA's nuclear weapon and DoD's aircraft that transports it. According to a senior SNL official, the AMAC tests play a vital role in assuring that nuclear weapon safety and compatibility are maintained for the weapon and aircraft to successfully interact. Without AMAC compatibility testing, there is a risk that the nuclear weapon will not successfully deploy or detonate when intended. Therefore, it is critical that AMAC compatibility testing be conducted in a timely manner. However, interagency differences have contributed to delays in AMAC compatibility testing, and the disagreements, in turn, have strained the cooperative intent of the MOU. A cooperative effort is essential to ensuring that AMAC POG's views, impacts, and issues are communicated, worked, and balanced against one another. While the issues covered have resulted in occasional tense working relationships, NNSA informed us that other joint AMAC and general aircraft compatibility issues have been successfully resolved.

Other Matter

During our evaluation, SNL officials informed us where they could use Air Force data for certification purposes, thus alleviating the duplication of some test collection. Specifically, the Air Force generates a significant amount of data when conducting surveillance tests of the AMAC system, which consists of a set of tests at the system interface to verify and monitor continued AMAC system compliance with design specification requirements. SNL officials believe that modifying the tests slightly could remove the duplication of some test collection and result in more useful data for certification purposes. Air Force officials agreed on the need to reassess the reliability and surveillance programs in a manner that would support and enforce reliability confidence.

RECOMMENDATIONS

We recommend that the Administrator for the National Nuclear Security Administration (NNSA) take action to:

1. Develop and issue guidance to establish timeframes and expectations for interagency issues that cannot be resolved, and which were not reported to the Nuclear Weapons Council or its subordinate committees, to be elevated to senior management.

To address the concerns identified in this report, we recommend that the NNSA Administrator, in conjunction with appropriate Air Force personnel:

2. Ensure personnel perform thorough final reviews prior to signature when Certification Requirements Plans are provided to NNSA and Sandia National Laboratories.

3. Determine whether the Aircraft Monitor and Control Project Officers Group should adhere to Department of Defense Manual 5030.55_Air Force Manual 63-103 requirements to report issues affecting safety, cost, performance, or other significant matters that cannot be resolved at the Project Officers Group level, to the Nuclear Weapons Council or its subordinate committees, and clarify by:

    a. Revising the Memorandum of Understanding provisions to align roles and responsibilities, including a determination on whether the Memorandum should be expanded to include the entirety of joint compatibility certification efforts; and

    b. Requesting that the Air Force revise the Aircraft Monitor and Control Project Officer's Group Charter, in accordance with the Memorandum of Understanding, and include NNSA's endorsement.

4. Determine whether a joint NNSA/Air Force study defining the number of aircraft and revision of the Aircraft Monitor and Control test criteria, documented in test requirement specifications, is warranted in resolving interagency differences that are based on technical justification.

5. Establish the likelihood of modifying and utilizing data from the Air Force's surveillance testing of the Aircraft Monitor and Control system to support compatibility testing, and alleviate testing constraints and duplication of some test collection efforts.

MANAGEMENT RESPONSE

Management generally concurred with our recommendations and stated that proposed actions will be completed no later than December 31, 2021. In addition, Management stated that NNSA is committed to working with the Air Force to reconcile interagency differences identified in the report in order to continue providing assurance that nuclear weapon safety and compatibility are maintained. Management's comments are included in Attachment 3.

INSPECTOR COMMENTS

Management's comments and corrective actions are responsive to our recommendations.

Attachments

cc: Deputy Secretary
Chief of Staff

OBJECTIVE, SCOPE, AND METHODOLOGY

OBJECTIVE

We conducted this inspection to determine the extent to which the Department of Energy provided oversight of the Aircraft Monitor and Control (AMAC) system testing requirements for nuclear weapons delivery.

SCOPE

The inspection was performed from November 2019 through September 2020. We conducted the inspection at the National Nuclear Security Administration's (NNSA) Albuquerque Complex and Sandia National Laboratories (SNL) in Albuquerque, New Mexico; NNSA Headquarters in Washington, DC; the Air Force Nuclear Weapons Center in Albuquerque, New Mexico; and the Air Force Global Strike Command at Barksdale Air Force Base in Shreveport, Louisiana. The inspection was conducted under the Office of Inspector General project number S20AL006.

METHODOLOGY

To accomplish our objective, we:

- Reviewed relevant Department of Energy, NNSA, SNL, and Department of Defense procedures and guidelines related to the AMAC system;
- Reviewed the present and prior Memorandums of Understanding between the NNSA and the Air Force;
- Reviewed the present and prior AMAC Project Officer Group Charters;
- Reviewed AMAC System 1 & 2 test requirements;
- Reviewed other Project Officer Group charters;
- Interviewed cognizant NNSA, SNL, and Air Force personnel to gain an understanding of roles, responsibilities, and testing of the AMAC system;
- Reviewed prior AMAC test completion reports for various aircraft and weapon systems to identify if testing was completed for major modifications and 5-10 year comprehensive tests; and
- Reviewed memorandums and letters between NNSA, SNL, and the Air Force pertaining to interagency issues about the AMAC system.

We conducted this inspection in accordance with the Council of the Inspectors General on Integrity and Efficiency, *Quality Standards for Inspection and Evaluation*. Those standards require that we plan and perform the inspection to obtain sufficient, appropriate evidence to

provide a reasonable basis for our conclusions and observations based on our inspection objective. We believe that the evidence obtained provided a reasonable basis for our conclusions and observations based on our inspection objective. Accordingly, the inspection included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the inspection objective. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our inspection. Finally, we relied on data provided by NNSA, SNL, and the Department of Defense Office of Inspector General to satisfy our objective. We conducted an assessment of this data by reviewing supporting documentation used to generate the computer-processed data and deemed the data to be sufficiently reliable for our purposes.

Management waived an exit conference on November 19, 2020.

RELATED REPORTS

Office of Inspector General

- Audit Report on *The National Nuclear Security Administration's Weapons Evaluation Test Laboratory* (OAI-M-17-04, January 2017). The Office of Inspector General received an anonymous complaint regarding the management of Sandia National Laboratories' (SNL) Integrated Stockpile Evaluation Group. The complaint alleged that SNL diverted equipment to other programs and failed to fund preventive maintenance for the Weapons Evaluation Test Laboratory. The Office of Inspector General did not substantiate the allegation that SNL diverted equipment to other programs. However, the Office of Inspector General found that SNL had not met the National Nuclear Security Administration's (NNSA) expectations for laboratory testing at the Weapons Evaluation Test Laboratory. Although SNL completed 98 tests overall, it completed only 88 of 107 (82 percent) baselined laboratory tests from fiscal years 2013 through 2015.

Government Accountability Office

- Report on *NUCLEAR WEAPONS: NNSA Needs to Improve Guidance on Weapon Limitations and Planning for Its Stockpile Surveillance Program* (GAO-12-188, February 2012). This report found that NNSA's guidance containing information on nuclear weapon limitations does not cover all limitations, and some Department of Defense officials said that it may not provide them with relevant information for some limitations. In addition, one senior Department of Defense official stated that the guidance did not help clarify the potential impact that a particular limitation may have on weapon operation and maintenance. NNSA has also begun to implement some recommendations from the agency's draft October 2010 management review of the nuclear stockpile surveillance program but has not developed a corrective action plan to guide its multiple actions. Without a corrective action plan, it is unclear how NNSA will (1) ensure that the draft October 2010 management review's recommendations are fully implemented, and (2) demonstrate to key stakeholders, such as Congress and Department of Defense, that NNSA is committed to improving the surveillance program.

MANAGEMENT COMMENTS

Department of Energy
Under Secretary for Nuclear Security
Administrator, National Nuclear Security Administration
Washington, DC 20585

November 12, 2020

MEMORANDUM FOR TERI L. DONALDSON
INSPECTOR GENERAL

FROM: WILLIAM A. BOOKLESS
ACTING UNDER SECRETARY FOR NUCLEAR SECURITY
AND ADMINISTRATOR, NNSA

SUBJECT: Response to the Department of Energy Office of Inspector General (DOE OIG) Draft Report *Evaluation of the Aircraft Monitor and Control System's Nuclear Certification* (S20AL006)

Thank you for the opportunity to review and comment on the subject draft report. We appreciate the DOE OIG's work with the Department of Defense Office of Inspector General and the independent validation of the DOE's National Nuclear Security Administration's (DOE/NNSA) efforts to address challenges with the Aircraft Monitor and Control (AMAC) system testing requirements. DOE/NNSA is committed to working with the Air Force to reconcile interagency differences identified in the report in order to continue providing assurance that nuclear weapon safety and compatibility are maintained.

The attached management decision details the actions taken and planned in response to the report's recommendations. DOE/NNSA subject matter experts have also provided technical comments to your audit team under separate cover. If you have any questions regarding this response, please contact Mr. Dean Childs, Director, Audits and Internal Affairs, at (301) 903-1341.

Attachment

Attachment

NATIONAL NUCLEAR SECURITY ADMINISTRATION
Management Decision

Evaluation of the Aircraft Monitor and Control (AMAC) System's Nuclear Certification
(S20AL006)

The Office of Inspector General (OIG) recommended that the Administrator for the Department of Energy's National Nuclear Security Administration (DOE/NNSA):

Recommendation 1: Develop and issue guidance to establish timeframes and expectations for interagency issues that cannot be resolved, and which were not reported to the Nuclear Weapons Council (NWC) or its subordinate committees, to be elevated to senior management;

Management Response: Concur in principle. DOE/NNSA personnel are aware of and follow expectations for elevating issues to senior management through the chain of command process. Given the wide range of complex issues that may arise, it is impractical to establish firm timeframes for elevating issues. We are confident in the DOE/NNSA staff's ability to use appropriate professional judgement to determine when issues should be elevated to senior management. DOE/NNSA will, however, evaluate existing formal report processes, including Quarterly Program Review briefings and Program Reviews, to identify opportunities to incorporate AMAC interagency issues reporting, where appropriate. The estimated completion date for these actions is June 30, 2021.

The OIG also recommended that the DOE/NNSA Administrator, in conjunction with appropriate Air Force personnel:

Recommendation 2: Ensure personnel perform thorough final reviews prior to signature when Certification Requirements Plans (CRP) are provided to DOE/NNSA and Sandia National Laboratories;

Management Response: Concur. DOE/NNSA will evaluate the CRP review and comment resolution process, and propose any changes necessary to ensure that stakeholders have appropriate time to address comments and that document continuity is appropriately maintained. DOE/NNSA will also create a formal process tool to document DOE/NNSA's internal process for coordinating Basic CRPs and CRPs. The estimated completion date for these actions is December 31, 2021.

Recommendation 3: Determine whether the AMAC Project Officers Group should adhere to the Department of Defense Manual's requirements to report issues affecting safety, cost, performance, or other significant matters that cannot be resolved at the Project Officers Group level, to the NWC or its subordinate committees, and clarify by

a. Revising the Memorandum of Understanding (MOU) provisions to align roles and responsibilities, including a determination on whether the Memorandum should be expanded to include the entirety of joint compatibility certification efforts; and

b. Requesting that the Air Force revise the Aircraft Monitor and Control Project Officer's Group Charter, in accordance with the MOU, and include DOE/NNSA's endorsement.

Management Response: Concur in principle. DOE/NNSA does not have the authority to solely revise the MOU. DOE/NNSA will work with the Air Force to establish a joint DOE/NNSA and Air Force working group to review existing guidance, including the MOU and Charter, to better align roles and responsibilities to existing AMAC Certification Processes and determine if guidance should be expanded to Aircraft Compatibility Certification. The estimated completion date for these actions is December 31, 2021.

Recommendation 4: Determine whether a joint DOE/NNSA/Air Force study defining the number of aircraft and revision of the AMAC test criteria, documented in test requirement specifications, is warranted in resolving interagency differences that are based on technical justification.

Management Response: Concur. DOE/NNSA will work with the Air Force to establish a joint DOE/NNSA and Air Force working group to review AMAC test requirements and evaluate the aircraft sample size that is necessary for AMAC testing in order to certify compatibility of a new platform and/or nuclear weapon. The working group will determine the resources required to support the study and execution of scope. The estimated completion date for these actions is December 31, 2021.

Recommendation 5: Establish the likelihood of modifying and utilizing data from the Air Force's surveillance testing of the AMAC system to support compatibility testing, and alleviate testing constraints and duplication of some test collection efforts.

Management Response: Concur. NNSA will work with the Air Force to establish a joint working group to review available Air Force surveillance testing data and determine the data's applicability to support DOE/NNSA and Sandia National Laboratories compatibility certification. The working group will determine the resources required to support the study and execution of scope. The estimated completion date for these actions is December 31, 2021.

FEEDBACK

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