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AREVA

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Ms. Annette L. Vietti-Cook
Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTN: Rulemakings and Adjudications Staff.

SUBJECT: Docket ID NRC-2011-0299, Proposed Rule on Station Blackout

The NRC Advanced Notice of Proposed Rulemaking (ANPR) published in the Federal Register March 20, 2012, requested comments by May 4, 2012.

AREVA NP Inc. (AREVA NP), as applicant for Design Certification for the U.S. EPR™, appreciates the opportunity to provide comments on the proposed rulemaking. These comments have been developed in coordination with other members of the U.S. EPR™ Design Centered Working Group (DCWG). AREVA NP anticipates that other DCWG members will submit these comments under separate letter. Specific comments directed at the specific questions in the ANPR are included as an enclosure to this letter. AREVA NP also offers the following general comments related to the ANPR:

1. Station blackouts (SBOs) resulting from equipment and grid unreliability (the bases for the current SBO rule) and SBOs resulting from external hazards that exceed plant design bases (e.g., Fukushima) are different in terms of duration and viable mitigating approach and should be treated separately from a regulatory perspective.
2. For traditional SBOs, the current SBO rule contained in 10 CFR 50.63 has been effective at mitigating risk for these types of events. Accordingly, the current requirements in 10CFR50.63 should remain intact for traditional SBOs.
3. For the Fukushima types of hazard-driven SBOs, proposed regulatory action should reflect the following considerations:
   - The reference bounds for design of the new plants in General Design Criteria (GDC) 2 already incorporate the higher margins specified in Fukushima Near Term Task Force (NTTF) Recommendations 2.1 and 2.3. The very low likelihood of natural events that exceed the new plant reference bounds means that, for new plants, postulated equipment failures resulting in station blackout from natural events ('hazard driven' SBOs) are too unlikely to materially impact estimates of probable impact on public health and safety. This is particularly true for new plants with advanced features for mitigating severe accidents.
   - Regulatory requirements for hazard-driven SBOs, if imposed, should be performance-based, consistent with Commission direction in SECY-11-0124. Performance-based regulation, similar to the approach used for 10CFR50.54 (hh)(2), should focus on desired, measurable outcomes, rather than prescriptive processes, techniques, or procedures. Performance-based regulation leads to defined results without specific direction regarding how those results are to be obtained. The more prescriptive suggestions in the ANPR could mandate a limited set of solutions without consideration of the effectiveness of alternatives, future innovations, designs, or operating experience.

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- Regulatory requirements for hazard-driven SBOs, if imposed, should require a mechanistic (cause-effect) relationship between any plant condition that a plant is required to cope with and a corresponding postulated external hazard. New regulation should not require an arbitrary determination that a certain list or category of equipment will be lost (e.g., lose emergency diesel generators, lose alternate ac source, lose inverters) if the probability that an external hazard that can cause that loss is extremely remote. For example, assuming that safety-related SSCs housed in Category I structures fail due to a beyond design basis flood at a site such as Palo Verde is simply not credible.

4. Any new rulemaking for SBO should avoid policies that favor mitigating strategies over preventive strategies because this would potentially discourage incorporation of SBO preventive features in plant design or operations. In particular, if 10CFR50.63 were changed to require mitigating strategies that do not credit permanently installed alternate AC systems (e.g., SBO generators), such systems might not be included in future plants. In that case, the new rule could have a net adverse impact on overall safety and establish a regulatory preference for mitigation over prevention as a matter of policy.

5. If the Commission determines new requirements are needed for new nuclear power reactors, such requirements should be performance-based. That is, establish for new plants a regulatory construct similar to the one used in the final rule for consideration of aircraft impacts for new nuclear power reactors. By using a performance-based objective, new rulemaking for SBO should not require a designer to use a specific methodology, process, or approach (e.g., imposing an unjustified assumption that A/C systems fail during an event). The objective should be practical design features and functional capabilities to cope with external events that could result in SBO conditions if not prevented or mitigated. A vendor may determine a well-protected AC source is superior to other alternatives. For new plants, the Commission should present a performance-based objective for identifying practical design features and functional capabilities that reduce reliance on operator actions. The designer should be able to choose technically sound optimum solutions that meet performance requirements while minimizing manual operator actions.

If you have any questions related to these comments on the ANPR, please contact Mr. David K. White, Corporate Regulatory Affairs. He may be reached by telephone at 434-832-4027 or by e-mail at david.white@areva.com.

Sincerely,

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Comments on Station Blackout (SBO) ANPR

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A.	***Advance Notice of Proposed Rulemaking Purpose*** In its SRM on SECY–11–0124, the Commission directed the staff to initiate a rulemaking to address SBO by means of an ANPR. Accordingly, this ANPR's objective is to solicit external stakeholder input to support the staff's efforts to assemble a regulatory basis for a rule that amends SBO requirements. The Commission also encouraged the staff to craft recommendations that continue to realize the strengths of a performance-based system as a guiding principle. The Commission indicated that, to be effective, approaches should be flexible and able to accommodate a diverse range of circumstances and conditions. The Commission stated that for consideration of events beyond the design basis, a regulatory approach founded on performance-based requirements will foster development of the most effective and efficient site specific mitigation strategies, similar to how the agency approached the approval of licensee response strategies for the "loss of large area" event addressed in 10 CFR 50.54(hh)(2). The NRC is open to flexible, performance-based strategies to address SBO mitigation. The following questions are intended to solicit information that will support development of such a framework and assembly of a complete and adequate regulatory basis for any rule changes that are ultimately determined to be justified. In this context, commenters are encouraged to provide information on any aspect of SBO mitigation that would support this regulatory objective, whether in response to an ANPR question or not.	
B.	***Rulemaking Scope*** The NRC would like external stakeholders to respond to the following questions to support the NRC's efforts to define the scope of the regulatory framework.	
1.	Recognizing the uncertainties associated with natural phenomena and in the context of establishing a set of events upon which to base reference bounds for design, should SBO equipment be designed to withstand natural phenomena which the facility is not already designed to withstand, and should SBO mitigation strategies consider such natural phenomena? What severity of natural phenomena should be considered (e.g., length of return period or duration of the phenomena)? For example, flooding risks are of concern due to a "cliff-edge" effect, in that the safety consequences of a flooding event may increase sharply with only a small increase in the flooding level. Therefore, to address uncertainties for SBO events and to build in additional defense-in-depth margin to mitigate SBO for such events, should analysis of an SBO	**Comment:** Based on previous U.S. regulatory guidance for SBO (e.g., Regulatory Guide 1.155) and the Fukushima lessons learned, the onsite emergency ac power system may be unavailable for one of two reasons: (a) all onsite emergency ac sources fail due to a non-mechanistic, common cause failure (i.e., 10 CFR 50.63), or (b) all onsite emergency ac power is lost due to a mechanistic, GDC 2 failure (i.e., Fukushima). For "traditional" types of SBOs, the current SBO rule contained in 10 CFR 50.63 has been effective at mitigating the risk associated with a loss of offsite power and the common mode failure of the emergency diesel generators at a nuclear power plant. For the Fukushima types of hazard-driven SBOs, new plants have been designed and evaluated for pertinent external hazards that ensure an adequate level of protection. Specifically, this includes the following: • The adequacy of the plant design basis for GDC 2 protection is discussed

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	consider a flood elevation at some prescribed level above the level for which the plant is designed? If so, what criteria should be used to establish the prescribed level? What is the basis for your position?	in NTTF recommendation 2.1. NTTF recommendation 2.1 addresses issues of scope of external hazards, as well as magnitude of external hazards. For design-basis flooding and seismic analysis, the NTTF report appropriately concludes that for New Plants "all of the current COL and design certification applicants are addressing them adequately in the context of the updated state-of-the-art and regulatory guidance used by the staff in its reviews." • To address uncertainties in the magnitude of external hazards, beyond design basis external hazards considered in the current ASME/ANS PRA standard have also been evaluated for New Plants in accordance with Chapter 19 of NUREG-0800, Standard Review Plan. For New Plants, these probabilistic evaluations demonstrate low risk and significant safety margins for relevant beyond design basis external hazards. Based on these considerations, there is no significant safety benefit for New Plants to design SBO mitigation equipment to withstand natural phenomena which the facility is not already designed to withstand.
2.	If such an analysis (per the above question) is warranted, what margin in addition to that included in the reference bounds for design should be considered? For existing facilities, should such an analysis include factors such as the existence of nearby dams or water sources?	**Comment**: Based on the Comments to Question IV.B.1, such an analysis of this type is not warranted for New Plants.
3.	For events that do not fall within the reference bounds for design, but may result in SBO conditions, it may be necessary for licensees to take early action in order to increase the potential for successful mitigation. Recognizing that there are several actions that take time during such events that include, but are not limited to (1) the need to properly identify and diagnose the event or situation, (2) the need to make the decision to implement actions or strategies to mitigate existing or imminent SBO conditions, and (3) the time for licensees to implement the strategies once the decision is made; what time constraints do	**Comment**: Based on previous U.S. regulatory guidance for SBO (e.g., Regulatory Guide 1.155) and the Fukushima lessons learned, the onsite emergency ac power system may be unavailable for one of two reasons: (a) all onsite emergency ac sources fail due to a non-mechanistic, common cause failure (i.e., 10 CFR 50.63), or (b) all onsite emergency ac power is lost due to a mechanistic, GDC 2 failure (i.e., Fukushima). For "traditional" types of SBOs, the time constraints imposed in the current SBO rule contained in 10 CFR 50.63 and Regulatory Guide 1.155 have been effective at mitigating SBO risks, and should be maintained.

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	stakeholders understand to be important in developing SBO mitigation requirements? For example, what should be the coping time with no mitigation for SBO conditions given time constraints that include the time to (1) identify and determine the need to take mitigative actions and (2) implement these strategies under worst case conditions? How long should mitigation strategies be expected to be deployed before the receipt of offsite assistance? If certain mitigation actions must be taken early in the event to avert core damage, how should those actions be determined and how should the time when they must be performed be determined?	For the Fukushima types of hazard-driven SBOs, performance-based time constraints should be determined on a reactor-specific and plant-specific basis, consistent with Order EA-12-049.
4.	Similar to question B.2, but from a broader perspective of establishing all the new SBO mitigation requirements: Different regions of the United States have different natural phenomena that are more significant in terms of potentially creating SBO conditions. Should the NRC construct a new regulatory framework containing criteria that enable licensees to establish the set of natural phenomena of concern for their sites? If so, what criteria should be used to determine whether an event needs to be considered at a particular site? Please provide the basis for your position.	**Comment:** For New Plants, the adequacy of the plant design basis for GDC 2 protection is discussed in NTTF recommendation 2.1. NTTF recommendation 2.1 addresses issues of scope of external hazards, as well as magnitude of external hazards. The NTTF report appropriately concludes that for New Plants "all of the current COL and design certification applicants are addressing them adequately in the context of the updated state-of-the-art and regulatory guidance used by the staff in its reviews." Consistent with the comments on IV.B.1, there is no need to establish a new regulatory framework containing criteria for natural phenomena for New Plants.
5.	The current requirements in 10 CFR 50.63 for SBO are "unit-specific," meaning that the total loss of all ac is not assumed to extend to all the power reactors at a given site. Based on the lessons learned from the Fukushima Dai-ichi event, the NRC believes the SBO requirements may need to be expanded to consider an SBO for the entire site (i.e., assume the SBO condition occurs to all the units for multi-unit sites). What are stakeholder views on this matter, and how should it be addressed in the new SBO rule? Please provide the basis for your position.	**No Comment.**

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6.	The current provisions in 10 CFR 50.63 require a facility to withstand, for a specified duration, and recover from an SBO as defined in 10 CFR 50.2. Should the new SBO rule require long term cooling and water makeup to SFPs during an SBO? Please provide the basis for your position.	**Comment**: The current SBO rule contained in 10 CFR 50.63 is appropriate for mitigating the risk associated with a loss of offsite power and the common mode failure of the emergency diesel generators at a nuclear power plant. For the limited coping time frame of the current SBO rule, cooling of the spent fuel is accomplished by the available water inventory. Consistent with the Comments to Question IV.D.1, spent fuel cooling should be a "key" safety function for the hazard-driven SBOs. The methods to cool the spent fuel should provide latitude to reflect reactor-specific and site-specific differences (e.g., water makeup only and/or spent fuel pool cooling). The timing aspects for fulfilling this function should be consistent with the Comments to Question IV.B.3.
7.	Should the SBO rule address how external events would affect the "specific duration" of the SBO and the associated coping time? Specifically: a. Should the NRC require consideration of the likelihood of external events that fall outside the bounding events selected for design purposes in the determination of SBO specified duration, or the capability to cope with an SBO for the specified duration, or both? If so, what should the rule require? What is the basis for your position? b. Should the NRC require consideration of additional margin in the probability or magnitude (or both) of bounding events selected for design purposes with respect to natural phenomena (e.g., design basis external flood plus 10 additional feet or extending the ability to withstand the total loss of ac power for longer durations) in the determination of SBO specified duration or the capability to cope with an SBO during the specified duration, or both? Provide any proposed rule provisions and a discussion that supports your position. c. Should the SBO rule require applicants and licensees to address a more challenging condition such as the total	**a. Comment**: No. The recommendations on external event likelihood and time constraints for SBO accident mitigation are provided in the Comments to Question IV.B.3. **b. Comment**: No. The recommendations on physical protection are provided in the Comments to Question IV.B.1 (e.g., margins for beyond design basis external hazards should be accommodated probabilistically in Chapter 19), while recommendations on time constraints for SBO accident mitigation are provided in the Comments to Question IV.B.3. **c. Comment**: No. For New Plants, it is recommended that this more challenging condition <u>not</u> be deterministically assumed because it provides no clear safety

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	loss of all ac, including ac from the dc batteries through inverters? Please provide the basis for your position.	benefit. This position is based on the following considerations: • AC power from the DC batteries may be unavailable for one of three reasons: (a) DC batteries fail due to a non-mechanistic, common cause failure, or (b) inverters fail due to a non-mechanistic, common cause failure, or (c) DC-AC distribution equipment fails due to a mechanistic, beyond-design-basis event induced-failure (e.g., Fukushima). • For operating plants and New Plants, a common cause failure of the DC batteries or inverters is of sufficiently low probability to not warrant concern (consistent with Regulatory Guide 1.155 and the current SBO rule). • For New Plants, mechanistic GDC 2 failures have been evaluated as discussed in the Comments to Question IV.B.1.
8.	If new requirements as discussed in this section should be imposed for existing licensees or with respect to existing certified designs, what sort of benefits or costs do stakeholders estimate could be incurred?	**Comment**: The benefits and costs of implementing prospective changes (consistent with this part of the ANPR) are difficult to characterize because the scope/strategy in different areas have not been finalized. For a New Plant design, the benefits are expected to be minimal since the plants currently have more robust physical protection with respect to natural phenomena hazards to satisfy GDC 2, as well as robust SBO mitigation strategies. As discussed in the Comments to Question IV.C.1.a, also note that New Plant core damage frequencies and large release frequencies are already significantly lower than the commission goals and those of the existing operating fleet.
C.	***Rulemaking Objectives/Success Criteria*** The NRC is considering whether enhancements to current SBO requirements are advisable in order to consider natural phenomena beyond the plant-specific events selected as bounding for design purposes, even if the plant's design basis meets the NRC requirements and guidance for natural phenomena that are applicable to new plant applications. The NRC would like stakeholder views on specific regulatory objectives and success criteria for the potential rulemaking, as follows:	
1.	What specific objectives should the SBO rule be designed to achieve? a. For example, should the objective of the SBO rule be to significantly reduce the frequency of core damage from	**a. Comment**: Neither of these options is appropriate for the hazard driven SBOs. For new plants, the designs already demonstrate very low core damage

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	a prolonged SBO, or would it be better to focus on the reduction of the frequency of large early release of radiation for low probability external events that result in SBO conditions? Please provide the basis for your position.	frequency (CDF) and large early release frequency (LERF) values, and exceed the Commission's quantitative safety goals by a wide margin. The Reliability Assurance Programs (RAP) developed and implemented successively by the Design Certification Applicant, the COL Applicant and the COL licensee ensure that the future plant is designed and constructed in a manner that is consistent with the risk insights and key assumptions of the PRA. Therefore, the focus should be on defense in depth and not on a quantitative measure. There is not a significant safety benefit to deterministically require further improvements in quantitative risk focused on SBO contributors.
	b. Alternatively, should the SBO rule be designed to achieve a more qualitative safety objective such as increasing, as a defense-in-depth measure, requirements for the mitigating strategies to cope with prolonged SBO conditions stemming from events that do not fall within the reference bounds for the design, assuming GDC 2 (or the corresponding PDC) is satisfied? Please provide the basis for your position.	**b. Comment:** As discussed in the comment to IV.C.1.a, the focus of any enhancements to the SBO requirements should be in the form of qualitative, defense in depth measures and <u>not</u> on quantitative risk measures.
	c. Should the SBO rule provide increased assurance that the facility can achieve and maintain a safe shutdown condition under SBO conditions for a set of initiating events that lead to SBO conditions, and as one way of doing this, enable licensees to use a criterion for determining the set of conditions that apply to their plants or sites? Please provide the basis for your position.	**c. Comment:** No. This approach is not recommended. Rather, the differentiated SBO approach described in the comments to IV.C.1.e and IV.C.1.d is the most appropriate strategy.
	d. Should the NRC adopt an SBO rule that is more performance-based and which would not specify the events that must be considered in determining the SBO duration or the capability for coping with an SBO of specified duration? Specifically should the NRC structure an SBO rule as follows:	**d. Comment:** Yes. In general, performance-based regulatory approaches should be utilized to the extent practical. The following performance-based strategies are recommended: • For mitigation of the more probable/common SBO events (i.e., non-mechanistic, common cause failures of all onsite emergency AC sources), performance-based regulation should be maintained. For example, the SBO rule (10 CFR 50.63) should continue to permit

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	(1) Require each applicant and licensee to develop, implement, and maintain SBO procedures that describe how the licensee will address the following areas if the plant experiences an event that exceeds the values or does not fall within the ranges of values chosen for the reference bounds for the design of the facility: (i) Communication with onsite personnel and offsite entities providing support to mitigate the event; (ii) Onsite actions necessary to enhance the capability of the facility to mitigate the consequences of the loss of all ac power and other equipment damage; (iii) Dispersal of equipment and personnel, as well as rapid entry into site protected areas for essential onsite personnel and offsite responders who are necessary to mitigate the event; and (iv) Recall of site personnel. (2) Require each applicant and licensee to develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and SFP cooling capabilities under the circumstances associated with the loss of all ac power, from an event that does not fall within the reference bounds chosen for the design of the facility, including: (i) Station blackout coping and power restoration activities; (ii) Operations to mitigate fuel damage; and (iii) Actions to minimize radiological release.	licensees to provide an alternate AC source **<u>or</u>** an AC-independent coping strategy. NRC regulations should <u>not</u> prescriptively stipulate that an AC-independent coping strategy be employed as suggested in Section IV.C.3 of this ANPR. • For mitigation of the low probability, hazard-driven SBO events (i.e., mechanistic, GDC 2 failures like Fukushima), performance-based regulation should be considered for New Plants as follows: ➢ The consequences of low probability, hazard-driven SBO events should be mitigated with installed OR portable equipment OR offsite equipment (or combination of these methods), consistent with the Order EA-12-049 related to NTTF recommendation 4.2. ➢ The hazard-driven SBO accident mitigation philosophy described in the Order EA-12-049 should be based on credible reactor-specific and site-specific considerations. These new rules should be created separately from the existing 10 CFR 50.63 rule.

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	Please provide the basis for your position.	
	e. Recognizing that the SBO mitigation requirements could address a set of events that fall outside the reference bounds for design of the plant and may lead to SBO conditions, success criteria might be more readily established. Should the rule establish success criteria or requirements that apply as a function of the probability of the events? For example, for the more probable/common SBO events, such as those that 10 CFR 50.63 currently addresses, the current 10 CFR 50.63 requirements could largely remain in place. For the low probability, high consequence, hazard-driven SBOs, a different set of success criteria could be established that recognize the lower probabilities of occurrence of these types of SBOs. Please provide the basis for your position.	**e. Comment:** In principle, this differentiated philosophy is appropriate for New Plants (see comments to IV.B.1). Further, note the following: • For the more probable/common SBO events (i.e., loss of offsite electric power system (LOOP) concurrent with non-mechanistic, unavailability of onsite emergency AC power sources), it is recommended that these events be addressed in a manner consistent with the current 10 CFR 50.63 rule. The Fukushima lessons learned suggests that the current 10 CFR 50.63 treatment for these types of non-mechanistic, reliability-based events is appropriate. • For the low probability, hazard-driven SBO events (i.e., hazard-induced LOOP and hazard-induced mechanistic, GDC 2 failures like Fukushima), no new success criteria are required for New Plants based on the following considerations: o The adequacy of the important-to-safety SCCs design basis for GDC 2 protection is the purview of NTTF recommendation 2.1. NTTF recommendation 2.1 addresses issues of scope of external hazards, as well as magnitude of external hazards. The NTTF report appropriately concludes that for New Plants "all of the current COL and design certification applicants are addressing them adequately in the context of the updated state-of-the-art and regulatory guidance used by the staff in its reviews." o To address uncertainties in the magnitude of external hazards, beyond design basis external hazard evaluations have also been performed for New Plants in accordance with Chapter 19 of NUREG-0800, Standard Review Plan (e.g., seismic margins assessment). For New Plants, these probabilistic evaluations demonstrate low risk and significant safety margins for beyond design basis external hazards.

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2.	How should actions taken to address the staff's recommended approach for NTTF Recommendation 4.2 be used to support the development of SBO mitigation requirements within a coherent, integrated regulatory framework? Provide a discussion that supports your position.	**Comment:** A coherent, integrated regulatory framework can be developed based on the Comments to selected questions in the ANPR. In particular, these include the following: • In the Comments to Question IV.F, it is recommended that Approach 1 (Base Case – Supplementary SBO Requirements) be selected. This will allow selected changes to be easily made to individual rules and implementing guidance (as appropriate). • In the Comments to Question IV.C.1.e, a differentiated philosophy for SBO mitigation that separately considers (a) the more probable/common SBO events currently addressed in 10 CFR 50.63, and (b) the low probability hazard-driven SBO events like Fukushima is recommended.
3.	The NRC would like stakeholder's views on a regulatory approach to SBO mitigation that conceptually follows the NTTF proposal in NTTF Recommendation 4.1. Specifically, do stakeholders believe that the best conceptual approach for SBO mitigation is to establish requirements for an initial coping period (no ac power available), during which time licensees establish mitigation strategies; followed by an interim period during which time the mitigation strategies are employed for a duration sufficient to enable offsite relief to arrive; followed by a final phase where offsite relief has arrived and a stable shutdown condition is established? Alternatively, if stakeholders have alternative approaches or suggested changes to this conceptual approach, please provide the basis for them.	**Comment**: For "traditional" types of SBOs, the mitigating strategies used in the current SBO rule (10 CFR 50.63) and Regulatory Guide 1.155 have been effective at mitigating SBO risks, and should be maintained. In particular, the mitigating strategies in the SBO rule (10 CFR 50.63) should continue to permit licensees to provide an alternate AC source **or** an AC-independent coping strategy. NRC regulations should not prescriptively stipulate that an AC-independent coping strategy be employed. For the Fukushima types of hazard-driven SBOs, a three phased approach is appropriate, consistent with Order EA-12-049. However, installed AC sources should be permitted as part of the mitigating strategy provided the AC sources are reasonably protected. Fukushima lessons learned do not directly suggest that a deterministic loss of all AC without consideration of alternate AC is warranted. An AC-independent means for SBO mitigation would not, in and of itself, have prevented the accidents at Fukushima. Fukushima Dai-ichi Units 1, 2 and 3 experienced fuel damage when the AC-independent means of decay heat removal failed. Therefore, there is no clear safety benefit to deterministically mandate an AC-independent approach in Phase 1 of the 3-Phase SBO mitigation strategy.
	The NRC notes that there is a close relationship between the SBO mitigation requirements under consideration in this regulatory effort and several other near-term actions stemming from the Fukushima Dai-ichi event (and identified in SECY–11–0124 and SECY–11–0137). Regulatory actions taken in response to these other activities may have an impact on any regulatory actions taken to address SBO. In this regard, the NRC would like stakeholder views on the following:	

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4.	Recognizing that SBO mitigation may rely upon Emergency Operating Procedures (EOPs) and Severe Accident Management Guidelines (SAMGs), how should regulatory actions taken to address NTTF Recommendation 8 with regard to coordination of EOPs, SAMGs, and Extensive Damage Mitigation Guidelines be best integrated with SBO mitigation requirements to ensure that actions to address each of these NTTF recommendations do not unduly overlap or inadvertently introduce unnecessary redundancy, inconsistency, or other unintended consequences?	**Comment**: Along with EOP's, SAMG, and EDMGs, the mitigating strategies for hazard-driven SBOs as required in order EA-12-049 will introduce a set of procedures and guidance. These procedures and guidance should be integrated into the other functional procedures appropriately.
5.	Recognizing that the containment function is a key defense-in-depth measure for SBO events, how should regulatory actions to address NTTF Recommendation 5.1, which discusses installation of reliable hardened containment vent systems for boiling water reactors with Mark I and II containments designs, be integrated with potential SBO load-shedding mitigation activities to ensure that actions to address each of these NTTF recommendations do not unduly overlap or inadvertently introduce unnecessary redundancy, inconsistency, or other unintended consequences?	No comment
6.	Recognizing the importance of SFP cooling and the need to understand the condition of the SFP, how should regulatory actions taken to address NTTF Recommendation 7.1, which addresses SFP instrumentation, be integrated into SBO mitigation plans to ensure that actions to address each of these NTTF recommendations do not unduly overlap or inadvertently introduce unnecessary redundancy, inconsistency, or other unintended consequences?	**Comment**: The current SBO rule contained in 10 CFR 50.63 is appropriate for mitigating the risk associated with a loss of offsite power and the common mode failure of the emergency diesel generators at a nuclear power plant. For the limited coping time frame of the current SBO rule, cooling of the spent fuel is accomplished by the available water inventory and SFP level instrumentation is not critical. For the hazard driven SBOs, spent fuel pool level instrumentation (Order EA-12-051) will be used as part of the mitigating strategies to ensure spent fuel cooling (Order EA-12-049).

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D.	***Functional Considerations and Requirements for Supporting Structures, Systems, and Components and Procedures*** An important element of a new set of SBO requirements would be identifying the functions that need to be performed under SBO conditions, since performance of these functions relates directly to achieving the objectives of the rulemaking. Additionally, establishing the functions that must be performed enables the identification of the set of SSCs (SBO mitigation equipment) and supporting procedures, guidelines, and strategies that would need to be employed. The NRC considers the key safety functions identified below to be the essential functions for SBO mitigation, and would like stakeholder's views on whether this is the correct set: 1. Reactor core cooling; 2. Spent fuel pool cooling; and 3. Containment. With regard to the requirements that would stem from identification of the SBO mitigation functions, the NRC would like stakeholder views on:	
1.	What requirements (e.g., design, inspection, testing, quality assurance, corrective action) should be applied to the SBO mitigation SSCs that perform the key safety functions to provide increased assurance that the functions can be performed? What constitutes increased assurance (i.e., what must be achieved with the additional treatment requirements) for the mitigation of SBO conditions stemming from either design basis events or from external events that exceed the events chosen as bounding for design purposes? Please provide the basis for your position.	**Comment**: For the current SBO rule contained in 10CFR50.63, the existing functions in the rule should be maintained. Spent fuel cooling is not challenged in these situations; there is adequate coolant inventory in the pools for the length of time of a 'traditional SBO'. Therefore, maintaining spent fuel <u>pool</u> cooling is not considered to be an essential function for a traditional SBO event. For the low probability hazard-driven SBO events, the functionality should be consistent with Order EA-12-049 with the exception of one clarification. "Spent Fuel Pool cooling" should be "Spent Fuel cooling" which recognizes that you may provide makeup to the pool or SFP cooling; either of which is acceptable for cooling the spent fuel. For the "traditional" SBOs, the programmatic considerations (e.g., design, inspection, testing, quality assurance, corrective action) for SBO mitigation SSCs should continue to follow the guidance of Regulatory Guide 1.155. Regulatory Guide 1.155 should continue to focus on the more probable/common SBO events currently addressed in 10 CFR 50.63. For the low probability hazard-driven SBO events like Fukushima, the programmatic considerations for SBO mitigation SSCs should be provided in the implementation guidance for Order EA-12-049. These programmatic considerations should be similar to the NEI 06-12 guidance for 10 CFR 50.54(hh)(2).

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2.	What requirements for supporting procedures, guidelines, strategies, and training should be included within the SBO rule (also refer to question C.6)? Please provide the basis for your position.	**Comment**: For "traditional" types of SBOs, procedures, guidelines and strategies already exist to mitigate these events. For the low probability hazard-driven SBO events like Fukushima, procedure and training considerations should be provided in the implementation guidance for Order EA-12-049. These procedure and training considerations should be similar to the NEI 06-12 guidance for 10 CFR 50.54(hh)(2).
3.	Should the SBO rule address licensee staffing requirements for SBO mitigation for an event involving more than a single unit (for multi-unit sites)? Please provide the basis for your position.	**Comment**: Yes. For the hazard-driven SBOs, the licensee staffing requirements for SBO mitigation should consider an event involving more than a single unit (for multi-unit sites), as appropriate. This is based on Fukushima lessons learned.
4.	Should the NRC require surveillance testing and limiting conditions for operation for some or all equipment credited for mitigating an SBO event? Alternatively, should the NRC use a different approach for testing of SBO equipment, such as either specific testing requirements in a new rule, use of 10 CFR 50.65 (Maintenance Rule), or other existing plant processes? Please provide the basis for your position.	**Comment**: For "traditional" types of SBOs, the testing used in the current SBO rule (10 CFR 50.63) and Regulatory Guide 1.155 have been effective at mitigating SBO risks, and should be maintained. For the low probability hazard-driven SBO events like Fukushima, the testing requirements should be provided in the implementation guidance for Order EA-12-049. These testing requirements should be similar to the NEI 06-12 guidance for 10 CFR 50.54(hh)(2).
5.	Should the NRC require applicants and licensees to describe the SSCs, supporting procedures, and programs used to implement the new SBO requirements in the Final Safety Analysis Report? Alternatively, should the NRC consider a special change control requirement for these SSCs, procedures, and programs? If stakeholders agree that such a requirement would be valuable, what criteria would be used to determine when changes could be made without prior NRC review and approval?	**Comment**: For "traditional" types of SBOs, the mitigation strategies are described in the FSAR for New Plants in accordance with Section 8.4 of NUREG-0800, Standard Review Plan. For the hazard-driven SBOs, the site specific mitigation strategies should be described in a similar fashion as the Emergency Plans or 50.54 (hh)(2) requirements. From a change control perspective, a special change control process for this information should not be adopted for New Plants design certifications. The U.S. NRC could designate this information as Tier 2* which provides an existing mechanism for change control and prior NRC review and approval.
6.	If new requirements under the items above were to be	**Comment**: The benefits and costs of implementing prospective changes (consistent

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	imposed for existing licensees or with respect to existing certified designs, what sort of benefits and costs do stakeholders estimate could be incurred?	with this part of the ANPR) are difficult to characterize because the scope/strategy in different areas have not been finalized. For a New Plant design, the benefits are expected to be minimal since the plants currently have more robust physical protection with respect to natural phenomena hazards to satisfy GDC 2, as well as robust SBO mitigation strategies.
E.	***Applicability to NRC Licenses and Approvals***	
	The NRC would apply any new SBO requirements to power reactors, both currently operating and new reactors, and would like stakeholder input on this aspect of the rule. Accordingly, the NRC envisions that this would include (but not be limited to): 1. Nuclear power plants currently licensed under 10 CFR parts 50 or 52; 2. Nuclear power plants currently being constructed under construction permits issued under 10 CFR part 50, or whose construction permits may be reinstated; 3. Current and future applications for standard design certification and standard design approval under 10 CFR part 52; 4. Future nuclear power plants whose construction permits and operating licenses are issued under 10 CFR part 50; 5. Future nuclear power plants whose combined licenses are issued under 10 CFR part 52, and 6. Future nuclear power plants that are manufactured under 10 CFR part 52.	The rule requirements should be applicable to those identified in items 1-6.
F.	***Relationship Between Existing Station Blackout Requirements in Title 10 of the Code of Federal Regulations, Section 50.63 and the New Station Blackout Requirements***	
	The NRC is considering how any new SBO requirements would relate to the existing SBO requirements in 10 CFR 50.63, and has identified three approaches: 1. Approach 1 (Base Case— Supplementary SBO Requirements): The new SBO requirements would 1)	**Comment:** Approach 1 (Base Case – Supplementary SBO Requirements) is the recommended approach. This recommendation is based on the following considerations: • The existing regulatory framework in the U.S. provides an effective balance between defense-in-depth and risk considerations.

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	address SBO issues which are separate from, and address scenarios which go beyond, the existing 10 CFR 50.63 requirements; and 2) be added to the existing 10 CFR 50.63 SBO requirements, possibly in a new section (e.g., 10 CFR 50.XX). This approach would not change the existing 10 CFR 50.63 requirements, with the exception of some conforming changes needed to ensure coordination between the existing, unchanged 10 CFR 50.63 requirements, and the newly-added SBO requirements. 2. Approach 2 (Unified SBO Requirements): The new SBO requirements would: (1) Address SBO issues which are separate from, and address scenarios which go beyond, the existing 10 CFR 50.63 requirements (same as Element 1 of Approach 1); and (2) be integrated into a single rule, representing a unified overall approach to SBO. This differs from Approach 1 in that the NRC would develop new rule language that presents a single, unified approach to SBO covering the full spectrum of issues, accidents, plant conditions, and performance objectives that each nuclear power plant must meet. The new rule would include the current 10 CFR 50.63 requirements. 3. Approach 3 (Superseding SBO Requirements): The new SBO requirements would envelope the full spectrum of issues, accidents, plant conditions, and performance objectives that each nuclear power plant must meet, so that the existing SBO requirements in 10 CFR 50.63 would be subsumed in the new rule. This approach differs from Approach 1 in that the new SBO requirements would address SBOs whose characteristics and scope may be more "severe" than originally envisioned in 10 CFR 50.63. Under Approach 3, the new SBO requirements would entirely supersede and displace the existing SBO requirements in 10 CFR 50.63. All existing SBO requirements would be removed from 10	• Enhancements to the regulatory framework based on Fukushima lessons learned can be invoked (as needed) in specific regulations. Further, these specific regulations would not necessarily be restricted to 10 CFR 50.63; other regulations may require modifications as well. • Smaller or conforming changes to existing regulations (Approach 1) can be adopted more easily and efficiently than wholesale replacement (e.g., Approach 2 or 3). The input on other questions in the ANPR is predicated on selection of Approach 1 as the overall regulatory approach.

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	CFR 50.63 and licensees would be required to change their SBO licensing bases (e.g., change or remove a Final Safety Analysis Report description, a technical specification, or a license condition) to comply with the new requirements. The NRC therefore seeks stakeholder views on which of these options is best suited for implementing new requirements recommended in response to ANPR Sections B, C, and D, above. What is the basis for your position?	
G.	***Advisory Committee on Reactor Safeguards Recommendations*** By letter dated October 13, 2011, the Advisory Committee on Reactor Safeguards (ACRS) provided its recommendations concerning near-term actions that should be taken without delay. With regard to the mitigation of SBO, the ACRS recommended that: *Staff should also require licensees to provide an assessment of capabilities to cope with an extended SBO, including system vulnerabilities (e.g., reactor coolant pump seal qualifications) and capabilities to mobilize and deliver offsite resources (e.g., portable generators, fuel supplies, water pumping equipment). This information will inform staff interactions with the industry during the rulemaking process and help develop guidance that can be applied in the near term for enhanced confidence that each site has identified their available options.*	
	Accordingly, the NRC is interested in stakeholder feedback regarding both current and projected future (i.e., considering other actions that could stem from the staff's recommendation to address NTTF Recommendation 4.2 as well as other relevant NTTF actions) capabilities for coping with an extended SBO, including system vulnerabilities. Additionally, the NRC would like stakeholder views concerning the capabilities to mobilize and deliver offsite resources (e.g., portable generators, fuel supplies, water pumping equipment) as contemplated by both the NTTF and by the industry conceptual approach described in the Nuclear Energy Institute (NEI) paper, "An Integrated, Safety-Focused Approach to Expediting Implementation of Fukushima Daiichi Lessons- Learned," dated December 16, 2011.	**Comment:** The capabilities for mitigating extended SBO for New Plants should be evaluated and reviewed as part of the COL and design certification licensing process, consistent with the NTTF report recommendations.

Rulemaking Comments

From: MCFADEN Sherry (AREVA) [Sherry.McFaden@areva.com]
Sent: Friday, May 04, 2012 1:27 PM
To: Rulemaking Comments
Cc: WHITE David (AREVA)
Subject: Docket ID NRC-2011-0299, Proposed Rule on Station Blackout
Attachments: nrc12025.pdf

The subject letter, NRC:12:025, is attached. Should you have questions, please contact David White at 434.832.4027.

Thank you.

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