

# PUBLIC SUBMISSION

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**Docket:** NRC-2011-0299  
Station Blackout Mitigation

**Comment On:** NRC-2011-0299-0048  
Station Blackout Mitigation Strategies

**Document:** NRC-2011-0299-DRAFT-0061  
Comment on FR Doc # 2013-08216

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## Submitter Information

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## General Comment

See attached file(s)

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## Attachments

20130528 AREVA comments on Reg Basis Document

## AREVA Comments on “Rulemaking for Station Blackout Mitigation Strategies – Regulatory Basis Document”

**(ID: NRC-2011-0299-0048)**

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. EPRTM Design Centered Working Group (DCWG). Here are our comments:

Comment	Citation in Regulatory Basis Document	Text in Regulatory Basis Document	Comment
1	Page 5, Order EA-12-049  Page 14, Table 1	The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.	<p>An objective, enforceable requirement cannot be written for an ‘indefinite coping period’. A more objective and performance based standard such as the requirement for long term cooling in 10CFR50.46 needs to be incorporated into the rule concepts. Credit for offsite mitigation sources should be credited similar to the credit in the SOARCA analysis (Table 2 of ML120250406).</p> <p>While it may be appropriate that mitigating strategies not rely on or assume the recovery of offsite power in the short term, there is no regulatory basis for assuming the infrastructure around the plant will <i>never</i> be restored. Reasonable and justifiable assumptions about the eventual restoration of external infrastructure should be allowed, commensurate with an appropriate balance of defense-in-depth and risk considerations (NTTF Recommendation 1).</p>
2	Page 13, Technical	While the existing SBO rule does require consideration of a loss of	The basis for NTTF Recommendation 4.1 was to address ‘significant natural disasters’ involving extensive damage to the

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	Basis for Mitigating Strategies	offsite power and the probable time to restore offsite power in determining the specified duration, it does not require consideration of a loss of offsite power caused by a fire, flood, or seismic activity because the NRC concluded that the likelihood of such events was sufficiently low.	surrounding infrastructure. There is no regulatory basis for extending this to internal fires which do not cause extraordinary widespread infrastructure destruction.
3	Page 15, Table 1	Use of installed equipment that is safety-related is assumed for the initial phase. Use of reasonably protected equipment is assumed for the second phase. Replenishing and supplementing equipment from offsite sources is provided in the third phase.	In the discussion of Acceptable Options in Table 1, the Regulatory Basis Document discusses the use of safety-related equipment during the initial phase. As written, this information could be misinterpreted and should be rephrased. Specifically, note the following: <ul style="list-style-type: none"> <li>• Neither the formal order (Attachment 2 of EA-12-049) nor the underlying discussion in the order require or assume that safety-related equipment <u>must</u> be used for the initial phase.</li> <li>• Reliance on safety-related equipment for any phase should be acceptable (i.e., it is optional), but should <u>not</u> be required. This approach is consistent with the beyond design basis nature of the order, and parallels the approach used in 10 CFR 50.63 for Station Blackout and 10 CFR 50.54(hh)(2) for Loss of Large Area fires.</li> </ul>
4	Page 17 first bullet under	Make the EA-12-049 requirements generically	The basis for rulemaking should be to minimize regulatory uncertainty rather than having to address the considerations for

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	section 3.1	applicable.	each license individually.
5	Page 18, NRC Guidance	<p>The NRC expects that these changes would note that licensees are required to deploy mitigating strategies as required by the new rule in part 50 when the time required to recover from an SBO event exceeds the existing specified duration.</p>	<p>The regulatory basis should not assume all measures taken to address ELAP will necessarily conflict with the measures taken to meet 10CFR50.63. ELAP measures that do not conflict with 50.63 coping strategies should not be artificially delayed.</p> <p>When the SBO coping period expires, licensees should enter a procedure for ELAP mitigation; however, the actual set of strategies deployed by that governing procedure should be based on actual plant conditions at the time. It would not make any sense, for example, to require deployment of strategies for cooling the core if it is defueled at the time; if an SBO diesel is operating, refueling that diesel may be a better option than some other ELAP strategy. ELAP governing procedures should be able, where appropriate, to consider the use of 10 CFR 50.54(hh)(2) equipment as stated in the intent in Section 3.1 to link 10 CFR 50.63, 10 CFR 50.54(hh)(2), and EA-12-049.</p>
6	Page 29, Draft Rule Concepts	<p>Accordingly, the title should reflect that the new requirements are fundamentally addressing two situations:</p> <ol style="list-style-type: none"> <li>1. Extended loss of all AC power conditions resulting from beyond-</li> </ol>	<p>The text in the title section is inconsistent with the stated regulatory objectives in Section 3.1 to link 10 CFR 50.63, 10 CFR 50.54(hh)(2), and EA-12-049.</p>

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		<p>design-basis external events where it is unlikely AC power will be recovered in the short term.</p> <p>2. Station blackout conditions that stem from loss of offsite power events with multiple onsite failures of emergency power sources that extend longer than the specified durations of 50.63.</p>	
7	Page 30, Applicability	Design requirements, including requirements that relate to protection of the equipment, could be addressed by design certification holders and applicants, or combined license holders or applicants, depending on the nature of the requirement and the equipment relied upon for mitigation. Requirements that relate to the need to have connections for portable equipment could be addressed by design certification holders and applicants. Requirements that involve the protection of	10 CFR 52.79 Contents of applications (for COL) and 10CFR 52.47 Contents of applications (for DC) both require “The coping analyses, and any design features necessary to address station blackout, as described in § 50.63.” The new rule should have a similar approach and should not specify a more prescriptive division of responsibilities.

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		portable equipment could be addressed by either the design certification holders or applicants or combined license holders or applicants. Lastly, requirements for maintenance and testing of equipment would be directed to the combined license holders or applicants.	
8	Page 31, Definitions	Exception: Initially AC power from inverters fed by safety-related batteries could be assumed available to support development of the strategies, provided this equipment is reasonably protected including the portions of the distribution system that are used.	Item 5 includes a description of an exception to the definition of an ELAP event. This text implies that only “safety-related” batteries can be credited to initially supply AC power through inverters. As discussed in previous comments on Table 1, there is no basis for restricting supply to only “safety-related” batteries.
9	Page 31, Definitions	An additional consideration on the use of an ELAP definition is not to unduly constrain the proposed provisions. A key attribute of sound strategies is the incorporation of contingency measures that provide alternate	Any definition, including the definition of ELAP, must define what is included and what is not. It is not an undue constraint to have definite limits.  A key attribute of sound strategies is not to provide unending

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		means for successfully maintaining or restoring functions should the event result in failures or potential challenges to the mitigation strategies.	layers of contingencies for more and more improbable events.  In the event of an extremely unlikely beyond design basis external event, mitigating strategies can be designed to provide additional capabilities; however, there is no risk informed basis for postulating additional failures. When considering additional layers of defense, the NRC should consider that, SOARCA demonstrated plants can already manage an extended SBO without core damage by relying on the equipment installed for 10CFR50.54(hh).
10	Page 31, Definitions	Another example is if the event results initially in a more severe condition such that DC power is also lost. In this circumstance, the alternate measure might involve local manual actions to operate a turbine-driven pump.	The definition of ELAP does not include a loss of DC power. See comment 9. While licensees often design contingencies for beyond design basis events, and operators are often tested on events beyond plant design basis, rulemaking to require beyond design basis contingencies already in place could potentially discourage licensees and certification holders from planning and designing for events beyond what is required by regulation.
11	Page 31, Definitions  Page 34, Design	Finally, the NRC staff believes there is merit to offering additional design flexibility not allowed by EA-12-049. As discussed below, these provisions would allow for use of	Item 6 on page 31 includes a description of an exception for supplemental AC power sources. Design features for the supplemental AC source are provided on page 34. With regards to the supplemental AC source, note the following:  1. The NRC staff should be commended for the conceptual inclusion of a supplemental AC power source in the SBO

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	Flexibility to Use a Supplemental AC Power Source	robust supplemental AC sources to restore power following beyond-design-basis events.	<p>rulemaking. Reliance on an alternate AC source or supplemental AC source was expressly prohibited in the EA-12-049 order. The timing of the proposed SBO rulemaking; however, means that this provision will have limited practical value for operating nuclear plants or new plants that are currently being licensed. This Fukushima experience (i.e., quickly issue orders and rules before thoroughly understanding the technical issues and viable paths forward) parallels the post-Three Mile Island-2 experience in many ways and represents an ineffective way to regulate the industry.</p> <p>2. In Item 4 on page 34, it states that “the supplemental AC power source(s) would be required to have sufficient combined capacity and capability to operate the equipment necessary to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities following a beyond-design-basis external event for each reactor unit at a site.” This requirement is overly constraining and prescriptive. A licensee should be able to rely on a supplemental AC power source in combination with selected portable equipment.</p> <p>3. In Item 5 on page 34, it states that “the supplemental AC power source would be required to have the capability to supply power through physically and electrically separate pathways to multiple electrical distribution systems or motor control centers...” This requirement is overly constraining and prescriptive. A licensee should be able to rely on existing electrical power distribution systems provided they are reasonably protected.</p>
12	Page 34, Design Requirements	The principal focus is towards portable equipment because installed equipment that would be	The discussion on Design Requirements includes information related to reasonable protection. This information appears to be derived, in part, from the discussion in Table 1 regarding reliance

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	Page 19, Implementation Issues	initially relied upon (not powered from the onsite emergency AC power system and therefore potentially available such as turbine-driven pumps) would typically be designed to safety-related standards and as such would be protected by design from external events (per GDC-2) and therefore considered to have reasonable protection.	on installed, safety-related equipment for the initial phase. Additional guidance is needed for reasonable protection of installed, non-safety-related equipment that is relied upon for mitigation in any phase. Most, if not all, nuclear plants will rely on some non-safety-related equipment for event mitigation (e.g., emergency lighting). Reasonable protection standards for installed, non-safety-related equipment should be analogous to the reasonable protection standards for portable equipment. That is, there is no technical basis for requiring a different reasonable protection standard for installed, non-safety-related equipment.
13	Page 34, Design Requirements	<p>Additionally, the NRC staff is considering whether there needs to be (in guidance or requirements) specific limits on a minimum condition for batteries (such as a minimum voltage or some other more applicable parameter) such that when, and if, AC power is recovered, there is sufficient battery capacity to support the actions</p> <p>needed to provide AC power to the emergency buses and/or the associated motor control centers,</p>	There does not need to be specific limits on battery minimum conditions for recovery unless the licensee coping plan for ELAP includes recovery and the rule allows for recovery in the longer term (rather than an 'indefinite' coping period.) If licensee mitigating plans include reliance on battery capabilities after partial discharge, they are already required to demonstrate the feasibility of such plans. Additional requirements are not needed.

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		including reenergizing emergency diesel generator exciter fields to allow starting the generators.	
14	Page 37, Additional Questions for Stakeholder Consideration	(1) Should the agency consider a broader rule that combines the current 10 CFR 50.54(hh)(2) and 10 CFR 50.63 with the proposed rule into a single regulatory framework, potentially enhancing efficiency and effectiveness and reducing the cumulative effects of regulation?"	Yes, provided it can be demonstrated that it will enhance the efficiency and effectiveness of the regulations.
15	Page 37, Additional Questions for Stakeholder Consideration	(2.a) Should new reactor designs be required to have station blackout AC power sources that are designed for external events (e.g., safe shutdown earthquake, flooding, and wind) and have sufficient capacity to shutdown the reactor? Should new reactor designs be required to include additional margin for flooding or other external events?	<p>With regards to SBO alternate AC sources, new reactor designs should be given the option of providing reasonable protection of alternate AC sources as a means of mitigating a beyond design basis external hazard. The current EA-12-049 order; however, prescriptively disallows credit for such an AC source. It is inappropriate to establish more conservative design criteria for the alternate AC sources and then deterministically disallow their use.</p> <p>With regards to design for external hazards, new reactors are already designed to incorporate additional margins for external events. Risk assessments are also performed on a site-specific</p>

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			<p>basis to evaluate plant vulnerabilities to these external hazards. These actions provide reasonable assurance that the plants are adequately protected from these hazards.</p> <p>No additional action is warranted.</p>
16	Page 38, Additional Questions for Stakeholder Consideration	(2.b) If so, should the NRC allow credit (i.e., allowing these AC sources to re-energize safety buses) under ELAP conditions, or should there be requirements for portable equipment as a diverse means to maintaining or restoring the key functions regardless of whether there are AC sources capable of re-energizing safety buses?	<p>Yes, credit for alternative methods should be allowed consistent with the Commission direction in SRM-SECY-11-1024. As discussed on page 4, the Commission directed the staff as follows:</p> <p>Craft recommendations that continue to realize the strengths of a performance-based system as a guiding principle. In developing these recommendations, the Commission directed the NRC staff to consider approaches that are flexible and able to accommodate a diverse range of circumstances and conditions. The Commission noted that “[i]n 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 under its B.5.b program (Ref. 1).”</p>

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17	Page 38, Additional Questions for Stakeholder Consideration	(2.d) The NRC is considering requiring a design certification applicant to address the first portion of the mitigative response with installed equipment and connections to allow for maintenance of functions, and then have the remaining scope (i.e., the portion of the response that is more reliant on portable equipment) be the responsibility of a combined license applicant. What are stakeholder views on the appropriate division of requirements between a design certification and a combined license?	10 CFR 52.79 Contents of applications (for COL) and 10CFR 52.47 Contents of applications (for DC) both require “The coping analyses, and any design features necessary to address station blackout, as described in § 50.63.” The new rule should have a similar approach and should not specify a more prescriptive division of responsibilities.
18	Page 38, Additional Questions for Stakeholder Consideration	(2.e)What information about mitigation strategies and the equipment to be used should be included in the final safety analysis report? Where should other supporting information be located?	In Section 3.1, the NRC staff stated its regulatory objectives to link 10 CFR 50.63, 10 CFR 50.54(hh)(2), and EA-12-049. Given this objective, the information to be included in the FSAR for this new proposed rule should be based, in part, on past regulatory practice for these other rules.
19	Page 38,	(2.f) For the combined license	The revised SBO rule should accommodate responses that satisfy

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	Additional Questions for Stakeholder Consideration	process, how should implementation be phased with application for a combined license, combined license issuance, and fuel load?	Fukushima order EA-12-049 and associated RAIs. If this is the case, the conceptual response to Fukushima, as documented in the COL applicant's FSAR, will meet the revised rule when the COL is issued. More detailed actions required to meet the full scope of the Fukushima order, RAIs and SBO rule, e.g. development of procedures, can be addressed via license conditions.
20	Page 38, Additional Questions for Stakeholder Consideration	(3) How should human reliability be considered for beyond-design-basis external events for which there is an undefined damage state and potentially severe conditions under which human actions would be required?	The proposed requirements for mitigating strategies are not based on likelihood of beyond design basis events, so the risk contribution of human errors should not be assessed quantitatively. A reasonable expectation that mitigating strategies can be effectively deployed for a beyond design basis external event can be established qualitatively by reviewing the human reliability programs and practices of those who are tasked with implementing the strategies.

## RulemakingComments Resource

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**From:** Gallagher, Carol  
**Sent:** Wednesday, May 29, 2013 1:13 PM  
**To:** RulemakingComments Resource  
**Subject:** Station Blackout Mitigation Strategies  
**Attachments:** NRC-2011-0299-DRAFT-0061.pdf

Attached for docketing is a comment from David White on the above noted rulemaking document (78 FR 21275; April 10, 2013) that I received via the regulations.gov website on May 28, 2013.

Thanks,  
Carol