Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
1	I.1	AREVA considers containment venting as a viable mitigation strategy. However, the justification of its use in terms of its conformance to GDC 16 and design details, as to its impact on the other systems, structures, and components (SSCs) that are important to safety (e.g. emergency core cooling system (ECCS) and combustible gas control system (CGCS)), is not provided.	Containment and Ventilation	S. Peng	The option to vent containment for containment pressure control as an ELAP strategy will be removed in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.
2	I.2	How long does it take to align the low flow purge system for venting?	Containment and Ventilation	S. Peng	The option to vent containment for containment pressure control as an ELAP strategy will be removed in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.
3	I.2	How long for containment spray?	Containment and Ventilation	S. Peng	FSAR Table 19.2-6 contains the following COL responsibility: "The COL applicant shall provide a portable containment spray pump capable of a containment spray flow of at least 88.2 lbm/sec and a borated water supply capable of being placed in service within 24 hours for events initiated in Modes 1 through 6." Note: additional analyses are being performed to limit containment pressure and temperature to design basis values. This may reduce the spray initiation time, which may change the COL Item (FSAR Table 19.2-6) time requirement.	AREVA will revise licensing submittal.
4	I.2	In addition, it is not clear to the staff why the containment venting is preferred over containment spray.	Containment and Ventilation	S. Peng	The option to vent containment for containment pressure control as an ELAP strategy will be removed in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
5	II.1	On page 2-4 of Technical Report ANP-10329, Section 2.1 (Bulleted item No. 2) – This paragraph makes no sense to the staff. The staff would like AREVA to explain if the steam generator is dried out why would RCS temperature lower? Section 4.1.5.2 discusses rising RCS temperature.	Operator License and Human Performance	J. Kellum	Use of the diesel driven fire pump for SG feed requires that the SGs be depressurized below the fire pump discharge pressure to initiate feed flow. An RCS cooldown is initiated by lowering the pressure in two SGs at a rate that results in an RCS cooldown rate of 90°F/hr. The SGs will dry out before SG pressure can be reduced enough to allow feed flow which results in a temporary loss of primary to secondary heat transfer. The temporary loss of primary to secondary heat transfer results in cessation of steam production and rapid depressurization of the SGs below the fire pump discharge pressure when operator action is taken to fully open the MSRTs. This results in initiation of feed flow through the high elevation EFW nozzles and restoration of primary to secondary heat transfer. Although primary to secondary heat transfer is rapidly restored due to feed to the high elevation EFW nozzles, SG levels will not be restored until approximately two hours after feed flow initiation. The description of this process will be clarified in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.
6	II.2	On page 2-5 of Technical Report ANP-10329, Section 2.2 (Third bulleted item) – The statement “addition of makeup water addition” is confusing. The staff would like AREVA to clarify this statement.	Operator License and Human Performance	J. Kellum	This bullet will be revised to read "A level at which fuel remains covered and actions to implement makeup water addition should no longer be deferred." in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
7	II.3	Technical Report ANP-10329, Section 3.10 – The staff issued an Advance Notice of Proposed Rulemaking (ANPR) on April 18, 2012, and draft Regulatory Basis on January 8, 2013. Section 3.10 does not adequately address the concerns of Near Term Task Force (NTTF) Recommendation 8. Section 3.10 refers out to U.S. EPR FSAR Sections 13.5 and 19.2.5. U.S. EPR FSAR Section 13.5 shows no tie to the other procedures for NTTF Recommendation 8 such as Extensive Damage Mitigation Guidelines (EDMGs), Flex, etc.; and does not refer to NTTF Recommendation 8. U.S. EPR FSAR Section 19.2.5 also does not close the loop for the integration of the procedure sets as specified by NTTF Recommendation 8.	Operator License and Human Performance	J. Kellum	The Technical Report will delete reference to NTTF Rec 8. NTTF Rec 8 is the subject of proposed rulemaking and there is already a requirement in the DC FSAR to address if new regulatory criteria are imposed at a later date: Table 1.8-2, "U.S. EPR Combined License Information Items", item 1.9-1, states, "A COL applicant that references the U.S. EPR design certification will review and address the conformance with Regulatory Criteria in effect six months before the docket date of the COL application for the site-specific portions and operational aspects of the facility design." Specific information for procedures is provided by the COL applicant as stated in FSAR section 13.5.2.1, "Operating and Emergency Operating Procedure". Note: Preparation of emergency procedures for the U.S. EPR plant would require completion of detailed design of systems. Preparation of procedures is not required for design certification (see FSAR section 7.5.2.2.1, "Conformance to Regulatory Guide 1.97 and BTP 7-10.")	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
8	II.4	Technical Report ANP-10329, Section 4.1.6 – AREVA indicates that for some events analyzed, thermal hydraulic computer/simulation codes such as S- RELAP5 and GOTHIC were used as analytic methods (see pages 31 and 48). These codes were used to model various system response times and to time operator actions. Although these codes may model operator response times, I think they only model the time available for operator actions to be taken, not the time required for an operator to perform the required action. The staff would like AREVA to provide input on the assumption made.	Operator License and Human Performance	J. Kellum	The times listed in Tables 4-8 and 4-9 represent times available for performance of the action. In some cases, these times include margin. Tables 4-8 and 4-9 will be revised to include footnotes providing information on margin to analytical limits and source of event times in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.
9	II.4	There is no rationale, bases, or assumption provided describing how the operator action times were determined except for statements such as, “operators are trained to place the SBO diesel generator in service within 10 minutes.” Although five operators were assumed to be in the main control room (MCR) for evaluating the total heat input to the MCR following an ELAP event to determine the minimum performance requirements for a portable cooler (air conditioner) for the MCR, there is no statement of whether this complement of operators is available for other conditions requiring operator action. There is no data reported to verify that operator actions can be completed in the time allowed. While most actions identified appear to have several minutes to days available for operator actions to be taken, without a clear definition of how many operators are assumed available, these times are questionable. For example, one critical action cited in Table 4-8 (page 4-90) is for operators to open five SB doors within 30 minutes of the initiation of the ELAP event to limit temperatures in the switchgear room.	Operator License and Human Performance	J. Kellum	It is the COL applicant's responsibility to ensure adequate staffing is available to perform the required operator actions within the specified times. COL responsibility for adequate staffing is listed in FSAR Table 1.8-2, COL Items 13.3-2 & 18.5-1. COL Item 13.3-2: A COL applicant that references the U.S. EPR design certification will address the Requested Information in Fukushima Recommendation 9.3 regarding Emergency Preparedness Communications and Staffing as outlined in Enclosure 5 of the request for additional information pursuant to the 10 CFR 50.54(f) letter dated March 12, 2012 (ML12053A340). COL Item 18.5-1: A COL applicant that references the U.S. EPR design will confirm that actual staffing levels and qualifications of plant personnel specified in Section 13.1 of the COL application remain bounded by regulatory requirements and results of the staffing and qualifications analysis.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
		Although the doors are "in the same area of the building," the rationale provided for the action to be taken successfully is that, "operators are trained to open these doors within the required time." Without knowing how many operators are available (or if these doors are opened by auxiliary operators), where the location of the SB is in relation to the MCR etc.; the staff feels it is inconclusive that these actions can be successfully and reliably accomplished.				
10	II.4	The staff believes a sufficient basis is lacking from Technical Report ANP-10329 in order for the staff to be confident that operators can accomplish critical actions (especially those with completion times in minutes). The staff suggests AREVA look at NRC guidance on Crediting Manual Operator Actions in Diversity and Defense-in-Depth (D3) Analyses (SRP Chapter 18, Appendix 18-A) for current guidance on criteria determining operator action times or American National Standards Institute (ANSI)/ANS 58.8 (which is a basis document for the Appendix).	Operator License and Human Performance	J. Kellum	It is the COL applicant's responsibility to ensure adequate staffing is available to perform the required operator actions within the specified times. COL responsibility for adequate staffing is listed in FSAR Table 1.8-2, COL Items 13.3-2 & 18.5-1. COL Item 13.3-2: A COL applicant that references the U.S. EPR design certification will address the Requested Information in Fukushima Recommendation 9.3 regarding Emergency Preparedness Communications and Staffing as outlined in Enclosure 5 of the request for additional information pursuant to the 10 CFR 50.54(f) letter dated March 12, 2012 (ML12053A340). COL Item 18.5-1: A COL applicant that references the U.S. EPR design will confirm that actual staffing levels and qualifications of plant personnel specified in Section 13.1 of the COL application remain bounded by regulatory requirements and results of the staffing and qualifications analysis.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
11	III.1	A paragraph entitled "Fire Protection Storage Tanks and Buildings" is included under U.S. EPR FSAR Section 3.7.2.8, "Interaction of Non-Seismic Category I Structures with Seismic Category I Structures." The applicant classified the fire protection storage tanks and buildings as Conventional Seismic (CS) which is neither Seismic Category I (SC-I) nor Seismic Category II (SC-II). In addition, the fire protection structures and tanks are not located adjacent to any Category I SSCs. Therefore, the information provided in this paragraph does not belong to this section which only addresses interaction effects of non-Category I structures with Category I SSCs. Furthermore, acceptance criteria in Standard Review Plan (SRP) Section 3.7.2.8 cannot be used to determine acceptability of this information. Therefore, the staff believes this paragraph should not be included in this FSAR section (but possibly in Chapter 19 for beyond design-basis events or Chapter 9 for fire protection systems).	Structural Engineering	S. Park	AREVA agrees with the comment. The discussion of this topic will be moved from FSAR section 3.7.2.8 to FSAR Section 9.5.1.2.	AREVA will revise licensing submittal.
12	III.2	In Technical Report, ANP-10329, Table 4-2 indicates, in the top row, that American Society of Civil Engineers (ASCE) 7-10 will be used for the design of SC-II and Conventional Seismic structures. The staff views that SC-II structures should be designed to standards applicable to SC-I structures and ASCE 7-10 does not qualify for the design of neither SC-I structures nor SC-II structures.	Structural Engineering	S. Park	Table 4-2 in the Technical Report has been corrected. Seismic Cat. II Structures are not used in the mitigation strategy. Conventional Seismic structures are designed for the SSE using ASCE 43-05 or AWWA D100-2005.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
13	III.3	AREVA intends to design the fire protection storage tanks and buildings to ASCE 7-10. Although these structures are not classified as safety-related, the staff feels they still should be designed to provide system pressure integrity under safe shutdown earthquake (SSE) loading conditions and the staff will evaluate the adequacy of the seismic design of these structures on a case-by- case basis.	Structural Engineering	S. Park	The Fire Protection Building is designed for the SSE as required by R.G. 1.189 using a limiting acceptance condition per ASCE 43-05. The Fire Water Storage Tanks are designed for the SSE using AWWA D100-2005. Design for the SSE is consistent with the FLEX guidance. Equipment that is credited for Fukushima event mitigation is either Seismic Category I, or is non-safety related equipment that is installed in Seismic Category I or Conventional Seismic structures designed for the SSE. To provide adequate functionality following a SSE, the following supplemental seismic requirements are imposed: - ANSI/ASME B31.1 for valves and piping - ASCE 43-05 for other SSCs. The description of seismic design requirements in the Technical Report will be revised in Revision 1.	AREVA will revise licensing submittal.
14	IV.1	Technical Report ANP-10329, Section 4.1.3.9, "DC Load Shedding," included discussion of analytical methods, key assumptions, and results. The staff needs to review the DC load shedding analysis used for determining that the EUPS battery discharge duration can be extended to eight hours and 30 minutes for Flex Phase 1. AREVA would need to make available to the staff the DC load shedding analysis that supports each load steps based on the actual expected operating time, and its cell voltages. **This item has been identified by the staff for audit; and tentatively proposed for July/August 2013.**	Electrical Engineering	P. Kang	Audit was performed in July 2013.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
15	IV.2	Technical Report ANP-10329, Section 4.1.5.1, "AC and DC Power," indicated that prior to depletion of all the batteries, Divisions 1 and 2 are recharged from a prestaged, permanently installed dedicated diesel generator using the Division1 and 2 battery chargers. The report referred to the diesel generator as ELAP diesel generator. The diesel generator is sized with a minimum load capability of 650 kW. In order to ensure the diesel generator has adequate capacity, AREVA should provide all the electrical loads that will be connected and identify any additional modifications required for the onsite electrical distribution systems to accommodate the ELAP diesel generator.	Electrical Engineering	P. Kang	Revision 1 of the Technical Report will revise Section 4.1.5.1, "AC and DC Power," to describe ELAP DG loads and modifications to accommodate the ELAP DG. ELAP DG loads are: - EUPS Battery Chargers - Primary Cooling Injection Pump - Battery Room Exhaust Fans - Fire water to EFW MOVs - SB 1 & 2 Supply & Exhaust fans - MCR Recirc Fans - MCR Portable Spot Cooler Portable generators can also be used to power these loads due to the provision of transfer switches in the ELAP DG output feeds. A calculation has been performed to demonstrate that the ELAP and portable generators provide sufficient power to operate the required loads. Figure 4-14 in the Technical Report provides a diagram of the ELAP DG interface with the onsite electrical distribution system.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
16	V.1	On page 4-34 of Technical Report ANP-10329, the staff would like AREVA to explain the extent in which AREVA intends to use the code ASCE 43-05. The staff understands this code is not currently endorsed by the NRC.	Engineering Mechanics	Y. Law	In previous public meetings, AREVA has stated that there was precedence for reliance on ASCE 43-05 for the Fire Protection System. FSAR Table 3.2.2.1 states where ASCE 43-05 is used. The Fire Protection Building is designed for the SSE as required by R.G. 1.189 using a limiting acceptance condition per ASCE 43-05. The Fire Water Storage Tanks are designed for the SSE using AWWA D100-2005. Design for the SSE is consistent with the FLEX guidance. Equipment that is credited for Fukushima event mitigation is either Seismic Category I, or is non-safety related equipment that is installed in Seismic Category I or Conventional Seismic structures designed for the SSE. To provide adequate functionality following a SSE, the following supplemental seismic requirements are imposed: - ANSI/ASME B31.1 for valves and piping - ASCE 43-05 for other SSCs. The description of seismic design requirements in the Technical Report will be revised in Revision 1.	AREVA will revise licensing submittal.
17	V.2	On page 4-112 of Technical Report ANP-10329, in Section 4.2.3.2, AREVA stated that the spent fuel pool spray (SFPS) system provides a spray cooling function and an alternate fill pipe for makeup to the spent fuel pool (SFP). AREVA further stated that the SFPS system is classified as Supplemental grade (NS-AQ) and SC-II. According to Regulatory Guide (RG) 1.29, SC-II SSCs are those of which continued function is not required but of which failure could reduce the functioning of any SC-I plant features during an SSE. The staff would like AREVA to explain its reasoning for classifying the SFPS system as a SC-II system instead of a SC-I system.	Engineering Mechanics	Y. Law	The spent fuel pool spray (SFPS) does not perform any safety related function and therefore is not required to be classified SC-1. Functionality during the event is assured by designing SSCs to ASCE 43-05 and B31.1. Refer to Reasonable Protection standards in Section 4.1.4 (to be further clarified in Rev. 1)	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
18	V.3	Advanced response to RAI 563, pages 37-40 of 212 – A review of the added piping and components in the markup to Table 3.2.2-1 indicated that these added piping and components belong to the Medium Head Safety Injection System, which according to Revision 4 of the U.S. EPR FSAR, all associated piping and components related to this system are classified as either quality group (QG) A or B. Please explain why some of these added piping and components are classified as QG D?	Engineering Mechanics	Y. Law	The quality group D piping and components do not perform any safety related functions and are isolated from the MHSI system whenever MHSI is required to be operable.	No further action.
19	V.4	Advanced response to RAI 563, Page 41 of 212 (30LAR55AA002 and 30LAR55AA005) – What is the location of these two isolation valves and the difference in QG classification?	Engineering Mechanics	Y. Law	Both valves are located in SB1. 30LAR55AA002 is downstream of the class break and 30LAR55AA005 is upstream of the class break. Refer to FSAR figure 10.4.9-1 sheet 1 of 3. 30LAR55AA002 is specified as QG C to provide a safety-related isolation between the EFW system and the non-safety related piping from the Fire Pump discharge header.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
20	V.5	Advanced response to RAI 563, Page 48 of 212 – The staff would like AREVA to explain the change in classification from SC-II to SC CS and the 10 CFR 50 treatment for the Fire Water Distribution System, Conventional Area (SSE Protection).	Engineering Mechanics	Y. Law	The Fire Protection Building is designed for the SSE as required by R.G. 1.189 using a limiting acceptance condition per ASCE 43-05. The Fire Water Storage Tanks are designed for the SSE using AWWA D100-2005. Design for the SSE is consistent with the FLEX guidance. Equipment that is credited for Fukushima event mitigation is either Seismic Category I, or is non-safety related equipment that is installed in Seismic Category I or Conventional Seismic structures designed for the SSE. To provide adequate functionality following a SSE, the following supplemental seismic requirements are imposed: - ANSI/ASME B31.1 for valves and piping - ASCE 43-05 for other SSCs. The description of seismic design requirements in the Technical Report will be revised in Revision 1.	AREVA will revise licensing submittal.
21	VI.1	Technical Report ANP-10329, Section 4.1.3.1 – Given Mode 5 operation with the loops filled, how has containment closure been incorporated into the analysis? Containment closure is not required in Mode 5 with the loops filled, and therefore, can be opened via the equipment hatch. Has the AC and DC power analysis accounted for closing the equipment hatch and other containment penetrations?	PRA/Severe Accidents	M. Pohida H. Phan	The equipment hatch can be manually closed in 91 minutes using six workers. See also NEI white paper on shutdown states regarding availability of extra people during outages. NEI 12-06, Section 3.2.1.11 provides an assumption that those containment isolation actions delineated in the current station blackout coping capabilities are sufficient for ELAP. The load shedding analysis did consider the power required to close containment isolation valves, consistent with the current station blackout analysis.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
22	VI.2	Technical Report ANP-10329, Section 4.1.3.1 – Given Modes 4 and 5, the accumulators are not required to be operable, and therefore, could be unavailable due to maintenance. For the ELAP RELAP analyses for Modes 4 and 5, do the fuel centerline temperatures remain well below 2200 °F without the accumulators?	PRA/Severe Accidents	M. Pohida H. Phan	Administrative controls to ensure availability of adequate fuel cooling in Modes 5 and 6 will be provided by the COL applicant. Control of maintenance risk is required by 10CFR 50.65 and temporary alternate means are permissible, provided they meet requirements. This is consistent with the NEI Position Paper: Shutdown/ Refueling Modes (ADAMS) Accession No. ML13273A514 as endorsed by the NRC Staff (ADAMS) Accession No. ML13267A382).	No further action.
23	VI.3	Technical Report ANP-10329, Section 4.1.3.1 – Given Mode 5 operation, the reported results do not seem to characterize Mode 5 operation. Given an SBO, with the loops filled in Mode 5, the RCS would need to repressurize (versus depressurize in Mode 1) until core cooling using the SGs becomes sufficient to remove decay heat. The RCS pressure response would seem to be based on initial RCS level (e.g., flange versus nominal level in the pressurizer) and decay heat. The staff would like AREVA to provide separate RELAP analyses for Mode 5 operation with the loops filled.	PRA/Severe Accidents	M. Pohida H. Phan	RCS level will be nominal pressurizer level when in Mode 5 with loops filled. Heating up from Mode 5 to Mode 4 places the plant into a mode analyzed in the previous Modes 1-4 cases, but with lower decay heat, lower RCS leakage due to unchallenged RCP seals, and lower stored heat in RCS components. The previously performed Modes 1-4 cases therefore bound the case in which the plant heats up from Mode 5 to Mode 4, and further RELAP analyses are not necessary.	No further action.
24	VI.4	Technical Report ANP-10329, Section 4.1.3.2 – The analysis assumes the RCS is adequately vented to remove decay heat via removal of the reactor vessel head. What if the RCS is vented but not sufficiently to remove decay heat? Has the AC and DC power analysis accounted for opening of additional pressurizer safety relief valves?	PRA/Severe Accidents	M. Pohida H. Phan	AREVA is performing analyses and increasing the discharge pressure of the Primary Coolant Injection Pump to provide a strategy for core cooling during this operating condition. This strategy will be described in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
25	VI.5	Technical Report ANP-10329, Section 4.1.3.2 – The analysis accounts for the accumulator volume although the accumulators are not required to be operable in Modes 4, 5, and 6. For the ELAP RELAP analyses in Mode 5 with the loops not filled and Mode 6, do the fuel centerline temperatures remain well below 2200 °F without the accumulators?	PRA/Severe Accidents	M. Pohida H. Phan	Administrative controls to ensure availability of adequate fuel cooling in Modes 5 and 6 will be provided by the COL applicant. Control of maintenance risk is required by 10CFR 50.65 and temporary alternate means are permissible, provided they meet requirements. This is consistent with the NEI Position Paper: Shutdown/ Refueling Modes (ADAMS) Accession No. ML13273A514 as endorsed by the NRC Staff (ADAMS) Accession No. ML13267A382). See also Comment # 22.	No further action.
26	VI.6	Technical Report ANP-10329, Section 4.1.3.2 – The analysis accounts for accumulator volume although the accumulators are not required to be operable in Modes 4, 5 and 6. Given this ELAP event initiates in Mode 5 or Mode 6, how is the discharge of nitrogen into the RCS prevented if the accumulators were to discharge into the RCS?	PRA/Severe Accidents	M. Pohida H. Phan	For events initiated in Mode 5 with loops filled, sufficient time exists to place portable RCS makeup pump in service and isolate accumulators before nitrogen injection. The time available for placing makeup in service is greater than the 24 hours available for events initiated in Modes 1-4 because RCP seals are not thermally challenged, RCS pressure is low, and lack of cooldown contraction result in minimal RCS leakage. Nitrogen injection is not a problem in Mode 5 drained down and Mode 6 because SGs are not used for core cooling.	No further action.
27	VI.7	AREVA should identify the impact of U.S. FSAR, Section 17.4 design-reliability assurance program (D-RAP) scope.	PRA/Severe Accidents	M. Pohida H. Phan	Design changes associated with ELAP mitigation strategies will be evaluated using the PRA maintenance and upgrade strategy described in Sections 19.1.2.4 and 19.1.2.4.1 of the FSAR. Conforming changes to the Section 17.4 D-RAP list will be made, as appropriate.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
28	VII.1	The descriptions of the cases described in Technical Report ANP-10329, Section 4.1.3.1 are confusing; it sounds like SG depressurization cools the core directly. The staff understands that the SG secondary side has no direct pressure communication with the core flow and has no direct surface contact with the core. The primary coolant cools the core via natural circulation. The staff would like AREVA to properly describe the core cooling method to include primary side natural circulation and secondary side cooling for all the applicable cases. Primary and secondary feed and bleed process descriptions may be added into Section 4.1.1, "Overview."	Nuclear Performance / Code Review	G. Thomas	The Technical Report will be revised in Rev. 1 to properly describe the primary to secondary heat transfer and primary natural circulation processes underlying the described mitigation strategies.	AREVA will revise licensing submittal.
29	VII.2	Technical Report ANP-10329, Table 4-1 "Mitigation Strategy Acceptance Criteria," – The acceptance criteria given for core cooling is "Fuel in core remains covered - no fuel damage." The staff feels a more clearly quantitative acceptance criteria may be required. The staff would like AREVA to specify the quantitative criteria to assure adequate core cooling. On Technical Report ANP-10329, page 4-8, it states that there is no fuel damage and peak cladding temperature (PCT) remains below 2200 °F. The staff would like AREVA to specify the calculated PCT for the limiting case. AREVA should also state if the Case 4 results presented in Figures 4-1 through 4-9 for the limiting case. The staff would like AREVA to provide the plots for PCT Vs time for the limiting case.	Nuclear Performance / Code Review	G. Thomas	NEI 12-06 Section 3.2.1.1 states "For a PWR, an additional requirement is to keep the fuel in the reactor covered." This is a much more conservative acceptance criteria than 2200 F PCT. Since core uncovery did not occur in the RELAP cases supporting the selected mitigation strategy, clad temperature limits were not challenged. PCTs are not excessive. A plot of highest PCT temperatures was obtained from the calculation data file, but is not documented calculation. Highest PCT observed in Case 4 was about 681°F	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
30	VII.3	On page 4-4 of Technical Report ANP-10329, it states "Because the ELAP scenario is characterized by slow, but continuous reactor coolant system (RCS) inventory leakage through the reactor coolant pump (RCP) seals and core cooling occurs via natural circulation in Modes 1 through 5, the S-RELAP small break loss of coolant analysis (SBLOCA) methodology was chosen to perform this analysis." The staff would like to conduct an audit to assure that the S-RELAP model changes to simulate ELAP conditions are correct. The staff would also like AREVA to submit its RELAP input deck for the most limiting case. The staff plans to perform confirmatory calculations and additional RAIs are expected in this area. **This item has been identified by the staff for audit; and tentatively proposed for July 2013.**	Nuclear Performance / Code Review	G. Thomas	NRC sent draft audit plan. No additional response required.	AREVA will support the NRC audit.
31	VII.4	On page 4-4 of Technical Report ANP-10329, it states "The S-RELAP5 SBLOCA model was used with the following best-estimate (or conservative) assumptions." The staff would like AREVA to clarify the use of "best estimate" or "conservative," with respect to its assumptions.	Nuclear Performance / Code Review	G. Thomas	Revision 1 of the Technical Report will clarify which assumptions are best estimate and which are conservative.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
32	VII.5	On page 4-4 of Technical Report ANP-10329, it states “No equipment out of service” but during ELAP many equipment will be out of service. Does AREVA assume the availability of all equipment used for ELAP for Phases 1, 2, and 3? The staff would like AREVA to provide additional clarification.	Nuclear Performance / Code Review	G. Thomas	The statement "No equipment out of service" refers to the initial conditions assumed prior to event initiation, not to conditions after event initiation. NEI 12-06, Section 3.2.1.3, "Initial Conditions," item 3) states "Cooling and makeup water inventories contained in systems or structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles are available." Item 5) states, "Fuel for FLEX equipment stored in structures with designs which are robust with respect to seismic events, floods and high winds and associated missiles, remains available." AREVA assumes the availability of all equipment used for ELAP for Phases 1, 2, and 3 that is located in reasonably protected structures, consistent with the NEI 12-06 guidance.	No further action.
33	VII.6	On page 4-6 of Technical Report ANP-10329, the discussions for Cases 1, 2, and 3 should be expanded for the staff to fully understand the scenario and the results. AREVA should also confirm whether S-RELAP5 Cases 1 and 2 were analyzed for all four SGs or only two SGs.	Nuclear Performance / Code Review	G. Thomas	S-RELAP5 cases 1, 2, and 3 were exploratory in nature, and descriptions of these cases were provided for information only; as they do not form the basis for any FLEX mitigation strategies. S-RELAP5 case 4 was selected as the basis for the FLEX primary to secondary heat transfer mitigation strategies in Modes 1-4, and in Mode 5 with the loops filled and SGs available.	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
34	VII.6.a	On page 4-6 – Specify the SG dry out time for Case 3.	Nuclear Performance / Code Review	G. Thomas	S-RELAP5 cases 1, 2, and 3 were exploratory in nature, and descriptions of these cases were provided for information only as they do not form the basis for any FLEX mitigation strategies. S-RELAP5 case 4 was selected as the basis for the FLEX primary to secondary heat transfer mitigation strategies in Modes 1-4, and in Mode 5 with the loops filled and SGs available. In case 3, SG3 dries out at 4370 sec and SGs 1,2,4 dry out at 4740 sec.	No further action.
35	VII.6.b	On page 4-7 – Specify the accumulator injection flow at 8970 seconds for Case 4.	Nuclear Performance / Code Review	G. Thomas	This should be resolved during the S-RELAP5 audit. Calculation includes a plot of accumulator levels over time from which this information can be obtained. At approximately 8970 seconds, the RCS pressure decreases below the accumulator pressure. Accumulator flows begin to slowly enter the cold legs to help maintain RCS inventory and reduce the rate of RCS depressurization.	AREVA will support the NRC audit.
36	VII.7	On page 4-16 of Technical Report ANP-10329, it states "The boil off rate is based on the American Nuclear Society (ANS) 1973 decay heat standard with 20% uncertainty." AREVA should provide clarification for the use of ANS-1973 instead of ANS-1979.	Nuclear Performance / Code Review	G. Thomas	The use of ANS-1973 decay heat standard with 20% uncertainty is consistent with Appendix K LOCA applications. It results in a higher decay heat than ANS-1979, increasing the steaming rate, and is therefore more conservative for boron precipitation analyses.	No further action.
37	VII.8	On page 4-16 of Technical Report ANP-10329, it states the time to boil was estimated using the following formula: Time to Saturation = (Cp) (Tsat - Tinitial)/(Q) The staff would like AREVA to provide clarification about the use of this formula without mass flow rate.	Nuclear Performance / Code Review	G. Thomas	Cp used in this equation is total heat capacity of the system in BTU/degF. Water and metal volumes were used in developing the value of this term. This is not the constant-pressure specific heat (Cp) used for instance in Qdot = Mdot Cp DeltaT. Time to boil will be determined by S-RELAP5 analyses.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
38	VII.9	In Technical Report ANP-10329, Section 4.1.5.2.1.1, "RCS Makeup," it states that "…accumulator injection began at approximately two and half hours into the event and continued until approximately 24 hours without exhausting the accumulator inventory." The staff would like AREVA to specify the analysis case provided in Section 4.1.3.1 which is applicable to this conclusion.	Nuclear Performance / Code Review	G. Thomas	S-RELAP5 Case 4 is the basis for all of the mitigation strategies for Modes 1-4 described in the Technical Report.	No further action.
39	VII.10	In Technical Report ANP-10329, Section 4.1.3.1, Mode 5 is cold shutdown and the initial condition for Mode 5 is less than RCS temperature of 200 °F; hence, may not be combined with other modes where the temperature is above 200 °F. Mode 4 can be combined with Mode 5, refueling condition where the temperature is less than 200 °F a. In Section 4.1.3.2, under "Key Assumptions" it states "The initial conditions span the conditions of Modes 5 and 6; an RCS pressure between 14.7 psia and 370 psia, and an RCS temperature ≤ 200 °F." Mode 5 is included in 4.1.3.2; therefore, why is Mode 5 also included in Section 4.1.3.1? AREVA should separate Mode 5 from the discussion in Section 4.1.3.1. b. In Section 4.1.3.2, under "Key Assumptions," since the Mode 5 condition is included in this section AREVA should change the title to include Mode 5.	Nuclear Performance / Code Review	G. Thomas	Section 4.1.3.1 describes S-RELAP5 analyses that were performed to evaluate core cooling using primary to secondary heat transfer. Primary to secondary heat transfer will be used whenever SGs are available. In Mode 5, if SGs are available, the RCS will be allowed to heat up into Mode 4 to allow steaming of the SGs. Therefore, Section 4.1.3.1 is applicable to events initiated in Mode 5 with SGs available. a. Primary feed and bleed cooling will be used for core heat removal whenever SGs are not available. Additional S-RELAP5 analyses are being performed to evaluate primary feed and bleed cooling in Mode 5 with SGs not available. A description of these analyses will be included in Revision 1 of the Technical Report in a separate section. b. As stated above, primary feed and bleed cooling will be described in a separate section in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
40	VII.11	On page 4-17 of Technical Report ANP-10329, Section 4.1.3.2, under "Results," it states "the estimated time to boil at 16.67 hours after shutdown with an initial temperature of 140 °F was 3.4 minutes (3 minutes and 24 seconds)." The staff would like AREVA to provide the maximum length of time the operator does not need to take any action.	Nuclear Performance / Code Review	G. Thomas	Additional S-RELAP5 analysis has been performed to better characterize event progression in Mode 6 with the head removed. This analysis included quantification of inventory losses due to liquid swell above the vessel flange. At 41.67 hours after shutdown (conservative estimate of the earliest time the RV head could be removed), time to boil was 3.6 minutes and time to core uncovery was 81 minutes. Therefore, operator action to restore adequate RCS makeup is required prior to 81 minutes after initiation of the event. A description of this analysis and results will be included in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.
41	VII.12	In Technical Report ANP-10329, Section 4.1.3.3, "RCP Seal Leakage," it states "For long-term ELAP event mitigation (i.e., beyond 24 hours), additional loss of RCP seal cooling tests are required for the standstill seal and the lower three RCP shaft seal stages." The staff would like AREVA to specify the schedule for the planned tests and submittal of the test report.	Nuclear Performance / Code Review	G. Thomas	The commitment to perform additional loss of RCP seal cooling tests for ELAP will be included as a new ITAAC.	AREVA will revise licensing submittal.
42	VII.13	On Page 4-49 of Technical Report ANP-10329, the letdown line isolation valve (30KBA10AA001) and pressurizer continuous degasification isolation valves (30JEF10AA503 and 30JEF10AA504) are mentioned. The staff would like AREVA to add the respective FSAR figures to locate these valves.	Nuclear Performance / Code Review	G. Thomas	The pressurizer continuous degasification isolation valves (30JEF10AA503 and 30JEF10AA504) are shown on FSAR Figure 5.1-4 Sheet 3 of 7). The letdown line isolation valve (30KBA10AA001) is shown on FSAR Figure 9.3.4-1 Sheet 1 of 9). Reference to these figures will be added in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.

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43	VII.14	In Technical Report ANP-10329, Table 4-4, "FLEX Capability – Core Cooling Summary – Mode 6," the staff would like to know the following information: a. Specify the core cooling in Mode 6 with one or more reactor vessel closure bolts less than fully tensioned. b. Specify the RCS vent path for this condition.	Nuclear Performance / Code Review	G. Thomas	AREVA is performing analyses and increasing the discharge pressure of the Primary Coolant Injection Pump to provide a strategy for core cooling during this operating condition. The RCS vent path selected for these analyses is one PDS flowpath open. This strategy will be described in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.
44	VIII.1.a	On page 4-6 of Technical Report ANP-10329, fourth paragraph, it states "…a controlled [steam generator] SG depressurization of 180 °F /hr..." The staff would like AREVA to clarify the following and revise the report, as necessary. a. How do operators control the depressurization, using manual or automatic control, valves or pumps? If it is automatic, what is the power supply source, direct current (DC) batteries or extended loss of alternate current (AC) power (ELAP) diesel generator? How is the feed flow controlled?	BOP / TS	C. Li	No automatic functions because I&C cabinets will be load shed. Nine SAS cabinets in Divisions 1 and 4, six safety automation system (SAS) cabinets in Divisions 2 and 3, and one SICS remote shutdown station (RSS) workstation cabinet in Divisions 1 and 4 are de-energized locally by opening isolation devices at the cabinets. MSRCVs & MSRIVs will have to be manually controlled from MCR, consistent with the current version of the Technical Report in mitigation strategies. The description of MSRT operation in section 4.1.5.2.2.2 of the Technical Report will be revised in Rev. 1 to clarify that the MSRTs are operated manually from the MCR and that automatic functions are not available.	AREVA will revise licensing submittal.
45	VIII.1.b	The rate of 180 °F /hr is a cooling rate. However, AREVA repeatedly used the term depressurization for cooling. The staff would like AREVA to clarify the term "depressurization."	BOP / TS	C. Li	The SGs will be depressurized at a rate that results in an RCS cooldown rate of 180 °F /hr.	No further action.
46	VIII.1.c	The staff would like AREVA to clarify the "cooling rate of 180 °F /hr". Does this cooling rate refer to SG cooling or core cooling?	BOP / TS	C. Li	The SGs will be depressurized at a rate that results in an RCS cooldown rate of 180 °F /hr.	No further action.

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47	VIII.1.d	For each case described in Technical Report ANP-10329, Section 4.1.3.1, "Core Cooling in Modes 1 through 5 - Secondary Side Feed and Bleed," that requires fire water for SG feed and bleed, how does AREVA plan to demonstrate that the water in the fire water storage tanks is sufficient to support feed and bleed for the duration of Phase 1 and Phase 2?	BOP / TS	C. Li	The water in one Fire Storage Tank is sufficient to support primary to secondary heat transfer for 17 hours. Therefore, the Fire Storage Tank will require replenishment during Phase 2. FSAR Table 19.2-6 includes the following COL responsibility: "The COL applicant shall provide a means of fire water storage tank replenishment or alternate feed supply that is capable of being placed in service within 17 hours for events initiated in Modes 1 through 5."	No further action.
48	VIII.2	The descriptions of the five cases described in Section 4.1.3.1 are confusing; it sounds like SG depressurization cools the core directly. The staff understands that the SG secondary side has no direct pressure communication with the core flow and has no direct surface contact with the core. The primary coolant cools the core via natural circulation. The staff would like AREVA to clarify and describe the core cooling method to include primary side natural circulation and secondary side cooling for all applicable cases.	BOP / TS	C. Li	Revision 1 of the Technical Report will clarify the description of the cooling mechanisms to specify that primary to secondary heat transfer is utilized, with heat transported from the core to the SGs via natural circulation.	AREVA will revise licensing submittal.
49	VIII.3	For the SG feed and bleed, where does the bleed flow discharge to? If the flow discharges to the atmosphere, AREVA should state so in the report. If not, identify the buildings that the bleed mass and energy discharge to. AREVA should provide the mass and energy releases from the SG to the buildings and provide the consequence analyses (elevated pressure and temperature, and internal flooding) of the discharged mass and energy releases. AREVA should also list all the equipment in the affected areas that are needed for the mitigation strategies, and demonstrate the equipment being environmentally qualified (temperature and flooding).	BOP / TS	C. Li	During primary to secondary heat transfer, the MSRTs are used to steam the SGs to atmosphere. No equipment inside plant buildings is exposed to a steam environment during this process.	No further action.

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50	VIII.4	On March 12, 2012, the NRC issued Order EA-12-049, requiring a three-phase approach for mitigating beyond-design-basis external events. The initial phase requires the use of installed equipment and resources. AREVA should determine the duration of the initial phase for U.S. EPR and explain the bases for the determination. AREVA should also specify the power supplies and water sources being used for the initial phase. It is not clear to the staff whether ELAP diesel generator is credited for Phase 1.	BOP / TS	C. Li	Tables 4-8 and 4-9 of the Technical Report define the earliest times for Phase 2 use of portable equipment. Phase durations will be determined by the COL Applicant in accordance with the COL Item in FSAR Table 19.2-6 which states: "The COL applicant shall establish Phase 2 and 3 ELAP event mitigation strategies." The ELAP diesel generator is not credited for Phase 1 event mitigation.	No further action.
51	VIII.5.a	AREVA should determine the duration of Phase 2 for U.S. EPR, and explain the bases for the determination.	BOP / TS	C. Li	Tables 4-8 and 4-9 of the Technical Report define the earliest times for Phase 2 use of portable equipment. Phase durations will be determined by the COL Applicant in accordance with the COL Item in FSAR Table 19.2-6 which states: "The COL applicant shall establish Phase 2 and 3 ELAP event mitigation strategies."	No further action.
52	VIII.5.b	On page 4-51 of Technical Report ANP-10329, AREVA indicates that during Phase 2 the fire water storage tanks and diesel fuel storage tanks can be refilled. The staff would like to know what the sources are for the refill water and fuel. AREVA should also provide the amounts of water and fuel available for Phase 2?	BOP / TS	C. Li	FSAR Table 19.2-6 contains the following COL responsibility: "The COL applicant shall provide a means of fire water storage tank replenishment or alternate feed supply that is capable of being placed in service within 17 hours for events initiated in Modes 1 through 5." and "The COL applicant shall provide a means of tank replenishment that is capable of filling the diesel driven fire water pump fuel oil storage tank within 3.5 days for events initiated in Modes 1 through 5." Replenishment sources and quantities will be determined by the COL applicant during fulfillment of these responsibilities.	No further action.
53	VIII.5.c	How does AREVA plan to demonstrate that the power supplies, fuel supply, and water sources in the U.S. EPR design are sufficient for the	BOP / TS	C. Li	The Technical Report specifies performance requirements and interface connections for Phase 2 and Phase 3 equipment. Provision of	No further action.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
		duration of Phase 2?			adequate power supplies, fuel supplies, and water sources in Phase 2 is the COL applicant's responsibility. FSAR Table 19.2-6 includes COL items for Phase 2 requirements addressing portable generators, ELAP DG fuel supplies, fire water storage tank replenishment, and SFP makeup.	
54	VIII.6	On page 4-45 of Technical Report ANP-10329, AREVA indicates that SG level control valves and SG isolation valves are open to allow flow to the respective SG. These valves are maintained open during normal operation and fail as-is when power is lost to the valves as a result of DC load shedding. The staff would like AREVA to clarify how can the feed and bleed process be controlled when these valves fail as a result of DC load shedding?	BOP / TS	C. Li	EFW level control valves are load shed and fail as is (open). The EFW discharge cross tie valves are not load shed and are throttle valves. These valves will be used for feed control if necessary. This is already described in the TR.	No further action.
55	VIII.7	Phase 3 requires sufficient offsite resources to sustain those mitigation functions indefinitely. The combined license (COL) information item (see final safety analysis report (FSAR) Table 19.2-6) should require COL applicants to provide Phase 3 water and fuel supplies to last indefinitely.	BOP / TS	C. Li	Already covered by new COL Item 19.2-2 in FSAR Table 1.8-2. (Previously submitted on Page 35 of 212 of FSAR markups)	No further action.
56	VIII.8	How does AREVA plan to demonstrate that there are sufficient power supplies to support the mitigation strategies in Phase 1, 2, and 3?	BOP / TS	C. Li	Load shedding analysis was performed and is described in Section 4.1.3.9. Before the EUPS divisions are depleted at eight hours and 30 minutes, EUPS Divisions 1 and 2 are powered from the ELAP DG (or portable generators).	No further action.
57	VIII.8.a	AREVA should identify all the ELAP Phase 1 equipment that require the power supplies and demonstrate that the power supplies are available for the equipment.	BOP / TS	C. Li	Rev. 1 of the Technical Report will revise Section 4.1.5.1, "AC and DC Power," to describe ELAP DG loads and modifications to accommodate the ELAP DG. Figure 4-14 provides a diagram of the ELAP DG interface with the onsite electrical distribution system.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
58	VIII.8.b	AREVA should identify all the equipment that the ELAP diesel generator and portable generators will support in Phase 2 and Phase 3 mitigation strategies and demonstrate that there are sufficient power supplies to perform the mitigation strategies.	BOP / TS	C. Li	Rev. 1 of the Technical Report will revise Section 4.1.5.1, "AC and DC Power," to describe ELAP DG loads and modifications to accommodate the ELAP DG. ELAP DG loads are: - EUPS Battery Chargers - Primary Cooling Injection Pump - Battery Room Exhaust Fans - Fire water to EFW MOVs - SB 1 & 2 Supply & Exhaust fans - MCR Recirc Fans - MCR Portable Spot Cooler Portable generators can also be used to power these loads due to the provision of transfer switches in the ELAP DG output feeds. A calculation has been performed to demonstrate that the ELAP and portable generators provide sufficient power to operate the required loads. Figure 4-14 in the Technical Report provides a diagram of the ELAP DG interface with the onsite electrical distribution system.	AREVA will revise licensing submittal.
59	VIII.9.a	COL information items should be specified for the following site-specific information: AREVA should identify and characterize all the applicable site specific beyond-design-basis external events (BDBEEs) (e.g., earthquake, high winds, and external flooding, etc.) that are subject to the mitigation strategies. Identification should involve determining whether the type of hazard applies to the site. Characterization should focus on the likely nature of the challenge (e.g., station blackout (SBO) and loss of normal access to the ultimate heat sinks) in terms of timing, severity, and persistence. Nuclear Energy Institute (NEI) 12-06, Section 4.1, “Site- Specific Identification of Applicable Hazards,” provides acceptable guidance.	BOP / TS	C. Li	Add new COL item to Table 19.2-6 requiring the COL applicant to identify and characterize beyond design basis external hazards applicable to the plant site as described in NEI-12-06 Section 4.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
60	VIII.9.b	COL information items should be specified for the following site-specific information: AREVA should provide detailed procedures and training. NEI 12-06, Section 11.4, "Procedure Guidance" and Section 11.6, "Training" provides acceptable guidance.	BOP / TS	C. Li	COL Item will be added to Table 19.2-6 to require ELAP event procedures and training. Additionally, (see also COL Item 8.4-2 for SBO training)	AREVA will revise licensing submittal.
61	VIII.10	Based on the fire water flow rates applied in the analysis, the fire water storage tank would need to be replenished at around 17 hours following the start of the event. Is it reasonable to assume that the COL could be ready for water replenishment in 17 hours, giving that the normal water supply infrastructure might not be available following a BDBEE? How long will it take to continuously replenish the water? What is the amount of water needed for the replenishment? Is there a COL information item on the water supplies in addition to a required replenishment rate?	BOP / TS	C. Li	As stated in the COL Items listed in FSAR Table 19.2-6, the COL applicant shall provide a means of fire water storage tank replenishment or alternate feed supply that is capable of being placed in service within 17 hours for events initiated in Modes 1 through 5. Additionally, there is a COL Item that the COL applicant shall establish Phase 2 and 3 ELAP event mitigation strategies.	No further action.
62	VIII.11	In the primary feed and bleed (Mode 6), the bleed flow discharges to the containment that results in internal flooding in the containment. AREVA should list all equipment in the flooded areas that are needed for the mitigation strategies and demonstrate that the equipment is either above the flood level or qualified for submergence.	BOP / TS	C. Li	Primary feed and bleed cooling does not result in containment flooding, because the suction supply for the primary coolant injection pump is the IRWST, and the injected water that flows out of the vent path will return to the IRWST. Containment flooding could occur as a result of containment spray that utilizes a suction source other than the IRWST. Revision 1 of the Technical Report will require action to remove water from containment prior to level exceeding the bottom of the heavy floor at elevation -1.64'. The only required equipment that could be affected is the hot leg pressure sensors. These sensors will either be relocated to an elevation higher than -1.64' or will be protected from the effects of submergence.	AREVA will revise licensing submittal.

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63	VIII.12	Technical Report ANP-10329, Section 4.1.3.5, "Safeguard Building Heatup Analysis": a. The analysis should address the heat input to the safeguard building (SB). b. AREVA should justify the ambient temperature of 100 °F. The ambient atmosphere temperature could be significantly elevated above 100 °F as a result of the continuously discharged steam from the main steam relief trains (MSRT) in the feed and bleed process. c. AREVA should list all equipment that is needed for the mitigation strategies, and demonstrate that the equipment is qualified for the elevated temperature in the affected SB.	BOP / TS	C. Li	The NRC has indicated they may audit this calculation and an ERR draft audit plan has been submitted. a. The analysis inputs included SB heat inputs. Heat inputs are documented in 26-9051145-004. b. Steam is released through the MSRT tailpipes/silencer at a high elevation and will not significantly affect general area ambient temperatures. The selected ambient temperature of 100°F represents a best estimate 1% exceedance value. This is appropriate due to the beyond design basis nature of the ELAP event. c. All equipment used in the mitigation strategies will qualified for the required environmental factors and will be addressed in the RAI 623 response (performance requirements).	AREVA will support the NRC audit.
64	VIII.13	Technical Report ANP-10329, Section 4.1.3.8, "Spent Fuel Pool Time to Boil and Makeup Analysis" – The staff would like AREVA to provide the following information relating to Page 4-28. **This item has been identified by the staff for audit; and tentatively proposed for July/August 2013.** a. Define the initial conditions for this analysis including mass of the water in the pool, water level, and cross section area of the pool. b. Discuss the effects on the above initial conditions resulting from the non- seismic pipe connections that could break in a seismically induced ELAP event. c. What is the initial heat load in the pool in terms of heat units that should include heat load from recently discharged spent fuel and previously stored spent fuel? Provide justification for the above initial heat load. What is the heat load as a function of time?	BOP / TS	C. Li	The NRC has indicated they may audit this calculation and an ERR draft audit plan has been submitted. a. The mass of water in the SFP was calculated assuming normal SFP water level at elevation 62.3 feet and a cross sectional area of 1247.4 ft2. Total water mass was calculated to be 3.143 X 10^6 lbm. b. All piping capable of draining water from the SFP is seismically qualified Cat. 1 piping. c. Bounding refueling full core offload SFP heat load is 19.8 Mw (6.762×10^7 BTU/h) at 130 hours after trip. This value was calculated assuming a conservative number of rack spaces (1645) all containing fuel assemblies, and approximately 15% additional conservatisms in heat load determination. The SFP heat load is conservatively held constant at this value over time.	AREVA will support the NRC audit.

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65	IX.1	The TS ensures that the power needed by the spent fuel pool (SFP) instrument (it does not specify which instrument) and the makeup system is available. However, there are no TS requiring the availability of the SFP instruments and makeup system, this comment is also reflected on the TS Bases.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
66	IX.2	RAI 563 is related to NTTF Recommendation 4.2 (mitigation strategies); however, the proposed TS 3.8.11, "Distribution Systems – Spent Fuel Pool," does not support the mitigation strategies. TS 3.8.11 is related to NTTF Recommendation 7.3, which the staff has not requested any applicant to address. The TS Bases are not entirely relevant to TS 3.8.11. The U.S. EPR FSAR Chapters 6 and 15 accident scenarios do not credit the SFP makeup or the instrumentation. The U.S. EPR has safety-related SFP cooling system that is credited to maintain the fuel cooled. The TS Bases discussion should be revised to accurately reflect the basis of TS 3.8.11. Also, AREVA should revise the references section.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
67	IX.3	On page 204 of 212 of the advanced response to RAI 563, the associated TS Bases states that, "The AC, DC, and AC vital electrical power distribution systems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii)." However, the staff believes that Criterion 4 is the more likely applicable criterion to LCO 3.8.11.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
68	IX.4	On page 205 of 212 of the advanced response to RAI 563, the third paragraph under "Applicability," states, "The AC, DC, and AC vital electrical power distribution subsystems requirements for Modes 5 and 6 are covered in LCO 3.8.10. The staff believes this should also include during movement of irradiated fuel assemblies.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.

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69	IX.5	On pages 205-206 of 212 of the advanced response to RAI 563, the "Actions" description in the TS Bases should be revised to improve clarity.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
70	IX.6	On page 205 of 212 of the advanced response to RAI 563, in the "Actions" section under " A1 and A.2, " the TS Bases discussion makes reference to system availability in order to allow continuation of fuel movement; however, the applicability of this proposed TS was previously described as applicable when there are irradiated fuel assemblies in the SFP. The staff believes this is inconsistent and would like AREVA to clarify.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
71	IX.7	On page 205 of 212 of the advanced response to RAI 563, the TS Bases discusses the option for declaring affected features inoperable but no action is specified in TS 3.8.11. The staff would like AREVA to explain.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
72	IX.8	On page 205 of 212 of the advanced response to RAI 563, the discussion about completion time does not address A2, only A1.	BOP / TS/Fire Protection	H. Le R. Hernandez	A decision was made to delete the new Technical Specifications at the June 25, 2013 meeting with concurrence from the NRC.	AREVA will revise licensing submittal.
73		Section 4.1 was reviewed and found that the transport of decay heat is up to containment only through the conversion of reactor coolant system (RCS) inventory into the steam. No further strategy for containment heat removal is provided in the report. Note that the heat sinks and cold containment spray water may condense the steam to slow down the containment pressurization. The heat is still remained in the isolated containment if there is no means to remove the containment heat to outside. Without removing the heat out of the containment, the containment will be heated up to an unacceptable level if the extended loss	Containment and Ventilation	S. Peng	Analysis has been performed that demonstrates that sufficient time exists prior to reaching containment temperature and pressure limits to allow initiation of containment heat removal in Phase 2. Since initiation of containment heat removal in Phase 1 is not required to prevent exceeding limits, and is not desired to avoid increasing the task load on available staff, there is no strategy to use any installed equipment or resources in Phase 1 to remove containment heat.	No further action.

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		of alternating current (AC) power (ELAP) is extended. 1. Is there any strategy to use any installed equipment and resources (Phase 1) to remove the containment heat? The staff as not found any description in Technical Report ANP-10329 for such information.				
74		Section 4.1 was reviewed and found that the transport of decay heat is up to containment only through the conversion of reactor coolant system (RCS) inventory into the steam. No further strategy for containment heat removal is provided in the report. Note that the heat sinks and cold containment spray water may condense the steam to slow down the containment pressurization. The heat is still remained in the isolated containment if there is no means to remove the containment heat to outside. Without removing the heat out of the containment, the containment will be heated up to an unacceptable level if the extended loss of alternating current (AC) power (ELAP) is extended. 2. If the answer to Question 1 is "no," then will a strategy to remove the containment heat be developed by providing sufficient, portable, onsite equipment and consumables to sustain up to resources brought from offsite (Phase 2)?	Containment and Ventilation	S. Peng	A strategy for containment heat removal will be determined in the COL Item in FSAR Table 19.2-6 which states the COL applicant shall establish Phase 2 and 3 ELAP event mitigation strategies. In Rev. 1 of the Technical Report, AREVA will provide connection points for a portable pump to take suction from the IRWST and also provide performance requirements for containment heat removal.	AREVA will revise licensing submittal.

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75		Section 4.1 was reviewed and found that the transport of decay heat is up to containment only through the conversion of reactor coolant system (RCS) inventory into the steam. No further strategy for containment heat removal is provided in the report. Note that the heat sinks and cold containment spray water may condense the steam to slow down the containment pressurization. The heat is still remained in the isolated containment if there is no means to remove the containment heat to outside. Without removing the heat out of the containment, the containment will be heated up to an unacceptable level if the extended loss of alternating current (AC) power (ELAP) is extended. 3. For Phase 3, is there a strategy that will assure that sufficient offsite resources be provided to sustain Phase 1 and Phase 2 functions of containment heat removal indefinitely?	Containment and Ventilation	S. Peng	A strategy for containment heat removal will be determined in the COL Item in FSAR Table 19.2-6 which states the COL applicant shall establish Phase 2 and 3 ELAP event mitigation strategies. In Rev. 1 of the Technical Report, AREVA will provide connection points for a portable pump to take suction from the IRWST and also provide performance requirements for containment heat removal.	AREVA will revise licensing submittal.
76		To facilitate the evaluation on containment heat removal that whether the associated mitigation strategy developed for each phase is required or sufficient, an acceptance criterion for the containment heat up or temperature should be defined. Note that, for example, the containment isolation or temperature loading can challenge a heating up concrete containment.	Containment and Ventilation	S. Peng	AREVA has conservatively elected to utilize the Design Basis temperature limit of 309°F as the containment temperature acceptance criteria. Maintaining containment temperature within design basis limits precludes containment challenges due to concrete or component damage caused by to high temperature.	AREVA will revise licensing submittal.

Item #	Branch Item #	Comment	Branch	NRC Person	PROPOSED RESOLUTION	DISPOSITION
77		Section 4.1 was reviewed and found that the transport of decay heat is up to containment only through the conversion of reactor coolant system (RCS) inventory into the steam. No further strategy for containment heat removal is provided in the report. Note that the heat sinks and cold containment spray water may condense the steam to slow down the containment pressurization. The heat is still remained in the isolated containment if there is no means to remove the containment heat to outside. Without removing the heat out of the containment, the containment will be heated up to an unacceptable level if the extended loss of alternating current (AC) power (ELAP) is extended. 4. AREVA considers containment venting as a viable mitigation strategy. However, the justification of its use in terms of its conformance to General Design Criterion (GDC) 16 and design details, as to its impact on the other systems, structures, and components (SSCs) that are important to safety (e.g. emergency core cooling system (ECCS) and combustible gas control system (CGCS)), is not provided.	Containment and Ventilation	S. Peng	The option to vent containment for containment pressure control as an ELAP strategy will be removed in Revision 1 of the Technical Report.	AREVA will revise licensing submittal.