

FINAL ENVIRONMENTAL ASSESSMENT BY THE
U.S. NUCLEAR REGULATORY COMMISSION
RELATING TO THE CERTIFICATION OF THE
STP NUCLEAR OPERATING COMPANY
AMENDMENT TO THE U.S. ABWR STANDARD PLANT DESIGN
DOCKET NO. 52-001

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UNITED STATES NUCLEAR REGULATORY COMMISSION
ENVIRONMENTAL ASSESSMENT AND FINDING OF
NO SIGNIFICANT IMPACT
RELATING TO THE CERTIFICATION OF THE
STP NUCLEAR OPERATING COMPANY
AMENDMENT TO THE U.S. ABWR STANDARD PLANT DESIGN
DOCKET NO. 52-001

The U.S. Nuclear Regulatory Commission (NRC or the Commission) is amending the design certification for the U.S. Advanced Boiling Water Reactor (U.S. ABWR) design in response to an application submitted to address the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.150, "Aircraft impact assessment," on June 30, 2009, by STP Nuclear Operating Company (STPNOC). A design certification is a rulemaking; the NRC has decided to adopt design certification rules (DCRs) as appendices to 10 CFR Part 52.

The NRC has performed the following environmental assessment (EA) of the environmental impacts of the new rule and has documented a finding of no significant impact in accordance with the requirements of 10 CFR 51.21 and the National Environmental Policy Act of 1969, as amended. This EA also addresses the severe accident mitigation design alternatives (SAMDA) that the NRC has considered for the STPNOC amendment to the U.S. ABWR design. This EA does not address the site-specific environmental impacts of constructing and operating any facility that references the U.S. ABWR design certification amendment at a particular site. Those impacts would be evaluated as part of any application or applications for the siting, construction, or operation of such a facility.

As discussed in Section 3.0 of this EA, the NRC has determined that issuing the subject design certification amendment does not constitute a major Federal action significantly affecting the quality of the human environment. This determination is based on the generic finding made in 10 CFR 51.32(b)(2) that there is no significant environmental impact associated with an amendment to a design certification. The action does not authorize the siting, construction, or operation of a facility using the U.S. ABWR design. Rather, it merely codifies the amendment to the U.S. ABWR design in a rule that could be referenced in a future combined license (COL) application. Furthermore, because certification of the amendment constitutes only a rule rather than a physical action, it does not involve the commitment of any resources that have alternative uses. As explained in the statements of consideration for “Licenses, Certifications, and Approvals for Nuclear Power Plants; Final Rule” (72 FR 49352; August 28, 2007, at 49427), the 10 CFR 51.32(b)(2) generic finding of no significant impact is legally equivalent to a categorical exclusion. Therefore, the NRC has not prepared an environmental impact statement (EIS) for the action.

In accordance with 10 CFR 51.30(d), an EA for an amendment to a design certification is limited to consideration of whether the design change, which is the subject of the amendment, renders a SAMDA previously rejected in the earlier environmental assessment to become cost beneficial, or results in the identification of new SAMDAs, in which case the costs and benefits of new SAMDAs and the bases for not incorporating new SAMDAs in the design certification must be addressed. As discussed in Section 4.0 of this EA, the amendment does not cause a SAMDA previously rejected in the environmental review for the U.S. ABWR design to become cost beneficial or lead to the identification of any new SAMDAs.

In addition, this EA is being issued in connection with a rule that is being published in the *Federal Register* on [INSERT FINAL RULE PUBLICATION DATE] ([INSERT FINAL RULE *Federal Register* CITATION]).

ENVIRONMENTAL ASSESSMENT

1.0 Identification of the Proposed Action

The proposed action is to issue a rule amending the certified U.S. ABWR design in Appendix A to 10 CFR Part 52. The revised rule would allow applicants to reference both the General Electric (GE) Design Certification Document (DCD) and the STPNOC DCD or to reference only the GE DCD and address the requirements of 10 CFR 50.150 as part of a COL application under 10 CFR Part 52.

2.0 The Need for the Proposed Action

The NRC has long sought the safety benefits of commercial nuclear power plant standardization and early final resolution of design issues. The NRC achieves these benefits by certifying nuclear plant designs. Subpart B to 10 CFR Part 52 allows for certification of nuclear plant designs in the form of rulemaking.

The proposed action is to issue a rule amending 10 CFR Part 52 to revise the certified U.S. ABWR design to meet the requirements of 10 CFR 50.150. The amendment would allow COL applicants to reference both the GE DCD and the STPNOC DCD rather than having to individually address the requirements of 10 CFR 50.150 as part of each COL application referencing the GE DCD. Those portions of the U.S. ABWR design included in the scope of the certification amendment rulemaking would not be subject to further safety review or approval in a COL proceeding. In addition, the DCR could eliminate the need to consider SAMDAs individually for any future facilities that reference the certified U.S. ABWR design.

3.0 The Environmental Impact of the Proposed Action

The proposed action constitutes issuance of an amendment to the U.S. ABWR design certification. According to 10 CFR 51.32(b)(2), the NRC has generically determined that there is no significant environmental impact associated with the issuance of an amendment to a design certification. The amendment would merely codify the NRC's approval of the amendment to the U.S. ABWR design through its final safety evaluation report (FSER) on the design and any FSER supplement issued during rulemaking (refer to Agencywide Documents Access and Management System (ADAMS) Accession No. ML102710198). Furthermore, because certification of the amendment constitutes a rule rather than a physical action, it would not involve the commitment of any resources that have alternative uses.

The amendment to the DCR by itself would not authorize the siting, construction, or operation of a nuclear power plant. An applicant for a COL that references the U.S. ABWR design will be required to address the environmental impacts of construction and operation at a specific site. The NRC would then evaluate the environmental impacts and issue an EIS in accordance with 10 CFR Part 51. However, the SAMDA analysis that has been completed as part of this EA can be incorporated by reference into an EIS related to an application for siting, construction, or operation of a nuclear plant that references the U.S. ABWR design.

4.0 Severe Accident Mitigation Design Alternatives

4.1 The STPNOC's Assessment of Severe Accident Mitigation Design Alternatives

Consistent with the objectives of standardization and early resolution of design issues, the Commission decided to evaluate SAMDAs as part of the original design certification for the U.S. ABWR design. In the 1985 policy statement on severe accidents, the Commission defined the term "severe accident," as an event that is "beyond the substantial coverage of design-basis events," including events where there is substantial damage to the reactor core (whether or not

there are serious offsite consequences). Design-basis events are events analyzed in accordance with the NRC Standard Review Plan (NUREG-0800, ADAMS Accession No. ML092330826) and documented in Chapter 15 of the GE DCD.

The U.S. ABWR SAMDA analysis in the Technical Support Document (December 21, 1994) concluded that there were no cost beneficial SAMDAs for the U.S. ABWR. In the “Applicant's Supplemental Environmental Report – Amendment to ABWR Standard Design Certification,” ABWR-LIC-09-062 (ADAMS Accession No. ML093170455), the STPNOC assessed the impacts of the proposed design changes on the probabilistic risk assessment (PRA) and the SAMDA analysis for the certified U.S. ABWR design. As described in Table 1 of the supplemental environmental report, the amendment includes the following design changes:

1. Addition of alternate feedwater injection system.

This design change adds a system that provides a new and diverse water supply for core cooling that is separate and independent from the existing sources of core cooling in the U.S. ABWR design.

2. Addition of instrumentation for new alternate feedwater injection system.

This design change adds instrumentation that can provide additional information for operators in events such as station blackout.

3. Addition of new fire doors and upgrading existing fire doors.

This design change adds and strengthens fire barriers inside the reactor building.

The STPNOC concluded “that none of the design changes has a negative impact on U.S. ABWR plant risk as evaluated in the U.S. ABWR PRA.” The STPNOC further concluded that the design changes will provide “a net benefit in terms of risk reduction over the existing U.S. ABWR design.” However, the quantitative effect of these design changes on the PRA is small. Therefore, the STPNOC concluded the design changes will not “result in a change to the

U.S. ABWR PRA or the DCD Chapter 19,” and the U.S. ABWR SAMDA assessment in the 1994 Technical Support Document will not change and remains valid.

As a result, the STPNOC concluded that the SAMDAs that were considered and rejected as not being cost beneficial in the SAMDA assessment in the 1994 Technical Support Document “did not become cost beneficial due to the proposed design changes.” The STPNOC also concluded that the “evaluation did not identify new SAMDAs that may be reasonably incorporated into the U.S. ABWR design.”

4.2 NRC Evaluation

The NRC staff reviewed the information in the supplemental environmental report; the referenced certified GE DCD, NUREG–1503, Supplement 1 (ADAMS Accession No. ML080710134); and the EA issued for the original U.S. ABWR design certification rule.

The NRC staff reviewed the applicant’s evaluations of the design changes and concluded that the proposed design changes would result in a small reduction in the core damage frequency, as compared with the existing U.S. ABWR design. In particular, the alternate feedwater injection system adds additional defense-in-depth to provide additional assurance of core cooling during an accident. Therefore, the staff concluded that the proposed design changes would not alter the original SAMDA evaluation and would not change the conclusions reached in the EA issued for the original U.S. ABWR DCR. Furthermore, the staff examined the list of potential design changes considered by GE in the Technical Support Document and concluded that the new design changes do not render any previously rejected SAMDA as cost beneficial. The staff could not identify any new SAMDAs worthy of further evaluation in accordance with 10 CFR 51.30(d). Finally, the existing site parameters specified in the 1994 Technical Support Document are not affected by the proposed design changes.

5.0 Public Comments and NRC Responses

The public comment period for the proposed rule closed on April 5, 2011. The NRC received no public comments on the draft EA.

6.0 Finding of No Significant Impact

On the basis of the EA, the NRC concludes that the proposed action would not have a significant effect on the quality of the human environment. Accordingly, the NRC has decided not to prepare an EIS for the proposed action.

For further details with respect to the proposed action, see the design certification amendment and the documents referenced in the statements of consideration for the amendment. Documents may be examined and/or copied for a fee, at the NRC's Public Document Room (PDR), located at One White Flint North, Room O-1F21, 11555 Rockville Pike, Rockville, Maryland 20852. 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>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents in ADAMS should contact the NRC PDR reference staff at 1-800-397-4209 or 301-415-4737 or send an e-mail to PDR.Resource@nrc.gov.