STAFF EVALUATION OF AREVA RICHLAND FACILITY RESPONSE TO GENERIC LETTER 2015-01: TREATMENT OF NATURAL PHENOMENA HAZARDS IN FUEL CYCLE FACILITIES

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 11, 2015, the AREVA Richland Fuel Fabrication Facility (AREVA) responded to GL 2015-01 (ADAMS Accession No.: ML15295A011). The NRC staff (staff) issued a request for supplemental information (RSI) on February 26, 2016 (ADAMS Accession No.: ML16036A105) and by letter dated April 8, 2016, AREVA provided its response (ADAMS Accession No.: ML16103A503 and ML16228A278).

The purpose of this evaluation report is to document the staff's review of AREVA's response to GL 2015-01, including its response to the RSI, to determine if AREVA adequately addressed the potential effects of NPH events in the ISA. The staff selected a subset of NPH using a risk-informed approach to verify that AREVA used appropriate methods to evaluate the impacts of NPH in conducting the facility's ISA. The staff did not perform a complete assessment of the ISA for all NPH events nor did it conduct a design certification review for NPH. This method is consistent with NRC guidance in Chapter 3 of NUREG-1520, "Standard Review Plan (SRP) for the Review of a License Application for a Fuel Cycle Facility." The staff also used Interim Staff Guidance (ISG) No.: FCSE-ISG-15, "Natural Phenomena Hazards in Fuel Cycle Facilities" (ADAMS Accession No.: ML15121A044) for its review. The staff will perform an inspection using Temporary Instruction (TI) 2600/016, "Inspection Activities Associated with GL 2015-01" (ADAMS Accession No.: ML15317A506) to independently verify that AREVA is in compliance with the regulatory requirements and applicable license conditions regarding the treatment of NPH in its ISA. The inspection results from this TI will also be used to follow-up with previously identified Unresolved Items regarding the treatment of NPH and to inform the closure process of NRC GL 2015-01. The results of these regulatory activities will allow the staff to verify that AREVA demonstrates compliance with regulatory requirements and applicable license conditions regarding the treatment of NPH at the facility.

The AREVA Richland Facility is located at Horn Rapids Road just within the northern limits of the city of Richland in Benton County, Washington. AREVA uses low enriched uranium to fabricate fuel assembled for commercial nuclear power plants. The majority of the processes at AREVA are not required to meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Paragraph 70.64(a), "Baseline design criteria" which applies to new facilities or new processes at existing facilities.

II. GL 2015-01 Requested Actions

In the GL, the staff requested that all addressees provide information to verify the assumptions in there 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. (See Section III.1.0 on page 2).

b) Submit a description of the safety assessment for the licensing and design basis natural phenomena events, including the following information: (See Section III.2.0 on page 3).

   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. 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. (See Section III.3.0 on page 10).

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. (See Section III.4.0 on page 10).

II. AREVA's 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.

AREVA submitted definitions of "unlikely," "highly unlikely," and "credible" that they applied in their ISA. These definitions do not prescribe specific criteria for NPH events. The staff verified that the definitions were consistently applied in the ISA analysis for NPH events. The results of the staff review can be found below. Therefore, the staff finds that AREVA 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 (See Section III.2.1, III.2.2 and III.2.3):

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.

AREVA submitted safety assessments for NPH events applicable to their site, including earthquakes, landslides, high winds, tornadoes, volcanoes, rangeland fires, river flooding, lighting, snow load and local intense precipitation. A summary of AREVA's assessments and the staff evaluations for selected NPH events are contained below.

2.1 Earthquakes

2.1.1 ISA for Seismic Hazards

AREVA provided information regarding implementation of its ISA methodology to determine whether additional IROFS are needed as a result of seismic induced accident sequences. Specifically, AREVA primarily referred to sections of its 2016 ISA Summary to describe the seismic conditions and applicable accident sequences at the Richland facility. The 2016 ISA Summary and AREVA's response to the staff's RSIs outline the safe shut down earthquake or peak ground acceleration (PGA) to which buildings and certain systems, structures, and components at the facility were designed in accordance with the uniform or international building code (UBC or IBC) applicable at the time of construction.

As described in the ISA Summary and the response to the staff's RSIs, the buildings and specified Systems, structures, and components at the Richland facility, depending on the year built, are designed to withstand earthquakes within a specified zone, class, or probability of exceedance which can be compared to an earthquake level with a 2 percent probability of exceedance in 50 years. AREVA compared the earthquake levels prescribed in the UBC or IBC to data from the nearby United States Department of Energy Hanford Reservation and Columbia Generating Station. The Hanford site is adjacent to the Richland site, and Columbia Generating Station is approximately 11 miles north. As described in AREVA's response to NRC GL 2015-01 Requested Action (1)b, the Hanford data and Final Safety Analysis Report for Columbia Generating Station indicate annual probabilities and PGAs comparable to those applied to the design of the Richland facility.

Buildings at the Richland facility were designed to withstand earthquakes as prescribed in the UBC or IBC applicable at the time of construction. Based on a comparison of the seismic data at Hanford and Columbia Generating Station to the Richland site, and accounting for the IROFS

already in place, AREVA concluded that there are no additional seismic-induced accident sequences to consider and, therefore, no additional IROFS to apply.

Staff Evaluation:

The staff reviewed AREVA's responses and the 2016 ISA Summary (ADAMS Accession No. ML16056A023). Specifically, the staff evaluated AREVA's approach for considering seismic events within its ISA and the methodologies applied to determine likelihoods, consequences, and IROFS.

AREVA's approach to analyzing seismic events within its ISA is similar to its approach for other process hazards. Specifically, AREVA estimated the likelihood of seismic induced accident scenarios, determined the consequences of those accidents, and applied IROFS for unmitigated scenarios with intermediate consequences or high consequences.

As previously mentioned, based upon the seismic design of buildings and certain systems, structures, and components, and data from Hanford and Columbia Generating Station, AREVA estimated the annual probability of an earthquake that could cause damage to structures and components is on the order of 10^{-4} to 10^{-5}. Based upon AREVA's likelihood definitions, AREVA designated the likelihood of this event as "highly unlikely." Therefore, the staff agrees that AREVA's approach to classify the likelihood of seismic induced events based on the definitions established within its ISA methodology is adequate.

The staff reviewed AREVA's approach to determining the consequences of the criticality and non-criticality accident sequences. Specifically, the staff noted that AREVA, consistent with 10 CFR Section 70.61, considered all criticality accident sequences to have high consequences. For radiological and chemical release consequences, in its ISA Summary, AREVA cites bounding accident sequences. AREVA qualified the consequence of each accident sequence in terms of the highest potential Temporary Emergency Exposure Limit or amounts of special nuclear material (SNM). In other words, depending on the equipment or component failure, AREVA analyzed the largest potential chemical release or accumulation of SNM, then determined the consequences to the worker and the public based on those amounts. Because AREVA performed these analyses using bounding release scenarios, the staff agrees that AREVA's approach to determining the consequences of seismic induced accident sequences is conservative and adequate.

The staff reviewed AREVA's approach to identify IROFS required to prevent or mitigate seismic induced accident sequences. Similar to the approach to determine accident sequence likelihoods and consequences, AREVA applied the results of seismic analyses to identify both safety-significant structure, system or components and necessary modifications to either prevent damage to those systems, structures, and components or mitigate the consequences in the event of a criticality or chemical release. As mentioned above, because AREVA performed these analyses prior to the issuance of GL-2015-01 and reconfirmed the results in response to the GL, AREVA did not identify the need for additional IROFS. Therefore, the staff agrees that AREVA's approach to identifying IROFS specific to seismic induced accident sequences is adequate.

The staff reviewed AREVA's approach to determining whether the IROFS identified adequately prevent or mitigate the seismic induced accident sequences. In the ISA Summary, AREVA, after designating specific IROFS, calculates a Controlled Event Index (CEI) for each sequence. Each IROFS is prescribed a probability of failure on demand index, indicating the degree of protection the IROFS provides. These indices are similar to those in Table A-10, "Failure Probability Index Numbers" in NUREG-1520 Revision 2, which establishes mitigation indices based on the quantitative failure probability or qualitative description of the type of IROFS. For each accident sequence, the indices associated with the IROFS applied are summed and then added to the initiating event frequency index. Based on the results of that calculation, AREVA could consider an accident sequence adequately protected if the CEIs of highly unlikely, high consequence sequences are less than or equal to -4 (~1E-4 likelihood in events/year) or unlikely, intermediate consequences sequences are less than or equal to -3 (~1E-3 likelihood in events/year). Implementing this approach, AREVA concluded that the CEIs for each accident sequence meet the required likelihood criteria and therefore, the IROFS established provide adequate protection.

In the context of NPH, AREVA demonstrates in the ISA Summary that it recognizes meeting the performance requirements does not rely on likelihood alone. AREVA includes four types of seismic induced accident sequences: sequences initiated by an earthquake with acceleration 1) less than the prescribed UBC/IBC earthquake; 2) less than or equal to the prescribed UBC/IBC earthquake; 3) equal to the prescribed UBC/IBC earthquake, and 4) greater than the prescribed UBC/INC earthquake. AREVA assigns each type of earthquake an initiating event frequency index according to its estimates of likelihood. For most seismic induced accident sequences, AREVA cites the applicable UBC/IBC earthquake zone and states that the associated building, piping, and equipment are designed to withstand the prescribed UBC/IBC earthquake. For those sequences involving equipment or components that are not designed to withstand the designated initiating earthquake, AREVA applies additional IROFS to prevent the accident. Some of the IROFS are specific to the accident sequence, while others apply to non-seismic sequences that bound the seismic sequence. Furthermore, for seismic induced accident sequences, AREVA implements what AREVA refers to as general criticality safety IROFS. These IROFS apply to every criticality accident sequence and essentially control equipment dimensions, materials, bounding assumptions, and the design of buildings and equipment to maintain subcriticality.

The staff agrees that, based on a seismic evaluation of the facility, as described in its response to NRC GL 2015-01 Requested Action (1)b and the general criticality IROFS, the IROFS AREVA identified represent an adequate defense-in-depth strategy to determining whether seismic induced accident sequences are adequately prevented or mitigated. The staff further acknowledges AREVA's statement in its response to the staff's RSIs, that "[t]he major components at the AREVA facility that could produce off site consequences of concern were designed and built to withstand seismic loads associated with the building code inforce at the time the buildings were constructed." This statement demonstrates that AREVA recognizes that the adequacy of its approach to determining whether the IROFS identified adequately prevent or mitigate the seismic induced accident sequences is based, in part, on the seismic design of the facility.

2.1.2 Seismic Evaluation of Building Structures and Equipment

Building Structures:

AREVA stated in response to GL 2015-01 Question (1)b, that the buildings at its Richland site were designed and constructed to comply with the UBC and the IBC criteria for the year of construction. AREVA indicated that although the earlier buildings were designed with the UBC building codes and later buildings were designed with the IBC building codes, the UBC seismic criterion and the IBC 2009 seismic criterion as they relate to PGA are very similar. In 2012, AREVA hired a contractor to conduct a site-specific soil characterization study of the AREVA Richland site. The contractor concluded that the site can be classified as soil site class D.

In response to NRC RSI 1.1, AREVA provided information that identified the year of construction and specified the seismic design bases for each of the process and storage buildings constructed between 1970 and 2007. These seismic design bases were based on the Seismic Zone 2 criteria of the UBC and IBC building codes in force at the time of construction. In Attachment 1 of the response to NRC RAI 1.1, AREVA also identified the calculations or recalculations conducted for the process and storage buildings supporting the design bases and the contractors who carried out these calculations. The methodology used for these design calculations or recalculations were done using the equivalent static force method. In response to NRC RAI 1.2, AREVA stated that the process and storage buildings at the AREVA Richland site can withstand a 0.20g horizontal PGA (design basis earthquake) without sustaining significant damage. In response to NRC RAI 1.3, AREVA stated that a seismic analysis of the Dry Conversion (DC) building by an AREVA contractor also showed that the DC building will not collapse even if it is subjected to a seismic event that produces a ground acceleration 1.5 times that used in the original design basis.

Equipment:

In response to NRC RAIs 1.3 and 2.1, AREVA identified the major internal components in the DC building whose failure may lead to offsite consequences of concern: (i) UF_6 cylinder autoclaves, (ii) DC Pyrohydrolysis (reactor) vessels and associated filter vessels, (iii) Calciners, (iv) Calciners recycle and discharge vessels, (v) powder blenders, (vi) powder preparation equipment, (vii) hydrogen fluoride (HF) condensers, and (viii) HF storage tanks. In response to NRC RAI 1.3, AREVA stated that the scenario of HF release from a ruptured UF_6 cylinder containing liquid (hot) UF_6 in the DC building could be impacted by a seismic event with such a magnitude that the building could collapse onto the autoclaves and Uranium Hexafluoride (UF_6) cylinders. AREVA indicated that based on the results of seismic analyses the DC building would not collapse even if subjected to a seismic event that produces a ground acceleration of 1.5 times that used in the original seismic design basis, thus assuring that UF_6/HF release would not occur under the design basis earthquake. In response to NRC RAI 2.1, AREVA stated that the other seven components and their supports in the DC building as listed above were designed and built to withstand seismic loads associated with the building code in force at the time the buildings were constructed, thus these components will not fail under the design basis earthquake.

In response to RAI 2.1, AREVA also evaluated the following major internal components of other buildings: (i) Uranium Nitrate (UN) Storage tanks in UN building; (ii) Fuel Bundle storage racks

located within the UO_2 building and the blended low enriched uranium (BLEU) Fuel Bundle Storage addition; (iii) Powder and Pellet storage racks in the UO_2 building, the BLEU Powder Storage addition, and Warehouse 7; (iv) Ammonian diuranate (ADU) Dryer and its supports and ADU Calciner located within the UO_2 building; and (v) Liquid storage tanks in the Uranium Dioxide (UO_2) and Engineering Laboratory Operations (ELO) buildings. AREVA stated that all these components except Liquid storage tanks in the UO_2 and ELO buildings were designed and constructed to meet the seismic criteria associated with the building code in force at the time of construction, thus these components will not fail under the design basis earthquake. The liquid storage tanks in the UO_2 and ELO buildings were assumed to leak as part of the safety analysis completely independent of natural phenomenon. Thus the effect of failure of these liquid storage tanks in the UO_2 and ELO buildings is enveloped in the AREVA safety analysis.

Staff Evaluation:

The staff reviewed a sample of structural analysis of the process and storage buildings and evaluation of the equipment. The staff agrees with the use of criteria of UBC and IBC building codes as an acceptable methodology for the evaluation of earthquake hazards at the facility for the design and construction of the process and storage buildings. The staff also agrees with the use of the equivalent static force method for the seismic analysis of the structures. The staff reviewed the sample calculations to ensure the use of equivalent static force method was applicable for the analysis of the sampled structures. The use of this method assumes that the building responds in its fundamental mode, which is normally the structural behavior for low-rise buildings such as the buildings located at the site. Also the staff verified that the structural calculations considered the effects of torsional loads. The staff also compared the base shear used in the analysis with the base shears obtained from the current version of the IBC. The use of the risk-targeted ground motions referenced by the IBC 2012 with a 2 percent probability of exceedance in 50 years provides a target risk of seismic induced structural collapse equal to 1 percent in 50 years based on a generic structural fragility. The results show that the base shear for the sampled buildings calculated with the current version of the IBC is comparable to that used in the original design of the buildings. In addition, the two calculations that were sampled showed that seismic loads for the site are of higher magnitude than those obtained from building pressures due to high winds.

As described in Section III.2.1.1, AREVA considers as an IROFS (IROFS #0.24) that the building and equipment at the facility are designed and constructed according to the applicable codes. The staff performed sample reviews of the building drawings and structural analysis reports to determine if the seismic evaluation was adequately performed. The staff also verified and determined that the seismic hazards curves and seismic input parameters that AREVA selected are the appropriate ground motion parameters for the seismic evaluation. Based on these reviews, the staff concludes that AREVA has adequately modeled and analyzed process and storage buildings under seismic ground motion.

2.1.3 Seismically Induced Fire Consequences

In its response to NRC GL 2015-01, AREVA did not analyze any fire related accident sequences or consequences because systems structures and components are design to withstand seismic loads.

Staff Evaluation:

The staff reviewed the licensee's submittal and ISA Summary and concludes that the accident sequences analyzed in the ISA and the resulting consequences bound a natural phenomenon event that may occur at the facility.

The assumptions used in the ISA summary when analyzing accident sequences related to fire that may be affected by a natural phenomenon event (i.e. natural gas explosion, hydrogen explosion, propane tank explosion, etc.) were sufficiently conservative as to be considered bounding. Several fire related IROFS are used throughout the facilities, including fire sprinklers and fire doors and walls. Given the results of the structural analysis, these IROFS are expected to remain functional during a natural phenomenon event. After reviewing the licensee submittal and ISA summary, the staff finds that the evaluation of seismic induced fire consequences is adequate.

2.2 High Winds and Tornadoes

In its 2016 ISA Summary, AREVA discussed the initiating event frequency of tornadoes and describes data associated with high wind conditions. Specifically, the 2016 ISA Summary discusses historical wind speeds at Hanford and describes the tornadic activity in Benton County.

Although AREVA stated that, "Due to the low frequency of tornadoes in this area, no specific design criteria relative to tornadoes are required in the Uniform Building Code," the 2016 ISA Summary includes several accident scenarios that high winds, resulting from tornadoes, could initiate. For each high wind scenario, AREVA states that the building and applicable equipment are designed to "…withstand any predictable weather event without experiencing a loss of geometry control…". In AREVA's response to the staff's RSIs to GL 2015-01, AREVA stated the Richland facility is designed for wind loading equivalent to 70 to 87 miles per hour, depending on the building code applied. Furthermore, AREVA stated it will perform confirmatory calculations to verify the buildings will withstand the forces from wind speeds in excess of the UBC or IBC specifications. Due to the design of the building, AREVA concluded that it is highly unlikely that high winds would result in failures of the building walls or other structural items, causing a release of hazardous material and further concluded that there are no additional high wind accident sequences to consider and, therefore, there are no additional IROFS to apply.

Staff Evaluation:

The staff evaluated AREVA's approach for considering high wind and tornado events within its ISA process and the methodologies applied to determine likelihoods, consequences, and IROFS. The staff reviewed AREVA's likelihood estimation of a tornado strike and the wind speed data from other high wind events. Based on the data in Appendices A, B, and C of NUREG-CR/4461, Revision 2, the staff agrees that a tornado strike at the Richland facility is highly unlikely. The staff further agrees that AREVA's approach to analyze the potential effects of other high wind events is adequate given that the data provided in the 2016 ISA Summary and the National Centers for Environmental Information Storm Events Database show the likelihood of exposure to high winds that could damage the facility to be highly unlikely. In

reference to determining consequences and IROFS, AREVA's approach for high winds and tornadoes is similar to that for seismic activity as described in Section III.2.1.1.

In its 2016 ISA Summary, AREVA identifies several accident sequences that high winds could initiate. The staff notes that although AREVA concludes in its ISA Summary that it does not consider those sequences to be credible and that the UBC does not include specific requirements for tornadoes, as described above, the Richland facility is designed to withstand wind speeds equivalent to those that historical tornadoes in other counties near Richland have produced. Therefore, the staff agrees with AREVA's approach to considering high winds and tornadoes in its ISA process.

2.3 Other Natural Phenomena Hazards

Similar to its approach for considering seismic activity, high winds, and tornadoes in its ISA, AREVA analyzed the potential hazards from landslides, floods, volcanoes, rangeland fires, lightning, snow loading, and local intense precipitation.

For floods, AREVA stated in response to GL 2015-01 and Section 7.1 of their ISA Summary that the facility is situated above the estimated 100 year and 500 year flood elevations based on the U.S. Army Corps of Engineers flood map. In the cases where UBC or IBC design criteria applied, such as snow loading and local intense precipitation, AREVA stated it used the UBC or IBC to design the Richland facility to withstand the prescribed limits and included the applicable accident scenarios. Furthermore, AREVA stated that with or without the flood control dams on the Yakima, Columbia, and Snake rivers, a 500 year flood from rainfall or snowmelt will not affect the site. AREVA based this conclusion on historical flood frequency data for the Hanford area.

For the remaining natural phenomena, AREVA considered the potential hazards and either determined whether resulting accident scenarios were bounded by others or concluded that there were no additional scenarios or IROFS required.

Staff Evaluation:

The staff reviewed the floodplain data to verify that the flood levels will not impact the manufacturing areas of the plant. Based on current data available for the site location, the staff agrees with AREVA that the site is located significantly outside the 1 percent (100 year flood) and 0.2 percent (500 year) annual chance floodplains.

The staff agrees with AREVA's approach to considering other natural hazard phenomena. The approach is similar to that for seismic activity and high winds, and is, therefore, adequate.

Overall Staff Evaluation for NRC GL 2015-01 Requested Action (1)b:

Based on the staff evaluations for earthquakes, high winds and tornadoes, and other NPH, the staff finds that AREVA has adequately responded to GL 2015-01 Requested Action (1)b. The staff expects that AREVA will continue to apply its existing configuration management process to assure that the impacts of changes to the facility do not negatively affect its performance under NPH.

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.

AREVA stated in response to GL 2015-01 that the ISA Summary updates since 2004 have not reflected changes (or new data) that would change the likelihood of earthquakes, tornadoes, strong winds/storms, or increased populations with respect to the AREVA Richland site. In addition, in the response to RAI 1.1, AREVA indicated that the seismic analysis of some of the buildings was reassessed.

The staff reviewed a sample of the seismic analysis, including one of the buildings in which seismic calculations were reassessed, and the staff evaluation is included in Section III.2.1.2 above. For buildings and structures at the site, earthquake structural loads are of higher magnitude than structural loads from high wind pressures. As stated in Section III.2.1.2 the staff compared the base shear calculated with the current version of the IBC and concluded that it is comparable to that used in the original design of the building. Therefore, based on the structural calculations sampled, the staff agrees that changes to seismic loads or high winds will not affect the current design of the facilities. Based on the staff evaluation the staff finds that AREVA has adequately responded to NRC 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.

In response to NRC RAI 3.1, AREVA stated that following the Fukushima earthquake, a team of AREVA Richland Nuclear Safety, Operations, Plant Engineering and an AREVA Corporate safety individual completed a walk-down of the facility and made some recommendations on potential actions to improve the ability of the site to respond to beyond design basis natural phenomenon events. A summary of the 14 most significant recommendations and the disposition of each were provided to the staff. The staff will inspect a sample of the results of the walkdowns during the implementation of TI 2600/016 “Inspection Activities Associated with NRC GL 2015-01.” Therefore, the staff finds that AREVA has adequately responded to NRC GL 2015-01 Requested Action (1)d.

III. Conclusion

The staff evaluated the response to the requested actions of the GL, the response to the RSI, and sample calculations and determined that AREVA adequately addressed the potential consequences of NPH events in the ISA. The staff agrees that, based on an evaluation of the selected NPH events for the facility, the IROFS AREVA identified represent an adequate defense-in-depth strategy to adequately prevent or mitigate consequences of accidents. Consistent with the guidance in NUREG-1520, unless the natural phenomena is not credible,

the approach should not rely on its likelihood to eliminate the need for IROFS. The approach, however, can consider the results of engineering analyses and qualitative, quantitative, or semi-quantitative analyses to determine IROFS and assess whether the performance requirements of 10 CFR 70.61 have been met. AREVA, in its ISA Summary and response to the staff RSI demonstrates that its basis for concluding the performance requirements are met is rooted in the engineering analyses performed to comply with applicable building codes which include consideration for NPH conditions comparable to those at Hanford and Columbia Generating Station. Therefore, the staff finds that AREVA adequately responded to Requested Actions (1)a through (1)d of the GL.

The staff will perform an inspection using TI 2600/016, “Inspection Activities Associated with GL 2015-01” to independently verify that AREVA is in compliance with the regulatory requirements and applicable license conditions regarding the treatment of NPH in its ISA. The inspection results from this TI will also be used to follow-up with previously identified Unresolved Items regarding the treatment of NPH, and to inform the closure process of GL 2015-01. The results of these regulatory activities will allow the staff to verify AREVA demonstrates compliance with regulatory requirements and applicable licensee conditions regarding the treatment of NPH at the facility.