



U.S. Nuclear Regulatory Commission
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Washington, DC 20555-0001

DCS-NRC-000398
09 September 2015

Subject: Docket Number 070-03098
CB&I AREVA MOX Services
Mixed Oxide Fuel Fabrication Facility
Response to NRC Generic Letter 2015-01, "Treatment of Natural Phenomena
Hazards in Fuel Cycle Facilities"

Reference: NRC Generic Letter 2015-01, "Treatment of Natural Phenomena Hazards in Fuel
Cycle Facilities," dated June 22, 2015

This letter provides CB&I AREVA MOX Services, LLC (MOX Services) response to Generic
Letter 2015-01 (Reference).

The U.S. Nuclear Regulatory Commission (NRC) issued NRC Generic Letter (GL) 2015-01
(Reference) to request that each addressee 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).

Specifically, GL 2015-01 directed holders of a construction permit to submit a written response
in accordance with 10 CFR 70.22(d) within 90 days of the GL. MOX Services' response to GL
2015-01 is provided in Enclosure 1.

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the
09th day of September, 2015.

Sincerely,

David Del Vecchio
President and Project Manager

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Enclosure:

(1) MOX Services Response to NRC Generic Letter 2015-01, "Treatment of Natural Phenomena Hazards in Fuel Cycle Facilities"

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Enclosure 1

**MOX Services Response to NRC Generic Letter 2015-01,
“Treatment of Natural Phenomena Hazards in Fuel Cycle Facilities”**

**MOX Services Response to NRC Generic Letter 2015-01,
“Treatment of Natural Phenomena Hazards in Fuel Cycle Facilities”**

The design of the Mixed Oxide Fuel Fabrication Facility (MFFF) is subject to the Baseline Design Criteria for natural phenomena hazards as detailed in 10 CFR 70.64 (a)(2). Therefore, as noted in GL 2015-01, MOX Services will provide references to the sections of the license application and/or ISA Summary in response to the requested actions.

GL 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.

Qualitative likelihood definitions for “unlikely,” “highly unlikely,” and “credible” are described in Integrated Safety Analysis Summary (ISAS) Section 5.1.2.5. These definitions are also presented in LA Section 5.2.5.1. As discussed in ISAS Section 5.3.1.1.2, a screening process was performed on a comprehensive list of NPHs to identify the NPHs that have the potential to affect MFFF operations. This initial screening was performed using the likelihood definitions provided in the LA and ISAS sections identified above. The results of this screening are provided in ISAS Table 5.3.1-8, *List of Applicable NPHs*. The next step in the evaluation of NPHs was 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 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 50.

GL Requested Action (1)b. Submit a description of the licensee’s 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*
- iv. items relied on for safety to prevent or mitigate the consequences of the events from items ii and iii*

(1)b.i. 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 License Application as summarized below. The bases for the Natural Phenomena Hazards (NPH) design criteria and other characterization information for the Mixed Oxide Fuel Fabrication Facility is discussed in LA Sections 1.3.3 *Meteorology*, 1.3.4 *Hydrology*, 1.3.5 *Geology*, and 1.3.6 *Seismology*.

Site Design Criteria	Annual Exceedance Probability	License Application Reference
Severe Wind (SC-I and SC-II)	1×10^{-4}	Table 1.3.3-9
Extreme Wind/Tornado (Wind Loads) (SC-I)	2×10^{-6}	Table 1.3.3-9
Floods	1×10^{-5}	Section 1.3.4.2.4.1
Precipitation	1×10^{-5}	Section 1.3.3.4.4
Snow and Ice Loads	1×10^{-2}	Section 1.3.3.3
Seismic (Ground Motion) (SC-I and SC-II) (CS)	1×10^{-4}	Section 1.3.6.7

(1)b.ii The ISA evaluates Natural Phenomena Hazards (NPHs) up to and including the NPH design bases discussed above. 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 10CFR70.61, is presented in ISAS Section 5.3.8 *Natural Phenomena*. NPH events are summarized in ISAS Table 5.3.8-1, *Summary of Natural Phenomena Event Evaluations*. The applicable events are described as excerpted below from ISAS 5.3.8.

Event Description – a general description of each event is included that provides the causes of the event and its location. The description includes a summary of process operations, sequence of events, or event phenomena as necessary to fully understand the event. A statement of unmitigated consequences is provided for each receptor. The safety strategy identified for the event is presented. The stated strategy for each event provides the basis for the selection of implementing IROFS.

(1)b.iii 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.

(1)b.iv 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*)

- ISAS Section 5.3.8.2.5 *Rain, Snow, and Ice (NPH-05)*

The IROFS for each NPH event are summarized in ISAS Table 5.3.8-1, *Summary of Natural Phenomena Event Evaluations*. The credited IROFS functions are provided ISAS Table 5.3.8-2 *List of Engineered IROFS*.

GL 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 natural phenomena events 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.

(1)c 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 maintains the integrated safety analysis 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*.

GL 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.

(1)d MOX Services did not require the performance of assessments or walk downs associated with degraded, nonconforming or unanalyzed conditions that can affect facility performance during NPHs.