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## RULEMAKING ISSUE

(Affirmation)

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July 31, 2014

SECY-14-0081

FOR: The Commissioners

FROM: Mark A. Satorius  
Executive Director for Operations

SUBJECT: FINAL RULE: ECONOMIC SIMPLIFIED BOILING-WATER REACTOR  
DESIGN CERTIFICATION

PURPOSE:

The purpose of this paper is to obtain the Commission's approval to publish in the *Federal Register* (FR) the enclosed final rule that amends Part 52 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Licenses, Certifications, and Approvals for Nuclear Power Plants," to certify the Economic Simplified Boiling-Water Reactor (ESBWR) standard design.

SUMMARY:

GE-Hitachi Nuclear Energy (GEH) submitted an application for certification of its ESBWR standard design in August 2005. The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the ESBWR standard design and published NUREG-1966, "Final Safety Evaluation Report Related to the Certification of the Economic Simplified Boiling-Water Reactor Standard Design," in April 2014. A draft Supplement No. 1 to NUREG-1966 will be made final and published upon Commission approval.

A proposed rule to certify the ESBWR design was published in the FR on March 24, 2011, for public comment. The NRC received 10 comment submissions on the proposed rule. A supplemental proposed rule was published in the FR on May 6, 2014, for public comment. The

CONTACT: George M. Tartal, NRO/DARR  
301-415-0016

supplemental proposed rule provided an opportunity for the public to comment on proposed changes related to the analysis methodology supporting the ESBWR steam dryer design and the NRC's proposed clarification of its intent to treat 50 referenced documents within Revision 10 of the ESBWR design control document (DCD) as requirements and matters resolved in subsequent licensing and enforcement actions for plants referencing the ESBWR design certification. The NRC received no public comments on the supplemental proposed rule.

After considering public comments on the proposed rule, and based on its safety review of the design, the staff concludes that the ESBWR design certification rule (DCR) meets all applicable requirements in 10 CFR 52.54, "Issuance of standard design certification," and meets the requirements of 10 CFR 50.150, "Aircraft impact assessment." Therefore, the staff seeks Commission approval to publish in the FR a final rule certifying the ESBWR design.

#### BACKGROUND:

GEH submitted an application for certification of its ESBWR standard design on August 24, 2005, and the NRC published a notice of receipt of the application in the FR (70 FR 56745; September 28, 2005). The staff completed its review of the ESBWR standard design and issued a final safety evaluation report (FSER) in March 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103470210). The staff also issued a standard design approval (SDA), "Final Design Approval for the Economic Simplified Boiling Water Reactor" (ADAMS Accession No. ML110540310) for the ESBWR design in March 2011. On March 24, 2011 (76 FR 16549), the NRC published in the FR a proposed DCR for the ESBWR standard plant design. The FR notice provided the public an opportunity to comment on the proposed DCR, the ESBWR DCD (Revision 9), and the draft environmental assessment (EA). The public comment period for the proposed rule closed on June 7, 2011.

After the close of the public comment period on the 2011 proposed rule, the staff identified concerns with the ESBWR steam dryer analysis methodology (ADAMS Accession No. ML120170304). The staff performed an audit of the steam dryer documentation in March 2012 and subsequently issued several requests for additional information (RAIs). GEH revised certain technical documents and the DCD (to Revision 10) to resolve these concerns. The staff reviewed the responses to the RAIs and revised documents and developed an advanced supplemental safety evaluation report (SER) (ADAMS Accession No. ML14043A134). As a result of its review, the staff concluded that the ESBWR steam dryer design meets all applicable NRC requirements and can be incorporated by reference in a combined license (COL) application.

Although the staff issued the original FSER in March 2011, it did not publish the FSER until April 2014 as NUREG-1966, "Final Safety Evaluation Report Related to Certification of the ESBWR Standard Design" (ADAMS Accession No. ML14100A304). In addition, the staff issued the advanced supplemental FSER on April 17, 2014, in order to support the supplemental proposed rule. However, the staff will not publish the supplemental FSER as Supplement No. 1 to NUREG-1966 (ADAMS Accession No. ML14155A333) until it has received Commission approval (the "Regulatory and Policy Issues," and "Technical Issues" sections of this paper discuss this topic further). In response to GEH's request in a letter sent to the NRC on June 3, 2014 (ADAMS Accession No. ML14154A094), the staff will withdraw the March 2011 SDA after publication of the final rule.

As of July 2014, the ESBWR design certification application has been referenced in the following COL applications:

COL Name	Docket Date	Docketing FR Citation
Fermi Unit 3	December 2, 2008	73 FR 73350
North Anna Unit 3	February 4, 2008	73 FR 6528
Grand Gulf Unit 3 <sup>1</sup>	April 24, 2008	73 FR 22180
River Bend Unit 3 <sup>1</sup>	December 10, 2008	73 FR 75141
Victoria County Station Units 1 and 2 <sup>2</sup>	November 6, 2008	73 FR 66059

<sup>1</sup> Application suspended.

<sup>2</sup> Application withdrawn.

## DISCUSSION:

### Public Comments

The NRC received four unique comment submissions on the proposed rule during the public comment period. Of those commenters, one commenter was in favor of the DCR and three commenters were opposed. The NRC also received six filings, five of which were self-characterized as “petitions” and one of which was a responsive filing to the “petitions.” One of those petitions was received after the close of the public comment period, on August 15, 2011. As stated in the proposed rule, comments received after June 7, 2011, “will be considered if it is practical to do so, but assurance of consideration cannot be given” to comments received after this date. The staff determined to treat the “petition” as a late-filed comment submission, and that it was practical to consider it. This comment opposed issuance of the final ESBWR rule.

Thereafter, on September 9, 2011, the Commission issued a *Memorandum and Order*, CLI-11-05, 74 NRC 141 (2011) (this decision is available on the NRC Web site in Volume 74 at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0750/>), on a series of petitions seeking suspension of adjudicatory, licensing, and rulemaking activities, including the ESBWR design certification rulemaking, in light of then-recent events at the Fukushima Dai-ichi Nuclear Power Station. Among other things, the Commission denied the requests in some of those petitions to suspend or postpone the ESBWR rulemaking, and referred the five petitions and associated filing to the staff “for consideration,” as comments on the ESBWR design certification rulemaking. *Id.* at 175-176. This included the one late-filed “petition” which the staff had already decided to consider in the ESBWR rulemaking. In accordance with the Commission’s direction, these five self-characterized “petitions” and the responsive filing to those “petitions” are treated as comment submissions in the ESBWR rulemaking in a manner consistent with other comment submissions filed in the ESBWR rulemaking.

The NRC did not receive any public comment submissions on the supplemental proposed rule. The enclosed *Federal Register* notice (FRN) summarizes the comments in the comment submissions and presents the NRC’s responses. None of the public comments resulted in a change to the final rule, the DCD, the EA, or the FSER.

## Regulatory and Policy Issues

The regulatory and policy issues that were addressed in the March 2011 proposed rule are: (1) access to safeguards information (SGI) and sensitive unclassified non-safeguards information (SUNSI), and (2) human factors engineering (HFE) operational program elements exclusion from finality. An additional regulatory and policy issue addressed in the May 2014 supplemental proposed rule is incorporation by reference of public documents and issue resolution associated with non-public documents. The NRC provided an opportunity for public comment in the supplemental proposed rule on the issue resolution associated with non-public documents, but not for incorporation by reference of public documents. A number of regulatory and policy issues were not included in either the March 2011 proposed rule or the May 2014 supplemental proposed rule. These are: (1) how the ESBWR design addresses Fukushima Near-Term Task Force (NTTF) recommendations, (2) changes to Tier 2\* information, (3) change control for severe accident design features, and (4) other changes to the ESBWR rule language and difference from other DCRs. Each of these topics is discussed below and in the enclosed FRN for the final rule. Some of the regulatory and policy issues discussed below arose after the close of the public comment period on the March 24, 2011, proposed rule. The public was afforded an opportunity to comment on some of these issues in the May 6, 2014, supplemental proposed rule. The "Rulemaking Procedure" section of this document describes the NRC's bases for not offering a supplemental comment opportunity for any of the other regulatory and policy issues that arose after the close of the public comment period on the proposed rule.

*How the ESBWR Design Addresses Fukushima Near-Term Task Force Recommendations*

The application for certification of the ESBWR design was prepared and submitted, and the staff's review of the application was completed, before the March 11, 2011, Great Tohoku earthquake and tsunami and subsequent events at the Fukushima Dai-ichi Nuclear Power Plant in Japan. The Commission created a NTTF to conduct an analysis of the lessons that can be learned from the event. The NTTF issued a report under SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," (ADAMS Accession No. ML11186A950), dated July 12, 2011, evaluating then-currently available technical and operational information from the events, and presented a set of recommendations to the Commission. The NTTF concluded that by the nature of its passive design and inherent 72-hour coping capability, the ESBWR design has many of the design features and attributes necessary to address the NTTF recommendations. The NTTF supported completing the ESBWR design certification rulemaking activity without delay (see pages 71-72 of the report).

In an August 19, 2011, Staff Requirements Memorandum (SRM) (ADAMS Accession No. ML112310021), the Commission set forth actions related to the NTTF report together with a schedule for the conduct of those actions. Two of those actions have been completed and are documented in the following reports: "Recommended Actions to Be Taken Without Delay from the Near-Term Task Force Report," September 9, 2011 (SECY-11-0124) (ADAMS Accession No. ML11245A158), and "Prioritization of Recommended Actions to be Taken In Response to Fukushima Lessons Learned," October 3, 2011 (SECY-11-0137) (ADAMS Accession No. ML11272A111). Further, on February 12, 2012, in SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," the staff recommended issuing orders to licensees to

address certain requirements related to the NTTF recommendations and indicated its intent to address similar requirements in its reviews of pending and future design certification applications. The Commission approved the staff's recommendations with some modifications, and the NRC issued Orders EA-12-049 and EA-12-051 (ADAMS Accession Nos. ML12054A735 and ML12054A679, respectively) on March 12, 2012.

The NTTF recommendations relevant to the ESBWR design certification are limited to mitigation strategies for beyond-design-basis external events (Recommendation 4.2) and spent fuel pool instrumentation (Recommendation 7.1). The staff considered how the ESBWR design addresses the underlying purpose of the requirements in the Commission's Orders. As described in the enclosed FRN, the ESBWR design satisfies the underlying purpose of the Orders, except in two limited areas related to spent fuel pool instrumentation – (1) that the instrumentation is designed to allow the connection of an independent power source, and (2) that the instrumentation will maintain its design accuracy following a power interruption or change in power source without recalibration. Further, the staff has engaged with the COL applicants referencing the ESBWR design to ensure they address the appropriate design functions to fully satisfy the underlying purpose of the Orders. As a result, the staff recommends that the Commission approve the final rule with an exclusion from issue finality and issue resolution with respect to these two matters. The exclusion would allow the Commission to require those functions in a future, generically-applicable rulemaking without having to address issue finality of the ESBWR design in that specific area. Notwithstanding the exclusion, the staff has engaged with the relevant COL applicants to ensure they also address these functions.

On April 17, 2014, the staff updated the Commission in SECY-14-0046, "Fifth 6-Month Status Update on Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami," (ADAMS Accession No. ML14064A523) on the current status of actions related to the NTTF recommendations. The staff does not foresee any near-term actions that would warrant consideration within the ESBWR design at this time.

Based on the considerations discussed above, the staff concludes that the ESBWR design adequately addresses the relevant NTTF recommendations and the underlying purpose of the related orders, and that no changes to the ESBWR design are required at this time to provide reasonable assurance of adequate protection of public health and safety. Therefore, the Commission may proceed with the issuance of the ESBWR DCR. If the Commission determines that additional design changes to the ESBWR are necessary or desirable, the NRC has the authority to impose such changes on the DCR and any nuclear power plant referencing the design (although the necessary Commission findings to support such action would need to be made). The bases for the staff's determinations with respect to the need for a supplemental opportunity for public comment with respect to these matters are discussed below under the "Rulemaking Procedure" section of this paper.

*Incorporation by Reference for Public Documents and Issue Resolution Associated with Non-Public Documents*

In Section III, "Scope and Contents," of the proposed ESBWR design certification rule, the only document for which the NRC proposed to obtain approval from the Office of the Federal Register (OFR) for incorporation by reference into the ESBWR design certification rule was the ESBWR DCD, Revision 9 (DCD Revision 9). Such approval would make DCD Revision 9 a

legally-binding requirement on any referencing combined license applicant and holder by virtue of publication in the *Federal Register* as a final rule. This was based upon the assumption that the DCD specified all necessary requirements in Tier 1 and Tier 2 (with the exception of non-public documents containing proprietary information, security-related information, and SGI).

After the close of the public comment period, the staff recognized that Tier 2, Section 1.6, “Material Incorporated by Reference and General Reference Material,” of the ESBWR DCD states that a number of documents are “incorporated by reference” into Tier 2 of the ESBWR, and which contain information intended to be requirements. These documents were listed in Tables 1.6-1, “Referenced GE/GEH Reports,” and 1.6-2 “Referenced non-GE/GEH Topical Reports,” of the DCD Revision 9. Although some of the documents contain information which are intended to be requirements, neither the DCD nor the proposed design certification rule clearly stated which of these documents were intended as requirements. Documents intended as requirements (and which are publicly available) should have been listed in Section III of the ESBWR design certification rule as being approved for incorporation by reference by the Director of OFR. Tables 1.6-1 and 1.6-2 also included documents which, although “incorporated by reference” into DCD Revision 9, were not intended to be requirements but were references “for information only.” Thus, the ESBWR proposed rule did not clearly differentiate between these two different classes of documents. Finally, Tables 1.6-1 and 1.6-2 of DCD Revision 9 included both publicly-available documents and non-publicly available documents,<sup>1</sup> but for some of the documents which were not publicly available, GEH had not created a publicly-available version of that document to support the public comment process. The creation of publicly-available versions of non-public documents to support the public commenting process and transparency has been a long-standing practice for both design certification rulemakings and in licensing.

To address the staff’s concerns, for those non-public documents which include information intended to be treated as requirements and for which a publicly-available version was not previously created, GEH created publicly-available versions of those non-public documents. GEH also submitted Revision 10 to the DCD (DCD Revision 10), which included three tables in Section 1.6 which supersede Tables 1.6-1 and 1.6-2 in DCD Revision 9. These three tables, Tables 1.6-1, “GE/GEH Reports Incorporated by Reference,” 1.6-2, “Non-GE/GEH Reports Incorporated by Reference,” and 1.6-3, “Referenced Reports (not Incorporated by Reference),” collectively clarify which documents are intended to be requirements and which documents are references only.

The supplemental proposed rule (79 FR 25715; May 6, 2014): 1) announced the availability of DCD Revision 10; 2) described the distinction between those documents intended as requirements versus those which were for information only; 3) requested public comments on the NRC’s intent to treat 50 non-public, referenced documents in DCD Revision 10 (listed in Table 2 of the supplemental proposed rule) as requirements and matters resolved in subsequent licensing and enforcement actions for plants referencing the ESBWR design certification; and 4) clarified, but did not request public comments on, the NRC’s intent to obtain approval for incorporation by reference from the Director of the Office of the Federal Register for both DCD Revision 10 and the 20 publicly-available documents, referenced in DCD Revision 10 (listed in Table 3 of the supplemental proposed rule), which are intended by the NRC to be

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<sup>1</sup> The non-publicly available documents contain proprietary, security-related, and/or safeguards information.

requirements. The bases for the staff's determinations with respect to the need for a supplemental opportunity for public comment with respect to these matters are discussed below under the "Rulemaking Procedure" section of this paper.

#### *Changes to Tier 2\* Information*

The staff proposes three changes from the proposed rule with respect to Tier 2\* matters under Section VIII, "Processes for Changes and Departures," of the ESBWR rule language. First, paragraph VIII.B.6.c.(1) is changed from "ASME Boiler and Pressure Vessel Code, Section III" to "ASME Boiler and Pressure Vessel Code, Section III, Subsections NE (Division 1) and CC (Division 2) for containment vessel design." Second, paragraph VIII.B.6.c.(3) is changed from "Motor-operated valves" to "Power-operated valves." Third, paragraph VIII.B.6.c.(8), "Steam dryer analysis methodology," is added consistent with the discussion of the changes to the steam dryer analysis methodology described below in this paper. These changes are necessary to conform the proposed rule text to Revision 10 of the ESBWR DCD. The bases for the staff's determinations with respect to the need for a supplemental opportunity for public comment with respect to the first two matters are discussed below under the "Rulemaking Procedure" section of this paper. The staff provided a supplemental opportunity for public comment with respect to the third matter, in connection with the changes to the steam dryer analysis methodology described under the "Technical Issues" section of this paper, and received no public comments.

#### *Change Control for Severe Accident Design Features*

The Supplementary Information section of the amendment to 10 CFR Part 52 (72 FR 49352, at 49394; August 28, 2007) states that the Commission codified separate criteria in paragraph B.5.c of Section VIII of each DCR for determining if a departure from design information that resolves these severe accident issues would require a license amendment. Originally, the final rule was applied specifically to changes to ex-vessel severe accident design features. In the SRM to SECY-12-0081, "Risk-Informed Regulatory Framework for New Reactors," dated October 22, 2012 (ADAMS Accession No. ML12296A158), the Commission directed the staff to make the change process in paragraph B.5.c of Section VIII applicable to severe accident design features, both ex-vessel and non-ex-vessel, that are described in the plant-specific DCD. This policy was changed after issuance of the proposed ESBWR rule. The policy was changed to ensure that, for changes to Tier 2 information, the effects on all severe accident design features – and not just ex-vessel severe accident design features – are considered.

However, the staff did not change the rule language in paragraph B.5.c of Section VIII for the ESBWR rulemaking because all of the relevant severe accident design features (i.e., those that are non-ex-vessel) are Tier 1 information. Tier 1 information, by definition, includes change controls in Section VIII of the rule text that meet the underlying purpose of the Commission's direction. Therefore, this change was not necessary for the ESBWR design certification.

#### *Access to Safeguards Information and Sensitive Unclassified Non-Safeguards Information*

Paragraph E of Section VI, "Issue Resolution," of the ESBWR rule language describes the procedure that an interested member of the public must follow to obtain access to SGI and SUNSI for the ESBWR design to request and participate in proceedings that involve licenses

and applications that reference the ESBWR design. The language in paragraph IV.E represents a change from the comparable language in the first four design certification rules as initially certified, but is consistent with the final rules amending two of those designs: the Advanced Boiling Water Reactor (76 FR 78096; December 16, 2011) and AP1000 (76 FR 82079; December 30, 2011) design certifications.

*Human Factors Engineering Operational Program Elements Exclusion from Issue Finality and Issue Resolution*

In the December 6, 1996, SRM (ADAMS Accession No. ML003754873) to SECY-96-077, "Certification of Two Evolutionary Designs," dated April 15, 1996, the Commission set forth a policy that operational programs should be excluded from finality except where necessary to find design elements acceptable. For HFE programs for the ESBWR standard design, the Commission is implementing this policy in a manner different than for other existing DCRs. The difference in treatment of HFE for the ESBWR design arises from the level of detail of HFE review for the ESBWR as compared to earlier certified standard designs. For the earlier designs, the staff reviewed the HFE programs at a "programmatic" level of design, while for the ESBWR, the staff reviewed the HFE programs at a more detailed "implementation plan" level of design. In providing this additional detail, GEH addressed existing NRC guidelines in NUREG-0711, Revision 2, "Human Factors Engineering Program Review Model," which are comprehensive and go beyond the operational program information needed as input to the HFE design. Therefore, GEH included, in the DCD, details on two HFE operational program elements (procedures and training) that are not used to determine the adequacy of the HFE. In keeping with the established Commission policy of not approving operational program elements through design certification except where necessary to find design elements acceptable, the NRC is excluding these two HFE operational program elements in the ESBWR DCD from the scope of the design approved in the rule. This is done explicitly in Section VI of the ESBWR rule, by excluding the two HFE operational program elements from the issue finality and issue resolution accorded to the design. In addition, the training and procedure elements included in the HFE program are redundant to what is reviewed as part of the operational programs described in Chapter 13, "Conduct of Operations," of the Standard Review Plan (SRP). Accordingly, the NRC is revising the HFE regulatory guidance in NUREG-0711, Revision 3, "Human Factors Engineering Program Review Model," to address this overlap, but the corresponding revision to the SRP has not yet been completed. This exclusion is unique to the ESBWR design because all other DCDs for the previously certified designs do not include operational program descriptions of HFE procedures and training, and the respective DCRs did not include specific exclusions from issue finality and issue resolution for them. This exclusion from issue finality and issue resolution was addressed in the proposed ESBWR DCR and the NRC received no public comments on this issue.

*Other Changes to the ESBWR Rule Language and Differences between the ESBWR Rule and Other DCRs*

There are two substantive areas where this DCR differs from existing DCRs as recently amended. The staff is making the Commission aware of these differences because they differ from the rule language that was included in the proposed rule or from other DCRs. These matters are described in further detail in Section III.G of the enclosed FRN.



### *Design Acceptance Criteria (DAC)*

The use of DAC for the ESBWR design is consistent with the policy implemented in all previous design certifications. The ESBWR DCD includes DAC in the areas of piping, digital instrumentation and controls (I&C), and HFE. The DAC provided in Tier 1 and Tier 2 of the DCD, including the design information and appropriate design methodologies, codes, and standards, provide sufficient detail to provide an adequate basis for the NRC to make a final safety determination. The use of DAC for the ESBWR design is described in Section 14.3, "Inspections, Tests, Analyses and Acceptance Criteria," of the DCD Tier 2. Chapters 3, 7, and 18 of the DCD describe the piping, digital I&C, and HFE design methodologies, codes, and standards, respectively.

### Technical Issues

The NRC issued an FSER for the ESBWR design in March 2011, and subsequently published the FSER as NUREG-1966 in April 2014. The NRC issued an advanced supplemental SER in April 2014 and plans to publish Supplement No. 1 to NUREG-1966 before the final rule becomes effective. The FSER and its supplement provide the basis for issuance of a design certification under Subpart B to 10 CFR Part 52.

The significant technical issues that were resolved during the initial review of the ESBWR design (i.e., the staff's review of Revision 9 of the ESBWR DCD and development of an FSER) are: (1) regulatory treatment of nonsafety systems, (2) containment performance, (3) control room cooling, (4) feedwater temperature operating domain, (5) steam dryer analysis methodology, (6) aircraft impact assessment, (7) the use of American Society of Mechanical Engineers (ASME) Code Case N 782, and (8) an exemption for the Safety Parameter Display System. These topics were all discussed in the FRN for the proposed rule and are also discussed in the enclosed FRN for the final rule. With the exception of the steam dryer analysis methodology, these are not discussed further in this paper as their resolution has not changed since the proposed rule.

After publishing the proposed rule, the NRC addressed several issues that were changed in Revision 10 of the DCD or required a change to the FSER. The staff reviewed these changes and developed a supplemental FSER as described above. The issues that are addressed in the supplemental FSER are: (1) steam dryer analysis methodology, (2) loss of one or more phases of offsite power, (3) spent fuel assembly integrity in spent fuel racks, (4) Turbine Building Offgas System design requirements, (5) ASME Boiler and Pressure Vessel (BPV) Code statement in Chapter 1 of the ESBWR DCD, and (6) clarification of ASME component design inspections, tests, analyses, and acceptance criteria (ITAACs). The NRC also made changes to the supplemental FSER after the publication of the supplemental proposed rule. These topics are discussed below and in the enclosed FRN for the final rule.

Also after publication of the proposed rule, the NRC addressed two issues that were not addressed in Revision 10 of the DCD or in a supplemental FSER. These issues are: (1) hurricane-generated winds and missiles, and (2) changes to Tier 2\* information. These topics are also discussed below and in the enclosed FRN for the final rule. Some of the technical issues discussed below arose after the close of the public comment period on the March 24, 2011, proposed rule. The public was afforded an opportunity to comment on some of

these issues in the May 16, 2014, supplemental proposed rule. The “Rulemaking Procedure” section of this document describes the NRC’s bases for not offering a supplemental comment opportunity for any of the other technical issues that arose after the close of the public comment period on the proposed rule.

### *Steam Dryer Analysis Methodology*

In its March 2011 FSER, the staff described its review of the GEH methodology used to demonstrate the steam dryer structural integrity as described in Revision 9 of the ESBWR DCD and four referenced topical reports on which the staff had issued separate SERs. The staff concluded that the methodology was technically sound and provided a conservative analytical approach for definition of flow-induced acoustic pressure loading on the steam dryer, and that the design provided assurance of the structural integrity of the steam dryer and demonstrated conformance with General Design Criteria (GDC) 1, “Quality Standards and Records,” 2, “Design Bases for Protection Against Natural Phenomena,” and 4, “Environmental and Dynamic Effects Design Bases.” The NRC received no public comments on the proposed rule with respect to the steam dryer analysis methodology.

Following the publication of the proposed rule, the staff identified safety issues applicable to the ESBWR steam dryer structural analysis based on information obtained during the NRC’s review of a license amendment request for a power uprate at an operating boiling water reactor nuclear power plant. Consequently, the staff communicated to GEH in a letter dated January 19, 2012, (ADAMS Accession No. ML120170304) that it was concerned that the bases for its FSER on the ESBWR DCD and its SERs on several applicable GEH topical reports were no longer valid. Specifically, errors were identified in the benchmarking GEH used as a basis for determining fluctuating pressure loading on the steam dryer, and errors were identified in a number of GEH’s modeling parameters. The staff subsequently issued RAIs and held multiple public meetings and non-public meetings (in which the staff and GEH discussed GEH proprietary information) to clarify and discuss the safety issues with the ESBWR steam dryer analysis methodology. The staff also conducted an audit of the GEH steam dryer analysis methodology at the GEH facility in Wilmington, North Carolina, in March 2012, and a vendor inspection, at that facility, of the quality assurance program for GEH engineering methods in April 2012.

To document the resolution of those issues, GEH revised the ESBWR DCD and created three new engineering reports to replace the four existing licensing topical reports. GEH revised the DCD to correct errors and provide additional information related to the design and evaluation of the structural integrity of the ESBWR steam dryer. The revisions to these documents enhance the detailed design and evaluation process related to the structural integrity of the ESBWR steam dryer in several ways, including changing the source of data used to benchmark the analysis methodology, making the details of the design methodology more restrictive, designating additional information as Tier 2\*, and clarifying regulatory process steps for completing the detailed design and startup testing of the ESBWR steam dryer.

The staff reviewed the revised ESBWR DCD sections, new GEH engineering reports, and RAI responses and prepared an advanced supplemental SER. The advanced supplemental SER concluded that: (1) Revision 10 to the ESBWR DCD and the referenced engineering reports provide sufficient information to support the adequacy of the design basis for the ESBWR reactor vessel internals, (2) the design process for the ESBWR reactor vessel internals is acceptable and meets the requirements of 10 CFR Part 50, Appendix A, GDCs 1, 2, 4, and 10;

10 CFR 50.55a; and 10 CFR Part 52, and (3) the design documentation for the ESBWR reactor vessel internals in Revision 10 to the ESBWR DCD is acceptable and GEH's application for the ESBWR design certification meets the requirements of 10 CFR Part 52, Subpart B, that are applicable and technically relevant to the ESBWR standard plant design. The staff concludes, based on its review of the application materials discussed in the FSER as modified by the advanced supplemental SER, that the ESBWR steam dryer design meets all applicable NRC requirements and may be incorporated by reference in a COL application.

The March 2011 proposed rule and the May 2014 supplemental proposed rule provided an opportunity for public comment on the GEH evaluation methodology supporting the ESBWR steam dryer design. The NRC did not receive any comments on either the proposed rule or the supplemental proposed rule related to the ESBWR steam dryer analysis methodology.

The staff briefed the Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on the ESBWR Design Certification on March 5, 2014, and the ACRS Full Committee on April 10, 2014, on its detailed review of the ESBWR steam dryer analysis methodology, including the significant improvements to the GEH Plant-Based Load Evaluation methodology for the ESBWR steam dryer to resolve the technical issues with the reliability of the methodology. During the ACRS Subcommittee briefing, the Committee suggested that the staff change the advanced supplemental SER to clarify the description of the steam dryer analysis methodology. Following the Full Committee meeting, the ACRS provided a letter to the Commission on April 17, 2014 (ADAMS Accession No. ML14107A263), that found that the ESBWR steam dryer design is adequate, and the associated structural analysis and planned startup test program are acceptable. In its letter, the ACRS noted that, "the process agreed to by the staff and GEH provides a good basis for satisfactory operation of the ESBWR steam dryer. In light of this reevaluation, there is reasonable assurance that the ESBWR design can be constructed and operated without undue risk to the health and safety of the public."

In preparing the supplemental FSER referenced in this final rule (which will become Supplement No. 1 to NUREG-1966), the staff modified the advanced supplemental SER referenced in the supplemental proposed rule to reflect the changes suggested during the March 5, 2014, ACRS subcommittee meeting. These changes include: (1) clarifying an inconsistency in referring to steam flow rates, (2) clarifying the acceptable methods for the analysis of the stress in the fillet welds in the ESBWR steam dryer caused by acoustic and hydrodynamic fluctuating pressure loads, and (3) for the three allowable methods proposed by GEH to analyze the stress in fillet welds in the ESBWR steam dryer, clarifying the description of (a) the test problem used by GEH to demonstrate the adequacy of those methods, (b) the limitations in the specific GEH engineering report for application of those methods, and (c) the results of the test problem in demonstrating the acceptability of each of the three fillet weld analysis methods. In addition, the supplemental FSER includes a new section that provides the conclusion of the review by the ACRS of the ESBWR steam dryer analysis methodology. The NRC's regulatory basis for the acceptance of the ESBWR steam dryer analysis methodology in the supplemental FSER remains unchanged from the advanced supplemental SER referenced in the supplemental proposed rule. In addition, the staff corrected a variety of typographical, grammatical, and format errors in the advanced supplemental SER. The staff also added appendices to the supplemental SER, each of which correspond to and augment the appendices in the FSER.

Because these FSER changes addressing the steam dryer analysis methodology were made after the NRC issued the proposed rule, the Commission must approve of the changes.

### *Hurricane-Generated Winds and Missiles*

Nuclear power plants must be designed to withstand the effects of natural phenomena, including the most severe wind events (tornadoes and hurricanes) historically reported for the site and surrounding area, with sufficient margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated. The NRC has historically considered tornadoes to be the bounding wind events as described in Regulatory Guide (RG) 1.76, "Design-Basis Tornado for Nuclear Power Plants," initially issued in April 1974, which reflected this technical position. RG 1.76 describes a design-basis tornado that a nuclear power plant should be designed to withstand without undue risk to the health and safety of the public. The design-basis tornado wind speeds were chosen so that the probability that a tornado exceeding the design-basis would occur was on the order of  $10^{-7}$  per year per nuclear power plant.

In March 2007, the NRC issued Revision 1 of RG 1.76. Revision 1 of RG 1.76 resulted in a decrease in design-basis tornado wind speed criteria, and as a result it could no longer be assumed that the revised tornado design-basis wind speeds would bound design-basis hurricane wind speeds in all areas of the United States. This prompted the staff to research extreme wind gusts during hurricanes and their relationship to design-basis hurricane wind speeds, which resulted in the NRC developing a new regulatory guide, RG 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants."

RG 1.221 evaluates missile velocities associated with several types of missiles considered for different hurricane wind speeds. The hurricane missile analyses results in the same missile having a higher maximum velocity in a hurricane wind field than in a tornado wind field with the same maximum (3-second gust) wind speed.

RG 1.221 was issued in final form in October 2011 (76 FR 63541). Thus, formal NRC adoption of RG 1.221 occurred after the June 7, 2011, close of the public comment period for the proposed ESBWR DCR, and well after completion of the NRC's review of the ESBWR DCD and the FSER for the ESBWR design in March 2011. The ESBWR DCD assumes that "tornado generated missiles are determined to be the limiting natural phenomena hazard in the design of all structures required for safe shutdown of the nuclear power plant. Because tornado missiles are used in the design basis, they envelop missiles generated by less intense phenomena such as extreme winds." Thus, the ESBWR applicant has not addressed, and the staff has not specifically determined, whether the ESBWR design is in conformance with GDCs 2 and 4 for hurricane wind and missile loads that are *not* bounded by the total tornado loads analyzed in the DCD. For these reasons, the staff did not make a final safety determination on the acceptability of the ESBWR design with respect to loads on the applicable systems, structures, and components (SSCs) from hurricane winds and hurricane-generated missiles that are not bounded by other loads analyzed in the DCD. The staff informally asked GEH if they wanted to revise the DCD to address hurricane wind and missile loads not bounded by tornado wind and missile loads. GEH declined to revise the DCD at this time because of the additional analysis and staff review that would be required.

Accordingly, the staff is proposing to exclude two issues in the ESBWR DCD from issue finality and issue resolution. First, with respect to the scope of the design in Section 3.3.2 of the ESBWR DCD, the staff proposes to exclude the narrow issue of loads on applicable SSCs from

hurricanes, but only to the extent that such loads are not bounded by other loads analyzed in the ESBWR DCD. Second, with respect to the scope of the design in Section 3.5.1.4 of the ESBWR DCD, the staff is proposing to exclude the narrow issue of loads on applicable SSCs from hurricane-generated missiles, but only to the extent that such loads are not bounded by other loads analyzed in the ESBWR DCD. This is accomplished in paragraph A.2.g of Section IV, "Additional Requirements and Restrictions," and paragraph B.1 of Section VI of the new Appendix E to 10 CFR Part 52, by excluding loads from hurricane winds and hurricane-generated missiles on the applicable SSCs from the issue finality and issue resolution accorded to the ESBWR design. Under the exclusion, a COL applicant referencing the ESBWR DCR must demonstrate that loads from site-specific hurricane winds and hurricane-generated missiles are bounded by the total tornado load as analyzed in the ESBWR DCD. If the total tornado load analyses are not bounding, the COL applicant has several ways of addressing the exclusion, for example, demonstrating that the design can withstand the site-specific hurricane wind loads and hurricane-generated missile loads.

#### *Loss of One or More Phases of Offsite Power*

Bulletin 2012-01, "Design Vulnerability in Electric Power System," as applied to passive plant designs such as the ESBWR, addresses the need for electric power system designs to be able to detect the loss of one or more of the three phases of an offsite power circuit connected to the plant electrical systems and provide an alarm in the control room. Bulletin 2012-01 was issued after the 2011 proposed rule was issued and the public comment period closed. In its response to Bulletin 2012-01, GEH provided additional details on the monitoring and alarm functions for all three phases of the offsite power circuits and included applicable information in Revision 10 to the DCD. GEH also added new ITAACs to ensure implementation of these design features by a COL holder. The staff reviewed the ESBWR design features that can detect and provide an alarm for the loss of one or more of the three phases of an offsite power circuit. For the reasons set forth in Section 8.2.3, "Staff Evaluation," of the supplemental FSER, the staff concluded that no design vulnerability identified in Bulletin 2012-01 exists in the ESBWR electric power system.

#### *Spent Fuel Assembly Integrity in Spent Fuel Racks*

The NRC performed its review of the integrity of spent fuel racks based on Section 9.1.2, "New and Spent Fuel Storage," of the SRP, NUREG-0800. The ESBWR FSER concluded that the design of the spent fuel pool, the buffer pool, and the fuel storage racks complied with the requirements of GDC 2 and met the guidance of SRP Section 9.1.2. After publication of the proposed rule, the staff recognized that Appendix D, "Guidance on Spent Fuel Pool Racks," to Section 3.8.4, "Other Seismic Category I Structures," of the SRP provides guidance related to spent fuel assembly integrity. During the initial review of the design, the NRC did not specifically review the design of the spent fuel in the spent fuel racks against Appendix D to Section 3.8.4 of the SRP, but rather that of Section 9.1.2 of the SRP.

To confirm the structural integrity of the fuel in the spent fuel racks, the staff conducted an audit on August 5 and September 8, 2011. The audit summary is available under ADAMS Accession No. ML112860614. GEH subsequently submitted additional information (ADAMS Accession No. ML11269A093) to address whether the consequent loads on the fuel assembly that result from the design basis seismic event would lead to fuel damage. For the reasons set forth in Section 3.8.4 of the supplemental FSER, the NRC finds that the fuel assemblies maintain

structural integrity when subject to the design basis seismic loads, the fuel assemblies in the fuel storage racks are structurally adequate to withstand the design basis seismic loads, and the fuel assemblies are in compliance with GDC 2.

Because of the staff's audit and GEH's submittal on the ESBWR docket – both after the completion of the FSER, issuance of the final SDA, and publication of the proposed rule – the NRC decided that the staff's review should be documented in Section 3.8.4 of the supplemental FSER.

#### *Turbine Building Offgas System Design Requirements*

RG 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants," provides guidance on classifying and designing radioactive waste management systems (RWMSs). The Offgas System (OGS), which is part of the Gaseous Waste Management System, is classified as a Category RW-IIa (High Hazard) RWMS in accordance with RG 1.143. Following publication of the proposed rule, the staff identified that, while it had evaluated the OGS against the guidelines of RG 1.143, the staff had not evaluated the structure housing the OGS (i.e., the turbine building) against the guidelines of RG 1.143. Subsequently, the staff reviewed the information included in various sections of the ESBWR DCD regarding protection of the OGS. For the reasons set forth in Section 3.8.4.3 of the supplemental FSER, the staff determined that the turbine building structure provides adequate protection for the OGS components to meet the design criteria in RG 1.143 for Category RW-IIa.

#### *ASME BPV Code Statement in Chapter 1 of the ESBWR DCD*

In Revision 10 to the ESBWR DCD, Tier 1, Section 1.1.1, "Definitions," GEH added a definition of "ASME Code" to its Tier 1 definitions. This addition addressed compliance with the ASME BPV Code and the use of alternatives to the ASME Code requirements as permitted in 10 CFR 50.55a(a)(3). The addition was based on lessons learned during the construction of two nuclear power plants which were licensed under 10 CFR Part 52 (Vogtle Electric Generating Plant, Units 3 and 4 and V.C. Summer Nuclear Station, Units 2 and 3). The question arose whether changes to ASME Code requirements, such as the use of alternatives in accordance with § 50.55a(a)(3), are permitted without the need to submit an exemption from the regulations pursuant to 10 CFR 50.12, "Specific exemptions." The staff determined that using alternatives to ASME BPV Code requirements authorized in accordance with § 50.55a is sufficient and does not require a COL holder to submit an exemption when changes involve a departure from only ASME BPV Code requirements. Because this change does not affect previous NRC safety findings in the FSER or change the status of how the ESBWR standard design complies with ASME BPV Code requirements, the staff finds these changes to the definition of ASME Code to be acceptable, as described in Section 14.3 of the supplemental FSER.

#### *Clarification of ASME Component Design ITAACs*

Following the publication of the proposed rule, the staff reviewed ITAACs for inspectability and consistency across several design certifications. This review identified the potential issue that

the ITAACs related to verification of component design, as written in Revision 9 of the ESBWR DCD, might be viewed as requiring design verification of as-designed ASME BPV Code components, rather than as-built ASME BPV Code components, as originally intended. Verifying interim ASME BPV Code design reports at the design stage would result in an unnecessary regulatory burden with no benefit to safety. In Revision 10 of the ESBWR DCD, GEH revised the ASME BPV Code component ITAACs to clarify that the activities needed to satisfy the ITAACs are performed at the as-built stage. For the reasons set forth in Section 14.3.3 of the supplemental FSER, the staff concludes that this clarification promotes efficient ITAACs closure and reduces potential confusion while having no effect on previous NRC safety findings.

#### *Corrections, Editorial, and Conforming Changes*

GEH made corrections and editorial changes in Revision 10 of the DCD and the NRC made corrections and editorial changes to its advanced supplemental SER. The staff also revised the supplemental FSER after publication of the supplemental proposed rule to include conforming changes such as adding appendices that augment the appendices in the FSER.

#### Rulemaking Procedure

The standard design certification is being conducted under the applicable requirements of Subpart B of 10 CFR Part 52, "Standard Design Certifications," and 10 CFR Parts 2 and 51, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," and "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," respectively. The rulemaking package includes the FRN of issuance of the final rulemaking (Enclosure 1) and the ESBWR EA (Enclosure 2).

As described under the "Regulatory and Policy Issues" and "Technical Issues" sections of this paper, after the close of the public comment period for the 2011 proposed rule, the NRC addressed several regulatory, policy, and technical issues associated with the ESBWR design certification. For each of these issues, the staff evaluated whether the issue warranted a supplemental opportunity for public comment. The staff's determinations for each of these issues is summarized below, and described in detail in the FRN for the final ESBWR design certification rule.

#### *Exclusions from Issue Finality and Issue Resolution for Spent Fuel Pool Instrumentation*

The final rule contains exclusions from issue finality and issue resolution related to spent fuel pool instrumentation. For these exclusions: (1) there were no changes to the DCD, the EA, or the FSER, and (2) the final rule is more conservative than the proposed rule because it is more limiting as to what is certified and to the scope of issue finality. The staff is not aware of any entity other than the applicant, GEH, who would be adversely affected by this change. With respect to the exclusions, GEH voluntarily declined to submit additional information that would avoid the need for exclusions from issue finality and issue resolution on this matter. The NRC did not receive any public comments in the area of spent fuel pool instrumentation (which otherwise would suggest public interest in this matter). For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for these exclusions from issue finality and issue resolution.

*Incorporation by Reference of Public Documents Referenced in the ESBWR DCD*

Section III.A of the final rule lists 20 publicly-available documents, in addition to Revision 10 of the DCD, to be approved for incorporation by reference by the OFR. The NRC did not offer a supplemental opportunity for public comment on this matter for the following reasons. First, the text of the DCD – when discussing each of the 20 publicly-available documents – makes clear that these are intended to be requirements. Thus, a member of the public could have discerned and commented on the failure of Tables 1.6-1 and 1.6-2 of the Revision 9 of the DCD to differentiate between documents intended to be requirements (given the information presented throughout DCD Revision 9) and documents which were intended only to be references (i.e., “for information only”). The public could also have commented on the discrepancy between the language of Revision 9 of the DCD (which regards these documents as being approved by the OFR for incorporation by reference into the DCD) and the failure of the proposed ESBWR design certification rule to list the publicly-available referenced documents as being incorporated by reference. Finally, the NRC did not receive any comments on the proposed rule with respect to Tables 1.6-1 and 1.6-2 in Revision 9 of the DCD, or the incorporation by reference language in Section III of proposed Appendix E to 10 CFR Part 52 (which otherwise would suggest public interest in this matter). For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted with respect to the status of the 20 documents as requirements and their incorporation by reference into the ESBWR design certification rule.

*Changes to Tier 2\* Information*

The final rule includes three changes from the proposed rule regarding Tier 2\* matter under Section VIII of the rule language. Because one of those changes was related to the steam dryer, and for the same reasons as the steam dryer analysis methodology being offered a supplemental opportunity for public comment, the related Tier 2\* change was included in the supplemental proposed rule and no public comments were received on this topic. The other two Tier 2\* changes – related to the specific subsections of ASME BPV Code and a correction to the type of valves used in the ESBWR design – were included for consistency with the ESBWR design as described in the DCD. Because these changes are corrective in nature, the staff concluded that a supplemental opportunity for public comment was not warranted for these matters.

*Other Changes to the ESBWR Rule Language and Differences from Other DCRs*

The NRC made a number of conforming changes to the final rule such as replacement of acronyms, inclusion of the NUREG number for the FSER, and revision of the rule language related to incorporation by reference. The staff also made conforming changes to the rule text such as conforming to NRC regulations regarding site characteristics for a COL, site parameters for a certified design, and the interface requirements. Because these changes are administrative in nature, the staff concluded that a supplemental opportunity for public comment was not warranted for these matters.



*Exclusions from Issue Finality and Issue Resolution (Hurricane-Generated Winds and Missiles)*

The final rule contains exclusions from issue finality and issue resolution related to hurricane-generated winds and missiles. For these exclusions: (1) there were no changes to the DCD, the EA, or the FSER, and (2) the final rule is more conservative than the proposed rule because it is more limiting as to what is certified and to the scope of issue finality. The staff is not aware of any entity other than the applicant, GEH, who would be adversely affected by this change. With respect to both exclusions, GEH voluntarily declined to submit additional information which would avoid the need for exclusions from issue finality and issue resolution on this matter. The NRC did not receive any public comments on hurricane winds or hurricane missiles (which otherwise would suggest public interest in this matter). For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for these exclusions from issue finality and issue resolution.

*Loss of One or More Phases of Offsite Power*

GEH made changes to the DCD to clarify how the ESBWR design addresses the loss of one or more phases of offsite power in order to demonstrate compliance with GDC 17, "Electric Power Systems." These changes did not require a change to the rule text or to the EA supporting this rulemaking. The NRC did not receive any public comments on the proposed rule with respect to the adequacy of the offsite power system (which would otherwise suggest public interest in this matter). For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for this matter.

*Spent Fuel Assembly Integrity in Spent Fuel Racks*

The staff's review of the spent fuel assembly integrity was documented in a supplemental FSER, but did not result in any change to the design as described in the DCD or new design commitments in the DCD. No changes were required to the DCD, the rule text, or the EA supporting this rulemaking. The NRC did not receive any public comments on the proposed rule with respect to spent fuel pool assembly integrity (which otherwise would suggest public interest in this matter). For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for this matter, including the supplemental FSER.

*Turbine Building Offgas System Design Requirements*

The supplemental FSER includes the staff's evaluation of the turbine building structure relative to the Turbine Building Offgas System design requirements. The evaluation, which was not documented in the March 2011 FSER, was performed using information in Revision 9 of the DCD that did not change in Revision 10 of the DCD. Further, there were no changes required to the DCD, the rule text, or the EA supporting this rulemaking. The NRC did not receive any public comments on the proposed rule with respect to the Turbine Building Offgas System (which otherwise would suggest public interest in this matter). For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for this matter.

*ASME BPV Code Statement in Chapter 1 of the ESBWR DCD*

GEH made a technical clarification to the DCD regarding the ASME BPV Code statement in Chapter 1 of the DCD. This clarification does not affect the NRC's previous safety findings in the FSER, change the ESBWR's compliance with Code requirements, or require changes to the rule text for this rulemaking. For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for this matter.

*Clarification of ASME Component Design ITAACs*

GEH made a technical clarification to the DCD regarding the ASME component design ITAACs. This clarification does not affect the NRC's previous safety findings in the FSER, nor does it require changes to the rule text for this rulemaking. For these reasons, the staff concluded that a supplemental opportunity for public comment was not warranted for this matter.

*Changes to the Supplemental FSER after Publication of the Supplemental Proposed Rule*

In preparing the supplemental FSER referenced in this final rule (which will become Supplement No. 1 to NUREG-1966), the staff modified the advanced supplemental SER referenced in the supplemental proposed rule to reflect the changes suggested during the March 5, 2014, ACRS subcommittee meeting. In addition, the supplemental FSER includes a new section that provides the conclusion of the review by the ACRS of the ESBWR steam dryer analysis methodology. The staff's regulatory basis for the acceptance of the ESBWR steam dryer analysis methodology in the supplemental FSER remains unchanged from the advanced supplemental SER referenced in the supplemental proposed rule. For this reason, the staff concluded that a supplemental opportunity for public comment was not warranted for this matter.

*Corrections, Editorial, and Conforming Changes*

GEH made editorial changes in Revision 10 of the DCD and the staff made editorial changes to its advanced supplemental SER. The staff also revised the supplemental FSER after publication of the supplemental proposed rule to include conforming changes such as adding appendices that augment the appendices in the FSER. Because these changes are administrative in nature, the staff concluded that a supplemental opportunity for public comment was not warranted for these matters.

*Planned Withdrawal of the ESBWR Standard Design Approval*

The staff issued an SDA for the ESBWR design in March 2011 after its completion of the FSER. On June 3, 2014, GEH requested that the NRC retire the SDA at the time of issuance of the final ESBWR design certification rule (ADAMS Accession No. ML14154A094). In accordance with GEH's request, the staff plans to issue a FRN announcing the withdrawal of the ESBWR SDA after the effective date of the final ESBWR design certification rule. The staff's planned withdrawal is a separate action from the ESBWR design certification rulemaking.

RECOMMENDATIONS:

That the Commission:

1. Approve the publication of a final rule adding Appendix E to 10 CFR Part 52 to certify the ESBWR standard design, including the proposed exclusion of the following matters from design certification issue finality and issue resolution:
  - a. HFE procedures and training.
  - b. Loads on applicable SSCs from hurricanes that are not bounded by other loads analyzed in the ESBWR DCD.
  - c. Loads on applicable SSCs from hurricane-generated missiles to the extent that such loads are not bounded by other loads analyzed in the ESBWR DCD.
  - d. Spent fuel pool instrumentation design allows the connection of an independent power source.
  - e. Spent fuel pool instrumentation maintains its design accuracy following a power interruption or change in power source without recalibration.
2. Approve the changes to the advanced supplemental SER that were incorporated into the draft supplemental FSER, so that the staff can issue the supplemental FSER as Supplement No. 1 to NUREG-1966.
3. Certify that this rule, if promulgated, will not have a negative economic impact on a substantial number of small entities in order to satisfy requirements of the Regulatory Flexibility Act (5 U.S.C. 605(b)).
4. Determine that neither the backfit rule (10 CFR 50.109, "Backfitting"), nor any of the issue finality provisions in 10 CFR Part 52, apply to the issuance of this final DCR.
5. Note:
  - a. The staff has prepared an EA that resulted in a finding of no significant impact and evaluated severe accident mitigation design alternatives for the proposed amendment (Enclosure 2).
  - b. This rule contains new information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). The information collection requirements must be submitted to the Office of Management and Budget (OMB) for its review and approval before publication of the final rule in the FR. Similar to that of the AP1000 amendment rulemaking, the staff plans to submit this information to OMB in parallel with the delivery of this paper to the Commission in accordance with the NRC's schedule to publish the final rule on or before September 2014.
  - c. The staff will inform the Chief Counsel for Advocacy of the Small Business

Administration of the certification regarding the economic impact on small entities and the reasons for it as required by the Regulatory Flexibility Act (Section XII of Enclosure 1).

- d. There are no outstanding issues from the inspection of the ESBWR aircraft impact assessment. The staff's findings regarding compliance with aircraft impact assessment requirements are described in Chapter 19 of the FSER.
- e. The Office of Congressional Affairs will keep the appropriate congressional committees informed.
- f. The Office of Public Affairs will issue a press release.
- g. The staff will use a communications plan with frequently asked questions on the DCR process and the use of a DCR in referenced COL applications, as well as questions specifically prepared for the ESBWR standard design.
- h. The staff is preparing a letter to the Director, OFR, requesting approval of the ESBWR DCD and 20 other documents for incorporation by reference. The letter will be sent to the OFR before requesting publication of the FRN and will address the criteria for approval of documents for incorporation by reference.
- i. The staff has determined that this is not a major rule under the Congressional Review Act of 1996 and has received verification from OMB.
- j. The staff will withdraw the ESBWR SDA after the effective date of the final rule as requested by GEH.

RESOURCES:

The New Reactors business line has budgeted 1.1 full-time equivalents (FTE) to complete this rulemaking in its fiscal year (FY) 2014 budget. The budget includes 0.8 FTE for the Office of New Reactors and 0.3 FTE for the Office of the General Counsel (OGC). The Office of Administration and the Office of Information Services (OIS) provide corporate support and are not specifically budgeted for in the New Reactors business line. The staff expects to complete this rulemaking in FY 2014 and has not requested resources for this rulemaking beyond FY 2014.

COORDINATION:

OGC has no legal objection to the final ESBWR design certification rulemaking. The Chief Financial Officer has reviewed this paper for resource implications and has no objections. OIS has reviewed this paper for information technology and information management implications and concurs on it. The staff provided draft copies of the ESBWR final rule to the ACRS on November 22, 2011, and July 2, 2014 (ADAMS Accession Nos. ML113120076 and ML14149A314, respectively), and requested that the ACRS waive its review of the final rule. On December 6, 2011, and July 17, 2014, the ACRS issued letters (ADAMS Accession Nos. ML11340A043 and ML14196A207, respectively) stating it has decided to not review the final rule and that it has no objection to the staff's proposal to issue the final rule.

*/RA/*

Mark A. Satorius  
Executive Director  
for Operations

Enclosures:

1. *Federal Register* Notice
2. Environmental Assessment

COORDINATION:

OGC has no legal objection to the final ESBWR design certification rulemaking. The Chief Financial Officer has reviewed this paper for resource implications and has no objections. OIS has reviewed this paper for information technology and information management implications and concurs on it. The staff provided draft copies of the ESBWR final rule to the ACRS on November 22, 2011, and July 2, 2014 (ADAMS Accession Nos. ML113120076 and ML14149A314, respectively), and requested that the ACRS waive its review of the final rule. On December 6, 2011, and July 17, 2014, the ACRS issued letters (ADAMS Accession Nos. ML11340A043 and ML14196A207, respectively) stating it has decided to not review the final rule and that it has no objection to the staff's proposal to issue the final rule.

Mark A. Satorius  
Executive Director  
for Operations

## Enclosures:

1. *Federal Register* Notice
2. Environmental Assessment

WITS 201100137

**ADAMS Accession No.: ML111680222 (pkg) \*via e-mail SECY-012**

OFFICE	NRO/DARR*	NRO/DARR*	NRO/DARR*	NRO/DARR*	NRO/DNRL*
NAME	GTartal	BAbeywickrama	JColaccino	MMayfield	FAkstulewicz
DATE	6/10/14	6/20/14	6/30/14	6/26/14	7/10/14
OFFICE	NRO/DSRA*	NRO/DE*	NRO/DCIP*	NRO/DSEA*	NRR/DE*
NAME	JMonninger	JTappert (RCaldwell for)	MCheok (MHayes for)	SFlanders	PHiland
DATE	7/10/14	7/8/14	7/1/14	7/10/14	7/9/14
OFFICE	ADM/RADB*	NSIR*	OE*	OIS/ICT*	OCFO*
NAME	CBladey (JShepherd for)	JWiggins (BMcDermott for)	PHolahan (JWray for)	KBenney	MMuessle (RAllwein for)
DATE	7/11/14	7/11/14	7/10/14	7/11/14	7/3/14
OFFICE	OGC/NLO*	NRO*	EDO		
NAME	BJones (GMizuno for)	GTracy (GHolahan for)	MSatorius (MJohnson for)		
DATE	7/11/14	7/23/14	7/31/14		

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