

October 21, 2016

Mr. Dealis W. Gwyn
Licensing Manager
CB&I AREVA MOX Services
P.O. Box 7097
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SUBJECT: CLOSURE OF GENERIC LETTER 2015-01, "TREATMENT OF NATURAL PHENOMENA HAZARDS IN FUEL CYCLE FACILITIES" (COST ACTIVITY CODE L33337) FOR THE MIXED OXIDE FUEL FABRICATION FACILITY

Dear Mr. Gwyn:

On June 22, 2015, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2015-01, "Treatment of Natural Phenomena Hazards in Fuel Cycle Facilities." (Agencywide Documents Access and Management System [ADAMS] Accession No. ML14328A029). GL 2015-01 was issued for two purposes: (1) to request that addressees submit information to demonstrate compliance with regulatory requirements and applicable license conditions regarding the treatment of natural phenomena events in the facilities' integrated safety analysis (ISA); and (2) to determine if additional NRC regulatory action is necessary to ensure that licensees comply with their licensing basis and existing NRC regulations.

The NRC staff completed its evaluation of the CB&I AREVA MOX Services (MOX Services) response to Generic Letter (GL) 2015-01 dated September 9, 2015 (ADAMS Accession No.: ML15252A072). The Staff Evaluation Report of the GL is enclosed. Consistent with Inspection Manual Chapter 2630, "Mixed Oxide Fuel Fabrication Facility Construction Inspection Program," (ADAMS Accession No.: ML15134A068) the staff performs inspections of the construction activities at the Mixed Oxide Fuel Fabrication Facility (MFFF). A sample of the activities inspected includes verification of the installation and construction of items relied on for safety related to natural phenomena hazards (NPH) accident sequences. The results of the inspections are documented in quarterly inspection reports.

In addition, the MFFF will be subjected to an Operational Readiness Review (ORR). The NRC staff's ORR activities will include a sampling of the operating and emergency procedures, personnel, and equipment credited in the licensee's prevention and mitigation strategies for NPH events.

Based on the evaluation of MOX Service's response to GL 2015-01, the NRC staff has concluded that MOX Services has performed appropriate evaluations of the NPH at the MFFF. As a result, GL 2015-01 is considered closed and no further information or action is requested.

D. Gwyn

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

Sincerely,

/RA/

Craig G. Erlanger, Director
Division of Fuel Cycle Safety, Safeguards,
and Environmental Review
Office of Nuclear Material Safety
and Safeguards

Enclosure: Staff Evaluation Report

Docket No. 70-3098

D. Gwyn

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STAFF EVALUATION OF THE RESPONSE TO GENERIC LETTER 2015-01,
“TREATMENT OF NATURAL PHENOMENA HAZARDS IN FUEL CYCLE FACILITIES”
MIXED OXIDE FUEL FABRICATION FACILITY
CB&I AREVA MOX SERVICES
DOCKET NUMBER: 070-03098

I. Background

On June 22, 2015, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2015-01, “Treatment of Natural Phenomena Hazards in Fuel Cycle Facilities” (Agencywide Documents Access and Management System [ADAMS] Accession No.: ML14328A029). The GL requests information from licensees of fuel cycle facilities to verify the assumptions in the facilities’ integrated safety analyses (ISAs) regarding how each facility addressed the potential consequences of natural phenomena hazards (NPH) events in the ISA. By letter dated September 9, 2015, CB&I AREVA MOX Services (MOX Services) responded to GL 2015-01 (ADAMS ML15252A072).

The purpose of this evaluation report is to document the staff’s review of MOX Services response to GL 2015-01, to determine if the potential effects of NPH events were adequately addressed in the ISA. MOX Services is required to evaluate NPH in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 70.64 “Requirements for new facilities or new processes at existing facilities”. Specifically, 10 CFR 70.64 (a)(2) states in part, that the design must provide for adequate protection against natural phenomena with consideration of the most severe documented historical events for the site. The staff reviewed the License Application (ML101040739), which was referenced in MOX Services response to GL 2015-01 and used previous findings made in a Safety Evaluation Report (SER) for the review of the LA dated December 15, 2010 (ADAMS ML103430615).

GL 2015-01 Requested Actions

In the GL, the staff requested that all addressees provide information to verify the assumptions in their facilities’ ISAs regarding how each facility provides adequate protection against the occurrence of natural phenomena events. Specifically, the staff asked that addressees take the following actions:

- a) Submit definitions of “unlikely,” “highly unlikely,” and “credible” in evaluating natural phenomena events in the ISA such as earthquakes, tornadoes, tornado missile impacts, floods, hurricanes, and other wind storms.
- b) Submit a description of the safety assessment for the licensing and design basis natural phenomena events, including the following information:
 - i. likelihood and severity of the natural phenomena events, such as earthquakes, tornadoes, floods, hurricanes, and other wind storms;
 - ii. accident sequences as a result of natural phenomena event impacts to facility structures and internal components;
 - iii. assessment of the consequences for the accident sequences from item ii that

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result in intermediate and/or high consequence events; and

- iv. items relied on for safety (IROFS) to prevent or mitigate the consequences of the events from items ii and iii.
- c) For facilities subject to 10 CFR Part 70, Subpart H requirements, submit a description of the results of the ISA review used to comply with 10 CFR 70.62(c), identifying the characteristics of the licensing and design basis natural phenomena events applicable to the site, that evaluates possible changes in the methodology, likelihood, and severity of natural phenomena events with those used in the original design/evaluation of the facility.
- d) Submit for staff review a summary of the results of any facility assessments or walk downs, if performed, to identify and address degraded nonconforming, or unanalyzed conditions that can affect the performance of the facility under natural phenomena and have available for NRC inspection the documentation of the qualifications of the team.

II. MOX Services Response to GL 2015-01 and Staff Evaluation

1.0 NRC GL 2015-01, Requested Action (1)a: Submit the definitions of “unlikely,” “highly unlikely,” and “credible” in evaluating natural phenomena events in the ISA such as earthquakes, tornadoes, tornado missile impacts, floods, hurricanes, and other wind storms.

MOX Services submitted definitions of “unlikely,” “highly unlikely,” and “credible” by referencing Section 5.1.2.5 of the Integrated Safety Analyses Summary (ISAS) and License Application (LA) section 5.2.5.1. MOX Services evaluated NPHs to establish the design basis for each NPH. The magnitude of the design basis NPHs was selected considering the most severe documented historical event for the Mixed Oxide Fuel Fabrication Facility (MFFF) site. The selection of annual exceedance probabilities for natural phenomena events is based on the criteria for reactors licensed in accordance with 10 CFR Part 50.

The staff has previously evaluated the definitions for NPH events in the ISAS in Section 5.3.3.1 and documented its finding on its SER dated December 2010. Therefore, the staff finds that MOX Services has adequately responded to GL 2015-01 Requested Action (1)a.

2.0 NRC GL 2015-01 Requested Action (1)b: Submit a description of the safety assessment for the licensing and design basis natural phenomena events, including the following information:

- i. likelihood and severity of the natural phenomena events, such as earthquakes, tornadoes, floods, hurricanes, and other wind storms;
- ii. accident sequences as a result of natural phenomena event impacts to facility structures and internal components;
- iii. assessment of the consequences for the accident sequences from item ii that result in intermediate and/or high consequence events; and

iv. IROFS to prevent or mitigate the consequences of the events from items ii and iii.

MOX Services stated that the severity of the applicable natural phenomena events is included in ISAS Table 3.1-2, *Summary of MFFF Site Design Criteria*. The likelihood of the applicable NPH is reflected in the "Exceedance Probability" which is identified within the LA. The bases for the NPH design criteria and other characterization information for the MFFF is discussed in LA Sections 1.3.3 *Meteorology*, 1.3.4 *Hydrology*, 1.3.5 *Geology*, and 1.3.6 *Seismology*.

The safety evaluation of the NPH events for events where the unmitigated consequences were determined to be "not low"; i.e., events where IROFS are required to comply with the performance requirements of 10 CFR 70.61, is presented in ISAS Section 5.3.8 *Natural Phenomena*. Natural phenomena hazard events are summarized in ISAS Table 5.3.8-1, *Summary of Natural Phenomena Event Evaluations*.

As summarized in ISAS Table 5.3.2-1, *Summary of Bounding Mitigated MFFF Event Consequences*, the consequences of natural phenomena events (i.e. high and intermediate consequence events) are prevented by design of the facility structure.

The IROFS identified to implement the safety strategy for the applicable NPH event are described in the following ISAS sections:

- ISAS Section 5.3.8.2.1 *Earthquake (NPH-01)*
- ISAS Section 5.3.8.2.2 *Tornado (NPH-02)*
- ISAS Section 5.3.8.2.3 *Severe Wind (NPH-03)*
- ISAS Section 5.3.8.2.4 *External Fire (NPH-04)* (evaluated in Section 5.3.4, *Fire Events*)

The staff has previously evaluated NPH events in Section 1.3 of the SER dated December 2010. The staff concludes that based on its previous review of the LA and ISAS, MOX Services has adequately responded to GL 2015-01 Requested Action (1)b.

3.0 NRC GL 2015-01 Requested Action (1)c: For facilities subject to 10 CFR Part 70, Subpart H requirements, submit a description of the results of the ISA review used to comply with 10 CFR 70.62(c). This requested documentation should have identified the characteristics of the licensing and design basis NPH applicable to the site. Additionally, the documentation should have evaluated possible changes in the methodology, likelihood, and severity of natural phenomena events with those used in the original design, evaluation, and licensing of the facility.

MOX Services stated in response to GL 2015-01 that ISAS Section 5.3.8 *Natural Phenomena* summarizes the results of the ISA evaluation for NPH events required for compliance with 10 CFR 70.62(c). The design bases for site applicable NPHs are based on the site description information summarized in ISAS Table 3.1-2, *Summary of MFFF Site Design Criteria*.

MOX Services also stated that it maintains the ISA in accordance with 10 CFR 70.62(c). MOX Services evaluates new information for possible impact to existing design basis information. The purpose of these evaluations is to ensure that the existing design basis provides adequate protection to the health and safety of the public from NPH. If adequate protection is not demonstrated, beyond Design Basis Event modifications, emergency response procedure

changes, and/or additional training is implemented to assure continued protection. Changes to process safety information and commitments are evaluated for impact to the LA and ISAS in accordance with project procedure, PP8-6, *Licensing Basis Configuration Management*. In addition, project procedure PP8-7, *Review of NRC Generic Communications*, is used to identify new information such as IN 2010-19, *Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States*.

The staff has previously evaluated the NPH events described above and documented its finding in Section 1.3 of the SER dated December 2010.

Additionally the staff performs yearly inspections of the changes that MOX Services has made to the LA and ISAS. The conclusions of these inspections has been that MOX Services has adequately followed its change process as required by 10 CFR 70.72 for the ISAS and the process outlined for changes to the LA as shown in Chapter 16 of their LA.

Therefore, the staff finds that MOX Services has adequately responded to GL 2015-01 Requested Action (1)c.

4.0 NRC GL 2015-01 Requested Action (1)d: Submit for staff review a summary of the results of any facility assessments or walk downs, if performed, to identify and address degraded, nonconforming, or unanalyzed conditions that can affect the performance of the facility under natural phenomena and have available for NRC inspection the documentation of the qualifications of the team.

MOX Services stated that they did not require the performance of assessments or walk downs associated with degraded, nonconforming or unanalyzed conditions that can affect facility performance during NPHs. Therefore, the staff finds that MOX Services has adequately responded to NRC GL 2015-01 Requested Action (1)d.

Conclusion

On the basis of this evaluation, the NRC staff finds that MOX Services has performed appropriate evaluations of the NPH at the MFFF. In addition, the NRC staff finds that appropriate actions have been taken to ensure that this facility is capable of withstanding credible NPH scenarios and perform their intended safety functions. Therefore, the staff concludes that the Certificate Holder has adequately addressed the requested actions discussed in GL 2015-01.