Proposed Rules

Federal Register
Vol. 77, No. 54
Tuesday, March 20, 2012

This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

[NRC–2011–0299]

RIN 3150–AJ08

Station Blackout

AGENCY: Nuclear Regulatory Commission.

ACTION: Advance notice of proposed rulemaking.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC or the Commission) is issuing this Advance Notice of Proposed Rulemaking (ANPR) to begin the process of considering amendments of its regulations that address a condition known as station blackout (SBO). SBO involves the loss of all onsite and offsite alternating current (ac) power at a nuclear power plant. The NRC seeks public comment on specific questions and issues with respect to possible revisions to the NRC's requirements for addressing SBO conditions to develop new SBO requirements and a supporting regulatory basis. This regulatory action is one of the near-term actions based on lessons-learned stemming from the March 2011 Fukushima Dai-ichi accident in Japan.

DATES: Submit comments by May 4, 2012. Comments received after the comment period deadline will be considered if it is practical to do so, but the NRC is only able to ensure consideration of comments received on or before the end of the public comment period. Due to priority of this regulatory action and the associated effort on the part of the Commission to expedite the action, the Commission will not accept requests for extensions of the public comment period unless extraordinary circumstances exist.

ADDRESSES: Please include Docket ID NRC–2011–0299 in the subject line of your comments. For additional instructions on submitting comments and instructions on accessing documents related to this action, see ''Submitting Comments and Accessing Information'' in the **SUPPLEMENTARY INFORMATION** section of this document. You may submit comments by any one of the following methods:

- *Federal Rulemaking Web Site:* Go to *http://www.regulations.gov* and search for documents filed under Docket ID NRC–2011–0299. Address questions about NRC dockets to Carol Gallagher; telephone: 301–492–3668; email: *Carol.Gallagher@nrc.gov*.
- *Mail comments to:* Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, ATTN: Rulemakings and Adjudications Staff.
- *Email comments to: Rulemaking.Comments@nrc.gov.* If you do not receive a reply email confirming that we have received your comments, contact us directly at 301–415–1677.
- *Hand deliver comments to:* 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. Federal workdays. (Telephone: 301–415–1677.)
- *Fax comments to:* Secretary, U.S. Nuclear Regulatory Commission at 301–415–1101.

FOR FURTHER INFORMATION CONTACT: Timothy A. Reed, Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission, Washington, DC 20555–0001; telephone: 301–415–1462, or email: *Timothy.Reed@nrc.gov*.

SUPPLEMENTARY INFORMATION:

I. Submitting Comments and Accessing Information

Comments submitted in writing or in electronic form will be posted on the NRC Web site and on the Federal rulemaking Web site, *http://www.regulations.gov*. Because your comments will not be edited to remove any identifying or contact information, the NRC cautions you against including any information in your submission that you do not want to be publicly disclosed.

The NRC requests that any party soliciting or aggregating comments received from other persons for submission to the NRC inform those persons that the NRC will not edit their comments to remove any identifying or contact information, and therefore, they should not include any information in their comments that they do not want publicly disclosed.

You can access publicly available documents related to this document using the following methods:

- *NRC's Public Document Room (PDR):* The public may examine and have copied for a fee, publicly available documents at the NRC's PDR, Room O–1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.
- *NRC's Agencywide Documents Access and Management System (ADAMS):* Publicly available documents created or received at the NRC are available online in the NRC Library at *http://www.nrc.gov/reading-rm/adams.html*. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1–800–397–4209, or 301–415–4737, or by email to *PDR.Resource@nrc.gov*.
- *Federal Rulemaking Web Site:* Public comments and supporting materials related to this advance notice of proposed rulemaking can be found at *http://www.regulations.gov* by searching on Docket ID NRC–2011–0299.

II. Fukushima Dai-ichi Event and the NRC Regulatory Response

On March 11, 2011, a magnitude 9.0 earthquake struck off the coast of the Japanese island of Honshu. The earthquake resulted in a large tsunami that is estimated to have exceeded 14 meters (45 feet) in height, which inundated the Fukushima Dai-ichi Nuclear Power Plant site. The earthquake and tsunami produced widespread devastation across northeastern Japan, and significantly affected the infrastructure and industry in the northeastern coastal areas of Japan.

When the earthquake occurred, Fukushima Dai-ichi Units 1, 2, and 3 were in operation, and Units 4, 5, and 6, were shut down for routine refueling and maintenance activities. The Unit 4 reactor fuel had been offloaded into the Unit 4 spent fuel pool (SFP) to facilitate maintenance activities in the reactor pressure vessel. Following the earthquake, the three operating units automatically shut down and offsite power was lost to the entire facility. The emergency diesel generators started at all six units, providing ac electrical power to critical systems at each unit. The facility response to the earthquake appears to have been normal.

Approximately 40 minutes following the earthquake and shutdown of the operating units, the first large tsunami wave inundated the site, followed by additional waves. The tsunami caused extensive damage to site facilities and resulted in a complete loss of all ac electrical power at Units 1 through 5, a condition known as SBO. In addition, all direct current (dc) electrical power was lost early in the event on Units 1 and 2, and after some period of time at the other units. Unit 6 retained the function of one air-cooled emergency diesel generator. Despite their actions, the operators lost the ability to cool the fuel in the Unit 1 reactor after several hours, in the Unit 2 reactor after about 70 hours, and in the Unit 3 reactor after about 36 hours, resulting in damage to the nuclear fuel shortly after the loss of cooling capabilities.

In the days following the Fukushima Dai-ichi nuclear accident in Japan, the NRC Chairman directed the staff to establish a senior-level agency task force to conduct a methodical and systematic review of the NRC's processes and regulations to determine whether the agency should make additional improvements to its regulatory system and to make recommendations to the Commission for its policy direction. This direction was provided in a tasking memorandum dated March 23, 2011, from the NRC Chairman to the NRC Executive Director for Operations (COMGBJ–11–0002). In SECY–11–0093, ''The Near-Term Report and Recommendations for Agency Actions Following the Events in Japan,'' dated July 12, 2011, the Near-Term Task Force (NTTF) provided its recommendations to the Commission regarding SBO and the need for revising the NRC's SBO rule (Title 10 of the *Code of Federal Regulations* (10 CFR) section 50.63). The staff requirements memorandum (SRM) for SECY–11–0093, dated August 19, 2011, directed the staff to ''identify and make recommendations regarding any NTTF recommendations that can, and in the staff's judgment, should be implemented, in part or in whole, without unnecessary delay.''

The NTTF provided a specific proposal for SBO mitigation that was subsequently endorsed by the National Resources Defense Council in a petition for rulemaking (PRM), PRM–50–101 (76 FR 58165) as a way to address SBO mitigation. The approach for SBO mitigation put forth by the NTTF as NTTF Recommendation 4.1 was:

> Initiate rulemaking to revise 10 CFR 50.63 to require each operating and new reactor licensee to: (1) Establish a minimum coping time of 8 hours for a loss of all ac power, (2) establish the equipment, procedures, and training necessary to implement an ''extended loss of all ac'' coping time of 72 hours for core and spent fuel pool cooling and for reactor coolant system and primary containment integrity as needed, and (3) preplan and prestage offsite resources to support uninterrupted core and spent fuel pool cooling, and reactor coolant system and containment integrity as needed, including the ability to deliver the equipment to the site in the time period allowed for extended coping, under conditions involving significant degradation of offsite transportation infrastructure associated with significant natural disasters.

In SECY–11–0124 and SECY–11–0137, the staff provided for Commission consideration its recommendations on those NTTF action items that should be initiated, in part or in whole, without unnecessary delay, and the associated prioritization for each item. Regarding SBO mitigation actions the staff recommended that the NRC, as a near-term action:

> Engage stakeholders in support of rulemaking activities to enhance the capability to maintain safety through a prolonged SBO. These activities will include the development of the regulatory basis, a proposed rule, and implementing guidance.

In SRM–SECY–11–0124, dated October 18, 2011, the Commission approved the staff's proposed actions to implement without unnecessary delay the NTTF recommendations as described in SECY–11–0124. Subsequently, in SRM–SECY–11–0137, dated December 15, 2011, the Commission approved the staff's proposed prioritization of the NTTF recommendations and supported action on the recommendations subject to the direction in the SRM.

Regarding regulatory actions to address SBO, the Commission directed the staff to initiate a rulemaking on NTTF Recommendation 4.1 in the form of an ANPR. This document is responsive to that Commission direction.

In November 2011, the Institute of Nuclear Power Operations (INPO) issued INPO–11–005, ''Special Report on the Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station.'' In SRM–SECY–11–0137, the Commission directed the staff to use INPO–11–005 as an input to its development of technical bases for any proposed regulatory changes. Much of the technical information regarding the Fukushima Dai-ichi accident discussed in this document has been derived from INPO–11–005.

III. Background

A. General Design Criteria 2 and 17

As defined in 10 CFR 50.2, ''design bases'' means that information which identifies the specific functions to be performed by a facility structure, system, or component (SSC), and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. The actual detailed design of facility SSCs must reflect the assigned design basis functions and assure performance of those functions within the reference bounds for design. An applicant for a construction permit or combined license for a facility is required, pursuant to 10 CFR 50.34(a)(3) or 52.79(a)(4)(i), respectively, to describe the principal design criteria (PDC) for the proposed facility. The PDC generally identify facility SSCs and their functions, which is part of the design bases described above. U.S. facilities for which construction permits were issued before 1971 had plant-specific PDC, since the Atomic Energy Commission (AEC), the authority that was the predecessor to the NRC, had yet to develop generic requirements for facility design criteria at that time.

On July 11, 1967, the AEC published for comment a proposed amendment to 10 CFR part 50 entitled ''General Design Criteria for Nuclear Power Plant Construction Permits'' (32 FR 10213). Subsequently, on February 20, 1971, the AEC published the final general design

criteria (GDC) and added appendix A, ''General Design Criteria for Nuclear Power Plants,'' to 10 CFR part 50 (36 FR 3255). The GDC provide minimum requirements for facility PDC, and form part of the facility design basis since they identify SSCs and their required functions at a high level. NRC regulations, including the GDC and plant-specific PDC, set general minimum standards for the values or ranges of values chosen for controlling parameters as reference bounds for design, which is the second element of the design bases defined in 10 CFR 50.2. These values or ranges of values are determined in accordance with detailed NRC guidance applicable to the particular SSCs found in nuclear power facilities. The GDC relevant to this ANPR are GDC 2, which governs consideration of natural phenomena, and GDC 17, which governs electrical system design. For facilities with construction permits issued before 1971, plant-specific PDC, which differ in certain respects from GDC 2 and 17, are also relevant to this ANPR.

GDC 2

General Design Criterion 2 currently requires nuclear power plants designed in accordance with appendix A to 10 CFR part 50 to be protected against natural phenomena. Specifically, SSCs important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated; (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena; and (3) the importance of the safety functions to be performed. Severe natural phenomena may be reflected in a facility design basis through selection and appropriate consideration of severe events that will then be the basis for establishing the reference bounds for the design. Accordingly, the questions in this ANPR will refer to the specific values or ranges of values chosen for controlling parameters as reference bounds for design associated with natural phenomena as ''the bounding events selected for design purposes.''

GDC 17

General Design Criterion 17 governs electric power systems for nuclear power plants designed in accordance with appendix A to 10 CFR part 50. The draft version of this GDC published for comment in 1967 was proposed GDC 39, ''Emergency Power for Engineered Safety Features (Category A)'' (32 FR 10213). Proposed GDC 39 read as follows:

> Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning required of the engineered safety features. As a minimum, the onsite power system and the offsite power system shall each, independently, provide this capacity assuming a failure of a single active component in each power system.

The public comments on proposed GDC 39 stated that the requirement that offsite power must satisfy the ''single failure criterion'' was impractical and asked the Commission to eliminate all reference to offsite power. The resolution to the comment stated the following:

> The criterion has been rewritten to make it clear that the offsite power system need not meet the ''single failure criterion.'' Reference to offsite power has not been deleted because we believe that offsite power is required to provide adequate assurance of safety (see New Criterion 17). New Criterion 17 has been discussed with the IEEE [Institute of Electrical and Electronics Engineers] Subcommittee which is developing criteria for power requirements for nuclear power units. The members of the subcommittee indicated that the new criterion is acceptable and consistent with their requirements.

Therefore, the Commission promulgated GDC 17 in appendix A to 10 CFR part 50 to state as follows:

> An onsite electrical power system and an offsite electrical power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.
>
> The onsite electrical power sources, including the batteries, and the onsite electrical distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.
>
> Electrical power from the transmission network to the switchyard shall be supplied by two physically independent transmission lines (not necessarily on separate rights of way) designed and located so as to suitably minimize the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. Two physically independent circuits from the switchyard to the onsite electrical distribution system shall be provided. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power sources and the other offsite electrical power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident to assure that core cooling, containment integrity, and other vital safety functions are maintained.
>
> Provisions shall be included to minimize the probability of losing electrical power from any of the remaining sources as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electrical power sources.

Section 8.2, ''Offsite Power System,'' of NUREG–75/087, ''Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition'' (SRP), published May 1980, and NUREG–0800, originally published November 1975 with the most current revision published May 2010, provide the review guidelines and acceptance criteria for the offsite power system. Similarly, Section 8.3 of the SRP provides the review guidelines and acceptance criteria for the onsite ac power system. For nuclear power plants that were licensed before GDC 17 applied, the plant-specific PDC, which are set forth in the Updated Final Safety Analysis Report, provide the applicable design criteria. A significant fraction of currently operating nuclear power facilities were licensed in accordance with plant-specific PDC rather than the GDC.

B. Station Blackout Rule

The availability of ac electrical power is essential for the safe operation and accident recovery of commercial nuclear power plants. The plant itself or offsite power sources normally supply this power through the plant switchyard, through which the plant is connected to the electrical grid. The term SBO is defined in 10 CFR 50.2 as follows:

> Station blackout (SBO) means the complete loss of alternating current (ac) electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., loss of offsite electric power system concurrent with turbine trip and unavailability of the onsite emergency ac power system). Station blackout does not include the loss of available ac power to buses fed by station

batteries through inverters or by alternate ac sources as defined in 10 CFR 50.2, nor does it assume a concurrent single failure or design basis accident (DBA). At single unit sites, any emergency ac power source(s) in excess of the number required to meet minimum redundancy requirements (i.e., single failure) for safe shutdown (non-DBA) is assumed to be available and may be designated as an alternate power source(s) provided the applicable requirements are met. At multi-unit sites, where the combination of emergency ac power sources exceeds the minimum redundancy requirements for safe shutdown (non-DBA) of all units, the remaining emergency ac power sources may be used as alternate ac power sources provided they meet the applicable requirements. If these criteria are not met, station blackout must be assumed on all the units.

Because many of the safety systems relied upon for reactor core decay heat removal and containment heat removal are dependent on ac power, the consequences of an SBO could be significant. In the event of an SBO, the capability to cool the reactor core is dependent on the availability of systems that do not rely upon ac power from the essential or nonessential switchgear buses for a specified time, and on the ability to restore ac power within the specified time. Unavailability of power can have a significant adverse impact on a plant's ability to achieve and maintain safe-shutdown conditions. In fact, risk analyses performed for nuclear power plants indicate that the loss of all ac power can be a significant contributor to the risk associated with plant operation, contributing more than 70 percent of the overall risk at some plants. Therefore, the frequency of a loss of offsite power (LOOP) and the time for subsequent restoration of offsite power are important inputs to plant risk models, and these inputs must reflect current industry performance in order for plant risk models to accurately estimate the risk associated with LOOP-initiated scenarios.

One important subset of LOOP-initiated scenarios involves SBO situations in which the affected plant achieves safe shutdown by relying on components that are not ac powered, such as turbine- or diesel-driven pumps. Thus, the reliability of such components, dc battery depletion times, and characteristics of offsite power restoration are important in determining risk from an SBO.

The SBO rule was developed based on insights gained from several plant-specific probabilistic safety studies; operating experience; and reliability, accident sequence, and consequence analyses completed between 1975 and 1988. One such study, WASH–1400, ''Reactor Safety Study,'' issued in 1975, indicated that SBO could be an important contributor to the total risk from nuclear power plant accidents. In 1980, the Commission designated the issue of SBO as Unresolved Safety Issue A–44, ''Station Blackout.'' The technical findings of the staff's studies of the SBO issue are presented in NUREG–1032, ''Evaluation of Station Blackout Accidents at Nuclear Power Plants, Technical Findings Related to Unresolved Safety Issue A–44,'' June 1988.

The final rule containing SBO requirements was published in the **Federal Register** (53 FR 23203) on July 21, 1988. The Commission issued the SBO rule based on operating experience suggesting that both onsite emergency ac power systems and offsite power from the transmission network might be less reliable than originally anticipated, even for plants designed to meet GDC 17 of appendix A to 10 CFR part 50. The objective of the rule is to reduce the risk of severe accidents resulting from SBO by maintaining highly reliable ac electric power systems and, as additional defense-in-depth, assuring that plants can cope with an SBO for a specified duration. NRC guidance for implementing the SBO rule can be found in Regulatory Guide 1.155, ''Station Blackout,'' August 1988 (RG 1.155), which endorses Nuclear Management and Resources Council (NUMARC) 8700, ''Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors,'' November 1987. Additional background regarding the SBO rule, its basis, and NRC guidance relating to SBO is referenced within RG 1.155.

The SBO rule requires that nuclear power plants have the capability to withstand an SBO and maintain core cooling and containment integrity for a specified duration. The specified SBO duration for a plant is determined based on (1) the redundancy of the onsite emergency ac power sources, (2) the reliability of the onsite emergency ac power sources, (3) the expected frequency of LOOP at the particular site, and (4) the probable time needed to restore offsite power. The assumption used for a LOOP at a plant site was an initiating event resulting from a switchyard-related or grid-related event due to random faults, or an external event, such as a grid disturbance, or weather events such as high winds, snow, and ice loading that affects the offsite power system either throughout the grid or at the plant. During the development of the current SBO rule, it was concluded that there was a sufficiently low likelihood of a LOOP generated by a fire, flood, or seismic activity and that preexisting licensing requirements specified sufficient protective measures such that LOOPs from such causes need not be considered under the SBO rule requirements (see NUREG–1032 and NUREG/CR–3226 for further detail).

In order to meet the requirements of the SBO rule and depending on the station's existing capability, some stations were modified (i.e., by adding an alternate ac power source or increasing the capacity of the station batteries, plant/instrument air system, or condensate storage tank) in order to cope with the longer station blackout duration. In addition, licensees enhanced station procedures and training for restoring both offsite and onsite ac power sources. The NRC and its licensees also increased their emphasis on establishing and maintaining high reliability of onsite emergency power sources. The SBO rule does not require systems and equipment used to cope with SBO to meet 10 CFR part 50 quality assurance requirements for safety-related equipment; instead, Appendix A of RG 1.155 provides the applicable quality assurance guidance for non-safety systems and equipment used to meet the SBO rule requirements.

Once the NRC has approved the ''specified duration'' of an SBO and the coping analysis for a particular facility, the SBO rule does not require licensees to update either the specified duration or the coping analyses. However, the parameters that were used for inputs into both the determination of the specified duration and the SBO coping analysis are subject to change over time. These parameters include the number of LOOP events expected at a particular site, recovery time for offsite power, frequency of grid blackout events, and diesel generator reliability. Changes to these parameters may have a significant effect on the SBO duration and coping analyses originally performed by the licensees. Nonetheless, if the NRC determines that a licensee's plans for coping with an SBO are no longer adequate, the NRC could require a licensee to modify its SBO plans or related equipment as necessary, so long as the NRC satisfies the requirements of the Backfit Rule (10 CFR 50.109).

C. Petition for Rulemaking on Station Blackout Due to Coronal Mass Ejection

The NRC has received a petition for rulemaking (PRM–50–96) from Thomas Popik (the petitioner) that deals with long-term cooling and unattended water makeup of SFPs due to potential long term grid loss stemming from extreme

solar activity (76 FR 26223, dated May 6, 2011). The petitioner believes that a widespread and prolonged grid outage of a year or longer is possible and could result in degradation of societal infrastructure to the extent that normal, commercial deliveries of diesel fuel to reactor sites could not be relied upon. In this scenario, grid failure might lead to a delayed SBO when onsite fuel for emergency diesel generators was exhausted. The NRC has not yet completed its evaluation of PRM–50–96 and it is unclear whether there are any implications for the SBO rulemaking activity which is the subject of this ANPR. Persons interested in the NRC action on PRM–50–96 may follow the NRC activities at the regulations.gov Web site under the docket heading NRC–2011–0069. Pending further evaluation of PRM–50–96, the SBO rulemaking activity will proceed independently.

D. Mitigating Strategies

Following the terrorist attacks of September 11, 2001, the NRC ordered licensees to develop and implement specific guidance and strategies to maintain or restore core cooling, containment, and SFP cooling capabilities using existing or readily available resources that can be effectively implemented under the circumstances associated with loss of large areas of the plant due to explosions or fire. After further development, these requirements were imposed as license conditions for individual licensees and formalized in the rulemaking of March 27, 2009, in 10 CFR 50.54(hh)(2) (74 FR 13969). Events at the Fukushima Dai-ichi Nuclear Power Station following the March 11, 2011, earthquake and tsunami highlighted the further potential benefits for these same strategies to mitigate the effects of prolonged SBOs or other events that may challenge core cooling, containment, and spent fuel pool cooling.

IV. Discussion and Request for Public Comment

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 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?

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?

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 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?

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.

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.

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.

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 loss of all ac, including ac from the dc batteries through inverters? Please provide the basis for your position.

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?

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 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.

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.

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.

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:

(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.

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.

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.

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.

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:

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?

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?

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?

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.

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.

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.

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.

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?

6. If new requirements under the items above were to be imposed for existing licensees or with respect to existing certified designs, what sort of benefits and costs do stakeholders estimate could be incurred?

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.

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) 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 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.

V. Public Meeting

The NRC plans to hold a category 3 public meeting with stakeholders during the ANPR public comment period. The public meeting is intended to provide a forum to discuss the ANPR with external stakeholders and inform stakeholder views on SBO mitigation to enable stakeholders to provide feedback. The meeting is not intended for the NRC to receive comments and instead the NRC will encourage stakeholders to provide any comments in written form. To support full participation of stakeholders, the staff plans to provide teleconferencing and Webinar access. The NRC does not intend to transcribe the meeting. The NRC will issue the public meeting notice at least 10 days prior to the public meeting. Stakeholders should monitor the NRC's public meeting Web site: *http://www.nrc.gov/public-involve/public-meetings/index.cfm.*

VI. Rulemaking Process

The NRC does not intend to provide detailed comment responses for information provided in response to this ANPR. The NRC will consider timely comments on this ANPR in the rule development process. If the NRC ultimately develops a proposed rule on SBO requirements, any notice of proposed rulemaking will provide an opportunity to comment on the proposed rule, and the NRC will document its responses to any comments received in accordance with the notice. If supporting guidance is developed for a proposed rule, stakeholders will have an opportunity to provide feedback on the guidance as well.

VII. Availability of Supporting Documents

The following documents provide additional background and supporting information regarding this rulemaking activity. The documents can be found using any of the methods provided in the table. Instructions for accessing ADAMS were provided under the **ADDRESSES** section of this document.

Date	Document	ADAMS Accession No./Web link/**Federal Register** citation
July 12, 2011	SECY–11–0093, ''The Near-Term Report and Recommendations for Agency Actions following the Events in Japan''.	ML111861807.
August 19, 2011	Staff Requirements—SECY–11–0093, ''The Near-Term Report and Recommendations for Agency Actions following the Events in Japan''.	ML112310021.
July 26, 2011	PRM–50–101, Petition for Rulemaking to Revise 10 CFR 50.63	*http://www.regulations.gov* by searching on Docket ID NRC–2011–0189.
September 9, 2011	SECY–11–0124, ''Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report''.	ML11245A127, ML11245A144.
October 18, 2011	Staff Requirements—SECY–11–0124, ''Recommended Actions to be Taken Without Delay From The Near-Term Task Force Report''.	ML112911571.
October 3, 2011	SECY–11–0137, ''Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned''.	ML11272A203, ML11269A204.
December 15, 2011	Staff Requirements—SECY–11–0137, ''Prioritization of Recommended Actions to be Taken in Response to the Fukushima Lessons Learned''.	ML113490055.

Date	Document	ADAMS Accession No./Web link/**Federal Register** citation
January 28, 1971	SECY–R–143, ''Amendment to Title 10 of the Code of Federal Regulations (10 CFR) Section 50—General Design Criteria for Nuclear Power Plants''.	ML072420278.
July 11, 1967	General Design Criteria for Nuclear Power Plant Construction Permits.	32 FR 10213.
May 1980	NUREG–75/087, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition.	ML042080088.
May 2010	NUREG–0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition, Section 8.2, ''Offsite Power System''.	ML100740246.
October 1975	WASH–1400 (NUREG–75/014), Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants.	ML072350618.
June 1988	NUREG–1032, ''Evaluation of Station Blackout Accidents at Nuclear Power Plants, Technical Findings Related to Unresolved Safety Issue A–44''.	Accessible from U. S. Department of Energy's Information Bridge at *http://www.osti.gov/bridge/purl.cover.jsp?purl=/5122568-gvK0cy/5122568.pdf.*
March 21, 1986	Notice of Proposed Rulemaking: Station Blackout (10 CFR 50.63) ..	51 FR 9829.
June 21, 1988, Sept. 22, 1998	Station Blackout (10 CFR 50.63)	53 FR 23203, 63 FR 50480.
March 27, 2009	10 CFR 50.54(hh)(2)	74 FR 13969.
March 23, 2011	Tasking Memorandum from Chairman Gregory B. Jaczko to the Executive Director for Operations (COMGBJ–11–0002): NRC Actions Following the Events in Japan.	ML110950110.
November 2011	INPO–11–005, ''Special Report on the Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station''.	ML11347A454.
March 15, 2011	PRM–50–96	*http://www.regulations.gov* by searching on Docket ID NRC–2011–0069. 76 FR 26223.
February 20, 1971	Amendment to 10 CFR Part 50—General Design Criteria For Nuclear Power Plants.	36 FR 3256.
July 6, 1970	Status Report On General Design Criteria	ML003726549.
August 28, 2007	Appendix A to Part 50—General Design Criteria for Nuclear Power Plants.	72 FR 49505.
April 1, 2002	Staff Guidance on Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout (SBO) Rule (10 CFR 50.63) for License Renewal (10 CFR 54.4(a)(3)).	ML020920464.
August 28, 2007	Final Rule: Licenses, Certifications, and Approvals for Nuclear Power Plants.	72 FR 49352.
December 16, 2011	NEI Submittal of An Integrated, Safety-Focused Approach to Expediting Implementation of Fukushima Daiichi Lessons Learned.	ML11353A008.
October 13, 2011	Initial ACRS Review of: (1) the NRC Near-Term Task Force Report on Fukushima and (2) Staff's Recommended Actions to be Taken Without Delay.	ML11284A136.
August 1988	NRC Regulatory Guide 1.155, ''Station Blackout''	ML003740034.
November 1987	''Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors,'' NUMARC 8700.	ML12074A007.

Dated at Rockville, Maryland, this 12th day of March 2012.

For the Nuclear Regulatory Commission.

R.W. Borchardt,

Executive Director for Operations.

[FR Doc. 2012–6665 Filed 3–19–12; 8:45 am]

BILLING CODE 7590–01–P

DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket No. EERE–2011–BT–NOA–0013]

Energy Conservation Program: Data Collection and Comparison With Forecasted Unit Sales of Five Lamp Types

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of data availability.

SUMMARY: The U.S. Department of Energy (DOE) is informing the public of its collection of shipment data and creation of spreadsheet models to provide comparisons between actual and benchmark estimate unit sales of five lamp types (*i.e.,* rough service lamps, vibration service lamps, 3-way incandescent lamps, 2,601–3,300 lumen general service incandescent lamps, and shatter-resistant lamps), which are currently exempt from energy conservation standards. As the actual sales do not exceed the forecasted estimate by 100 percent for any lamp type (*i.e.,* the threshold triggering a rulemaking for an energy conservation standard for that lamp type has not been exceeded), DOE has determined that no regulatory action is necessary at this time. However, DOE will continue to track sales data for these exempted lamps. Relating to this activity, DOE has prepared, and is making available on its Web site, a spreadsheet showing the comparisons of anticipated versus actual sales, as well as the model used to generate the original sales estimates. The spreadsheet is available at: *http://www1.eere.energy.gov/buildings/appliance_standards/residential/five_lamp_types.html.*

FOR FURTHER INFORMATION CONTACT: Ms. Lucy deButts, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies, EE–2J, 1000 Independence Avenue SW., Washington, DC 20585–0121. Telephone: (202) 287–1604. Email: *Lucy.Debutts@ee.doe.gov.*