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MOX SERVICES, LLC

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U.S. Nuclear Regulatory Commission
Washington, DC 20555

DCS-NRC-000478
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Subject: Docket Number 070-03098
CB&I AREVA MOX Services
Mixed Oxide Fuel Fabrication Facility
Response to Request for Additional Information Regarding MOX Project Quality Assurance Plan (MPQAP) Amendment Number: MPQAP-2017-0001

References: NRC-DCS-000791, Letter from NRC to CB&I AREVA MOX Services, dated February 05, 2018, Request for Additional Information Related to Amendment Number: MPQAP-2017-0001 of the MOX Project Quality Assurance Plan

CB&I AREVA MOX Services, LLC (MOX Services) hereby submits to the U.S. Nuclear Regulatory Commission (NRC) responses to a request for additional information (RAI) related to MOX Project Quality Assurance Plan (MPQAP) Amendment Number: MPQAP-2017-0001 (Reference). No changes to the MPQAP amendment were necessary as a result of the RAIs and associated responses.

If you have any questions, please feel free to contact me at (803) 442-6485 or Dealis Gwyn, Licensing and Nuclear Safety Manager at (803) 819-2780.

Sincerely,

David Del Vecchio
President and Project Manager

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Enclosure

MOX Services Response to Request for Additional Information Regarding Amendment Number: MPQAP-2017-0001

RAI 1(a) **Describe the key elements used to perform and document engineering evaluations and determine adequate preventive maintenance for equipment in storage and layup areas.**

RAI Response

While the procedure describing the process for developing the engineering evaluations will not be developed until after MPQAP Amendment 2017-001 is reviewed and approved by the NRC, the primary goal of a maintenance program implemented by MOX Services, as described in the License Application Section 5.3, includes provisions for planned, scheduled, and unplanned maintenance to ensure MFFF equipment will be available and reliable to perform their intended safety functions. Maintenance activities include surveillances, preventive maintenance, and corrective maintenance. The layup and storage periodic maintenance engineering evaluations will determine the appropriate PM requirements during this project phase. In particular, deviations which relax vendor recommendations will be documented and justified. Examples of elements that will be considered, in these evaluations, as appropriate, include

- storage environment
- component complexity
- safety function
    - active or passive
    - permissive (e.g., requires component to execute safety function to allow operations to continue; similar to fail-safe)
    - if component fails, it fails to a safe condition (e.g., air operated valve closes upon loss of air or power)
- vendor recommendations
- reference plant operating experience
- lessons learned from other facilities or industries
- safety classification (e.g., QL-1 or QL-1LR)

MOX Services may also consider the replacement or refurbishment costs as compared to the anticipated cost of the preventive maintenance activities. The inclusion of cost considerations will not impact the reasonable assurance determination that must be made in the engineering evaluations. In addition to the above factors in implementing a cost effective preventive maintenance program prior to operations, the following related factors support a reasonable assurance determination of IROFS reliability and availability during operations

- checks/inspections prior to component installation that provide confidence the component will perform required function before the component is installed
- checks/inspections after component is installed to verify the installation is in accordance with the design basis
- checks/inspections prior to component testing that provide confidence that it is safe to energize the component or pressurize the component/system (where applicable)
- testing to demonstrate the component can perform credited safety function prior to system turnover to operations (unless nuclear material is required to demonstrate performance of the safety function)

- Periodic preventive and/or corrective maintenance performed after installation but prior to operations
- Periodic surveillance testing to demonstrate IROFS safety function performance after system turnover to operations

The implemented PMs, supported by engineering evaluations, coupled with the other maintenance activities (e.g., other PM activities, surveillances, and corrective maintenance) will continue to provide reasonable assurance that the IROFS will be reliable and available during operations. While MOX Services may consider costs of PM activities during layup and storage during the construction phase in the engineering evaluations, this consideration will not impact the purpose of the maintenance program of providing reasonable assurance the safety functions and ISA requirements will be achieved during operations.

MPQAP Changes

No changes were required to amendment MPQAP-2017-0001.

RAI 1(b) Are the key elements used in engineering evaluations, requirements, and evaluation process different for items in storage and in layup? If yes, please describe the differences.

RAI Response

While the key elements are the same, the impact of the element may be different – which could result in different PM considerations. For example, there may be differences in the environmental conditions in layup versus storage. Similarly, the current condition and status of the component may result in different PM considerations. PM feedback may result in adjustments to PM requirements for items in storage and/or items in layup.

MPQAP Changes

No changes were required to amendment MPQAP-2017-0001.

RAI (2) **As part of the justification for the changes MOX provides a description of the three aging categories that the preventive maintenance addresses. MOX states, that, "[c]omplex assemblies comprise a multitude of different components. Each assembly and each component within the assembly is subject to different aging mechanisms that determine whether the assembly falls under one of the following three aging categories." They define these categories as infinite lifetime, finite lifetime with periodic renewal, and finite lifetime with no effective renewal process. Do these aging mechanisms take into consideration the shelf life of the component? If no, how is shelf life of the component considered?**

RAI Response

The aging categorization does take into consideration the shelf life of the component, but does recognize that "aging" is a more general term than "shelf life". Aging applies to subassemblies, assemblies, and systems in storage, layup, and service. Shelf life only applies to subassemblies, assemblies, and systems in storage.

The difference in the terms is that aging mechanisms may change when a subassembly, assembly, or system is installed or fabricated into a component part. Aging categorization places subassemblies, assemblies, and systems into groups depending on the dominant aging mechanisms during storage, layup, and services. Preventive maintenance provides the renewal service required to maintain the equipment in a nominal state when the aging categorization identifies renewal as a viable life-extension mechanism. Preventive maintenance is minimal for equipment with infinite lifetime and for equipment with a finite lifetime with no effective renewal process. For these aging categories, the equipment will be evaluated prior to being placed into service rather than expending resources to provide maintenance for equipment whose lifetimes are not affected by maintenance.

MPQAP Changes

No changes were required to amendment MPQAP-2017-0001.