NATIONAL NUCLEAR SECURITY ADMINISTRATION

Office of Defense Programs

Office of Nuclear Safety, Nuclear Operations,

And Governance Reform

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Review Report And Recommendations

For

Y-12 National Security Complex

Building 9720-5

Confinement Ventilation Systems Evaluations

April 14, 2011

EXECUTIVE SUMMARY

Y-12 National Security Complex personnel performed an evaluation of Building 9720-5's ventilation systems in response to the Defense Nuclear Facilities Safety Board (Board) request transmitted in a February 4, 2011 letter to the National Nuclear Security Administration (NNSA). The evaluation focused on whether the ventilation systems were operated in compliance with their safety basis and with the performance requirements of the DOE *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety Related Systems* document (VSEG).

Complete results of the Y-12 evaluation are provided the report that is provided as an attachment to this document. Per the Y-12 report, the Building 9720-5 SAR does not credit the ventilation systems for any safety functions or defense-in-depth (DID) for the building's safe operation. Due to Building 9720-5's Hazard Category-2 (HC-2) classification, the ventilation systems were evaluated against safety class (SC), safety significant (SS) and defense-in-depth (DID) performance criteria. The report identified numerous performance gaps since the ventilation systems were not designed as nuclear confinement systems. The cost projection for modifying the facility to provide active confinement ventilation systems is approximately $50 Million.

Upon completion of its review of the Y-12 ventilation system evaluation (VSE) report, The Y-12 Site Office (YSO) determined that since no credited safety functions are provided by the ventilation systems, no upgrades are required.

NA-17 concurs with YSO's recommendations.

INTRODUCTION

This report is the result of the NA-17 independent review of the Y-12 Building 9720-5 VSE report. The evaluation was performed as a response to the February 4, 2011 Board letter that was transmitted to Thomas P. D'Agostino. In this letter, the Board expressed concerns about the proposed change in use of Building 9720-5, from building closure to utilization for storage of non-Material Access Area (MAA) material.

In 2005, the National Nuclear Security Administration (NNSA) informed the Board that Building 9720-5 would be excluded from the scope of the Department of Energy's (DOE) Implementation Plan for Recommendation 2004-2, *Active Confinement Systems*, on the basis that the facility was being replaced by the new Highly Enriched Uranium Materials Facility (HEUMF). Based on this plan, Building 9720-5 was to be closed and, therefore, did not warrant a VSE being performed.

Due to Building 9720-5's currently proposed use, the Board requested that an evaluation be performed that is consistent with the Recommendation 2004-2 IP. As a response to the Board's request, Y-12 performed a VSE that generally adhered to the evaluation guidelines required by

the 2004-2 IP and the resultant DOE *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety Related Systems* document (VSEG).

EVALUATION

Building 9720-5 is identified as a HC-2 facility based on the inventory of radioactive materials and the potential for a criticality accident within the facility. Based on the hazards/accident analysis in the Building 9720-5 SAR and accidents postulated for the events of interest, the fire events within the facility are bounding due to the potential release and dispersion of toxic materials. The consequences of large facility fires, however, are controlled through the implementation of the fire suppression system which is designated safety significant.

The Building 9720-5 ventilation systems were evaluated against the VSEG's safety class (SC), safety significant (SS) and defense-in-depth (DID) performance criteria. The Building 9720-5 SAR, however, does not credit any portion of the ventilation systems as safety systems for confinement/containment. The ventilation system has no role in consequence mitigation and does not perform any DID function. When this non-safety, non-confinement system was evaluated against the VSEG SC, SS and DID performance criteria, significant gaps were identified.

Based on the Building 9720-5 VSE report significant modifications to the facility would be required to implement active confinement ventilation. The cost projection for modifying the facility to provide active confinement ventilation systems is approximately $50 Million. A cost/benefit analysis conforming to requirements of the VSEG was not performed.

CONCLUSION

The Y-12 Site Office (YSO) reviewed the VSE report and determined that since no credited safety function is provided by the ventilation system, no upgrades are required for the building ventilation system. In addition, YSO concluded that the facility was not designed to operate with a confinement or containment system and only serves as a storage or staging area for transfer of material.

YSO further offers that the 9720-5 facility was excluded from further review based on sound considerations of expected facility life. Based on the extension of the mission for storage of Non-MAA radioactive material beyond the projected closure date of the facility, a review of the applicability of the listed exclusion criteria and confinement ventilation system evaluation were completed. Since the facility does not have an active confinement ventilation system (ACVS) and the building was not designed as a confinement or containment structure, the installation of an active confinement ventilation system would not be effective in release reductions.

In conclusion, YSO recommends that Building 9720-5 be excluded from additional reviews and evaluations for an ACVS under the previously established exclusion criteria. Additionally YSO

recommends that no changes are required or recommended to the building ventilation system since the current documented safety analysis does not require or credit the ventilation system to maintain safety function or DID for the safe operations of the facility.

Based on the NA-17 review of both the Y-12 VSE report and YSO's independent review, NA-17 concurs that no ventilation system changes are required.