



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

February 28, 2018

Mr. Dealis W. Gwyn  
Licensing Manager  
CB&I AREVA MOX Services  
P.O. Box 7097  
Aiken, SC 29804-7097

SUBJECT: SAFETY EVALUATION REPORT RELATED TO THE APPROVAL OF  
AMENDMENT NUMBER: MPQAP-2017-0001 OF THE "MIXED OXIDE  
PROJECT QUALITY ASSURANCE PLAN" FOR THE MIXED OXIDE FUEL  
FABRICATION FACILITY, UNDER CONSTRUCTION IN AIKEN, SOUTH  
CAROLINA

Dear Mr. Gwyn:

By letter dated December 20, 2017, (Agencywide Documents Access and Management System [ADAMS] Accession Number ML17355A100), CB&I AREVA MOX Services (MOX Services) submitted Amendment Number: MPQAP-2017-0001 of the MOX Project Quality Assurance Plan (MPQAP) to the U.S. Nuclear Regulatory Commission (NRC) for review and approval. MOX Services requested a revision to the MPQAP related to preventive maintenance requirements during construction.

As described in the enclosure to this letter, the NRC staff has reviewed the changes requested by MOX Services in Amendment Number: MPQAP-2017-0001 and finds them acceptable on the basis that the NRC staff concluded in its safety evaluation report that the change in wording is acceptable and in accordance with NQA-1 1994/1995a.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS. ADAMS is accessible from the NRC Web site at: <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

D. Gwyn

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If you have any questions, please contact me by telephone at (301) 415-8740, or via e-mail to [David.Tiktinsky@nrc.gov](mailto:David.Tiktinsky@nrc.gov).

Sincerely,

**/RA/**

David Tiktinsky, Senior Project Manager  
Fuel Manufacturing Branch  
Division of Fuel Cycle Safety, Safeguards,  
and Environmental Review  
Office of Nuclear Material Safety  
and Safeguards

Docket No. 70-3098

Enclosure:  
Safety Evaluation Report

cc:

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G. Carroll  
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SAFETY EVALUATION REPORT RELATED TO THE APPROVAL OF AMENDMENT  
 NUMBER: MPQAP-2017-0001 OF THE "MIXED OXIDE PROJECT QUALITY ASSURANCE  
 PLAN" FOR THE MIXED OXIDE FUEL FABRICATION FACILITY, UNDER CONSTRUCTION  
 IN AIKEN, SOUTH CAROLINA

DATED: February 28, 2018

**DISTRIBUTION:** FCSE r/f

**ADAMS Accession No.: ML18051A777**

**\* via e-mail**

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**SAFETY EVALUATION REPORT RELATED TO THE APPROVAL OF AMENDMENT  
NUMBER: MPQAP-2017-0001 OF THE “MIXED OXIDE PROJECT QUALITY ASSURANCE  
PLAN (MPQAP)” FOR THE MIXED OXIDE FUEL FABRICATION FACILITY**

Background:

By letter dated December 20, 2017 (Agencywide Documents Access and Management System Accession Number ML17355A100), CB&I AREVA MOX Services (MOX Services) submitted Amendment Number: MPQAP-2017-0001 of the MPQAP to the U.S. Nuclear Regulatory Commission (NRC) for review and approval in accordance with Paragraph 70.23(b) of Title 10 of the *Code of Federal Regulations* (10 CFR). MOX Services proposes a revision of the following sections: (1) MPQAP Section 19.2.3 “Preventive Maintenance;” (2) MPQAP Attachment A: “Commitment to Quality Assurance Standards” Subpart 2.2, “Quality Assurance Requirements for Packing, Shipping Receiving, Storage, and Handling of Items for Nuclear Power Plants;” and (3) MPQAP Attachment A: “Commitment to Quality Assurance Standards” Subpart 2.18, “Quality Assurance Requirements for Maintenance of Nuclear Facilities.” The technical evaluation in this SER describe the details of the revisions to the MPQAP. On February 5, 2018, the NRC staff issued a request for additional information (RAI) to supplement the amendment (ADAMS Accession Number ML18025A882). On February 8, 2018, MOX Services provided a response to the staff’s RAI’s (ADAMS Accession Number ML18039A797).

Regulatory Evaluation:

Paragraph 70.23(b) of 10 CFR, states in part, that the criteria in Appendix B, “Quality Assurance Criteria For Nuclear Power Plants and Fuel Reprocessing Plants,” to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” will be used by the Commission in determining the adequacy of the Mixed Oxide Fuel Fabrication Facility quality assurance program. NUREG-1718, “Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility,” states, that an acceptable method for meeting the requirements of 10 CFR Part 50, Appendix B is to follow the 1994 edition of the American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA-1) standard, with the 1995 addenda (NQA-1-1994/1995a). The applicable criterion in Appendix B for the proposed changes is Criterion XIII, “Handling, Storage and Shipping.” This criterion is executed via ASME NQA-1 1994/1995a Requirement 13, “Handling, Storage, and Shipping.” Requirement 13 states, “Handling, storage, cleaning, packaging, shipping, and preservation of items shall be controlled to prevent damage or loss and to minimize deterioration.” MOX Services has committed to comply with the guidance contained in Requirement 13. Specifically, the MOX Services’ MPQAP describes associated quality assurance (QA) procedures used for the implementation of 10 CFR Part 50, Appendix B; NQA-1-1994 as revised by NQA-1a-1995 addenda including Subpart 2.18 for the MOX startup and operations of the facility; and Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation).”

Technical Evaluation

MOX Services proposes to modify wording in multiple sections of the MOX MPQAP via amendment MPQAP-2017-0001. These changes include changes in the following sections: (1) MPQAP Section 19.2.3 “Preventive Maintenance;” (2) MPQAP Attachment A: “Commitment to Quality Assurance Standards” Subpart 2.2, “Quality Assurance Requirements for Packing, Shipping Receiving, Storage, and Handling of Items for Nuclear Power Plants;” and (3) MPQAP Attachment A: “Commitment to Quality Assurance Standards” Subpart 2.18, “Quality Assurance

Requirements for Maintenance of Nuclear Facilities.” Specifically, the MOX Services QA Program described in these sections is implemented in accordance with requirements of 10 CFR Part 50, Appendix B; NQA-1-1994 as revised by NQA-1a-1995 addenda; including Subpart 2.18 applicable to Option 2 (startup and operations of the facility); and Regulatory Guide 1.33 (Rev.2), “Quality Assurance Program Requirements (Operation)”. The predominant criterion of Appendix B and NQA-1-1994/1995a that is related to the proposed MPQAP changes and which may be affected is Criterion XIII, “Handling, Storage and Shipping.” MOX Services proposes to change the language to provide clarity and reduce ambiguity in their MPQAP requirements for the preventive maintenance (PM) of items in the storage and lay up areas. Specifically, MOX Services intends to incorporate an engineering evaluation and documentation process for the application of PM in the storage and lay up area. These changes are summarize below:

1. For MPQAP Attachment A: “Commitment to Quality Assurance Standards, Subpart 2.2 Quality Assurance Requirements for Packing, Shipping Receiving, Storage, and Handling of Items for Nuclear Power Plants,” MOX Services proposes to delete the statement, “This subpart is not applicable to Operations.” The NRC staff determined that the deletion of the statement eliminates the caveat concerning the applicability of the Commitment to NQA-1 Subpart 2.2 during construction and operations. The staff determined that this change is acceptable since these requirements should apply during operations as well. This change is acceptable and does not result in the reduction of commitments.
2. For MPQAP Attachment A: “Commitment to Quality Assurance Standards, Subpart 2.2 Quality Assurance Requirements for Packing, Shipping Receiving, Storage, and Handling of Items for Nuclear Power Plants,” MOX Services proposes changes to Section 4.5.2, “Inspection at Point of Shipment,” and Section 4.5.3, “Inspection at Port Entry,” language from “prior to shipment and at receipt of the item” to “prior to shipment and/or receipt of the item.” The staff determined that this change is acceptable because the receipt inspection prescribed in Section 5.2, “Receiving Inspection Requirements,” will still be required.
3. For MPQAP Attachment A: “Commitment to Quality Assurance Standards, Subpart 2.2 Quality Assurance Requirements for Packing, Shipping Receiving, Storage, and Handling of Items for Nuclear Power Plants,” MOX Services proposes for a new language to be inserted applicable to Section 6.4.2 Subparagraph (h) and Section 6.5. MOX Services proposes to follow either vendor recommendations for PM, an engineering evaluation, or engineering requirements documents delineating appropriate maintenance requirements for items in layup and storage areas instead of only following vendor recommendations. They stated that engineering evaluations would consider vendor recommendations as well as document and justify any deviation from the vendor recommendation. The same change was proposed for Subpart 2.18, “Quality Assurance Requirements for Maintenance of Nuclear Facilities,” Section 3.2.1. The staff determined that this modification to the MPQAP is acceptable based on the following proposed controls:
  - a. MOX Services will generate a new procedure describing the process for developing and documenting engineering evaluations to determine adequate preventive maintenance for Items in storage and layup.
  - b. The new procedure developed to generate engineering evaluations at a minimum shall consider these key elements: storage environment; component complexity; safety function of the component; vendor recommendations;

- c. operating experience; lessons learned from other facilities or industry; and safety classification of the component (QL-1 or QL-1LR).
  - d. Engineering evaluations and documentation will be retained for items in storage and layup and these will describe the respective preventive maintenance applicable to the item in storage or layup.
4. For MPQAP Section 19.2.3, "Preventive Maintenance," MOX Services proposes to remove the words "industry standards" from the following sentence, "The rationale for deviations from industry standards or vendor recommendations for PM shall be documented." The staff determined that this change in language is acceptable since it is to provide clarity on the proposed process for engineering evaluations. Specifically, this is to clarify that any deviations from vendor's recommended PM will be documented and justified in engineering evaluations for items in storage and layup areas. This change was performed to achieve consistency with changes reflected in sections: MPQAP Attachment A: "Commitment to Quality Assurance Standards," Subpart 2.2, "Quality Assurance Requirements for Packing, Shipping Receiving, Storage, and Handling of Items for Nuclear Power Plants;" Section 6.4.2 Subparagraph (h); Section 6.5; and Subpart 2.18, "Quality Assurance Requirements for Maintenance of Nuclear Facilities," Section 3.2.1. However, since this is a clarification for the PM of items in storage and layup areas it does not result in a reduction of commitments in other areas. The full applicability of ASME NQA-1 Subpart 2.18, "Quality Assurance Requirements for Maintenance of Nuclear Facilities," during operations will still be valid and applicable to the Mixed Oxide Fuel Fabrication Facility. Specifically, NQA-1 Subpart 2.18 Section 3.2.1, "Equipment," which states, in part, "Equipment shall be evaluated to determine its preventive maintenance requirements. That evaluation shall include the vendor recommendations as delineated in their Technical Manual and Bulletins, applicable industry standards and operational experience, and maintenance experience and equipment history files. Equipment shall be monitored and evaluated for degradation of performance because of age, as appropriate." This change is acceptable and does not result in the reduction of commitments.

Based on the controls mentioned above the NRC staff determined that the changes in language proposed by MOX Services do not result in a reduction of regulatory requirements or safety. MOX Services provides reasonable assurance of the determination of the reliability and availability of IROFS during operations by performing inspections before and after the installation of components.

### Conclusions

The NRC staff has reviewed the changes requested by MOX Services in Amendment Number: MPQAP-2017-0001 and supporting documents and finds them acceptable. Based on the technical evaluation described above the NRC staff finds the modifications are acceptable and do not result in a reduction of regulatory requirements or safety.