AFFIRMATION ITEM

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: Commissioner Apostolakis

SUBJECT: SECY-11-0145 – FINAL RULE: AP1000 DESIGN CERTIFICATION AMENDMENT

Approved __X__ Disapproved _____ Abstain _____

Not Participating _____

COMMENTS: Below __ Attached _X_ None ___

SIGNATURE

11/29/11
DATE

Entered on "STARS" Yes _x__ No ___

Commissioner Apostolakis' Comments on SECY-11-0145
Final Rule: AP1000 Design Certification Amendment

I approve publication of the final AP1000 design certification rule in the *Federal Register*, subject to the attached edits. The staff should also make the attached edits to the AP1000 Comment Response Document prior to publication of the final rule.

I propose to make a finding of "good cause" to make the rule effective upon publication. NRC rules are published in the *Federal Register* and typically become effective 30 days after publication. The intent is to allow time for persons affected by the rule to conform their activities to the requirements of the new rule. The reference combined license applicant for the AP1000 design, Southern Nuclear Operating Company, has requested that the NRC make the AP1000 design certification amendment rule effective upon affirmation, an even earlier date than publication.

Although the Administrative Procedure Act requires that rules ordinarily must have a 30-day waiting period before becoming effective, an exception is that, upon a finding of good cause, an agency may provide for the immediate effectiveness of a rule upon publication in the *Federal Register*. The NRC regulations recognize this exception to the 30-day waiting period in 10 CFR 2.807. In such a case, the NRC must publish a good cause justification with the rule. As stated above and further explained in the attached mark-up, I conclude that good cause has been demonstrated here.

Furthermore, strict adherence to the normal process could involve unnecessary regulatory delay without health or safety benefit. This would be contrary to the regulatory principle that "Regulatory decisions should be made without undue delay", as well as President Obama's clear messages that it is critical that Federal agencies make permitting and environmental reviews more effective and efficient. [1]

George Apostolakis
11/29/11

[1] Executive Order 13579, "Regulation and Independent Regulatory Agencies" (July 11, 2011) and Presidential Memorandum, "Speeding Infrastructure Development through More Efficient and Effective Permitting and Environmental Review (August 31, 2011).

Enclosure 1
Federal Register
Notice

Good Cause Edits

1. On p. 1, in the paragraph labeled "Dates," the statement "insert date 30 days after publication in the *Federal Register*" should be changed to "insert date of publication in the *Federal Register*" in two places.

2. On p.1, in the paragraph labeled "Dates," after the existing text which ends, "The incorporation by reference of certain material specified in this regulation is approved by the Director of the Office of the Federal Register as of [insert date 30 days after publication in the Federal Register]." add the following text:

The applicability date of this rule for those entities who receive actual notice of this rule is the date of receipt of this rule.

3. On p. 3, in the Table of Contents, under "III. Discussion," add a new "C. Immediate Effectiveness of Final Rule; Provision of Actual Notice."

4. On p. 34, under "3. Applicable Regulations (Section V)," the statement "which is 30 days after the publication of this rule in the *Federal Register*" should be changed to "which is the date of publication of this rule in the *Federal Register*."

5. On p. 43, add a new "C. Immediate Effectiveness of Final Rule; Provision of Actual Notice" and text to read as follows:

C. Immediate Effectiveness of Final Rule; Provision of Actual Notice to Southern Nuclear Operating Company

The NRC is making this final rule immediately effective, and is also providing notice of this final rule (including the NRC-approved DCD, Revision 19) to Southern Nuclear Operating Company (SNOC). Under a provision of the Administrative Procedure Act (APA), 5 U.S.C. 553(d), there ordinarily must be a 30-day waiting period before a new rule is effective, subject to certain exceptions, including "good cause:"

> The required publication or service of a substantive rule shall be made not less than 30 days before its effective date, except: (1) a substantive rule which grants or recognizes an exemption or relieves a restriction; (2) interpretive rules and statements of

> policy; or (3) as otherwise provided by the agency for good cause found and published with the rule.

Consistent with the APA, 10 CFR 2.807 provides that the NRC may make a rule effective in less than 30 days after publication in the *Federal Register* upon making the good cause finding as noted in the third exception listed in 5 U.S.C. 553(d). For the reasons noted below, the NRC has determined that good cause exists for making this design certification rulemaking immediately effective.

Good cause can be demonstrated by any number of circumstances. Here the circumstances demonstrate that the basis for the 30-day waiting period – to allow those regulated by a new rule time to conform their activities to it – is absent. As pertinent here, several sources of guidance on Section 553(d) support the NRC's good cause finding for this rulemaking.

Specifically, in reviewing the legislative history of the 30-day provision to determine its purpose, the NRC notes the final report of the House Committee on the Judiciary, which offered the following explanation of the "good cause" exception in 5 U.S.C. 553(d)(3):

> [The purpose of the 30-day delay is to] afford persons affected a reasonable time to prepare for the effective date of a rule or rules or to take any other action which the issuance of rules may prompt. . . . Many rules . . . may be made operative in less than 30 days . . . because the parties subject to them may during the usually protracted hearing and decision procedures anticipate the regulation.

S. Doc. 79-249, Administrative Procedure Act: Legislative History 259-60 (1946). Additional guidance is found in the Attorney General's Manual on the APA, which provides:

> The requirement of publication not less than thirty days prior to the effective date may be shortened by an agency 'upon good cause

> found and published with the rule'. This discretionary exception was provided primarily to take care of the cases in which the public interest requires the agency to act immediately or within a period less than thirty days. Senate Hearings (1941) pp. 70, 441, 588, 650, 812, 1506. *Where the persons concerned request that a rule be made effective within a shorter period, this circumstance would ordinarily constitute good cause.* Also, it is clear from the legislative history that for good cause an agency may put a substantive rule into effect immediately; in such event, the requirement of prior publication is altogether absent, and the rule will become effective upon issuance as to persons with actual notice, and as to others upon filing with the Division of the Federal Register in accordance with section 7 of the Federal Register Act. Senate Hearings (1941) pp. 594, 599, 1340, 1455.

U.S. Dep't of Justice, Attorney General's Manual on the Administrative Procedure Act 37 (1947) (*emphasis added*). In light of this background, the NRC believes that there is good cause for making this final rule amending the AP1000 design certification rule immediately effective.

On May 27, 2011, one of the first COL applicants to which this amended AP1000 design certification rule would potentially apply, SNOC, submitted a "white paper" that set forth alternatives to making the final AP1000 rule effective 30 days after publication. (ADAMS Accession No. ML11152A189). Thereafter, SNOC submitted a July 20, 2011 letter indicating that making the certified design rule immediately effective would serve important policy objectives.[1] (ADAMS Accession No. ML11210B421). SNOC's letter thus requested

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[1] The letter by SNOC, requesting that the final rule amending the AP1000 design certification rule be made effective before 30 days after *Federal Register* publication, was filed on the docket for the Vogtle Electric Generating Plant, Units 3 and 4 (Docket Nos. 52-025-COL and

Commission action. During the *Vogtle* uncontested, or "mandatory," hearing held by the Commission on SNOC's applications for a COL and a limited work authorization (LWA), SNOC reiterated its request that the NRC issue the COL and LWA immediately upon Commission affirmation of the final rule amending the AP1000 design certification rule. Transcript of *Vogtle* COL Mandatory Hearing at 22-23, 350 (Sept. 27, 2011). (ADAMS Accession No. ML11305A228).

Here, SNOC, which is likely to use (and be bound by) the AP1000 design certification rule in the short term if the Commission otherwise authorizes issuance of the COL, wishes the rule be made immediately effective. Given SNOC's longstanding awareness of and participation in the AP1000 rulemaking, it does not need the 30-day waiting period to come into compliance with the final rule. Under the Attorney General's Manual, *supra,* at 37, SNOC's request that the rule be made effective in a shorter time period constitutes good cause to bypass the 30-day waiting period. As noted above, the extensive process for consideration of this design certification rulemaking would clearly constitute a situation where "the parties subject to [the regulation] may during the usually protracted hearing and decision procedures anticipate the regulation." S. Doc. 79-249, Administrative Procedure Act: Legislative History 259-60 (1946). In fact, that "anticipation" is clearly manifested in SNOC's use of the design certification rulemaking, as well as use by other applicants for COLs referencing the AP1000 design certification rule, which would occur only after the completion of a public process that includes NRC adjudicatory processes for each COL application. The determination of good cause regarding the effective date of the AP1000 rule is separate from, and does not prejudge, the licensing determinations that are otherwise required in the COL proceedings.

52-026-COL) (*Vogtle*). SNOC's request is more appropriately addressed in this rulemaking proceeding to amend the AP1000 design certification rule.

Finally, the NRC is providing actual service of the final AP1000 rule (including the NRC-approved DCD, Revision 19) to SNOC concurrently with the NRC's transmission of the final rule to the Office of the Federal Register for publication.[2] Thus, either before, or simultaneous with, any issuance of a COL for *Vogtle* (and any other COL application referencing the AP1000, upon request), SNOC (and any other COL applicant referencing the AP1000, upon request) will have actual notice of the requirements of the final AP1000 rule and Revision 19 of the DCD for which their NRC-licensed activities under the COL must conform.

The immediately effective rule cannot be used by anyone until the agency has made the necessary health and safety findings and completed the environmental review processes that necessarily precede the issuance of a COL relying on the design certification rulemaking. Each finding necessary under the Atomic Energy Act would have been made through public rulemaking and the NRC's adjudicatory processes that serve to allow consideration of public input before the agency issues its determination on an application referencing the AP1000. The rule itself does not force anyone to take action immediately based on its effective date because it does not compel, but rather permits, action. Therefore, from the standpoint of regulatory efficiency, delaying issuance of a licensing decision when the decision is ready to be issued is not in the public interest, whether the decision is to deny or grant the requested license.

On October 14, 2011, counsel for several organizations who were previously admitted as Joint Intervenors in the contested portion of the *Vogtle* COL proceeding indicated that they would be adversely affected by the issuance of an immediately effective rule. Letter from Mindy Goldstein, Counsel for Southern Alliance for Clean Energy, Georgia Women's Action for New Directions, and Center for a Sustainable Coast (Goldstein Letter) (ADAMS Accession No.

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[2] The NRC would also provide actual notice of the final AP1000 rule to any other COL applicant upon request. On the date of the transmission of the final rule package to the Federal Register, the NRC will issue an announcement of its transmission and make the final rule package as transmitted to the federal Register available on the NRC website.

ML11287A054).[3] The Goldstein Letter states that SNOC has requested a waiver of 10 CFR. 2.807 during the uncontested hearing, which the letter states is an improper forum, and that waiver of 10 CFR. 2.807 would not afford them time to prepare for issuance of the Vogtle COL or LWA. The Goldstein Letter states that a waiver of Section 2.807 is required to be submitted under Section 2.335. The Goldstein Letter explains that when the design certification rule becomes effective, a COL and LWA will be issued, resulting in a nuclear power plant that will affect all persons located near the site. The *Vogtle* Joint Intervenors believe the 30-day effective period is necessary to determine whether they wish to appeal the rule and seek a stay of construction.

First, a waiver of Section 2.807 is not required to make a rule immediately effective; a rule can be made immediately effective pursuant to the requirements of Section 2.807. The Commission in this rulemaking has determined to use the good cause exception to the 30-day effective date for the rulemaking and thus, is acting consistently with the provisions of Section 2.807 rather than waiving its provisions.

Second, as noted above in the discussion of the legislative history of the 30-day effective date provision, the primary purpose of the 30-day requirement is to allow affected persons time to comply with the new rule. The final rule amending the AP1000 design certification is focused on the conduct of regulatory activities licensed by the NRC. But, the *Vogtle* Joint Intervenors are neither current NRC licensees who must comply with the final rule amending the AP1000 rule, nor applicants for NRC licenses referencing the final AP1000 rule. Thus, the final AP1000 rule imposes no substantive legal obligations on them. The NRC does not believe that the Goldstein Letter describes any legally-cognizable harm within the scope of protection afforded to third parties by the APA's 30-day waiting period provision. That an immediately effective

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[3] Because the Goldstein Letter was submitted in response to SNOC's request, which is being considered in this AP1000 design certification rulemaking, the NRC is, in its discretion, considering the Goldstein Letter here as well. Therefore, the NRC need not address the matters raised in the Goldstein Letter with respect to SNOC's compliance with the adjudicatory requirements in 10 CFR 2.335.

AP1000 rule may facilitate issuance of a COL for the Vogtle plant does not appear to adversely affect the rights or capability of any public stakeholder to do what they would otherwise do if the AP1000 rule were made effective 30 days after publication in the Federal Register. Whether the AP1000 rule is immediately effective or not does not change any public stakeholder's legal rights or options; it merely affects the timing of asserting such rights or exercising those options.

Further, the Commission is not aware of any regulatory history indicating that the purpose of the 30-day effective date is tied to or affects appeal rights. Regardless of the immediate effectiveness of the rule, the *Vogtle* Joint Intervenors may seek legal action on the immediately effective rule in Federal court, or they may file an appropriate motion in the *Vogtle* COL proceeding if they satisfy the requirements in 10 CFR Part 2 to reopen the record and submit late-filed contentions. *See* 10 CFR 2.309, 2.326. Thus, an immediately effective AP1000 rule does not foreclose, or render moot, challenges to the rule, including stay remedies. For these reasons, the NRC concludes that making the final AP1000 rule immediately effective would not adversely affect these organizations or any other public stakeholders.

In sum, the NRC finds good cause for making the final rule amending the AP1000 design certification rule immediately effective upon publication in the *Federal Register.* Therefore, the NRC is making the final rule immediately effective. In addition, there is sufficient reason to provide prompt actual notice of this final rule (including the NRC-approved DCD, Revision 19) to SNOC (and potentially to any other combined license applicant referencing the amended AP1000 design certification rule in its application).

6. On p. 76, under "V. Applicable Regulations," the statement "INSERT DATE THAT IS 30 DAYS AFTER THE DATE OF PUBLICATION IN THE *FEDERAL REGISTER*" should be changed to "INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*."

Other Edits

requesting the NRC to reconsider comments made during the initial AP1000 DC rulemaking, and two submissions with supplemental information to support suspending this rulemaking. The NRC also received several comment submissions after June 30, 2011. ~~Although~~ The NRC deemed that it was not practical to consider, in this rulemaking, comments received after June 30, 2011 and, therefore, does not provide responses to those comments. However, the NRC has briefly reviewed them to ensure that they contain no health and safety matters.

There were several commenters in favor of completing the AP1000 rulemaking, while some were unconditionally opposed to completing the proposed amendment to the AP1000 design. The vast majority of commenters favored delaying (in some fashion) the AP1000 amendment rulemaking until lessons are learned from the Fukushima Daiichi Nuclear Power Plant (Fukushima) accident that occurred on March 11, 2011, and the NRC applies the lessons learned to U.S. nuclear power plants, including the AP1000 design.

Before responding to specific comments based upon the Fukushima Daiichi Nuclear Power Plant Event, the NRC is providing this discussion about the ongoing actions underway in response to this event. The Commission created a Near-Term Task Force (NTTF) to conduct an analysis of the lessons that can be learned from the event. The task force was established to conduct a systematic and methodical review of NRC processes and regulations to determine whether the NRC should make additional improvements to its regulatory system. The NTTF issued a report (ADAMS Accession No. ML111861807) evaluating currently available technical and operational information from the events, and presented a set of recommendations to the Commission. The task force concluded that continued operation and continued licensing activities do not pose an imminent risk to public health and safety. Among other recommendations, the NTTF supports completing the AP1000 design certification rulemaking activity without delay (see pages 71-72 of the report).

In an August 19, 2011, Staff Requirements Memoranda (SRM) (ADAMS Accession No. ML112310021), the Commission set forth actions related to the NTTF report together with a

functions. The shield building is not intended to be a pressure retaining structure or to mitigate the effects of a containment failure. The shield building construction is primarily a steel-concrete composite module wall, with a reinforced concrete roof and reinforced concrete where the wall meets the foundation. The wall is appropriately reinforced and sized where the composite wall module joins the reinforced concrete sections and as appropriate to accommodate seismic loads and aircraft loads. This design is new to the amendment; previously the structure was all reinforced concrete.

The shield building and the containment are designed with a gap, or annulus, that ensures that both the shield building and steel containment are physically separate, excluding their foundation, and are considered to be "freestanding." In the shield building, air flows from the environment through openings in the shield building wall. The air then flows down along an interior baffle, turns toward the steel containment vessel, and then rises alongside the steel containment vessel where it absorbs heat. This heated air naturally rises and is then exhausted through the chimney located in the center of the primary containment cooling ~~storage~~ water storage tank.

Design changes to the passive containment cooling system and shield building principally involve the redesign of the shield building to a steel-composite design, with related changes to air inlet sizing, height of the building and gratings above the chimney opening. Revised safety analyses were performed to confirm adequate containment pressure control, capability of the shield building to withstand external events (tornado, seismic), as well as aircraft impact assessment. The shield building functions to protect the containment and facilitate passive containment cooling were not changed in the current amendment.

Spent Fuel Pool

The spent fuel pool (SFP) is a safety-related structure, housed in the auxiliary building that provides protection from aircraft impact or other external hazards.

For the first 72 hours after loss of normal SFP cooling, including response to a station

blackout (SBO) event, the spent fuel pool ~~including response to a station blackout (SBO) event~~ relies upon the natural heat capacity of the water in the pool to absorb the heat from spent fuel elements, and boil the water in the pool. Thus, the safety-related means of heat removal for 72 hours is by heat-up of the volume of water in the pool and in safety-related water sources such as the cask washdown pit. The AP1000 design (as initially certified) included safety-related water level indication with readout and alarm in the main control room. A nonsafety-related spent fuel pool cooling system is also installed. Onsite, protected sources of water are available for up to 7 days, controlled from areas away from the pool. In modes with high heat load in the pool, two sources of ac power are specified in the availability controls. Water can be sprayed into the pool from two nozzle headers on opposite sides of the pool. A cross-connection also exists to the residual heat removal system. Those design features needed to provide make-up water after 72 hours and up to 7 days, such as the passive containment cooling water ancillary storage tank, and ancillary diesel generators, are protected from external hazards including the safe-shutdown earthquake (SSE), tornado, and flooding.

Design changes within the scope of the current amendment are the number of fuel assemblies stored, the rack designs for new and spent fuel storage, the criticality analysis for spent fuel in the pool (including use of boron material attached to the storage cells), installation of spray headers, and credit for additional water sources for pool makeup.

C. *Significant Public Comments and Overall NRC Responses*

Comment: Many comments noted the NRC staff nonconcurrence on the shield building design and requested that the NRC should reconsider the views expressed in the nonconcurrence.

NRC Response: The NRC disagrees with these comments. Professional opinions may vary, and the NRC has in place mechanisms for making differing views known.

NRC employees can choose to exercise the nonconcurrence process as a way of communicating their views and ensuring their opinions are heard by NRC management. The

systems. By nature of their passive designs and inherent 72-hour coping capability for core, containment, and spent fuel pool cooling, the AP1000 designs have many of the design features and attributes necessary to address the NTTF recommendations. The NTTF supports completing the AP1000 design certification rulemaking activities without delay.

The NRC believes that the AP1000 final rulemaking can and should proceed without extending the public comment period because: (i) the NRC has determined that the AP1000 design certification amendment meets current regulations; (ii) the NRC will provide an opportunity for the public to provide input on NTTF recommendations, and (iii) if the NRC imposes additional requirements on the AP1000 design, existing regulations already define the process for doing so. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: One comment questioned whether the NRC endorsed NQA-1-1994 for work performed for the AP1000 project, where the NRC documented that NQA-1-1994 adequately meets the NRC requirements in the *Code of Federal Regulations*, and whether the Westinghouse's AP1000 design meets the requirements of 10 CFR Part 50, Appendix B.

NRC Response: ~~The NRC disagrees with this comment.~~ The NRC has, in application-specific requests for NRC approval of quality assurance programs, approved the use of NQA-1-1994 as an acceptable method to meet the requirements of Appendix B to 10 CFR Part 50. The NRC's approvals of NQA-1-1994 have been documented in NRC SERs on those requests.

The NRC believes that the AP1000 design meets the requirements of 10 CFR Part 50, Appendix B. By letter dated February 23, 1996 (~~available in~~ ADAMS Accession No. ML11280A309 ~~legacy library~~), the NRC issued a safety evaluation report approving Revision 1 of the Westinghouse Quality Systems Manual (Westinghouse Quality Assurance (QA) Manual). The Westinghouse QA Manual is based upon the guidance in NQA-1-1994. The NRC found that the Westinghouse QA Manual meets all the requirements of Appendix B. In addition, the

that the containment building and the shield building, working as a system, would transfer heat to the atmosphere during severe accidents as well as design-basis earthquakes. Experiments were conducted to demonstrate that these predictions are based upon physical phenomena that can be relied upon to work even when there is no ac power. In short, Westinghouse has demonstrated that the containment building is robust and will perform its safety functions effectively if a severe accident occurs at an AP1000 plant.

The commenters did not offer any basis for Westinghouse to revise its design or for the NRC to revise its evaluation. No change was made to the final rule, the DCD, or the EA as a result of these comments.

Comment: Many comments stated that Westinghouse has not proven that the reactor could be properly cooled in conditions similar to those at Fukushima.

NRC Response: The NRC considers these comments to be outside the scope of the rulemaking amending the AP1000 DCR. The Fukushima event involved an extended SBO (loss of offsite and onsite ac power). Westinghouse has shown that the AP1000 includes design features that keep the reactor properly cooled under these conditions. The features of the AP1000 design ensuring that the reactor can be properly cooled in ~~conditions similar to those at Fukushima~~an extended SBO are already part of the certified design for the AP1000, and are not being changed or modified by this final rule amending the AP1000 design. Therefore, these comments are out of scope for this rulemaking.

In addition, even if these comments are assumed to be within the scope of the rulemaking, the NRC disagrees with the comment. If a severe accident occurs, seriously damaging the core, the AP1000 containment can be adequately cooled for 3 days – even if a loss-of-coolant accident (LOCA) occurred and without any ac power – because the AP1000 containment is cooled by gravity-fed water from a tank located at the top of the containment. After 3 days with no ac power, only a small "ancillary" generator is needed. This generator is used to power a small pump that re-fills the tank that supplies water to the outside surface of the

The NRC evaluated each of the proposed changes and concluded that they are acceptable. The NRC's bases for approval of these changes are set forth in the FSER for the AP1000 amendment and are summarized in Section XII, "Backfitting and Issue Finality,," of this document, as part of the discussion as to how each of the 15 changes satisfy the criteria in =10 CFR 52.63(a).

Changes to Address Compliance with the AIA Rule

Westinghouse requested changes to the AP1000 design in order to comply with the requirements of the AIA rule, 10 CFR 50.150. The NRC confirmed that Westinghouse has adequately described key AIA design features and functional capabilities in accordance with the AIA rule and conducted an assessment reasonably formulated to identify design features and functional capabilities to show, with reduced use of operator action, that the facility can withstand the effects of an aircraft impact. In addition, the NRC determined that there will be no adverse impacts from complying with the requirements for consideration of aircraft impacts on conclusions reached by the NRC in its review of the original AP1000 design certification. The NRC's bases for approval of these changes are set forth in the FSER for the AP1000 amendment. As a result of these changes, the AP1000 design will achieve the Commission's objectives of enhanced public health and safety and enhanced common defense and security through improvement of the facility's inherent robustness to the impact of a large commercial aircraft at the design stage.

AP1000 Design Control Document Changes Since Revision 18

Introduction

The NRC staff's (staff's) review of DCD Revision 18 (ADAMS Accession No. ML103260072) identified a few areas where the DCD wording should be revised for clarity, to resolve internal inconsistencies, or to provide updated versions of referenced technical reports. In addition, three technical issues were noted: a load combination for the shield building, the method used to evaluate tank sloshing, and containment peak pressure analysis error

determined that it had not performed an analysis of hydrodynamic loads using an equivalent static analysis as stated in Westinghouse's response (ADAMS Accession No. ML102650098) to an action item from the NRC's shield building report review (documented in AFSER Chapter 3, ADAMS Accession No. ML103430502). Instead, the analysis had been done by response spectrum analysis. Both the equivalent static method and the response spectrum method had previously been approved by the NRC for use in the AP1000 design for structural analyses as described in Revision 18 of the DCD. This issue was discussed in a May 17, 2011, public meeting (see meeting summary dated May 26, 2011 (ADAM Accession No. ML111430775)). In response, Westinghouse performed the analysis with ~~this~~ the equivalent static method and presented the results in the revised shield building report and in DCD Revision 19 as follows. The use of the equivalent static method for the tank is discussed in Section 3.7 and Appendix 3G, and a table and figure were added to Appendix 3H. The revised shield building report included the results of the load combination for the containment cooling water storage tank using the equivalent static analytical method, which demonstrated that the design remained adequate when evaluated using the equivalent static analytical method. No change to the language of the AP1000 DCR in 10 CFR Part 52, Appendix D was made as a result of the DCD changes.

The NRC does not believe these DCD changes require renoticing. Revision 18 of the DCD stated that the design would be verified through the use of the equivalent static method, and that method had been previously approved by the NRC for AP1000 analyses equivalent to that peformed for the containment cooling water tank. No change to the actual design of the tank was needed, and there was no change to the language of the AP1000 DCR. The NRC also notes that one of the petitions (dated June 16, 2011) that the NRC is responding to in the comment response document specifically raised this issue and the NRC has provided an answer similar to that described above.

Debris Limits

In its December 20, 2010, letter on long-term core cooling (ADAMS Accession No.

design certification (or amendment) to supply the design for the applicant's use. Paragraph A.4 requires that a COL applicant referencing Appendix D to 10 CFR Part 52 include, as part of its application, a demonstration that an entity other than Westinghouse is qualified to supply the AP1000 certified design unless Westinghouse supplies the design for the applicant's use. In cases where a COL applicant is not using Westinghouse to supply the AP1000 certified design, this information is necessary to support any NRC finding under 10 CFR 52.73(a) that the entity is qualified to supply the certified design.

3. Applicable Regulations (Section V).

The purpose of Section V is to specify the regulations applicable and in effect when the design certification is approved (i.e., as of the date specified in paragraph A, which is 30 days after the publication of this rule in the *Federal Register*). The NRC is redesignating paragraph A as paragraph A.1 to indicate that this paragraph applies to that portion of the design that was certified under the initial design certification. The NRC is further adding a new paragraph A.2, similar to paragraph A.1, to indicate the regulations that would apply to that portion of the design within the scope of this amendment, as approved by the Commission and signed by the Secretary of the Commission.

4. Issue Resolution (Section VI).

The purpose of Section VI is to identify the scope of issues that were resolved by the Commission in the original certification rulemaking and, therefore, are "matters resolved" within the meaning and intent of 10 CFR 52.63(a)(5).

Paragraph B presents the scope of issues that may not be challenged as a matter of right in subsequent proceedings and describes the categories of information for which there is issue resolution. Paragraph B.1 provides that all nuclear safety issues arising from the Atomic Energy Act of 1954 (the Act), as amended, that are associated with the information in the NRC's ~~AFSER~~ FSER related to certification of the AP1000 standard design (ADAMS Accession No. ~~ML103260072~~ ML112061231) and the Tier 1 and Tier 2 information and the rulemaking record

for Appendix D to 10 CFR Part 52, are resolved within the meaning of 10 CFR 52.63(a)(5). These issues include the information referenced in the DCD that are requirements (i.e., "secondary references"), as well as all issues arising from PI and SGI, which are intended to be requirements. Paragraph B.2 provides for issue preclusion of PI and SGI.

The NRC revised paragraph B.1 to extend issue resolution to the information contained in the NRC's FSER (Supplement No. 2), Appendix 1B of Revision 19 ~~(Supplement No. 2)~~ of the generic DCD, and the rulemaking record for this amendment. In addition, the NRC revised paragraph B.2 to extend issue resolution to the broader category of SUNSI, including PI, referenced in the generic DCD.

The NRC also revised paragraph B.7, which identifies as resolved all environmental issues concerning severe accident mitigation design alternatives (SAMDAs) arising under the National Environmental Policy Act of 1969 (NEPA) associated with the information in the NRC's final EA for the AP1000 design and Appendix 1B of the generic DCD (Revision 15) for plants referencing Appendix D to 10 CFR Part 52 whose site parameters are within those specified in the SAMDA evaluation. The NRC revised this paragraph to identify all resolved environmental issues concerning SAMDA associated with the information in the NRC's final EA for this amendment and Appendix 1B of Revision 19 of the generic DCD for plants referencing Appendix D to 10 CFR Part 52 whose site parameters are within those specified in the SAMDA evaluation.

Finally, the NRC is revising paragraph E, which provides the procedure for an interested member of the public to obtain access to SUNSI (including PI) and SGI for the AP1000 design in order to request and participate in proceedings, as identified in paragraph B, involving licenses and applications that reference Appendix D to 10 CFR Part 52. The NRC is replacing the current information in this paragraph with a statement that the NRC will specify at an appropriate time the procedure for interested persons to review SGI or SUNSI (including PI) for the purpose of participating in the hearing required by 10 CFR 52.85, the hearing provided under 10 CFR 52.103, or in any other proceeding relating to Appendix D to 10 CFR Part 52 in which interested

Document	PDR	Web	ADAMS
SECY-11-XXXX0145, "Final Rule – AP1000 Design Certification Amendment"	x	x	ML112380823
AP1000 Final Rule Environmental Assessment	x	x	ML112380827
AP1000 Final Rule Public Comment Response Document	x	x	ML112212319
SECY-11-0002, "Proposed Rule – AP1000 Design Certification Amendment"	x	x	ML103000397
AP1000 Proposed Rule *Federal Register* Notice	x	x	ML103000412
AP1000 Proposed Rule Environmental Assessment	x	x	ML103000415
NUREG-1793, Supplement 2 to Final Safety Evaluation Report for Revision 19 to the AP1000 Standard Design Certification (publicly available)	x	x	ML112061231
NUREG-1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, September 2004	x	x	ML043570339
NUREG-1793, Supplement 1 to Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design	x	x	ML053410203
Emergency Petition to Suspend All Pending Reactor Licensing Decisions And Related Rulemaking Decisions Pending Investigation Of Lessons Learned From Fukushima Daiichi Nuclear Power Station Accident, April 14 - 18, 2011	x	x	ML111040355 ML111110862
AP1000 Design Control Document (DCD), Revision 19, Transmittal Letter	x	x	ML11171A315
AP1000 DCD, Revision 19 (Public Version)	x	x	ML11171A500
Redacted Version of Dissenting View on AP1000 Shield Building Safety Evaluation Report With Respect to the Acceptance of Brittle Structural Model to be Used for the Cylindrical Shield Building Wall, December 3, 2010	x	x	ML103370648
AP1000 Containment Cleanliness – DCD Markup for Revision 19, February 23, 2011	x	x	ML110590455
Interim Staff Guidance DC/COL-ISG-011, "Finalizing Licensing-basis Information"	x	x	ML092890623
Design Changes Submitted by Westinghouse, Revision 18	x	x	ML100250873
AP1000 Technical Reports (Appendix)	x	x	ML103350501
TR-3, AP1000 Standard COL Technical Report Submittal of APP-GW-S2R-010, "Extension of Nuclear Island Seismic Analysis to Soil Sites," Revision 5, February 28, 2011	x	x	ML110691050
TR-26, "AP1000 Verification of Water Sources for Long-Term Recirculation Cooling Following	x	x	ML102170123

included within its application a detailed list of each DCD content change and the basis for concluding that one or more of the criteria in 10 CFR 52.63(a)(1) are satisfied for each change.

In the course of the NRC review of the technical changes proposed by Westinghouse, the NRC considered the basis offered by Westinghouse and made conclusions about whether the criteria of 10 CFR 52.63(a) were satisfied. These conclusions are included in the chapters of the FSER under ADAMS Accession No. ML112061231. The NRC concluded that all of these changes met at least one of the criteria in 10 CFR 52.63(a) and are not otherwise inconsistent with the issue finality provisions of 10 CFR 52.63 and 52.83. Fifteen of the most significant changes are discussed below, to show that each of the 15 substantive changes to the AP1000 certified design meet at least one of the criteria in 10 CFR 52.63(a)(1)(i) through (a)(1)(vii) and, therefore, do not constitute a violation of the finality provisions in that section.

I. **10 CFR 52.63 Criterion (a)(1)(iv): Provides the Detailed Design Information to be Verified under those ITAAC, which are Directed at Certification Information (i.e., DAC).**

Title: Removal of Human Factors Engineering Design Acceptance Criteria from the Design Control Document

Item: 1 of 15

Significant Description of Change: The ITAAC Design Commitments for HFE ~~is~~ are in Tier 1, Table 3.2-1. In Revision 17 of the AP1000 DCD, Westinghouse proposed deletion of the Human Factors DAC (Design Commitments 1 through 4) and provided sufficient supporting documentation to meet the requirements of these ITAAC. Design Commitment 1 pertains to the integration of human reliability analysis with HFE design. Design Commitment 2 pertains to the HFE task analysis. Design Commitment 3 pertains to the human-system interface. Design Commitment 4 pertains to the HFE program verification and validation implementation. The information developed by Westinghouse to satisfy these ITAAC is included in Chapter 19 of the DCD.

proposed changes into the AP1000 DCR as part of this amendment contributes to the increased standardization of the certification information by eliminating the possibility of multiple departures. Therefore, these changes enhance standardization, and meet the finality criterion for changes in 10 CFR 52.63(a)(1)(vii).

Changes for which COL applicants would otherwise request departures

Westinghouse proposes several changes to its DCD with the stated purpose of contributing to increased standardization. Westinghouse represents that these changes were requested by the lead COL applicants currently referencing the AP1000. The NRC, in meetings with these applicants as part of the "Design-Centered Working Group" process for jointly resolving licensing issues, confirmed that these applicants requested these changes and committed to pursue ~~of~~ plant-specific departures from the AP1000 if Westinghouse did not initiate such changes to the AP1000 DCR. Such departures may be pursued by individual COL applicants (and licensees) as described in Part VIII, "Processes for Changes and Departures" of the AP1000 DCR (Appendix D to 10 CFR Part 52). Incorporating these proposed changes into the AP1000 DCR as part of this amendment contributes to the increased standardization of the certification information by eliminating the possibility of multiple departures. Therefore, all Westinghouse-initiated changes for the purpose of eliminating plant-specific departures enhance standardization, and meet the finality criterion for changes in 10 CFR 52.63(a)(1)(vii).

Title: **Minimization of Contamination (10 CFR 20.1406 (b))**

Item: 3 of 15

Description of Change: In DCD Section 12.1.2.4, Westinghouse discussed features incorporated into the amended design certification to demonstrate compliance with 10 CFR 52.47(a)(6), which requires that a design certification application include the information required by 10 CFR 20.1406 (b), which was adopted in 2007 as part of the general revisions to 10 CFR Part 52. This regulation requires design certification applicants whose applications are submitted after August 20, 1997, to describe how the design will minimize, to the extent

Location within the SER where the changes are principally described:

The details of the NRC's evaluation of Westinghouse's design features associated with I&C systems are in Sections 7.1 through 7.3, and 7.9 of NRC's Chapter 7 FSER.

Evaluation of the Criteria in 10 CFR 52.63(a)(1):

Inclusion in the DCD of the more detailed information about the I&C architecture and communications provides additional information leading to increased standardization of this aspect of the design. Therefore, the change meets the finality criterion for changes in 10 CFR 52.63(a)(1)(vii).

Title: Changes to the Passive Core Cooling System – Gas Intrusion

Item: 9 of 15

Description of Change: In AP1000 DCD Tier 1 and Tier 2, Westinghouse proposed changes to the design of the PCCS to add manual maintenance vent valves and manual maintenance drain valves, and to reroute accumulator discharge line connections in order to address concerns related to gas intrusion. In addition, Westinghouse provided descriptions of surveillance and venting procedures to verify gas void elimination during plant startup and operations. These proposed changes are responsive to the actions requested by Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems."

The passive core cooling system (PCCS) provides rapid injection of borated water, which provides negative reactivity to reduce reactor power to residual levels and ensures sufficient core cooling flow. Noncondensible gas accumulation in the PCCS has the potential to delay injection of borated water, which would impact the moderating and heat removal capabilities, thus providing a challenge to the primary fission product barrier and maintenance of a coolable core geometry. As part of its review, the NRC determined that the proposed changes in the design of the PCCS were acceptable for providing protection for ~~DBEs~~design basis events, such as LOCAs.

module. Subsection 3.8.3.1.1 of the AP1000 DCD Tier 2 would be changed to reflect modifications to the RPV support design. In the revised design, there are four support "boxes" or "legs" located at the bottom of RPV's cold leg nozzles. The support boxes are anchored directly to the primary shield wall concrete base via steel embedment plates. This CA04 structural module is no longer used in the new design. The four ~~RV~~ RPV support boxes are safety-related and the design of the RPV associated support structures is consistent with the safe shutdown earthquake design of Seismic Category I equipment. Subsections 3.8.3.5.1 and 5.4.10.2.1 of the DCD are modified.

Location within the SER where the changes are principally described:

The details of the NRC's evaluation of Westinghouse's design features associated with RPV supports are in Chapter 23, Section R, of the FSER.

Evaluation of the Criteria in 10 CFR 52.63(a)(1):

Inclusion in the DCD of the changes to the RPV supports contributes to the increased standardization of this aspect of the design. Therefore, the change meets the finality criterion for changes in 10 CFR 52.63(a)(1)(vii)

Title: Spent Fuel Pool Decay Heat Analysis and Associated Design Changes

Item: 13 of 15

Description of Change: In AP1000 DCD Tier 2, Section 9.1.3, Westinghouse proposed changes to the SFP cooling system. Westinghouse proposed to increase the number of spent fuel storage locations from 619 to 889 fuel assemblies and implement the following associated design changes: (1) increase in component cooling system (CCS) pump design capacity, (2) increase in the CCS supply temperature to plant components, and (3) changes in the CCS parameters related to the RCPs. The increase in the number of assemblies affects the decay heat removal/SFP heatup analyses. The supporting bases for these DCD changes are documented in: TR-111, "Component Cooling System and Service Water System Changes Required for Increased Heat Loads," APP-GW-GLN-111, Revision 2, dated May 2007 (ADAMS

Other Technical Changes

The above discussion on selected technical changes is illustrative of the NRC's consideration of applicability of the finality provisions to other technical changes proposed from Revision 15 of the DCD, which are reflected in Revision 19. As noted earlier, Westinghouse provided its proposed basis for each change as part of the application. The NRC concludes that the other technical changes meet one or more of the finality criteria and thus do not constitute a violation of the finality provisions of 10 CFR 52.63.

Changes Addressing Compliance with Aircraft Impact Assessment Rule (10 CFR 50.150)

The final rule amends the existing AP1000 DCR, in part, to address the requirements of the AIA rule. The AIA rule itself mandated that a DCR be revised, if not during the DCR's current term, then no later than its renewal to address the requirements of the AIA rule. In addition, the AIA rule provided that any COL issued after the effective date of the final AIA rule must reference a DCR complying with the AIA rule, or itself demonstrate compliance with the AIA rule. The AIA rule may therefore be regarded as inconsistent with the finality provisions in 10 CFR 52.63(a) and Section VI of the AP1000 DCR. However, the NRC provided an administrative exemption from these finality requirements when the final AIA rule was issued (74 FR 28112; June 12, 2009). Accordingly, the NRC has already addressed the backfitting implications of applying the AIA rule to the AP1000 with respect to the AP1000 and referencing COL applicants.

Conclusion

The amended AP1000 DCR does not constitute backfitting and is consistent with the finality provisions in 10 CFR Part 52. Accordingly, the NRC has not prepared a backfit analysis or documented evaluation for this rule.

c. In Section V, redesignate paragraph A as paragraph A.1 and add a new paragraph A.2;

d. In Section VI, revise paragraphs B.1, B.2, B.7, and E;

e. In Section VIII, revise the introductory text of paragraph B.5.b, redesignate paragraphs B.5.d, B.5.e, and B.5.f as paragraphs B.5.e, B.5.f, and B.5.g, respectively, and add a new paragraph B.5.d, and revise paragraphs B.6.b and B.6.c; and

f. In Section X, revise paragraph A.1 and add a new paragraph A.4.

The revisions and additions read as follows:

Appendix D to Part 52—Design Certification Rule for the AP1000 Design

* * * * *

III. Scope and Contents

A. Tier 1, Tier 2 (including the investment protection short-term availability controls in Section 16.3), and the generic TSs in the AP1000 Design Control Document, Revision 19, (Public Version) (AP1000 DCD), dated June 13, 2011, are approved for incorporation by reference by the Director of the Office of the Federal Register under 5 U.S.C. 552(a) and 10 CFR Part 51. Copies of the generic DCD may be obtained from Stanley E. Ritterbusch, Manager, AP1000 Design Certification, Westinghouse Electric Company, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066, telephone 412-374-3037. A copy of the generic DCD is also available for examination and ~~copied for a fee, publicly available documents~~copying at the NRC's PDR, Room O-1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. Copies are available for examination at the NRC Library, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland 20852, telephone 301-415-5610, e-mail LIBRARY.RESOURCE@NRC.GOV. The DCD can also be viewed online in the NRC Library at http://www.nrc.gov/reading-rm/adams.html by searching under ADAMS Accession No. ML11171A500. All approved material is available for inspection at the National Archives and

Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to http://www.archives.gov/federal-register/cfr/ibr-locations.html.

* * * * *

D. 1. If there is a conflict between the generic DCD and either the application for the initial design certification of the AP1000 design or NUREG-1793, "Final Safety Evaluation Report Related to Certification of the Westinghouse Standard Design," and Supplement No. 1, then the generic DCD controls.

2. If there is a conflict between the generic DCD and either the application for Amendment 1 to the design certification of the AP1000 design or NUREG-1793, "Final Safety Evaluation Report Related to Certification of the Westinghouse Standard Design," Supplement No. 2, then the generic DCD controls.

* * * * *

IV. Additional Requirements and Restrictions

A.* * *

3. Include, in the plant-specific DCD, the ~~SUNSI~~sensitive unclassified non-safeguards information (including ~~PI~~proprietary information) and ~~SGI~~safeguards information referenced in the AP1000 DCD.

4. Include, as part of its application, a demonstration that an entity other than Westinghouse is qualified to supply the AP1000 design, unless Westinghouse supplies the design for the applicant's use.

* * * * *

V. Applicable Regulations

A.* * *

2. The regulations that apply to those portions of the AP1000 design approved by Amendment 1 are in 10 CFR Parts 20, 50, 73, and 100, codified as of [INSERT DATE THAT IS

30 DAYS AFTER THE DATE OF PUBLICATION IN THE *FEDERAL REGISTER*], that are applicable and technically relevant, as described in the Supplement No. 2 of the FSER (NUREG-1793).

* * * * *

VI. Issue Resolution

* * * * *

B.* * *

1. All nuclear safety issues, except for the generic TS and other operational requirements, associated with the information in the FSER and Supplement Nos. 1 and 2, Tier 1, Tier 2 (including referenced information, which the context indicates is intended as requirements, and the investment protection short-term availability controls in Section 16.3 of the DCD), and the rulemaking records for initial certification and Amendment 1 of the AP1000 design;

2. All nuclear safety and safeguards issues associated with the referenced ~~SUNSI~~sensitive unclassified non-safeguards information (including ~~PI~~proprietary information) and ~~SGI~~safeguards information which, in context, are intended as requirements in the generic DCD for the AP1000 design;

* * * * *

7. All environmental issues concerning severe accident mitigation design alternatives associated with the information in the NRC's EA for the AP1000 design, Appendix 1B of Revision 15 of the generic DCD, the NRC's final EA for Amendment 1 to the AP1000 design, and Appendix 1B of Revision 19 of the generic DCD, for plants referencing this appendix whose site parameters are within those specified in the severe accident mitigation design alternatives evaluation.

* * * * *

E. The NRC will specify at an appropriate time the procedures to be used by an interested person who wishes to review ~~SUNSI~~sensitive unclassified non-safeguards information (including ~~PI~~proprietary information, such as trade secrets or financial information obtained from a person that are privileged or confidential (10 CFR 2.390 and 10 CFR Part 9)) or ~~SGI~~safeguards information for the AP1000 certified design, for the purpose of participating in the hearing required by 10 CFR 52.85, the hearing provided under 10 CFR 52.103, or in any other proceeding relating to this appendix in which interested persons have a right to request an adjudicatory hearing.

* * * * *

VIII. Processes for Changes and Departures

* * * * *

B.* * *

5.* * *

b. A proposed departure from Tier 2, other than one affecting resolution of a severe accident issue identified in the plant-specific DCD or one affecting information required by 10 CFR52.47(a)(28) to address 10 CFR 50.150, requires a license amendment if it would:

* * * * *

d. If an applicant or licensee proposes to depart from the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the standard design certification, then the applicant or licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(a). The applicant or licensee must also document how the modified design features and functional capabilities continue to meet the assessment requirements in 10 CFR 50.150(a)(1) in accordance with Section X of this appendix.

* * * * *

6.* * *

b. A licensee who references this appendix may not depart from the following Tier 2* matters without prior NRC approval. A request for a departure will be treated as a request for a license amendment under 10 CFR 50.90.

(1) Maximum fuel rod average burn-up.

(2) Fuel principal design requirements.

(3) Fuel criteria evaluation process.

(4) Fire areas.

(5) Reactor coolant pump type.

(6) Small-break loss-of-coolant accident (LOCA) analysis methodology.

(7) Screen design criteria.

(8) Heat sink data for containment pressure analysis.

c. A licensee who references this appendix may not, before the plant first achieves full-power following the finding required by 10 CFR 52.103(g), depart from the following Tier 2* matters except under paragraph B.6.b of this section. After the plant first achieves full-power, the following Tier 2* matters revert to Tier 2 status and are subject to the departure provisions in paragraph B.5 of this section.

Comment [nvg1]: Delete hyphen in "full-power"

Comment [nvg2]: Delete hyphen in "full-power"

(1) Nuclear Island structural dimensions.

(2) American Society of Mechanical Engineers Boiler & Pressure Vessel Code (ASME Code) piping design and welding restrictions, and ASME Code Cases.

(3) Design Summary of Critical Sections.

(4) American Concrete Institute (ACI) 318, ACI 349, American National Standards Institute/American Institute of Steel Construction (ANSI/AISC)–690, and American Iron and Steel Institute (AISI), "Specification for the Design of Cold Formed Steel Structural Members, Part 1 and 2," 1996 Edition and 2000 Supplement.

(5) Definition of critical locations and thicknesses.

(6) Seismic qualification methods and standards.

(7) Nuclear design of fuel and reactivity control system, except burn-up limit.

(8) Motor-operated and power-operated valves.

(9) Instrumentation and control system design processes, methods, and standards.

(10) Passive residual heat removal (PRHR) natural circulation test (first plant only).

(11) Automatic depressurization system (ADS) and core make-up tank (CMT) verification tests (first three plants only).

(12) Polar crane parked orientation.

(13) Piping design acceptance criteria.

(14) Containment vessel design parameters, including ASME Code, Section III, Subsection NE.

(15) Human factors engineering.

(16) Steel composite structural module details.

* * * * *

X. Records and Reporting

A. * * *

1. The applicant for this appendix shall maintain a copy of the generic DCD that includes all generic changes it makes to Tier 1 and Tier 2, and the generic TS and other operational requirements. The applicant shall maintain ~~SUNSI~~sensitive unclassified non-safeguards information (including ~~PI~~proprietary information) and ~~SGI~~safeguards information referenced in the generic DCD for the period that this appendix may be referenced, as specified in Section VII of this appendix.

* * * * *

4.a. The applicant for the AP1000 design shall maintain a copy of the AIA performed to comply with the requirements of 10 CFR 50.150(a) for the term of the certification (including any period of renewal).

Enclosure 3
Comment Resolution Document

The comment numbers for each comment submission are provided in the following documents:

Unique comment submittals 1 through 57 (partial): ADAMS Accession No. ML11265A035
Unique comment submittals 57 (continued) through 66: ADAMS Accession No. ML11265A034
Form letter and additional form letter submittals: ADAMS Accession No. ML11265A050
Petitions: ADAMS Accession No. ML11265A051

Unique Comments and NRC Responses

Fukushima-related

This subject area includes comments requesting specific action (hold, suspend, terminate, or extend comment period) based upon the Fukushima Daiichi NPP accident. This subject area includes AP1000-specific comments, as well as more general comments (e.g., close all plants), as a result of Fukushima. Other Fukushima-related topics covered under this subject area include tsunami/earthquake, core cooling, station blackout (SBO), and the need for a second control room. This subject area excludes comments relating to another AP1000-specific subject area (e.g., shield building).

Before responding to specific comments based upon the Fukushima Daiichi Nuclear Power Plant Event, the NRC is providing this discussion about its ongoing actions underway in response to this event. The Commission created a Near-Term Task Force (NTTF) to conduct an analysis of the lessons that can be learned from the event. The task force was established to conduct a systematic and methodical review of NRC processes and regulations to determine whether the NRC should make additional improvements to its regulatory system. The NTTF issued a report (ADAMS Accession No. ML111861807) evaluating currently available technical and operational information from the events, and presented a set of recommendations to the Commission. The NTTF concluded that continued operation and continued licensing activities do not pose an imminent risk to public health and safety. Among other recommendations, the NTTF supports completing the AP1000 design certification rulemaking activity without delay (see NTTF Report pages 71-72).

In an August 19, 2011, Staff Requirements Memoranda (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. ML11245A127) and "Prioritization of Recommended Actions to be Taken In Response to Fukushima Lessons Learned," October 3, 2011 (SECY-11-0137) (ADAMS Accession No. ML11269A204).

Inasmuch as the NTTF recommendations relevant to the AP1000 design certification are limited to: seismic and flooding protection (Recommendation 2); mitigation of prolonged SBO (Recommendation 4); and enhanced instrumentation and makeup capability for spent fuel pools (SFPs) (Recommendation 7) and the task force concluded that the AP1000 design by the nature of its passive design and inherent 72-hour coping capability, ~~AP1000 designs have~~has many of the design features and attributes necessary to address the Task Force recommendations, the NRC concludes that no changes to the AP1000 DCR are required at this time. Moreover, even if the Commission concludes ~~that~~ at a later time that some additional

The transfer of spent fuel to a permanent repository or other facility is out of the scope for this rulemaking process, which concerns an amendment to the rule certifying the AP1000 design in 10 CFR Part 52, Appendix D. However, current national policy, as found in the Nuclear Waste Policy Act (42 USC 10101, et seq.) mandates that high-level wastes (such as spent fuel) are to be buried at a deep geologic repository.

No change was made to the rule, the DCD, or the EA as a result of this comment.

Fukushima – Put Application on Hold to Consider Fukushima Lessons Learned

Comment: The approval of the AP1000 DCA should be put on hold until the lessons learned from the Fukushima event in Japan have been taken into consideration. (S6-1, S6-2, S8-2, S18-1, S20-1, S20-2, S29-10, S29-12, S33-2, S40-5, S48-1, S49-7, S51-1, S52-2, S57-2, S65-1)

NRC Response: The Commission declines to suspend or postpone the AP10000 rulemaking. See *Memorandum and Order*, CLI-11-05 (September 9, 2011, ADAMS Accession No. ML112521039). The reasons for the Commission action are set forth in CLI-11-05.

The Commission has taken and is continuing to take a series of actions to evaluate the Fukushima Daiichi Plant accident, identify possible regulatory actions, obtain stakeholder input, determine what actions should be adopted, and implement the Commission's determinations. In brief, the Commission established an NTTF to review relevant NRC regulatory requirements, programs, and processes, and their implementation, and to recommend whether the agency should make near-term improvements to its regulatory system. The NTTF issued its report (ADAMS Accession No. ML111861807) on July 12, 2011. The Commission held a public meeting on July 28, 2011, to discuss the results of the NTTF Report with members of the public and other interested stakeholders. Thereafter, the Commission issued ~~an~~ two SRMs on the NTTF recommendations (reference SRM-SECY-11-0093, dated August 19, 2011, and SRM-COMWDM-11-0001/ COMWCO-11-0001, dated August 22, 2011). These SRMs directed the NRC staff to take several actions, notably to engage with stakeholders to review and assess the NTTF recommendations, provide the Commission with a draft charter for the NRC's longer term review of the NTTF recommendations, and to provide the Commission with papers recommending prioritization of the recommendations and which recommendations should be implemented, in part or in whole, without unnecessary delay.

The pendency of these NRC actions; however, does not support any delay in the AP1000 rulemaking. The NRC noted that the NTTF did not recommend any changes to the AP1000 design certification (see NTTF Report, pages 71-72). Therefore, delay in the AP1000 rulemaking process is not needed to ensure that the AP1000 reflects the recommendations of the Fukushima NTTF. Moreover, even if the Commission concludes that some additional action is needed for the AP1000, the NRC has ample opportunity and legal authority to modify the AP1000 DCR to implement NRC-required design changes, as well as to take any necessary action to ensure that COLs, which reference the AP1000 also make the necessary design changes. Such actions would follow rulemaking processes allowing for public comment. For these reasons, a delay in the AP1000 rulemaking is not necessary.

No change was made to the rule, the DCD, or the EA as a result of this comment.

such that these SSCs will be available to perform their safety functions. No change was made to the rule, the DCD, or the EA as a result of this comment.

Fukushima – Fast-Tracking Concerns

Comment: The NRC should not "fast-track" the approval of any reactors without pausing to learn from Fukushima. (S17-2)

NRC Response: The NRC agrees with the comment. Protection of public health and safety is the foremost regulatory objective of the NRC, and the review of the AP1000 design has been conducted with that in mind. The NRC also recognizes that it must perform its regulatory responsibilities in an efficient and effective manner. The NRC has not ignored any safety issues in order to speed up the regulatory review process or for any other reason. The NRC has followed all applicable procedures and processes in its safety review and has found that the AP1000 DCA meets all NRC requirements.

In addition, the Commission established an NTTF to perform a review of the Fukushima Daiichi accident. The NTTF evaluated all technical and policy issues related to the event to identify potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to regulatory framework that should be conducted by the NRC. The NTTF issued its report (ADAMS Accession No. ML111861807) on July 12, 2011, recommending that the AP1000 rulemaking process proceed without delay (see NTTF Report, pages 71-72). Consistent with this recommendation, the NRC believes that the AP1000 final rulemaking can and should proceed without delay because: (i) the NRC has determined that the AP1000 DCA meets current regulations; (ii) the AP1000 design features already address many of the design concerns and recommendations raised by the NTTF; (iii) the NRC will provide an opportunity for the public to provide input on NTTF recommendations, and (iv) if the NRC imposes additional requirements on the AP1000 design, existing regulations already define the process for doing so under 10 CFR 52.63.

No change was made to the rule, the DCD, or the EA as a result of this comment.

Fukushima – 75-Day Public Comment Period

Comment: Given the recent event at the Fukushima plant in Japan, the 75-day comment period is not adequate and should be extended. (S8-4, S24-3, S29-11, S49-2)

NRC Response: The NRC disagrees with this comment, and believes that the 75-day public comment period, which is consistent with most other NRC technical rulemakings, is adequate. The Commission established an NTTF to review relevant NRC regulatory requirements, programs, and processes, and their implementation, and to recommend whether the agency should make near-term improvements to its regulatory system. The public comment period for the proposed rule on the AP1000 DCA closed on May 10, 2011, and the NTTF issued its report (ADAMS Accession No. ML111861807) on July 12, 2011. The NTTF considered the AP1000 DCA in its report. The NTTF Report noted that the AP1000 design certification, currently in the rulemaking process, has passive safety systems. By nature of its passive design and inherent 72-hour coping capability for core, containment, and SFP cooling, the AP1000 design has many of the design features and attributes necessary to address the NTTF recommendations.

Therefore, the NTTF expressed support for completing the AP1000 design certification rulemaking without delay (see NTTF Report, pages 71-72).

The Commission directed the NRC staff, via SRM, to request public input on the NTTF recommendations for the purpose of providing the Commission with fully-informed options and recommendations (SRM-SECY-11-0093, dated August 19, 2011 (ADAMS Accession No. ML112310021), and SRM-COMWDM-11-0001/COMWCO-11-0001, dated August 22, 2011).

To the extent that the Commission might approve any NRC staff recommendations to impose additional requirements on the AP1000 design, the NRC can amend the AP1000 DCR to reflect those requirements. Any Commission-imposed changes would be subject to the issue finality provisions of 10 CFR 52.63(a)(1) and would have to meet one or more of the change criteria of that paragraph.

The NRC believes that the AP1000 final rulemaking can and should proceed without extending the public comment period because: (i) the NRC has determined that the AP1000 DCA meets current regulations; (ii) the AP1000 design features already address many of the design concerns and recommendations raised by the NTTF; (iii) the NRC will provide an opportunity for the public to provide input on NTTF recommendations, and (iii) if the NRC imposes additional requirements on the AP1000 design, existing regulations already define the process for doing so under 10 CFR 52.63.

No change was made to the rule, the DCD, or the EA as a result of this comment.

Fukushima – Cooling Capabilities

Comment: Several comments raised concerns about the AP1000's capability to maintain reactor core cooling following a major natural disaster, given the recent events at the Fukushima plant in Japan. (S49-4, S53-6)

NRC Response: The NRC interprets these comments to refer to the severe external environmental conditions experienced at Fukushima and the resultant accident. The AP1000 design can withstand severe external environmental hazards such as fires, flooding, tsunamis, high winds, hurricanes, tornadoes, snow and ice impacts, and seismic events that are considered credible in the U.S. The AP1000 design was previously analyzed for these severe environmental conditions as part of the initial design certification; therefore, these comments are out of scope. Moreover, the AP1000 design, as amended, continues to meet NRC requirements. Westinghouse has shown and the NRC has concluded in its review as documented in the FSER (NUREG-1793, Supplement 2) that the AP1000 design can keep the reactor properly cooled under these severe environmental conditions, thus providing reasonable assurance that the public is protected.

The Fukushima accident occurred, in part, because of the loss of ac power (also known as SBO), which was necessary to maintain core cooling. The AP1000 design has a passive safety system (natural circulation) and inherent 72-hour coping capability for core, containment, and SFP cooling – even if a loss-of-coolant accident (LOCA) has occurred.

After 3 days with no alternating current (ac) power, only a small "ancillary" generator is needed. This generator is used to power a small pump that re-fills the tank that supplies water to the

required to function for 72 hours. The design also has a separate (nonsafety-related) ac-powered control room ventilation system. Control room instrumentation can be powered with battery-supplied direct current (dc) power. Specific details of the NRC's review of the control room design may be found in the FSER Section 6.4, "Control Room Habitability Systems" (NUREG-1793, Supplement 2).

In response to the Fukushima Daiichi accident, the Commission established an NTTF to review relevant NRC regulatory requirements, programs, and processes, and their implementation, and to recommend whether the agency should make near-term improvements to its regulatory system. The NTTF issued its report (ADAMS Accession No. ML111861807) on July 12, 2011. The NTTF's recommendations considered improving the safety of both operating reactors and new reactor designs. The Commission directed the NRC staff, via SRM, to request public input on the NTTF recommendations for the purpose of providing the Commission with fully-informed options and recommendations (SRM-SECY-11-0093, dated August 19, 2011 (ADAMS Accession No. ML112310021), and SRM-COMWDM-11-0001/COMWCO-11-0001, dated August 22, 2011). The NRC believes that current operating reactors are safe and continue to meet NRC requirements. Further, a backup, offsite, shielded reactor plant control center with full reactor plant status would constitute a new requirement. If the NRC imposes additional requirements on new or currently operating reactors, existing regulations already exist defining the process for doing so. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: After an initial look at lessons learned from Fukushima, we cannot expect structural volumes and 'channels' to maintain structural integrity. We should also expect the immediate ground underneath these structures to be porous (earth). Thus, design of these volumes and channels should be such that they minimize connections to other (adjacent) volumes from which contaminated (liquid) effluents can flow. (S52-1j)

NRC Response: The NRC disagrees with this comment. Applicants for a license must demonstrate that the plant can shutdown safely after specified ground motion based upon consideration of the most severe earthquake that has been historically reported for the site and surrounding area, with margin sufficient to account for the limited period of time, quantity and accuracy of the historical data. The applicant must show that there is a large margin in the seismic capacity of all of the safety-related SSCs necessary for safe-shutdown. The applicant also performs a severe accident analysis (a "seismic margins" analysis) to show that there is still a high confidence of low probability of failure – even if an earthquake occurs that is much larger than predicted. The containment vessel of the AP1000 and the piping systems penetrating the containment are designed to isolate potentially contaminated fluids from the environment during all DBEs and severe accidents.

In addition, Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," Criterion 2, requires that SSCs important to safety (e.g., the liquid waste management system), be designed to withstand the effects of natural phenomena (including earthquakes, tornadoes, floods, hurricanes, and tsunamis) that have historically been reported for the site and surrounding area, with margin to account for uncertainty in the historical data, such that these SSCs will withstand the effects of natural phenomena without the loss of the capability to perform their safety functions. These SSCs are designed to withstand accident conditions in combination with the effects of natural phenomena. Technical Specifications include the design feature specifications for the liquid waste management system that limit the volume and type of

(h) Collectively, the design-basis and beyond-design-basis analyses conducted by the applicant demonstrated that the out-of-plane shear is not a concern for design-basis loads in the non-ductile region of the shield building, and there is substantial margin in the design above design-basis loads.

The NRC, therefore, concluded from its evaluation that the AP1000 shield building design is adequate, because it meets the Commission's regulations and provides reasonable assurance that the shield building will remain functional under design-basis loads. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The comments urge the Commission not to finalize its pending approval of the AP1000 reactor design until serious safety concerns about its shield building have been addressed. These concerns include that there is a risk that an earthquake at, or aircraft impact on, the AP1000 could result in a catastrophic core meltdown. (S40-1, S40-2, S48-4, S66-1)

NRC Response: The NRC disagrees that NRC has not addressed the concerns relating to the shield building. The AP1000 shield building design is first-of-a-kind. It relies on SC composite construction in a safety-critical application to an extent never before reviewed by the NRC. The NRC staff conducted a careful review of the unique and complex design of the shield building to ensure that under design-basis loads, including the SSE, the shield building possesses sufficient strength, stiffness, and ductility to remain functional. The NRC relied on the applicable regulatory requirements, such as Appendix S to 10 CFR Part 50, "Earthquake Engineering Criteria" and Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plant Structures." The NRC staff utilized the implementation guidance in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition (SRP)" and independent reviews by seismic design experts to ensure that the shield building met the applicable regulatory requirements. The bases for the NRC's acceptance of the design are documented in its FSER.

The NRC ~~therefore~~ concluded from its evaluation that the AP1000 shield building design is adequate, because it meets the Commission's regulations and provides reasonable assurance that the shield building will remain functional under design-basis loads. Because the shield building concerns have been resolved, the NRC concludes that there is no reason to delay the amendment to the rule certifying the AP1000 design. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The Commission has apparently accepted Westinghouse's argument that the brittle module design would only be used in regions of the building that are unlikely to encounter high loads. Thus the failing tests were ignored. Instead of relying on the results from the test intended to prove the shield building's design, Westinghouse substituted results from computer simulations that may be a poor approximation of reality. The AP1000 design should not be approved when the material making up 60 percent of the shield building, an essential structural component that is meant to withstand earthquakes, storms, and airplane strikes, has failed a critical physical test showing it to be brittle. (S66-3)

NRC Response: Through the detailed review of the application, the NRC staff reached a conclusion that there is reasonable assurance that the design of the shield building, including the region of the building with modules with the wider spacing (Module 2), meets regulatory requirements and will remain functional under design-basis loads with substantial margin. The

Spent Fuel

This subject area includes comments on onsite SFP storage and long-term storage/disposal of spent fuel, whether related to the AP1000 design or in general.

The SFP is a safety-related structure, housed in the auxiliary building that provides protection from aircraft impact or other external hazards.

For the first 72 hours after loss of normal SFP cooling, including response to an SBO event, the SFP design relies upon the natural heat capacity of the water in the pool to absorb the heat from spent fuel elements, and boil the water in the pool. Thus, the safety-related means of heat removal for 72 hours is by heat-up of the volume of water in the pool and in safety-related water sources such as the cask washdown pit. A nonsafety-related SFP cooling system is also installed. Onsite, protected sources of water are available for up to 7 days, controlled from areas away from the pool. In modes with high heat load in the pool, two sources of ac power are specified in the availability controls. Water can be sprayed into the pool from two nozzle headers on opposite sides of the pool. A cross-connection also exists to the residual heat removal system. Those design features needed to provide make-up water after 72 hours and up to 7 days, such as the passive containment cooling water ancillary storage tank, and ancillary diesel generators (DGs), are protected from external hazards including the SSE, tornado, and flooding.

Design changes within the scope of the current amendment are the number of fuel assemblies stored, the rack designs for new and spent fuel storage, the criticality analysis for spent fuel in the pool (including use of boron material attached to the storage cells), installation of spray headers, and credit for additional water sources for pool makeup.

Comment: A number of comments expressed concern that existing storage methods are inadequate. Some offered proposals for backup control, monitoring and power systems. A few stated that early lessons learned from Fukushima reveal that the SFPs should not be densely packed; there should be a robust containment around the fuel pools; there should be redundant cooling systems for the fuel pools; the buildup of hydrogen in the fuel pools needs to be addressed; and there should be back up power for pumps, cooling systems and monitoring systems. (S46-1; S57-1 through -8)

NRC Response: As discussed in the FSER, the AP1000 design meets current requirements. The Commission established an NTTF to perform a review of the Fukushima Daiichi accident. The NTTF evaluated all technical and policy issues related to the event to identify potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the NRC's regulatory framework that should be conducted by the NRC. The NTTF issued its report (ADAMS Accession No. ML111861807), dated July 12, 2011 and recommended that enhancements be made to SFP makeup capability and instrumentation for the SFP. Due to the AP1000's passive design, the NTTF recommended that design certification rulemaking activities continue.

It is important to note that the AP1000 SFP design is significantly different from the pool designs at the Fukushima Daiichi reactors in Japan and all of the operating reactors in the U.S. In addition to having a forced cooling system that utilizes pumps that rely upon ac electrical power for operation, the AP1000 also has a passive safety-related pool cooling capability that does not require ac electrical power to operate. Thus, the fuel remains adequately cooled for 72 hours in the event of an SBO.

NRC regulations require that the AP1000 SFP be designed with adequate SFP criticality controls and cooling capability to handle all operational conditions and postulated accident scenarios. The NRC reviewed the AP1000 SFP design presented in the AP1000 DCD amendment, evaluated the design against applicable regulations and guidance, and determined that the AP1000 SFP design meets all applicable requirements. The engineering calculations and analyses that were performed to support the SFP safety analysis were based on the geometry of the pool and the fuel stored in the SFP. Therefore, the density of spent fuel in the SFP was considered in both criticality and cooling calculations.

The comments presented potential concerns related to the density at which fuel is packed into the SFP, but do not list any specific deficiencies in the AP1000 criticality analysis. The AP1000 DCD Revision 18 criticality analysis was reviewed following the guidance found in SRP Section 9.1.1, Revision 3, "Criticality Safety of Fresh and Spent Fuel Storage and Handling," to ensure that the applicant is in compliance with the applicable regulations (GDC 62, "Prevention of Criticality in Fuel Storage and Handling," and 10 CFR 50.68, "Criticality Accident Requirements"). These requirements are generally performance-based with limitations on the reactivity values, and as such, there are no specific physical design requirements such as minimum geometric spacing which must be met. The AP1000 SFP criticality analysis demonstrates that, with the proposed storage arrangement of the SFP, the reactivity requirements are met. Therefore, the NRC staff has determined that the AP1000 SFP storage arrangement is acceptable based on the criticality analysis.

The AP1000 SFP cooling review results presented in the NRC safety evaluation were based on the SFP design in AP1000 DCD Revision 18. The AP1000 DCD Revision 18, SFP cooling analysis was reviewed following the guidance found in NUREG-0800 Section 9.1.3, Revision 3, "Spent Fuel Pool Cooling and Cleanup System," to ensure that the applicant is in compliance with the applicable regulations (GDC 2, "Design Bases for Protection Against Natural Phenomena," GDC 4, "Environmental and Dynamic Effects Design Bases," GDC 5, "Sharing of Structures, Systems, and Components," GDC 61, "Fuel Storage and Handling and Radioactivity Control," and GDC 63, "Monitoring Fuel and Waste Storage"). The increase in pool capacity (between DCD Revisions 15 and 18) allows the SFP to store 270 additional fuel assemblies. The number of fuel assemblies assumed to be offloaded during each refueling, and the frequency of refueling is not affected by this change. As a result of the increased SFP capacity, an additional 270 fuel assemblies will remain in the pool for a longer period of time. These assemblies would have over 10 years of decay time, which will result in a decreasing heat load from them. Therefore, the heat load contribution from these additional assemblies represents only a small fraction of the overall pool heat load. The safety-related cooling for the AP1000 SFP is dependent only on the use of passive safety features for the first 72 hours. The seismic Category I PCCWST contains water that drains by gravity into the SFP to provide safety-related makeup water to ensure that the spent fuel remains covered with water. The NRC staff reviewed the pool cooling analysis performed by the applicant and determined that the AP1000

SFP has adequate cooling and makeup water sources to cool the spent fuel stored in the pool under all anticipated operational occurrences and accident scenarios.

Comment [nvg1]: Add space between paragraphs.

The Commission established a NTTF to perform a review of the Fukushima Daiichi accident. The NTTF evaluated all technical and policy issues related to the event to identify potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the NRC's regulatory framework that should be conducted by the NRC. The NTTF recommended no changes to the AP1000 design. Should the Commission implement new requirements for spent fuel storage that are applicable to the AP1000 design, the NRC will use its regulatory processes to apply them.

No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: In light of the Fukushima Daiichi accident, the SFP cannot be in proximity to the reactor core, pressure vessel or containment and should be passively cooled. The comment indicates this is a lessons-learned from the Fukushima accident. (S52-1e)

NRC Response: Although the comment does not specify what distance constitutes "in proximity," the SFP for the AP1000 is in the auxiliary building, which is a substantial structure, and outside of the containment that houses the reactor core and pressure vessel. The AP1000 passive cooling offers benefits unique to this design. The NRC has found both passive and active cooling systems for SFPs to be acceptable. The AP1000 DCA has been found to comply with NRC regulations. The NRC's Fukushima Daiichi NTTF noted in its report that the AP1000 design certification, currently in the rulemaking process, has passive safety systems. By nature of its passive design and inherent 72-hour coping capability for core, containment, and SFP cooling, the AP1000 design has many of the design features and attributes necessary to address the NTTF recommendations. Therefore, the NTTF expressed support for completing the AP1000 design certification rulemaking without delay (see NTTF Report, pages 71-72). Consistent with this recommendation, the NRC believes that the AP1000 final rulemaking can and should proceed without delay because: (i) the NRC has determined that the AP1000 DCA meet current regulations; (ii) the AP1000 design features already address many of the design concerns and recommendations raised by the NTTF; (iii) the NRC will provide an opportunity for the public to provide input on NTTF recommendations, and (iv) if the NRC imposes additional requirements on the AP1000 design, existing regulations already define the process for doing so under 10 CFR 52.63. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The SFP should be redefined as a subcritical assembly with the potential to go critical with no active or passive control mechanism. (S52-1f)

NRC Response: The NRC disagrees with this comment. Nuclear reactor plants include facilities for storage of new and spent fuel. The new fuel storage facility includes the fuel assembly storage racks, the concrete storage vault that contains the storage racks, and the auxiliary components. The spent fuel storage facility includes the spent fuel storage racks, the spent fuel storage pool that contains the storage racks, and the associated equipment storage pits.

The NRC reviewed the AP1000 design, specifically the new and spent fuel storage facilities and verified that the storage facilities maintain the new and spent fuel in subcritical arrays during all

credible storage conditions, in accordance with GDC 62 and 10 CFR 50.68, and that new and spent fuel will remain subcritical during fuel handling, in accordance with GDC 62 and 10 CFR 50.68. NRC requirements permit the use of control mechanisms such as soluble boron, boronated steel racks, and assembly inserts. The NRC has completed its review of the AP1000 DCA and determined that it meets applicable regulatory requirements and will provide reasonable assurance of adequate protection of public health and safety. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: If an in-containment SFP is maintained, then a fuel transfer crane must be designed so it is available to remove fuel during post-accident cleanup or a second means of moving fuel must be available. (S52-1h)

NRC Response: For the AP1000 design ~~certification in the proposed rulemaking~~, the SFP is not located in containment. The NRC has concluded from its evaluation that the AP1000 design meets the Commission's regulations and provides reasonable assurance of adequate protection of public health and safety. Therefore, no change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: Spent fuel should not be stored within the reactor containment. (S55-18)

NRC Response: The AP1000 design has a spent fuel storage pool in the auxiliary building, not in the reactor containment. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: Spent fuel should be moved to dry cask storage as soon as possible. (S55-18)

NRC Response: This comment is out of the scope for this rulemaking process, which concerns an amendment to the rule certifying the AP1000 design in 10 CFR Part 52, Appendix D. The NRC has established regulatory requirements to provide reasonable assurance of adequate protection of public health and safety in regard to spent fuel assemblies whether they are in pool storage or dry storage. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The comment submits an article about an "emergency fuel pool cooling system (EFPCS) developed by Westinghouse" and requests that the information in it be considered concerning the design of the AP1000 spent fuel system. The AP1000 SFP was requested by Westinghouse to be packed more densely than originally planned. The comment states that the NRC must reanalyze the ability of the AP1000 SFP to be cooled in case of SBO and that NRC must review the ability of the Westinghouse "stand-alone emergency fuel pool cooling system" concept to be applied to the AP1000 SFP. The article discusses this design in response to the Fukushima accident. (S64-1)

NRC Response: The Commission established an NTTF to perform a review of the Fukushima Daiichi accident. This NTTF evaluated all technical and policy issues related to the event to identify potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the NRC's regulatory framework that should be conducted by the NRC. Among the technical issues that were evaluated, the NTTF considered enhancements to SBO coping capability (10 CFR 50.63, "Loss of all alternating current power") for all operating and new reactors in the U.S. The NTTF recommended no changes to the

this comment. The NRC has found the AP1000 design to provide reasonable assurance of adequate protection of the public health and safety, and has determined that the AP1000 design meets its regulations, as documented in its FSER, which has been published as NUREG-1793, Supplement 2. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The NRC should take all possible precautions before moving forward with the Westinghouse AP1000 reactor design. (S29-5, S49-3)

NRC Response: The NRC has performed a comprehensive and thorough review and evaluation of the AP1000 design, including changes to the original certified design that is the subject of this DCA, and has determined that the AP1000 design meets its regulations. NRC review of the AP1000 design was originally completed in September 2004 and is documented in its three-volume FSER published as NUREG-1793. On January 27, 2006, the NRC issued the final DCR for the AP1000 design in the *Federal Register* (71 FR 4464). The NRC performed a comprehensive review and evaluation of the subsequent revisions to the original AP1000 certified design and documented its evaluation in its FSER issued publicly on ~~December 28, 2010~~August 5, 2011 (ADAMS Accession No. ~~ML103260072~~ML112061231). The NRC performed an extensive technical evaluation of the AP1000 design changes that included detailed design reviews, analysis methodology and calculation reviews, reviews of construction methodology, reviews of testing results to support the design, and confirmatory analyses. As a result of this review, the NRC concluded that the changes to the AP1000 certified design included in the DCA meet NRC regulations. No change was made to the rule, the DCD or the EA as a result of this comment.

Comment: Using a special liquid nitrogen technology called CryoRain would ensure improved worker safety and prevent possible reactor core meltdown. (S50-1)

NRC Response: The NRC does not have enough information to evaluate the specific technology offered in the comment. Further, it was not proposed by Westinghouse for inclusion in the DCA certification. The NRC has found the AP1000 design to provide reasonable assurance of adequate protection of the public health and safety, and has determined that the AP1000 design meets its regulations, as documented in its FSER, which has been published as NUREG-1793, Supplement 2. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: There is a definite need for a backup offsite shielded reactor plant control center with full reactor plant status can be managed. (S52-1c)

NRC Response: The NRC interprets this comment to mean that the habitability of the control room as proposed in the AP1000 design is not adequate in light of the Fukushima accident. The AP1000 control room is designed to protect reactor operators and the associated plant monitoring and control functions during normal operation DBEs, and severe accidents. Specific details of the NRC's review of the control room design may be found in the FSER Section 6.4, "Control Room Habitability Systems" (NUREG-1793, Supplement 2). No change was made to the rule, the DCD, or the EA as a result of this comment.

uncertainty in the historical data, such that these SSCs will withstand the effects of natural phenomena without the loss of the capability to perform their safety functions. The AP1000 safety-related SSCs (including the Auxiliary Building, which houses the dc batteries) are designed to withstand the effects of seismic events and external floods. The AP1000 design, as described in the DCD, meets the requirements of GDC 2 with respect to such seismic events and floods.

Below, the NRC addresses the more specific points in the comment. While it is true that safety-related batteries are located below grade per the AP1000 DCD, all the components of safety-related dc systems are housed in seismic Category I structures, which are also designed to withstand flooding. That is, these structures are designed to withstand the seismic and flooding events specified in the DCD. Under 10 CFR Part 52.79(d), an applicant for a COL referencing the AP1000 standard design will be required to demonstrate that the site characteristics, including seismic events and floods, fall within the site parameters specified in the AP1000 DCD, which were used to establish the design bases for the standard design. A COL applicant referencing the AP1000 standard design must show that the most severe seismic and flooding events reported historically for its site, with margin, fall within the events specified in the DCD, thus satisfying GDC 2. Additionally, safety-related dc electric systems must meet GDC 4 (for internal environmental and dynamic effects) and GDC17 (for independence and redundancy, and the capacity to perform their functions assuming a single failure).

According to the DCD (as reviewed by the NRC staff in Section 3.4.1 of the FSER for the AP1000), the plant design protects safety-related systems and components from exterior sources (e.g., floods, ground water) by locating them above design flood level, with the land sloping away from the building, or enclosing them in concrete structures protected from ground water. The seismic Category I structures (including the Auxiliary Building, which houses the dc batteries) that may be subjected to the design-basis flood are designed to withstand the flood level and ground water level as stated in the DCD. This is done by locating the plant grade elevation above the flood level and incorporating structural provisions into the plant design to protect the SSCs from the postulated flood and ground water conditions.

The DCD describes the following design features for seismic Category I SSC's:

- Walls below flood level designed to withstand hydrostatic loads
- Curbs and elevated thresholds
- Water stops in all expansion and construction joints below flood and ground water levels
- Waterproofing of external surfaces below flood and ground water levels
- Water seals at pipe penetrations below flood and ground water levels
- Roofs designed to prevent pooling of large amounts of water in accordance with RG 1.102
- No exterior access openings below grade

These measures not only protect against external natural floods, but also guard against flooding from onsite storage tank rupture. Because the plant grade is above the design flood level, the seismic Category I structures remain accessible during postulated flood events. Accordingly, safety-related structures housing the safety-related dc electric systems are designed to withstand the effects of external flooding identified in the comment.

Comment: The passive safety measures and simpler design should make this a much safer reactor. (S14-2)

NRC Response: The AP1000 passive design contains fewer components and fewer possibilities for error. Operators have fewer decisions to make and tasks to perform. This leaves more time for operators to take prompt actions when necessary. The use of PRA during its design helped to make it safer still. To the extent that the comment favors NRC approval of the AP1000 design amendment, no further response is necessary. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The Fukushima accident has demonstrated that a filtered hermetically sealed standby control room at some distance from the plant is needed in the event of a DBA. (S55-16)

NRC Response: The AP1000 control room is designed to protect reactor operators and the associated plant monitoring and control functions during normal operation, DBEs, and severe accidents. The control room is located on the plant site and is not hermetically sealed. During normal plant operation, the control room is supplied by filtered air and is overpressurized to ensure only filtered air escapes the room. During emergencies, clean air stored in pressurized cylinders is supplied to the control room and during that time, air that is recycled is filtered. Specific details of the review of the control room design and the NRC review may be found in the FSER Section 6.4, "Control Room Habitability Systems." The habitability of the control room was addressed in the certified design and the amendment to the certified design and found to be acceptable, and has determined that the AP1000 design meets its regulations, as documented in its FSER, which has been published as NUREG-1793, Supplement 2. No change was made to the rule, the DCD, or the EA as a result of this comment.

Other AP1000 Topics – Hydrogen Generation

Comment: The hydrogen explosions in the Fukushima accident show that zirconium-based fuel cladding should not be allowed. (S55-14)

NRC Response: The NRC disagrees with this comment. Zirconium-based cladding is widely used in the nuclear industry. NRC rules and regulations are designed to preclude the conditions which would result in hydrogen generation and cladding failure.

The NRC created an NTTF to review the Fukushima event and conduct a methodical and systematic review of the NRC's processes and regulations to determine whether the agency should make additional improvements to its regulatory system and to make recommendations to the Commission for its policy consideration. *See Tasking Memorandum – COMGJB-11-0002 – NRC Actions Following the Events in Japan* (March 23, 2011) (ADAMS Accession No. ML111861807); included as Appendix B to the NTTF Report). In its report, the NTTF noted that the AP1000 design certification, currently in the rulemaking process, has passive safety systems. By nature of its passive design and inherent 72-hour coping capability for core, containment, and SFP cooling, the AP1000 design has many of the design features and attributes necessary to address the NTTF recommendations. Therefore, the NTTF expressed support for completing the AP1000 design certification rulemaking without delay (see NTTF Report, pages 71-72).

night, or during a snow storm). There are no minimum or maximum time requirements associated with evacuation. The estimated evacuation times are used by the offsite State and local governmental agencies to determine whether evacuation or sheltering is the appropriate protective action in response to an incident at the nuclear facility. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: In light of the accident at Fukushima, it is immoral to ask local populations to accept the financial and medical liabilities of a nuclear reactor while receiving inadequate or no compensation. The NRC must stop the development or licensing of nuclear facilities that cause harm to the families living near them (even when there are no "accidents") through low levels of radioactive substances released as part of normal operations. (S65-1, S65-2)

NRC Response: This comment is out of the scope for this rulemaking process, which concerns an amendment to the rule certifying the AP1000 design in 10 CFR Part 52, Appendix D. The NRC does not determine whether reactors are to be built in the U.S.; rather, its mission is to ensure that if reactors are to be built in the U.S. that they comply with NRC requirements. The NRC sets requirements for normal operations at nuclear power facilities. The NRC requirements for radiation are set forth in 10 CFR Part 20, *"Standards for Protection Against Radiation."* Any releases from a NPP must comply with the terms of its license, and the Commission will not license a facility that does not provide reasonable assurance of adequate protection of public health and safety. The AP1000 design certification or this DCA is not an authorization of construction. No change was made to the rule, the DCD, or the EA as a result of this comment.

Comment: The NRC must refuse to license nuclear facilities that are unable to protect populations from radiation exposure when there are earthquakes (6.0 and higher on Richter scale) or power outages lasting more than 12 hours. (S65-6)

NRC Response: The NRC understands this comment to refer to the severe external environmental conditions experienced at Fukushima and the resultant accidents from long-term loss of ac power. The AP1000 design can withstand severe external environmental hazards such as fires, flooding, tsunamis, high winds, hurricanes, tornadoes, snow and ice impacts, and seismic events that are considered credible in the U.S. and which can be similar to those experienced at Fukushima. The AP1000 design was previously analyzed for these severe environmental conditions as part of the initial design certification. Westinghouse has shown and the NRC review has concluded that the AP1000 design can keep the reactor properly cooled under these severe environmental conditions, thus providing reasonable assurance that the public is protected. The AP1000 earthquake design-basis is for 0.3 g peak ground acceleration and is designed to cope for 72 hours without ac power. Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," GDC 2, requires that SSCs important to safety be designed to withstand the effects of natural phenomena without the loss of capability to function, and that these SSCs be designed to withstand accident conditions in combination with the effects of natural phenomena. The NRC has concluded from its evaluation (FSER Section 3.8.7 for Category I structures) that the AP1000 design meets the Commission's regulations and provides reasonable assurance of adequate protection of public health and safety. No change was made to the rule, the DCD, or the EA as a result of this comment.