

ENVIRONMENTAL ASSESSMENT BY THE
U.S. NUCLEAR REGULATORY COMMISSION
RELATING TO EXTENSION OF THE AP1000 STANDARD DESIGN CERTIFICATION
DOCKET NO. 52-006

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TABLE OF ABBREVIATIONS

ADAMS	Agencywide Documents Access and Management System
COL	combined license
CFR	<i>Code of Federal Regulations</i>
DBE	design-basis event
DC	design certification
DCD	design control document
DCR	design certification rule
EA	environmental assessment
EIS	environmental impact statement
FR	<i>Federal Register</i>
NEPA	National Environmental Policy Act of 1969, as amended
NRC	U.S. Nuclear Regulatory Commission
PDR	Public Document Room
PRA	probabilistic risk assessment
SAMDA	severe accident mitigation design alternatives

UNITED STATES NUCLEAR REGULATORY COMMISSION
ENVIRONMENTAL ASSESSMENT AND
FINDING OF NO SIGNIFICANT IMPACT
RELATING TO EXTENSION OF THE
AP1000 STANDARD DESIGN CERTIFICATION
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1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC or the Commission) is amending the design certification (DC) for the AP1000 standard plant design to extend the duration of the DC for 5 years, as proposed by the NRC staff in SECY-20-0082, “Rulemaking Plan to Extend the Duration of the AP1000 Design Certification,” dated September 8, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20252A153), and approved by the Commission in SRM-SECY-20-0082, dated November 17, 2020 (ADAMS Accession No. ML20322A047). The NRC also is updating the DC to reflect changes provided by Westinghouse Electric Company LLC (Westinghouse), by letter dated March 19, 2021 (ADAMS Accession No. ML21081A023).

The NRC issues design certification rules (DCRs) as appendices to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, “Licenses, certifications, and approvals for nuclear power plants.” The purpose of the amendment is to extend by 5 years the period that the AP1000 DC is valid for referencing by an applicant and to include design changes previously approved by the NRC in multiple combined license (COL) proceedings. The extended duration

would align with the extended renewal period previously granted by the NRC to Westinghouse for the AP1000 DC in the exemption NRC issued by letter dated February 14, 2018 (ADAMS Accession No. ML17265A099). With the proposed extended duration, the AP1000 DC would remain valid for referencing until February 27, 2026.

The NRC developed this environmental assessment (EA) of the environmental impacts of the amendment and has documented the staff's finding of no significant impact in accordance with the requirements of 10 CFR 51.21, "Criteria for and identification of licensing and regulatory actions requiring environmental assessments"; 10 CFR 51.31, "Determinations based on environmental assessment"; and the National Environmental Policy Act of 1969, as amended (NEPA). This EA also addresses the severe accident mitigation design alternatives (SAMDA) that the NRC has previously evaluated for the Westinghouse AP1000 design in its EA dated December 22, 2011 (ADAMS Accession No. ML113480019). This EA does not address the site-specific environmental impacts of constructing and operating any facility that references the AP1000 DC at a particular site. The NRC would evaluate those impacts as part of any application(s) for the siting, construction, or operation of such a facility.

As discussed in Section 6.0 of this EA, the NRC has determined that issuing the subject 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 DC. This amendment does not authorize the siting, construction, or operation of a facility referencing the AP1000 design; it only codifies an extension of the period an applicant can reference the AP1000 design in a COL application. Furthermore, because the extension of the certification and update of the design constitute a rule change rather than a physical action, it does not involve the commitment of any resources that have alternative uses. The 10 CFR 51.32(b)(2) generic finding of no significant impact is, essentially, the legal

equivalent of a categorical exclusion (72 FR 49427; August 28, 2007). Therefore, the NRC has not prepared an environmental impact statement (EIS) for the action.

Under 10 CFR 51.30(d), an EA for an amendment to a DC is limited to the consideration of whether the design change that is the subject of the proposed amendment renders a SAMDA previously rejected in the earlier EA 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 DC must be addressed.

This amendment extends the period of applicability for referencing the DC and updates the DC to include previously approved changes to the AP1000 design, which are consistent with the departures previously reviewed and approved for COLs such as the Southern Nuclear Company's Vogtle Electric Generating Plant, Units 3 and 4, and Florida Power and Light's Turkey Point Nuclear Generating Station, Units 6 and 7. Although the design changes associated with this amendment do not affect the overall risk profile for the AP1000 design (i.e., they do not change the risk insights and conclusions of the AP1000 DC or COL probabilistic risk assessments (PRAs) nor change the SAMDA analysis in Appendix 1B to Tier 2, Chapter 1 (ADAMS Accession No. ML11171A340), of the AP1000 Design Control Document (DCD), Revision 19, dated June 13, 2011 (ADAMS Accession No. ML11171A500)), the staff updated its evaluation and performed sensitivity analyses to determine whether any SAMDAs previously rejected in the earlier EAs could become cost beneficial due to updated cost parameter information.

As discussed in Section 5.0 of this EA, the NRC staff determined that the proposed amendment would not cause a SAMDA that was previously rejected in the environmental review for the AP1000 design to become cost beneficial. Because the amendment does not affect the overall risk profile for the design, no new SAMDAs need to be considered for incorporation.

2.0 Identification of the Proposed Action

The proposed action is to amend 10 CFR Part 52, Appendix D, “Design Certification Rule for the AP1000 Design,” to extend the duration of the certification and update the AP1000 standard design. The amended rule allows applicants to reference the certified AP1000 standard design as part of a COL application under 10 CFR Part 52, or as part of a construction permit or operating license under 10 CFR Part 50, “Domestic licensing of production and utilization facilities,” for an additional 5-year period.

3.0 Need for the Proposed Action

The proposed action extends the duration of the certification and updates the AP1000 standard design. The amendment allows an applicant to reference the certified AP1000 standard design as part of a COL application under 10 CFR Part 52, or as part of a construction permit or operating license under 10 CFR Part 50, for an additional 5-year period. Those portions of the AP1000 standard design included in the scope of the design certification rulemaking are not subject to further safety review or approval in a COL proceeding. In addition, the DC rule could resolve SAMDAs for any future applications for facilities that reference the certified AP1000 standard design.

4.0 Environmental Impact of the Proposed Action

The proposed action constitutes issuance of an amendment to 10 CFR Part 52 to extend the certification and update the AP1000 standard design. As stated in 10 CFR 51.32(b)(1), no significant environmental impact is associated with the issuance of a DC. The DC merely codifies the NRC staff’s approval of the AP1000 standard design, which is documented in NUREG-1793, “Final Safety Evaluation Report Related to the Certification of the AP1000 Standard Design,” issued September 2004; its supplements (ADAMS Accession Nos. ML043570339, ML060330557, and ML112061231); and the staff’s verification evaluation

of the updates to the AP1000 design (ADAMS Accession No. ML21131A221). Furthermore, because the extension of the certification and update of the design constitute a rule change rather than a physical action, the action would not involve the commitment of any resources that have alternative uses.

As described in Section 5.0 of this EA, the NRC staff has previously reviewed alternative design features for preventing and mitigating severe accidents. NEPA requires consideration of alternatives to show that the DC rule is the appropriate course of action. The NRC's regulations at 10 CFR 51.30(d) in part require consideration of the costs and benefits of SAMDAs and the bases for not incorporating SAMDAs in the DC. Through an independent evaluation, described in Section 5.0, the NRC staff concludes that extension and update of the DCR for an additional 5 years would not alter the previous staff conclusions on not incorporating SAMDAs in the DC.

Finally, this amended DCR itself does not authorize the siting, construction, or operation of a nuclear power plant facility. An applicant that references the AP1000 standard design for a COL or early site permit under 10 CFR Part 52, or for a construction permit or operating license under 10 CFR Part 50, will be required to address the environmental impacts of construction and operation for its specific site. The NRC staff will then evaluate the environmental impacts for that particular site and issue an EIS in accordance with NEPA and 10 CFR Part 51, "Environmental protection regulations for domestic licensing and related regulatory functions." However, the SAMDA analysis completed as part of the December 22, 2011, 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 AP1000 standard design.

5.0 Severe Accident Mitigation Design Alternative Evaluation

Consistent with the objectives of standardization and early resolution of design issues, the Commission decided to evaluate SAMDAs as part of the original DC for the AP1000 design. In its "Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing

Plants” (50 FR 32138; August 8, 1985), the Commission defined the term “severe accident” as an event that is “beyond the substantial coverage of design-basis events (DBEs),” including events where there is substantial damage to the reactor core (whether or not there are serious offsite consequences). DBEs are analyzed in accordance with NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,” and documented in several chapters of the AP1000 DCD, such as Chapters 2, 3, and 15.

5.1. Westinghouse’s Prior Assessments of Severe Accident Mitigation Design Alternatives

The SAMDA analysis in Appendix 1B to Tier 2, Chapter 1, of the AP1000 DCD, Revision 15, dated December 8, 2005 (ADAMS Accession No. ML053460400), as originally certified, concluded that there were no cost-beneficial SAMDAs for the AP1000 design. In Westinghouse’s technical report APP-PRA-GER-001, “AP1000 Design Change Proposal Review for PRA and Severe Accident Impact,” dated September 21, 2007 (ADAMS Accession No. ML072670541), Westinghouse assessed the impacts of proposed design changes on the PRA and the SAMDA analysis for the certified AP1000 design as part of a May 26, 2007, request to amend the certified design (ADAMS Accession No. ML071580757).

The SAMDA analysis in Appendix 1B to Tier 2, Chapter 1, of the AP1000 DCD, Revision 19, which supported the 2011 amendment to the certified design in response to the May 26, 2007, application, as supplemented by subsequent letters, concluded that the proposed design changes did not significantly affect the applicability of the previous PRA. Therefore, Westinghouse concluded that it could be inferred that the “AP1000 PRA revision will not impact the AP1000 SAMDA.” Westinghouse further noted that it did not identify any new SAMDAs to incorporate that had not been considered previously. Therefore, Westinghouse concluded the design changes would not result in a change to the applicability of the certified AP1000 PRA, and the AP1000 SAMDA assessment in the original design remained valid.

As a result, Westinghouse concluded that the SAMDAs that were considered and rejected as not being cost beneficial in the original (Revision 15) SAMDA assessment did not become cost beneficial due to the proposed (Revision 19) design changes. In its March 19, 2021, submittal, Westinghouse did not modify the prior SAMDA assessment.

5.2. NRC Evaluation

The NRC staff reviewed the information in Appendix 1B to Tier 2, Chapter 1, of the AP1000 DCD, Revision 19, and in the EAs issued for the original AP1000 DCR (ADAMS Accession No. ML053630176) and for the amendment to the AP1000 DC (ADAMS Accession No. ML112380827). The NRC staff evaluated new cost information on updates to the dollar-per-person-rem value consistent with draft guidance in NUREG-1530, "Reassessment of NRC's Dollar Per Person-Rem Conversion Factor Policy, Draft Report for Comment," Revision 1, issued August 2015 (ADAMS Accession No. ML15237A211), and inflated to 2020 dollars the previously undiscounted cost parameters used in the maximum benefit valuation formulas of NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook," issued January 1997 (ADAMS Accession No. ML050190193). Based on the updated maximum benefit valuation with sensitivity analyses, the NRC staff concluded that the new cost information would not change the conclusions reached in the EAs issued for the original and amended AP1000 DCRs. For any future application referencing the AP1000 DC, the inflation of cost parameters and revised cost-benefit guidance should be considered in determining the subsequent applicability of the SAMDA conclusions described above.

6.0 Conclusions

On the basis of 10 CFR 51.32(b) and this EA, the NRC staff concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC staff is not required to prepare an EIS for the proposed action.

The documents referenced in the statement of considerations for the direct final rule contain further details on the action. The [Public Document Room \(PDR\)](#), where the public may examine and order copies of public documents, is currently closed. The public can submit requests to the PDR by sending an e-mail to PDR.Resource@nrc.gov or by calling 1-800-397-4209 between 8:00 a.m. and 4:00 p.m. (eastern time), Monday through Friday, except Federal holidays. Publicly available records will be accessible electronically in ADAMS on the NRC Web site at <https://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's PDR reference staff at 1-800-397-4209, at 1-301-415-4737, or PDR.Resource@nrc.gov.