ABB
ASEA BROWN BOVERI

August 4, 1995

Mr. John Hoyle, Secretary
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTN: Docketing and Services Branch

SUBJECT: Proposed Rule: Standard Design Certification for the System 80+™ Advanced Pressurized Water Reactor (60 Fed. Reg. 17925, April 7, 1995)

Dear Mr. Hoyle:

Combustion Engineering Inc. (ABB-CE), a Connecticut-based U.S. corporation with nearly four decades of experience in the U.S. nuclear industry, is the applicant for design certification (Docket No. 52-002) of the System 80+™ Standard Plant Design described in the above-referenced proposed rule. ABB-CE commends the NRC for meeting another major milestone in the effectuation of a new licensing regime for advanced, standardized nuclear power plants with issuance of the Notice of Proposed Rulemaking (NOPR) for System 80+.

While resolution of many technical and regulatory details delayed somewhat the original schedule for System 80+ design certification, ABB-CE is extremely pleased with the end product achieved in the design itself, and commends NRC Staff for an extraordinary achievement through issuance of the Final Design Approval (FDA) for System 80+ last summer. System 80+ has been offered for sale in the foreign marketplace, and was the only all-U.S. advanced design that remained available to Taiwan Power Company in recent competitive solicitations by that company.

Design certification of advanced, standardized plants has been recognized by the nuclear industry to be a vital prerequisite for restoring the nuclear option in this country. Accordingly, in addition to the countless hours spent by ABB-CE and NRC Staif on activities leading up to NRC's issuance of the System 80+ NOPR, the nuclear industry has also devoted substantial human and monetary resources to the review and comment process for System 80+, and has participated actively in many of the NRC's public

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meetings that were held on System 80+ design certification since the initial filing of our application in March 1989.

That application was based in large part on the industry's technical desires as expressed in the Electric Power Research Institute's Advanced Light Water Reactor Utility Requirements Document (ALWR URD), itself the subject of extensive NRC and industry review. Design certification of System 80+ is addressed in one of the key "Building Blocks" comprising the U.S. nuclear energy industry's Strategic Plan for Building New Nuclear Power Plants.

ABB-CE participated with the nuclear industry in the development of detailed comments that are being filed by the Nuclear Energy Institute (NEI) on the proposed System 80+ rule and on NRC's proposed rule for design certification of the General Electric Advanced Boiling Water Reactor (ABWR). ABB-CE strongly supports NEI's comments on both rules and urges NRC to review those comments carefully.

ABB-CE hereby incorporates by reference the NEI comments into its own comments. No effort will be made here to address all of the important points raised in the NEI comments.

A. OVERALL ASSESSMENT OF THE SYSTEM 80+ NOPR

1. Beneficial Provisions

ABB-CE is in accord with NRC Staff's views, most recently articulated in NRC's May 11, 1995 public workshop on design certification, that the four principal objectives intended to be achieved by design certification are:

1. Early Resolution of Design Issues
2. Standardization of Designs
3. Enhancement of Safety
4. Creation of a Stable and Predictable Licensing Regime

Toward these ends, the proposed System 80+ rule appears to make some strides. Among them:

- It provides for certification of the System 80+ Standard Plant Design.

- The NOPR affirms the longstanding agreement between industry and the Commission that the two-tiered process is acceptable for implementation of

design certification of the standard designs. (The Commission had earlier approved the two-tiered structure in its February 15, 1992 Staff Requirements Memorandum on SECY-90-377 as appropriate for implementation of Part 52.)

- The NOPR affirms the industry's view that the § 50.59-like change process should apply to both license applicants and to licensees.

2. Unacceptable Provisions

Notwithstanding the beneficial provisions listed above, a substantial number of other provisions in the System 80+ NOPR depart significantly from the fundamental objectives and principles of design certification, threatening to render the design certification rule unusable. These unacceptable provisions, which are discussed below and in further detail in the referenced NEI comments, are generally related to the legal/regulatory finality, or lack thereof, of the design and its supporting documentation. In these key areas, ABB-CE believes the NOPR has fundamentally rejected the interrelationships between standardization and finality embodied in the two-tiered process, proposing to grant finality only to an unreasonably limited set of design information considered, approved, and resolved in the course of the extensive activities which preceded release of the System 80+ NOPR.

Whereas the proposed rule, at its core, is premised on a two-tiered structure intended by the Commission and industry to provide essential flexibility to designers and licensees in less-safety-significant design details, other provisions in the NOPR hamstring that flexibility in the name of standardization, denying many of the components of the approved design (and changes to the approved design) any finality in future NRC proceedings. Paradoxically, in other safety-significant areas where industry and NRC Staff desired to make the standard design unchangeable (e.g., building into Tier 1 certain severe accident features), the System 80+ NOPR gives NRC unjustified and unnecessary powers to demand compliance modification backfits of those features through the artifice of "applicable regulations," detracting from the finality that is essential for successful implementation of Part 52.

B. DISCUSSION OF ISSUES CONSIDERED UNACCEPTABLE

1. Finality Issues

In ABB-CE's view, the major challenge of the rulemaking proceedings for System 80+ is one of preserving the achievements made in finalizing and securing NRC approval of the design itself, and in adhering to the founding principles of Part 52 and its affirming 1992 Energy Policy Act (EPACT) legislation.

Relative to ABB-CE's predecessor design -- the System 80 NSSS coupled with a typical balance of plant -- the System 80+Standard Plant possesses many new severe accident prevention and mitigation features and represents an overall improvement in safety of more than two orders of magnitude in terms of risk. **It is important to recognize that this means the cumulative risk of one hundred System 80+ standardized plants would not total the acknowledged acceptable risk of one typical nuclear plant operating in the U.S. today.** Ironically, System 80+ will nevertheless be subjected by the rule, as proposed, to substantially greater regulatory burdens in some areas, and will be afforded less flexibility, than existing designs attempting to accomplish the same ends. ABB-CE is as dismayed as the nuclear industry with this unacceptable result.

For example, as now proposed, every Section 50.59-like change made to Tier 2 of the System 80+ design will cause a loss of design finality and subject System 80+ to a potential new hearing; existing plants, meanwhile, can make Section 50.59 changes with no such impediments. This and other, similarly inflexible approaches in the NOPR to design changes made in accordance with the rule's stringent change criteria are not only counterintuitive, but constitute a regulatory penalty for designs which ought to be given more, not less, latitude given their enhanced safety features. Additional detail in this regard is provided in NEI's comments on the NOPR.

2. Standardization Issues

Many of the finality problems evident in the System 80+ NOPR appear to stem from confusion over the nature and role of standardization in a two-tiered Part 52 implementation process. The NOPR often fails to recognize the fundamental distinctions between the standardization objectives embodied in Tier 1 and those embodied in Tier 2. This is telegraphed in statements such as the NOPR's seemingly gratuitous comment that "a two-tiered structure was not envisioned or subsequently deemed necessary to implement standard design certifications...." 60 Fed. Reg. at 17927. Because of this

confusion, the NOPR overreaches in denying finality to certain key aspects of and provisions regarding Tier 2 of the standard designs, and yet it falls short of granting the requisite finality for certain key aspects of the design in Tier 1.

Tier 1 was intended by the Commission and the industry to encompass only the most important safety and design features and to fix and standardize those features in both scope and time. Accordingly, changes to Tier 1 were intended to involve a high threshold of difficulty and, thus, cannot occur without a rule change or an exemption. Likewise, the burden on NRC Staff to impose backfits on Tier 1, by rule or plant-specific order, was to involve a high threshold of difficulty, necessitating either a nonconformance with regulations or questions of adequate protection.

Tier 2, on the other hand, was recognized to involve a lesser level of safety significance and substantially greater design detail. Accordingly, a 50.59-like change process was deemed adequate and desirable. Tier 2 was created precisely because both the Commission and the industry recognized that it was not possible or workable to fix the entire design in the same manner as was appropriate for Tier 1. Due to the greater level of detail of Tier 2 -- coupled with the desire of industry and the Commission to ensure some level of flexibility to modify these lower-level design details for sound economic and technical reasons (e.g., to incorporate experience from the construction, startup, and operation of the lead plant) or to foster desirable innovation (e.g., to allow incorporation of advanced I&C technology) -- the standardization threshold was deliberately and appropriately lowered for Tier 2.

In promulgating Part 52, the Commission declared that, while all of the information required in the application by 10 C.F.R. § 52.47(a)(1) would be subject to Commission review and approval, only the most important design features would comprise the "certified" design portion of the rule. In particular, the Commission stated in the Part 52 Statements of Consideration:

> The Commission does expect, however, that there will be less detail in a certification than in an application for certification, and that a rule certifying a design is likely to encompass roughly the same design features that Section 50.59 prohibits changing without prior NRC approval.

54 Fed. Reg. 15372, 15377 (1989).

This difference in the level of detail between the "certified" design and the "approved" design formed the conceptual basis for development of the two-tiered implementation approach, and reflects a significant difference in what is expected to be

fixed in each tier. In all cases, however, the certification was to finally "resolve" both the certified (i.e., Tier 1) and the approved (i.e., Tier 2) design issues within the meaning of 10 C.F.R. § 52.63(a)(4).

Although the distinction in level-of-detail and standardization thresholds for the two tiers was evident to the Commission in its SRM on SECY-90-377 and to the NRC Staff in its Statement of Considerations accompanying Part 52, the System 80+ NOPR, in effect, negates those distinctions, by dramatically endangering Tier 1's high standardization threshold while capriciously raising Tier 2's appropriately lower threshold. In effect, the NOPR approaches a single standardization criterion for both tiers. Thus, in weighing possible avenues to issue resolution and finality, NRC Staff's efforts appear directed toward enforcement of this effectively single criterion, undoing standardization where it is needed and compelling standardization where it is not needed.

This confusion is evident, for example, in the NOPR's statement that Tier 2 changes by industry should lose finality "to restrain Tier 2 changes in order to maintain the benefits of standardization." 60 Fed. Reg. at 17904. On the other hand, the NOPR states that NRC should be able to impose changes to Tier 2 by plant-specific order without considering the impacts on loss of standardization because "the Tier 2 information is not as safety significant as the Tier 1 information." 60 Fed. Reg. at 17912. Yet, where design information is clearly safety significant, and therefore loss of standardization ought to weigh heavily (as in the case of Tier 1 severe accident features), the NRC Staff has informed the industry that Staff's primary objective in imposing the concept of the proposed "applicable regulations" is to enhance NRC's ability to enforce compliance backfits to Tier 1, presumably irrespective of standardization.

In short, the Staff's original reluctance to embrace the two-tiered implementation process appears to have carried forward into the NOPR, notwithstanding the adoption five years ago by the Commission (and now by the NOPR itself) of that implementation process. ABB-CE believes the approaches to standardization and finality suggested in the NOPR, unless corrected to reflect the goals and objectives of design certification and the two-tiered implementation process, will significantly diminish the achievements embodied in the System 80+ Standard Plant Design, and will compromise the substantial licensing benefits that were intended by industry, NRC, and Congress to be embodied in Part 52.

3. Term of Tier 2* Applicability

Another example reflecting the NOPR's confusion over standardization and finality is evident in the NOPR's extension beyond plant startup of a special category of information which has been labeled "Tier 2*." Tier 2* is intended by the NOPR to include information that is not important enough to safety to be included in Tier 1, but is sufficiently important to NRC Staff from a standardization standpoint to have a change process even more controlled than that for Tier 2 information. The NOPR provides that Tier 2* information may not be changed without prior NRC approval. This is a regulatory restriction over and above that of the 50.59-like change process.

ABB-CE accepted the Tier 2* concept for the specific items identified as Tier 2* in the System 80+ FSER in order to resolve NRC Staff's concerns and to avoid the prospect that additional Tier 1 restrictions would otherwise be required for that information. The Tier 2* items are listed in Table 1-2 of the DCD Introduction, entitled "Index of ADM Items Requiring NRC Approval for Change." In the case of most of these items, the "prior approval" restriction expires for each referencing plant when that plant first achieves full power operation. ABB-CE believes a "first full power" expiration date is reasonable, given the need to complete design details for plant construction and to do startup testing.

However, ABB-CE strongly objects to the NOPR's proposal that there will be no expiration date for two of the Tier 2* items -- Control Room Human Factors Engineering and Piping Design Acceptance Criteria. Extending the Tier 2* restriction beyond first full power impairs licensing stability and creates another unnecessary level of regulatory oversight and expense to licensees with no identifiable safety benefit. Moreover, the 50.59 design change process, the normal inspection and enforcement authority of NRC Staff, the industry's plan for self-policing the standardization of each family of plants, and the strong economic motivation to maintain a standard design, provide sufficient oversight of design changes and ample assurances against inappropriate changes. The NRC Staff's apparent fear that Tier 2* changes after achieving first full power (when the plant is constructed and operating) represent such a threat to safety as to merit an independent new level of regulatory oversight for the life of the design is simply unfounded, and will be destabilizing.

Indeed, the NOPR's approach could actually impede design changes intended to improve plant safety and performance. An example in the Human Factors Engineering area is that of control room video display units. Those units currently use a touch screen feature for the operator to initiate an action. The utility owner (or the designer) should be allowed to switch to a mouse-cursor or a track ball-cursor method, possibly to be consistent with standard methods already in place at the utility, without having to secure

prior NRC approval. Any control room changes significant enough to affect safe plant operation would unquestionably result in an unreviewed safety question under the 50.59-like change process and NRC's current inspection and enforcement authority for such changes provides more than adequate protection against abuse. The extension of the Human Factors Engineering Tier 2* restriction beyond achievement of first full power is an unnecessary administrative burden with no benefit to plant safety.

With respect to the Tier 2* restriction for the Piping Design Acceptance Criteria, NRC staff has expressed concern that significant changes could be erroneously made to the piping design after the plant has operated for some time. This concern is not well founded for a certified design since 1) the efficiency of maintaining and operating the plant as a member of a standard plant family will discourage any significant design change and 2) any piping design change significant enough to be made for economical reasons would surely result in an unreviewed safety question. NRC's current inspection and enforcement authority provide ample capability to monitor changes and take any needed corrective enforcement action. On the other hand, the Tier 2* restriction beyond obtaining first full power could impede reasonable changes in methods for re-analysis after the plant is operating. For example, Section 3.9.1.2.1 of the DCD requires that computer codes used for dynamic analysis be benchmarked in accordance with NRC's report NUREG/CR-6128. While such a requirement may be reasonable during the initial design of the piping systems, it would be overly restrictive when selecting a method for analysis of a minor design change.

For the Piping Design Acceptance Criteria as well as for Human Factors Engineering, the extension of Tier 2* beyond First Full Power is an unnecessary burden on both the COL holder and NRC staff and should be eliminated.

4. "Applicable Regulations"

The industry, including ABB-CE, committed several years ago by adopting the ALWR URD to build into the advanced light-water-reactor designs certain features (such as severe accident features) that were intended to reach substantially beyond existing regulations for plants licensed under Part 50. Such features were thus required by the industry, as well as by NRC.

Upon issuance of the FDA for System 80+ last year, NRC approved the System 80+ design, including such advanced design features. Those features were built into the design as illustrated in Table 1 (attached), and almost all of them are reflected in the high-level Tier 1 requirements of the design. Upon certification, those requirements (whether in Tier 1 or Tier 2) will form a portion of the design certification rule; i.e., they

will constitute regulatory requirements in their own right. Such advanced design features are the very features that have improved safety by more than two orders of magnitude. In essence, the very presence of these advanced design features in System 80+ is really superlative from a regulatory standpoint.

Nevertheless, NRC Staff has made a determination, as articulated in the NOPR, that additional stand-alone regulatory requirements, described as "applicable regulations," are needed for these legally superlative design features (1) to ensure that the NRC has not required ABB-CE to adhere to design requirements for which there are no regulatory requirements; and (2) to ensure Staff's ability to backfit the design by rule or plant-specific order. ABB-CE strongly opposes the NOPR's application of the concept of "applicable regulations," as well as the extremely imprecise and overreaching language proposed by Staff for those regulations. The Commission should reject the Staff's position, and its rationale, on both points.

On the first point, it should be obvious that ABB-CE and the industry collectively have already agreed and committed to design features intended to be encompassed by the NOPR's "applicable regulations." **Upon certification, those design features will become regulatory requirements in their own right by virtue of this rulemaking.** Staff's concern that a set of free-standing requirements is redundantly necessary to ensure that NRC has not inappropriately compelled compliance with non-regulatory-based design criteria is therefore misplaced.

On the second point, ABB-CE strongly objects to the Staff's attempt to preserve for itself a compliance backfit prerogative that (1) could not be accomplished in the case of existing plants even to backfit the features now present in System 80+, let alone to accommodate changes to those features; (2) would apply only to features that enhance the level of safety beyond that of existing designs; and (3) could be accomplished by NRC in any event if a genuine issue of adequate protection were involved. In short, the proposed new regulations are either unnecessary, or redundant, or both. Worse, they add an unpredictable new dimension of licensing risk to the design that could well negate the regulatory stability obtained through the inclusion of severe accident features in the System 80+ FDA.

Compounding the problem of the fifteen "applicable regulations" themselves, the language proposed by NRC Staff for the new regulations is needlessly vague and expansive. Despite the many man-years of rigorous effort spent by ABB-CE and NRC Staff's and Management's reviewing and revising Tier 1 certified design description and ITAAC language to ensure that it would be objective, precise, and limited in scope, none of the principles used in developing the certified design language were apparently employed by the Staff in crafting the far more significant applicable regulations. Thus,

for example, words that were expunged in every instance from the Tier 1 drafts as being vague, over-expansive, or imprecise, are frequently employed in the NOPR's proposed applicable regulations for System 80+, making those new regulations doubly unacceptable.

Phrases such as "must be minimized," "to the extent practical," "advanced techniques," "adequate defense," "best estimate," "reliable means," "the time period needed," "more likely," and other, similarly open-ended phrases pervade the proposed System 80+ applicable regulations. Such words and phrases were routinely rejected by ABB-CE, the Staff, and the industry for ITAAC, since they were viewed to be destabilizing. Additional examples relating to each of the applicable regulations proposed for System 80+ are provided in Table 3 of the NEI comments on the NOPR.

In sum, ABB-CE believes the Staff's proposed applicable regulations for System 80+ undercut the regulatory stability sought to be achieved by Part 52. They are also unnecessary, lack any technical or legal justification, and (based on industry feedback to date) expose the System 80+ Standard Plant design to what may be an unacceptable level of licensing risk for potential COL applicants. It is unfortunate that this occurs due to Staff's overly-conservative attempts to account redundantly for the very design features which make the System 80+ Standard Plant design a substantially safer design than existing plant designs. For all these reasons, ABB-CE requests that the Commission examine the NEI comments on applicable regulations very carefully, and that it reject, outright, all of the applicable regulations as being unnecessary and counterproductive.

5. ITAAC Requirement for Part 50

The NOPR proposes that if the System 80+ Standard Plant design is referenced under Part 50 instead of under Part 52, the ITAAC should nevertheless be requirements for Part 50 licensing. As explained in detail in the NEI comments, **this proposal, if adopted, would render the System 80+ design essentially unlicensable under Part 50,** since no potential licensee would ever desire to subject itself to the risks of a second hearing under Part 50, and yet be forced to meet the ITAAC acceptance criteria as additional prerequisites for fuel load.

ABB-CE believes it is unfortunate and unacceptable, particularly given the present defects in the NOPR that would make Part 52 licensing substantially more risky than originally envisioned, for the NOPR to simultaneously vitiate the only available alternative licensing regime for System 80+, i.e., Part 50, by requiring ITAAC adherence for Part 50 licensing of System 80+. This result is contrary to the obvious intent of Part 52, which repeatedly attempts to preserve the ability of potential licensees

to seek licensing under Part 50. Moreover, as explained in the NEI comments, there is no legal or technical justification for the result proposed by the NOPR.

C. MISCELLANEOUS COMMENTS

1. Unnecessary Exemption

In Section 5(a) of the NOPR, seven regulations, or portions thereof, are identified, from which the System 80+ design is exempt. ABB-CE agrees with these exemptions, with one exception. System 80+ is exempted from Section (b)(3) of 10 C.F.R. § 50.49 (Environmental Qualification of Post-Accident Monitoring Equipment) when no exemption is needed or required. The specific issue in question is a footnote to that regulation which identifies Revision 2 of Regulatory Guide 1.97 for guidance as to the types of variables to be monitored. Regulatory guide 1.97 is clearly identified as a guidance document only and, therefore, the use of Regulatory Guide 1.97, Revision 3 for System 80+ -- at the request of the Staff and with the agreement of ABB-CE -- is not counter to any regulation, and does not require an exemption from any regulation. Moreover, NRC Staff's issuance of an exemption for the guidance in this particular footnote is inconsistent with the approach taken by NRC Staff in at least one other situation for System 80+. A note to 10 C.F.R. 100 identifies "TID-14844" as guidance for a radiological source term. In this case, however, NRC staff correctly determined that an exemption was not necessary for ABB-CE to depart from the guidance upon the agreement of NRC.

2. External Events Analysis

All tables within Section 19.7 of the DCD, entitled "External Events Analysis," should be deleted. This information, provided to the NRC in the CESSAR-DC application, was not intended by ABB-CE or by NRC Staff to be retained in the DCD as can be ascertained by reading ABB-CE's original markups submitted to the Staff on October 12, 1994 in ABB-CE letter LD-94-061. In agreement with NRC Staff, the probabilistic numerical results from the PRA have not been included in the DCD. However, these tables were placed in the DCD as a result of a printing error which was brought to Staff's attention in March 1995, just prior to the release of the NOPR for comment.

ABB-CE proposes to amend the DCD to delete the tables from Section 19.7.

D. CONCLUSION

In conclusion, ABB-CE believes the historic achievement represented by NRC's issuance of an FDA for the System 80+ Standard Plant Design last year must be juxtaposed against a proposed System 80+ design certification rule that, because it departs from the fundamental principles of Part 52 and EPACT, may make it difficult for utilities and independent power producers to actually use the final design certification in the United States. With the System 80+ FDA, the longstanding objective of designing and obtaining NRC approval of a safer and more efficient plant has been achieved. The goal of design certification should be one of preserving that achievement by making the standard plant design useable and licensable, with a reduction in licensing risk commensurate with the plant's enhanced safety. The NOPR for the System 80+ Standard Plant Design has not achieved the latter goal, and should be revised to do so.

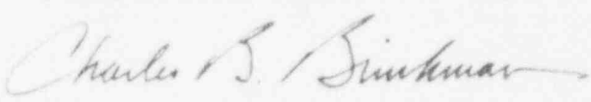
Attached to these comments is a legislative markup of the proposed System 80+ design certification rule which reflects ABB-CE's proposal for an acceptable Appendix B to the Part 52 rule. The markup is footnoted for the reader's benefit to provide cross reference to the ABB-CE comments and NEI comments pertaining to each proposed non-editorial wording change.

Although our comments, which also incorporate the NEI comments, are both substantive and extensive, ABB-CE does not request a hearing under the provisions of NOPR § V.B, nor do we believe that a hearing is necessary to effect the changes requested. We further believe that the Commission can adopt the rule as presented in Attachment B without issuing a renotification for public comment.

Thank you for the opportunity to comment on this pioneering rulemaking which ABB-CE believes to be pivotal to the future of nuclear power as an energy option in the United States.

If you have questions on this submittal or if you wish to discuss these comments, please contact me at (301) 881-7040 or ABB-CE's counsel, Joe Egan, at (202) 663-9200.

Respectfully submitted,
COMBUSTION ENGINEERING, INC.



Charles B. Brinkman, Director
Nuclear Licensing

Attachments:

Table 1: Tier 1 Treatment of the NRC Staff's Proposed "Applicable Regulations" for System 80+.

A. ABB-CE's Suggested Revisions to the Language of the Proposed Design Certification Rule for the System 80+ Standard Plant Design.

B. ABB-CE's Proposed Design Certification Rule for the System 80+ Standard Plant Design (Clean Copy of Suggested Revisions).

C. A Word Perfect diskette containing these comments, Attachment A, and Attachment B.

cc: Chairman Shirley Jackson
Commissioner Kenneth Rogers
James Taylor
Karen Cyr
William Russell
Martin Malsch
Dennis Crutchfield
Theodore Quay
Jerry Wilson
Stewart Magruder
Norman Fletcher (DOE)
Ronald Simard (NEI)

TABLE 1

TIER 1 Treatment of the NRC Staff's Proposed "Applicable Regulations" for System 80+

Applicable Regulation	Relevant Provision from Tier 1 of System 80+
(1) In the standard design, the effects of intersystem loss-of-coolant accidents must be minimized by designing low-pressure piping systems that interface with the reactor coolant pressure boundary to withstand full reactor coolant system pressure to the extent practical.	The design pressure of systems interfacing with the reactor coolant pressure boundary is specified in Tier 1 as follows: a. Shutdown Cooling System pressure retaining components shown on Figure 2.3.2-1, except for the shell sides of the heat exchangers, have a design pressure of at least 900 psig.; b. Safety Injection System pressure retaining components outside Containment shown on Figure 2.4.4-1 have a design pressure of at least 900 psig.; c. Containment Spray System pressure retaining components shown on Figure 2.4.6-1, except the shell sides of the heat exchangers, have a design pressure outside Containment of at least 900 psig.; and d. Pressure retaining components in the Chemical and Volume Control System charging pump suction line from the check valve to the pumps as shown on Figure 2.7.16-1 have a design pressure of at least 900 psig.

(2)(i) Piping systems associated with pumps and valves subject to the test requirements set forth in 10 CFR >0.55a(f) must be designed to allow for

(A) Full flow testing of pumps and check valves at maximum design flow, and

(B) Testing of motor operated valves under maximum achievable differential pressure, up to design basis differential pressure, to demonstrate the capability of the valves to operate under design basis conditions.

(ii) For pumps and valves subject to the test requirements set forth in 10 CFR 50.55(f), an applicant for a combined license which references this standard design certification rule shall submit, as part of the application:

(A) a program for testing check valves that incorporates the use of advanced non-intrusive techniques to detect degradation and monitor performance characteristics, and

(B) a program to determine the frequency necessary for disassembly and inspection of each pump and valve to detect degradation that would prevent the component from performing its safety function and which cannot be detected through the use of advanced non-intrusive techniques. The licensee shall implement these programs throughout the service life of the plant.

Tier 1 states the capability for flow testing safety-related pumps in Sections 2.3.2 (SCS), 2.4.4 (SIS), 2.4.6 (CSS), and 2.8.8 (EFWS).

Tier 1 also has standard statements regarding the operability of check valves shown on the following figures: 2.3.2-1 (SCS); 2.4.4-1 (SIS); 2.4.5-1 (CIS, containment isolation check valves having an active safety function); 2.4.6-1 (CSS); 2.7.5-1 (SSWS); 2.7.6-1 (CCWS); 2.7.16-1 (CVCS); 2.8.6-1B (Condensate and Feedwater Systems); 2.8.8-1 (EFWS).

In addition, the following Tier1 sections have standard statements regarding the operability of motor operated valves that have an active safety-related function: 2.3.2 (SCS); 2.4.1 (SDS); 2.4.4 (SIS); 2.4.5 (CIS, only motor operated valves that receive a CIAS); 2.4.6 (CSS); 2.7.6 (CCWS); 2.7.16 (CVCS); 2.8.8 (EFWS).

(3) For digital instrumentation and control systems, the design must include:

(i) An assessment of the defense-in-depth and diversity of instrumentation and control systems;

(ii) A demonstration of adequate defense against common-mode failures; and

(iii)Provisions for independent backup manual controls and displays for critical safety functions in the control room.

Tier 1 specifies the following features:

a. Manual reactor trip from the Main Control Room or the Remote Shutdown Room uses hardwired circuits which are independent of the Plant Protection System (PPS) bistable and coincidence processors (Section 2.5.1, PPS);

b. Manual activation from the Main Control Room is provided for each of the ESF initiating signals input to the Engineered Safety Features-Component Control System (ESF-CCS) and manual activation from the Remote Shutdown Room is provided for the initiating signals for Main Steam Isolation. Manual activation of these initiating signals is independent of the PPS bistable and coincidence processors (Section 2.5.1, PPS);

c. Diverse manual actuation switches as an alternate means for actuation of ESF components in one division of the ESF-CCS are provided as follows (Section 2.5.2, ESF-CCS):

- 2 trains of safety injection,
- 1 train of containment spray,
- 1 train of emergency feedwater to each steam generator,
- 1 main steam isolation valve in each main steam line.
- 1 isolation valve in each containment air purge line, and
- 1 letdown isolation valve.

The diverse manual actuation switches provide input signals to the lowest level in the ESF-CCS digital equipment. Communication of the signals from the switches is diverse from the software used in the higher levels of the ESF-CCS. Actuation of the switches provides a signal which overrides higher level signals to actuate the associated ESF component or

components;

d. Hardware and software used in the Data Processing System (DPS) for information processing and display is diverse from that used in the Discrete Indication and Alarm System-N (DIAS-N) and the DIAS-P (Section 2.5.3, DIAS and DPS);

e. Information provided to the DIAS-P displays is communicated via means which are diverse from the communication software used in the PPS and the ESF-CCS (Section 2.5.3, DIAS and DPS);

f. The digital equipment and software used in the Power Control System/Process-Component Control System (PCS/P-CCS) are diverse from those used in the PPS and the ESF-CCS (Section 2.5.4, PCS/P-CCS); and

g. The circuits in the PCS/P-CCS used for alternate actuation of reactor trip, turbine trip, and emergency feedwater are independent and diverse from the protection system actuation circuits (Section 2.5.4, PCS/P-CCS).

(4) The electric power system of the standard design must include an alternate power source that has sufficient capacity and capability to power the necessary compliment of non-safety equipment that would most facilitate the ability of the operator to bring the plant to safe shutdown, following a loss of the normal power supply and reactor trip.	Tier 1 Section 2.6.1 specifies that, in addition to two Unit Auxiliary Transformers, there are two Reserve Auxiliary Transformers (RAT's) with each RAT sized to supply the design operating requirements of at least its respective Class 1E buses and permanent non-safety bus, and one reactor coolant pump and its reactor coolant pump support loads.
(5) The electric power system of the standard design must include at least one offsite circuit supplied directly from one of the offsite power sources to each redundant safety division with no intervening non-safety buses in such a manner that the offsite source can power the safety buses upon failure of any non-safety bus.	Tier 1 Section 2.6.1 describes the direct feed from each RAT to its respective Class 1E buses (i.e., not through any bus supplying non-Class 1E loads).

(6)(i) The requirements of 10 CFR 50.48(a)[9] and 10 CFR Part 50, Appendix R, Section iii G.1.a, apply to all structures, systems, and components important to safety.

(ii) Not withstanding any provision in paragraph (i) of this section, all structures, systems, and components important to safety in the standard design must be designed to ensure that:

(A) Safe shutdown can be achieved assuming that all equipment in any one fire area will be rendered inoperable by the fire and re-entry into that fire area for repairs and operator actions is not possible, except that this provision does not apply to (1) the main control room, provided that an alternative shutdown capability exists and is physically and electrically independent of the main control room, and (2) the reactor containment;

(B) Smoke, hot gases, or fire suppressant will not migrate from one fire area into another to an extent that could adversely affect safe-shutdown capabilities, including operator actions; and

(C) In the reactor containment, redundant shutdown systems are provided with fire protection capabilities and means to limit fire damage such that, to the extent practicable, one shutdown division remains free of fire damage.

Tier 1 Section 2.7.24 (Fire Protection System) contains a commitment to perform a fire hazards analysis that demonstrates safe shutdown.

In addition, Tier 1 contains the following provisions relevant to achieving safe shutdown in the event of a fire:

a. Fire and flood barriers are shown in Sections 2.1.1 (NI Structures), 2.1.3 CCW Heat Exchanger Structure), and 2.1.4 (Diesel Fuel Storage Structure).

b. Class 1E power requirements and physical separation requirements for mechanical components and systems as specified in the following Sections must be met: 2.3.1 (Reactor Coolant System); 2.8.8 (Emergency Feedwater System); 2.3.2 (Shutdown Cooling System); 2.8.2 (Main Steam Supply System); 2.4.4 (Safety Injection System); 2.4.1 (Safety Depressurization System); 2.7.12 (Essential Chilled Water System); 2.7.6 (Component Cooling Water System); 2.7.5 (Station Service Water System); 2.7.17 (Control Complex Ventilation System); 2.7.23 (Nuclear Annex Ventilation System); Subsphere Building Ventilation System); 2.7.19 (Diesel Building Ventilation System)2.7.3 (Pool Cooling and Purification System); and, 2.6.2 (Emergency Diesel Generator System).

c. Reactor Coolant Pump seal cooling is provided by either the Component Cooling Water System (Section 2.7.6) or by seal injection from the Chemical and Volume Control System (Section 2.7.16) from the charging pumps or the dedicated seal injection pump.

d. An Alternate AC power source provides power to the permanent non-safety buses (Section 2.6.5).

e. A Remote Shutdown Room (Section 2.12.2) is provided.

f. A Fire Protection System (Section 2.7.24) is provided.

(7) The standard design must include and an application for a combined license which references this standard design certification rule shall submit as part of the application:

(i) The description of the reliability assurance program used during the design that includes scope, purpose, and objectives;

(ii) The process used to evaluate and prioritize the structures, systems, and components in the design, based on their degree of risk-significance;

(iii) A list of structures, systems, and components designated as risk-significant; and

(iv) For those structures, systems, and components designated as risk-significant:

(A) A process to determine dominant failure modes that considered industry experience, analytical models, and applicable requirements; and

(B) Key assumptions and risk insights from probabilistic, deterministic, and other methods that considered operation, maintenance, and monitoring activities.

Tier 1 Section 3.3 contains a requirement for a Design Reliability Assurance Program (D-RAP) that includes the following elements:

a. The scope, purpose, and objectives of the program;

b. The process used to evaluate and prioritize the structures, systems, and components (SSC's);

c. The list of SSC's designated as risk-significant;

d. For those SSC's designated as risk-significant, the process used to determine dominant failure modes considered industry experience, analytical models, and applicable requirements; and

e. For those SSC's designated as risk-significant, the key assumptions and risk insights considered operations, maintenance, and monitoring activities.

(8) The probabilistic risk assessment required by 10 CFR 52.47(a)(1)(v) must include an assessment of internal and external events. For external events, simplified probabilistic methods and margins methods may be used to assess the capacity of the standard design to withstand the effects of events such as fires and earthquakes. Traditional probabilistic techniques should be used to evaluate internal floods. For earthquakes, a seismic margin analysis must consider the effects of earthquakes with accelerations approximately one and two-thirds the acceleration of the safe-shutdown earthquake.

CESSAR-DC contains the specified assessments.

Further, Tier 1 contains the significant design features that resulted from PRA insights. In addition, the Tier 1 features cited in response to Applicable Regulation (6) above address fire and flood protection. Tier1 contains commitments for Seismic Category 1 classification for safety-related systems, structures, and components, and the Tier 1 General Provisions require verification of the seismic capability of electrical and mechanical equipment classified Seismic Category 1.

The High Confidence of Low Probability of Failure computations of the seismic margins assessment were preformed with respect to a review level earthquake of 0.6g as documented in CESSAR-DC. That is twice the acceleration of the Safe Shutdown Earthquake.

(9) The standard design must include an on-site alternate ac power source of diverse design capable of powering at least one complete set of equipment necessary to achieve and maintain safe-shutdown for the purpose of dealing with station blackout.

Tier 1 Section 2.6.5 describes the Alternate AC Source. The AAC is stated to have a capacity at least as large as that of an emergency diesel generator and to be capable of powering the non-Class 1E permanent non-safety buses or a Class 1E Division through its associated non-Class 1E permanent non-safety bus.

(10)(i) The standard design must include the features in paragraphs (A) -(C) below that reduce the potential for and effects of interactions of molten core debris with containment structures:

(A) Reactor cavity floor space to enhance debris spreading;

(B) A means to flood the reactor cavity to assist in the cooling process; and

(C) Concrete to protect portions of the containment liner and other structural members.

(ii) The features required by paragraph (i) of this section, in combination with other features, must ensure for the most significant severe accident sequences that the best-estimate environmental conditions (pressure and temperature) resulting from core-concrete interaction do not exceed ASME Code Service Level C for steel containments or Factored Load Category for concrete containments for approximately 24 Hours.

Tier 1 specifies the following features that reduce the potential for and effects of interactions of molten core debris with Containment structures:

a. The minimum flat floor area for the reactor cavity is 693 $ft.^2$ (Section 2.1.1).

b. A Cavity Flooding System as described in CDM Section 2.4.7 provides water to flood the reactor cavity in response to beyond design basis events.

c. The reactor cavity floor is constructed with a limestone aggregate concrete with a minimum $CaCO_3$ content of 17 percent. The minimum floor thickness in the flat region of the cavity floor is 3.0 ft. The reactor cavity sump is constructed with a limestone aggregate concrete having a minimum thickness of 3.2 ft (all in Section 2.1.1).

In addition, Tier 1 Section 2.1.1 states that the Containment pressure boundary is evaluated to assure that the ASME Code Section III Service Level C stress limits are not exceeded for a Containment internal pressure of 120 psig.

Features identified in Tier 1 that reduce the probability of Containment failure under severe accident conditions are noted in the response to Applicable Regulation 13 below.

(11) The standard design must include: (i) a reliable means to depressurize the reactor coolant system and (ii) cavity design features to reduce the amount of ejected core debris that may reach the upper containment.

Tier 1 Section 2.4.1 describes the Rapid Depressurization System, and Section 2.1.1 describes the indirect gas vent path between the reactor cavity and the free volume of the Containment.

(12) The standard design must include analyses based on best-available methods to demonstrate that:

(i) Equipment, both electrical and mechanical, needed to prevent and mitigate the consequences of severe accidents is capable of performing its function for the time period needed in the best-estimate environmental conditions of the severe accident (e.g., pressure, temperature, radiation) in which the equipment is relied on to function; and

(ii) Instrumentation needed to monitor plant conditions during a severe accident is capable of performing its function for the time period needed in the best-estimate environmental conditions of the severe accident (e.g., pressure, temperature, radiation) in which the instrumentation is relied on to function.

CESSAR-DC contains the specified analyses. In addition, Tier 1 discusses provisions applicable to equipment survivability under severe accident conditions as summarized below.

Tier 1 design descriptions for System 80+ indicate that the following components and systems used in severe accidents are located outside the primary containment: most portions of safety-related fluid-mechanical systems that can provide core cooling and containment atmosphere cooling including most of the active components of those systems (Sections 2.3.2, 2.4.4, 2.4.6, and 2.8.8); and, hydrogen recombiners and electrical portions of the hydrogen igniters (Section 2.4.3).

The cavity flooding system valves located in the holdup volume are designed to be actuated while submerged (Section 2.4.7).

The "basic configuration" ITAAC, as amplified by the Tier 1 General Provisions, requires verification that Class 1E electrical equipment identified in individual sections of the CDM is qualified to withstand the environmental conditions that would exist during and following a design basis accident. ABB-CE's evaluations indicate that the conservatism of those environmental conditions provides reasonable assurance that the equipment will survive severe accident environments. Sections 2.5.1 and 2.5.2 address environmental qualification of specified equipment in a mild environment.

(13) The standard design must include features to limit the conditional containment failure probability for the more likely severe accident challenges.

Tier 1 identifies various features that contribute to limiting the conditional containment failure probability under severe accident conditions as discussed below. These features are in addition to the safety related systems described in the CDM that mitigate design basis accidents and which would also provide mitigation capability for severe accidents.

a. The minimum flat floor area for the reactor cavity is 693 $ft.^2$ (Section 2.1.1).

b. A Cavity Flooding System as described in Section 2.4.7 provides water to flood the reactor cavity in response to beyond design basis events.

c. The reactor cavity floor is constructed with a limestone aggregate concrete with a minimum $CaCO_3$ content of 17 percent. The minimum floor thickness in the flat region of the cavity floor is 3.0 ft. The reactor cavity sump is constructed with a limestone aggregate concrete having a minimum thickness of 3.2 ft (all in Section 2.1.1).

d. The Containment pressure boundary is evaluated to assure that the ASME Code Section III Service Level C stress limits are not exceeded for a Containment internal pressure of 120 psig (Section 2.1.1).

e. A Rapid Depressurization System is provided (Section 2.4.1).

f. An indirect gas vent path between the reactor cavity and the free volume of the Containment is provided (Section 2.1.1).

g. The reactor cavity has a corium debris chamber (Section 2.1.1).

h. A Combustible Gas Control System as described in CDM Section 2.4.3 is provided.

i. A Containment Isolation System as described in CDM Section 2.4.5 is provided.

j. A connection is provided to permit the use of an emergency Containment Spray System backup source of water as shown on CDM Figure 2.4.6-1.

(14)(i) The standard design must include a systematic examination of features in relation to shutdown risk assessing:

(A) Specific design features that minimize shutdown risk;

(B) The reliability of decay heat removal systems;

(C) Vulnerabilities introduced by new design features; and

(D) Fires and floods occurring with the p'ant in modes other than full power.

(ii) An applicant for a combined license which references this design certification rule shall submit as part of the application a description of the program for outage planning and control that ensures:

(A) The availability and functional capability during shutdown and low power operations of features important to safety during such operations; and

(B) The consideration of fire, flood, and other hazards during shutdown and low power operations. The licensee shall implement this program throughout the service life of the plant.

CESSAR-DC contains the specified examination. In addition, Tier 1 includes the following features that reduce risk during reduced inventory operations:

a. Reactor coolant level instrumentation shown on Figure 2.3.1-1;

b. Pressure, flow, motor current, and temperature instrumentation shown on Figure 2.3.2-1; and

c. Pressure and motor current instrumentation shown on CDM Figure 2.4.6-1.

Fire and flood protection are addressed by the Tier 1 provisions identified in the response to Applicable Regulation 6 above.

(15) The standard design must include a best-estimate, systematic evaluation of the plant response to a steam generator tube rupture (STGR) to:

(i) Identify potential design vulnerabilities, and

(ii) Assess potential design improvements to mitigate the amount of containment bypass leakage that could result from a STGR.

CESSAR-DC contains the required evaluation. In addition, Tier 1 specifies the following features that were added to the System 80+ design to provide additional mitigation capability for a STGR:

a. A radiation monitor is installed on one steam line from each steam generator (Section 2.8.2).

b. The instrument air compressors are supplied with component cooling water by the portion of the Component Cooling Water System that is not isolated by a Safety Injection Actuation Signal (Figure 2.7.6-1).

ATTACHMENT A

ABB-CE'S SUGGESTED REVISIONS TO THE

LANGUAGE OF THE PROPOSED DESIGN CERTIFICATION RULE

FOR THE SYSTEM 80+ STANDARD PLANT DESIGN

This attachment provides ABB-CE's suggested changes to the language of the proposed design certification rule for the System 80+ Standard Plant Design. This attachment identifies ABB-CE's suggested additions through the use of highlighting, and suggested deletions through the use of line-outs. Each non-editorial change has an associated footnote which explains ABB-CE's reason for the change.

Appendix B To Part 52 -- Design Certification Rule
for the System 80+™ Standard Plant

1. Scope.

This Appendix constitutes the standard design certification for the System 80+™ Standard Plant design, in accordance with 10 CFR ~~part~~ Part 52, ~~subpart~~ Subpart B. The applicant for certification of the System 80+ Standard Plant design was Combustion Engineering, Inc. (ABB-CE).

2. Definitions.

As used in this part:

(a) Design control document (DCD) means the master document that contains the DCD Introduction,[1/] Tier 1 and Tier 2 information that is incorporated by reference into this design certification rule.

(b) Tier 1 means the portion of the design-related information contained in the DCD that is certified by this design certification rule (hereinafter Tier 1 information). Tier 1 information consists of:

(1) Definitions and general provisions;
(2) Certified design descriptions;
(3) Inspections, tests, analyses, and acceptance criteria (ITAAC);
(4) Significant site parameters; and
(5) Significant interface requirements.

The certified design descriptions, interface requirements, and site parameters are derived from Tier 2 information[2/], but may be more general than the provisions in Tier 2. Compliance with the more detailed Tier 2 material provides a sufficient method, but not the

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1/ This change to Section 2(a) provides clarification that the DCD Introduction is incorporated by reference into the design certification rule. See NEI Comments, Att. B, § VI. If NRC does not incorporate by reference the DCD Introduction into the design certification rule, the additions at the end of Section 2(b) and 2(c) as well as new Section 10 are necessary to reflect the provisions in the DCD Introduction that have been approved by NRC. See NEI Comments, Att. B, § VI.

2/ The additions to Section 2(b) are not necessary if NRC incorporates by reference the DCD Introduction into the design certification rule. See footnote 1.

only acceptable method, for complying with the more general design provisions in Tier 1. However, the methods and provisions specified in Tier 2 shall be followed unless a change is made in accordance with the change processes specified in the design certification rule for the System 80+ Standard Plant Design.

The Design Descriptions in Tier 1 pertain only to the design of the structures, systems and components of a System 80+ Standard Plant Design and not to their operation, maintenance and administration. In the event of an inconsistency between Tier 1 and Tier 2, Tier 1 shall govern. Design activities for structures, systems, and components outside the scope of the System 80+ Standard Plant Design may be performed using site-specific design parameters.

(c) Tier 2 means the portion of the design-related information contained in the DCD that is approved by this design certification rule (hereinafter Tier 2 information). Tier 2 information includes:

(1) The information required by 10 CFR 52.47;

(2) The information required for a final safety analysis report under 10 CFR 50.34(b); ~~, and~~

(3) Supporting information on the inspections, tests, and analyses that will be performed to demonstrate that the acceptance criteria in the ITAAC have been met. [1/]Compliance with Tier 2 is a sufficient, but not necessarily the only, method for complying with the ITAAC. The provisions and methods specified in Tier 2 shall be followed unless a change is made in accordance with the change process specified in the design certification rule for the System 80+ Standard Plant Design;

(4) COL Information Items, which identify certain matters that need to be addressed by an applicant or licensee referencing the design certification rule for the System 80+ Standard Plant Design. The purpose of these COL Information Items is to identify the type of information that must be addressed in plant-specific Safety Analysis Reports (SARs) that reference the design certification rule for the System 80+ Standard Plant Design. These COL Information Items do not establish requirements; rather, they identify an acceptable set of information, but not the only acceptable set of information, for inclusion in a plant-specific SAR. An applicant may deviate from or omit these COL Information Items provided that the deviation or omission is identified and justified in the plant-specific SAR. After issuance of a construction permit or license, the COL Information Items have no further effect for that licensee; instead, the corresponding provisions in the plant-specific SAR become applicable;

(5) Conceptual designs for those portions of the plant that are outside the scope of the System 80+ Standard Plant Design, which are described and designated as out-of-scope in various locations within Tier 2. As provided by 10 CFR 52.47(a)(1)(ix),

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1/ The additions to Sections 2(c)(3)-(6), and the concluding sentence in Section 2(c) are not necessary if NRC incorporates by reference the DCD Introduction into the design certification rule. See footnote 1.

these conceptual designs are not a part of the design certification rule for the System 80+ Standard Plant Design, and do not impose requirements applicable to a license, nor to an application for a license, that references the design certification rule for the System 80+ Standard Plant Design;

(6) References to the System 80+ Standard Safety Analysis Report, which shall not be construed as incorporating its sections, or the information therein, within Tier 2; and

[4/](7) Proposed technical specifications for the portion of the plant within the scope of the standard design. These proposed technical specifications are applicable to an applicant for a combined license or an operating license referencing this design certification rule, and shall be incorporated in the technical specifications in the license, except as changed pursuant to the provisions in Section 8 of this design certification rule that apply to changes in Tier 2 information. Changes in the proposed technical specifications by a license applicant are subject to NRC review and approval and a hearing as part of the license proceeding. After issuance of a combined license or operating license, the proposed technical specifications in Tier 2 have no further effect to that licensee, and the technical specifications in the license are effective.

Tier 2 does not include proprietary information from the Standard Safety Analysis Report for the System 80+ Standard Plant. The proprietary references or their equivalent must be included or referenced as part of the license application that references the design certification rule for the System 80+ Standard Plant.

(d) Tier 2* means the portion of the Tier 2 information which cannot be changed without prior NRC approval [5/]by letter or other written document. This information is identified in the DCD. [6/]The restrictions on changes to Tier 2* information expire at first full power for a plant that references this design certification rule. Thereafter, changes to the Tier 2* information shall be controlled in the same manner as changes to other Tier 2 information.

(e) All other terms in this rule have the meaning set out in 10 CFR 50.2, 10 CFR 52.3, or Section 11 of the Atomic Energy Act of 1954, as amended, as applicable.

[4/] The addition of Section 2(c)(7) clarifies that the proposed technical specifications in Chapter 16 of Tier 2 are different from the technical specifications discussed in Sections 8 and 9 of the design certification. See NEI Comments, Att. B, § IX.

[5/] The addition in the first sentence of Section 2(d) clarifies that the prior NRC approval of Tier 2* changes does not need to be included as part of a license or license amendment. See NEI Comments, Att. C, Response to Question 7.

[6/] The additional two sentences at the end of Section 2(d) indicates that all Tier 2* restrictions expire at first full power. See NEI Comments, Att. B, § VIII.

3. [Reserved].

4. Contents of the design certification.

(a) ~~Both Tier 1 and Tier 2 of the~~ [7/]The System 80+ Design Control Document, ABB-CE, [8/]~~Revision 1, February 1995~~ Revision 2, [dated,] ~~are~~ is incorporated by reference. This incorporation by reference was approved by the Director of the Office of the Federal Register on [Insert date of approval] in accordance with 5 U.S.C. 552(a) and 1 CFR ~~part~~ Part 51. Copies of the System 80+ DCD may be ~~obtained~~ [9/]purchased from ~~[Insert name and address of applicant or organization designated by the applicant]~~ the National Technical Information Service, Springfield, VA 22161. Copies are also available for examination and copying at the NRC Public Document Room, 2120 L Street NW, Washington, DC 20555, and for examination at the NRC Library, 11545 Rockville Pike, Rockville, Maryland 20582-2738.

(b) An applicant for a construction permit, operating license, or combined license that references this design certification shall reference both Tier 1 and Tier 2 of the System 80+ DCD. [10/]However, the ITAAC in Tier 1 are not applicable to an applicant for a construction permit or operating license.

(c) If there is a conflict between the System 80+ DCD and either the application for design certification for the System 80+ Standard Plant design or NUREG-1462, "Final Safety Evaluation Report ~~related~~ Related to the Certification of the System 80+ Standard Plant Design," dated August 1994 (FSER), then the System 80+ DCD is the controlling document.

7/ The change in the first line of the first sentence in Section 4(a) clarifies that all of the DCD, and not just Tier 1 and Tier 2, are incorporated by reference into the design certification rule. See NEI Comments, Att. B, § VI.

8/ The change in the second line of the first sentence in Section 4(a) is necessary so that the DCD Introduction can be modified in two areas: to modify the expiration date of certain Tier 2* restrictions; and to specify that the change process only applies to Section 19.15 of Tier 2, rather than all of Chapter 19 of Tier 2. See NEI Comments, Att. B, §§ VIII and IV; ABB-CE Comments; § B.3.

9/ The changes in the third sentence in Section 4(a) clarifies that copies of the DCD may not be obtained for free, but must be purchased from the designated organization.

10/ The addition in Section 4(b) clarifies that ITAAC are not appropriate for application to Part 50 construction permits. See NEI Comments, Att. B, § X; ABB-CE Comments, § B.5.

5. Exemptions and applicable regulations.

(a) The System 80+ Standard Plant design is exempt from portions of the following regulations, as described in the FSER (index provided in Section 1.6 of the FSER):

(1) Section VI(a)(2) of ~~appendix~~ Appendix A to 10 CFR ~~part~~ Part 100 - Operating Basis Earthquake Design Consideration;

~~[11/](2) Section (b)(3) of 10 CFR 50.49 - Environmental Qualification of Post-Accident Monitoring Equipment;~~

~~(3)~~(2) Section (f)(2)(iv) of 10 CFR 50.34 - Separate Plant Safety Parameter Display Console;

~~(4)~~(3) Section (f)(2)(viii) of 10 CFR 50.34 - Post-Accident Sampling for Hydrogen, Boron, Chloride, and Dissolved Gases;

~~(5)~~(4) Section (f)(3)(iv) of 10 CFR 50.34 - Dedicated Containment Penetration;

~~(6)~~(5) Section III.A.1.(a) of ~~appendix~~ Appendix J to 10 CFR ~~part~~ Part 50 - Containment Leakage Testing; and

~~(7)~~(6) Sections (f)(2)(vii), (viii), (xxvi), and (xxviii) of 10 CFR 50.34 - Accident Source Terms.

(b) Except as indicated in paragraph ~~(c)~~ (a) of this section, the regulations that apply to the System 80+ Standard Plant design are those regulations in 10 CFR Parts 20, 50, 73, and 100 (August 1994), that are applicable and technically relevant, as described in the FSER.

~~[12/](c) In addition to the regulations specified in paragraph (b) of this section, the following regulations are applicable for purposes of 10 CFR 52.48, 52.54, 52.59 and 52.63:~~

~~(1) In the standard design, the effects of intersystem loss of coolant accidents must be minimized by designing low pressure piping systems that interface with the reactor coolant pressure boundary to withstand full reactor coolant system pressure to the extent practical.~~

~~(2) (i) Piping systems associated with pumps and valves subject to the test requirements set forth in 10 CFR 50.55a(f) must be designed to allow for:~~

11/ The deletion of Section 5(a)(2) is necessary since NRC has already concluded that the System 80+ Standard Plant design can follow Regulatory Guide 1.97, Rev. 3 and still meet the requirements of 10 C.F.R. § 50.49(b)(3). Hence, there is no need for an exemption from the regulations. See ABB-CE Comments, § C.1

12/ The deletion of Sections 5(c) and 5(c)(1) through 5(c)(15) eliminates applicable regulations from the design certification rule. See NEI Comments, Att. B, § II; ABB-CE Comments, § B.4.

(A) Full flow testing of pumps and check valves at maximum design flow, and

(B) Testing of motor operated valves under maximum achievable differential pressure, up to design basis differential pressure, to demonstrate the capability of the valves to operate under design basis conditions.

(ii) For pumps and valves subject to the test requirements set forth in 10 CFR 50.55a(f), an applicant for a combined license which references this standard design certification rule shall submit, as part of the application:

(A) A program for testing check valves that incorporates the use of advanced non-intrusive techniques to detect degradation and monitor performance characteristics, and

(B) A program to determine the frequency necessary for disassembly and inspection of each pump and valve to detect degradation that would prevent the component from performing its safety function and which cannot be detected through the use of advanced non-intrusive techniques. The licensee shall implement these programs throughout the service life of the plant.

(3) For digital instrumentation and control systems, the design must include:

(i) An assessment of the defense-in-depth and diversity of instrumentation and control systems;

(ii) A demonstration of adequate defense against common mode failures; and

(iii) Provisions for independent backup manual controls and displays for critical safety functions in the control room.

(4) The electric power system of the standard design must include an alternate power source that has sufficient capacity and capability to power the necessary complement of non-safety equipment that would most facilitate the ability of the operator to bring the plant to safe shutdown, following a loss of the normal power supply and reactor trip.

(5) The electric power system of the standard design must include at least one offsite circuit supplied directly from one of the offsite power sources to each redundant safety division with no intervening non-safety buses in such a manner that the offsite source can power the safety buses upon a failure of any non-safety bus.

(6) (i) The requirements of 10 CFR 50.48(a)[n2] and 10 CFR Part 50, appendix R, section III.G.1.a, apply to all structures, systems, and components important to safety.

(ii) Notwithstanding any provision in paragraph (i) of this section, all structures, systems, and components important to safety in the standard design must be designed to ensure that:

(A) Safe shutdown can be achieved assuming that all equipment in any one fire area will be rendered inoperable by fire and re-entry into that fire area for repairs and operator actions is not possible, except that this provision does not apply to (1) the main control room, provided that an

alternative shutdown capability exists and is physically and electrically independent of the main control room, and (2) the reactor containment;

(B) Smoke, hot gases, or fire suppressant will not migrate from one fire area into another to an extent that could adversely affect safe shutdown capabilities, including operator actions; and

(C) In the reactor containment, redundant shutdown systems are provided with fire protection capabilities and means to limit fire damage such that, to the extent practicable, one shutdown division remains free of fire damage.

(7) The standard design must include and an applicant for a combined license which references this standard design certification rule shall submit as part of the application:

(i) The description of the reliability assurance program used during the design that includes scope, purpose, and objectives;

(ii) The process used to evaluate and prioritize the structures, systems, and components in the design, based on their degree of risk significance;

(iii) A list of structures, systems, and components designated as risk significant; and

(iv) For those structures, systems, and components designated as risk significant:

(A) A process to determine dominant failure modes that considered industry experience, analytical models, and applicable requirements; and

(B) Key assumptions and risk insights from probabilistic, deterministic, and other methods that considered operation, maintenance, and monitoring activities.

(8) The probabilistic risk assessment required by 10 CFR 52.47(a)(1)(v) must include an assessment of internal and external events. For external events, simplified probabilistic methods and margins methods may be used to assess the capacity of the standard design to withstand the effects of events such as fires and earthquakes. Traditional probabilistic techniques should be used to evaluate internal floods. For earthquakes, a seismic margin analysis must consider the effects of earthquakes with accelerations approximately one and two thirds the acceleration of the safe shutdown earthquake.

(9) The standard design must include an on site alternate ac power source of diverse design capable of powering at least one complete set of equipment necessary to achieve and maintain safe shutdown for the purposes of dealing with station blackout.

(10) (i) The standard design must include the features in paragraphs (A) (C) below that reduce the potential for and effect of interactions of molten core debris with containment structures:

(A) Reactor cavity floor space to enhance debris spreading;

(B) A means to flood the reactor cavity to assist in the cooling process; and

(C) Concrete to protect portions of the lower drywell containment liner and other structural members.

(ii) The features required by paragraph (i) of this section, in combination with other features, must ensure for the most significant severe accident sequences

that the best-estimate environmental conditions (pressure and temperature) resulting from core-concrete interaction do not exceed ASME Code Service Level C for steel containments or Factored Load Category for concrete containments for approximately 24 hours.

(11) The standard design must include:

(i) a reliable means to depressurize the reactor coolant system and

(ii) cavity design features to reduce the amount of ejected core debris that may reach the upper containment.

(12) The standard design must include analyses based on best-available methods to demonstrate that:

(i) Equipment, both electrical and mechanical, needed to prevent and mitigate the consequences of severe accidents is capable of performing its function for the time period needed in the best-estimate environmental conditions of the severe accident (e.g., pressure, temperature, radiation) in which the equipment is relied upon to function; and

(ii) Instrumentation needed to monitor plant conditions during a severe accident is capable of performing its function for the time period needed in the best-estimate environmental conditions of the severe accident (e.g., pressure, temperature, radiation) in which the instrumentation is relied upon to function.

(13) The standard design must include features to limit the conditional containment failure probability for the more likely severe accident challenges.

(14) (i) The standard design must include a systematic examination of features in relation to shutdown risk assessing:

(A) Specific design features that minimize shutdown risk;

(B) The reliability of decay heat removal systems;

(C) Vulnerabilities introduced by new design features; and

(D) Fires and floods occurring with the plant in modes other than full power.

(ii) An applicant for a combined license which references this design certification rule shall submit as part of the application a description of the program for outage planning and control that ensures:

(A) The availability and functional capability during shutdown and low power operations of features important to safety during such operations; and

(B) The consideration of fire, flood, and other hazards during shutdown and low power operations. The licensee shall implement this program throughout the service life of the plant.

(15) The standard design must include a best-estimate, systematic evaluation of the plant response to a steam generator tube rupture (SGTR) to:

(i) Identify potential design vulnerabilities, and

(ii) Assess potential design improvements to mitigate the amount of containment bypass leakage that could result from a SGTR.

6. Issue resolution for the design certification.

[13/](a) The Commission has found that the structures, systems, components, and design features of the System 80+ Standard Plant design as described in the DCD and FSER satisfy the relevant Commission regulations and provide adequate protection of the health and safety of the public. Inherent in this finding is the determination that additional or alternative structures, systems, components, design features, design criteria, testing, analyses, or justifications are not necessary for the System 80+ Standard Plant design. The lack of need thereof is, accordingly, also considered a matter resolved in connection with issuance of this design certification rule.

[14/](~~a~~)(b) All nuclear safety issues associated with the information in the FSER ~~or DCD~~ , DCD, application for design certification of the System 80+ Standard Plant, including the System 80+ Standard Safety Analysis Report, docket of the application for design certification of the System 80+ Standard Plant, and the rulemaking record for design certification of the System 80+ Standard Plant, are resolved within the meaning of 10 CFR 52.63(a)(4). Within the scope of the standard design as discussed in the FSER and DCD, the NRC may not require an applicant or licensee to:

(1) provide structures, systems, components, or design features not discussed in the FSER or DCD; or
(2) provide additional design criteria, testing, analysis, or justification for structures, systems, components or design features discussed in the FSER or DCD;

except in accordance with the change processes and other provisions in this design certification rule.

~~(b)~~(c) All environmental issues associated with the information in the NRC's Environmental Assessment for System 80+ Standard Plant design or the severe accident design alternatives in Revision 2 of the Technical Support Document for the System 80+ Standard Plant dated January 1995, are resolved within the meaning of 10 CFR 52.63(a)(4).

[15/](d) Any change made in accordance with the change process set forth in Section 8 of this design certification rule is resolved within the meaning of 10 CFR 52.63(a)(4).

[13/] The addition of new Section 6(a), and the changes to re-numbered Section 6(b) are necessary to broaden the scope of issues entitled to finality. See NEI Comments, Att. B, § I.B; ABB-CE Comments, § B.1.

[14/] See footnote 13.

[15/] The addition of new Section 6(d) is necessary to provide finality for changes made in accordance with the change process specified in the design certification rule. See NEI Comments, Att. B, § I.C; ABB-CE Comments, § B.1.

[16/](e) The matters listed above shall be considered resolved in all subsequent proceedings, including proceedings for issuance of a combined license, construction permit, or operating license; permit or license amendment proceedings; design certification and license renewal proceedings; proceedings under 10 CFR 52.103; and enforcement proceedings.

7. Duration of the design certification.

This design certification may be referenced for a period of 15 years from [insert date 30 days after publication of the final rule in the Federal Register], except as provided for in 10 CFR 52.55(b) and 52.57(b). This design certification remains valid for an applicant or licensee that references this certification until their application is withdrawn or their license expires, including any period of extended operation under a renewed license.

8. Change process.

(a) Tier 1 information.

(1) Generic (rulemaking) changes to Tier 1 information are governed by the requirements in 10 CFR 52.63(a)(1).
(2) Generic changes to Tier 1 information are applicable to all plants referencing the design certification as set forth in 10 CFR 52.63(a)(2).
(3) Changes from Tier 1 information that are imposed by the Commission through plant-specific orders are governed by the requirements in 10 CFR 52.63(a)(3).
(4) Exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1).

(b) Tier 2 information.

(1) Generic [17/](rulemaking) changes to Tier 2 information are governed by the requirements in 10 CFR 52.63(a)(1).
(2) Generic changes to Tier 2 information are applicable to all plants referencing the design certification as set forth in 10 CFR 52.63(a)(2).

[16/] The addition of new Section 6(e) is necessary to clarify that design certification issues have finality in all subsequent proceedings. See NEI Comments, Att. B, § I.D; ABB-CE Comments, § B.1.

[17/] The addition in Section 8(b)(1) is necessary to provide consistency with Section 8(a)(1).

(3) The Commission may not impose new requirements by plant-specific order on Tier 2 information of a specific plant referencing the design certification while the design certification is in effect under §§ 52.55 or 52.61, unless:

(i) A modification is necessary to secure compliance with the Commission's regulations applicable and in effect at the time the certification was issued, or to assure adequate protection of the public health and safety or the common defense and security; and

(ii) Special circumstances as defined in 10 CFR 50.12(a) are present.

(4) An applicant or licensee who references the design certification may request an exemption from Tier 2 information. The Commission may grant such a request only if it determines that the exemption will comply with the requirements of 10 CFR 50.12(a). The granting of an exemption on request of an applicant must be subject to litigation in the same manner as other issues in the construction permit, operating license, ~~or~~ combined license[18], or permit or license amendment hearing.

(5) (i) An applicant or licensee who references the design certification may depart from Tier 2 information, without prior NRC approval, unless the proposed change involves a change to Tier 1 or Tier 2* information, as identified in the DCD, the technical specifications [19]in an operating license or combined license, or an unreviewed safety question as defined in paragraphs (b)(5)(ii) or (b)(5)(iii) of this section. When evaluating the proposed change, an applicant or licensee shall consider all matters described in the DCD, including generic issues and shutdown risk for all postulated accidents including severe accidents[20], but excluding the information in Chapter 19 of Tier 2 other than the information in Section 19.15. ~~These changes will no lor er be considered "matters resolved in connection with the issuance or renew d of a design certification" within the meaning of 10 CFR 52.63(a)(1).~~

(ii) A proposed departure from Tier 2 information, oth than severe accident issues identified in Section ~~19.11 of the DCD, ir cluding appendices 19.11A~~

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[18] The addition in Section 8(b)(4) reflects the fact that exemptions may also be the subject of construction permit or license amendment hearings.

[19] The addition in the first sentence of Section 8(b)(5)(i) clarifies that the technical specifications in question are in the license, as distinct from the proposed technical specifications in Chapter 16 of Tier 2. See NEI Comments, Att. B, § IX.

[20] The deletion of the last sentence and the addition to the second to last sentence in Section 8(b)(5)(i) serves two purposes. First, it reflects that changes made in accordance with the change processes should have finality. See NEI Comments, Att. B, § I.C; ABB-CE Comments, § B.1. Second, it clarifies that only Section 19.15, and not all of Chapter 19, should be subject to the change process. See NEI Comments, Att. B, § IV.

~~through 19.11L, must~~ 19.15, shall[21] be deemed to involve an unreviewed safety question if:

(A) The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the DCD may be increased;

(B) A possibility for an accident or malfunction of a different type than any evaluated previously in the DCD may be created; or

(C) The margin of safety as defined in the basis for any technical specification [22] in an operating license or combined license is reduced.

(iii) A proposed departure from information associated with severe accident issues identified in Section ~~19.11 of the DCD, including appendices 19.11A through 19.11L, must~~ 19.15 of Tier 2 shall[23] be deemed to involve an unreviewed safety question if:

(A) There is a substantial increase in the probability of a severe accident such that a particular severe accident previously reviewed and determined to be not credible could become credible; or

(B) There is a substantial increase in the consequences to the public of a particular severe accident previously reviewed.

(iv) Departures from Tier 2 information made in accordance with Section 8(b)(5) above[24], technical specification changes, and Tier 2* changes that do not involve an unreviewed safety question do not require an exemption from this design certification rule.

21/ The deletion and addition to Section 8(b)(5)(ii) clarify that only Section 19.15, and not all of Chapter 19, should be subject to the change process. See NEI Comments, Att. B, § IV.

22/ The addition in Section 8(b)(5)(ii)(C) clarifies that the technical specifications in question are in the license, not the proposed technical specifications in Chapter 16 of Tier 2. See NEI Comments, Att. B, § IX.

23/ The deletion and addition to Section 8(b)(5)(iii) clarify that only Section 19.15, and not all of Chapter 19, should be subject to the change process. See NEI Comments, Att. B, § IV.

24/ The addition to Section 8(b)(5)(iv) clarifies that only unreviewed safety questions, and not technical specification changes and Tier 2* changes, require exemptions. See NEI Comments, Att. B, § VII.C.

(c) Other requirements of this design certification rule.

[25](1) Generic (rulemaking) changes to the provisions in this Appendix or to the DCD Introduction are governed by the requirements of Subpart H of 10 CFR Part 2.

(2) An applicant or licensee ~~who references the design certification may not depart from this rule's requirements, other than Tier 1 or 2 information, other than by an exemption~~ may request an exemption from the provisions in this Appendix or the DCD Introduction in accordance with 10 CFR 50.12(a).

[26](d) Generic Changes to the DCD by the Design Certification Applicant

(1) Changes to Tier 1 - Any change to Tier 1 proposed by the design certification applicant shall be the subject of a request for proposed rulemaking in accordance with the provisions of subsection (a) of this Section.

(2) Changes to Tier 2 - Prior to the first license application that references the DCD, the design certification applicant may make a change to Tier 2, unless the proposed change involves a change in Tier 1 or an unreviewed safety question. Any change by the design certification applicant to Tier 2* information designated in the DCD shall be subject to prior NRC Staff approval.

(i) The design certification applicant shall submit reports of any change in Tier 2 to the NRC. The reports shall describe the change and provide a summary of a safety evaluation which provides the basis for the determination that the change does not involve an unreviewed safety question.

(ii) For changes made hereunder, the design certification applicant shall submit to the NRC an update to the DCD on a replacement-page basis, which shall indicate the area changed, e.g., a bold line vertically drawn in the margin adjacent to the portion changed, and a page change identification (date of change or change number, or both).

(iii) A change made hereunder shall be considered resolved under 10 CFR 52.63(a)(4) unless the NRC determines, within six months of submission of the change, that the change involves an unreviewed safety question as defined in Section 8(b)(5) above.

(iv) A license applicant shall reference and utilize the updated DCD, unless the license applicant makes a change in accordance with the other provisions of this Section.

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[25] The changes to Section 8(c) serve two purposes. First, it makes the provision in the proposed rule more precise and less confusing. Second, it adds a provision specifying how changes can be made in the DCD Introduction. See NEI Comments, Att. B, § XI.

[26] The addition of Section 8(d) allows the design certification applicant to make changes to Tier 2. See NEI Comments, Att. B, § V.

9. Records and Reports.

(a) Records.

(1) The applicant for this design certification shall maintain a copy of the DCD that includes all generic changes to [27]the DCD, including Tier 1 and Tier 2 information.

(2) An applicant or licensee that references this design certification shall maintain records of all changes to and departures from the DCD pursuant to Section 8 of this appendix. Records of changes made pursuant to Section 8(b)(5) must include a written safety evaluation which provides the bases for the determination that the proposed change does not involve an unreviewed safety question, a change to Tier 1 or Tier 2* information, or a change to the technical specifications [28]in the operating license or combined license.

(b) Reports. An applicant or licensee that references this design certification shall submit a report to the NRC, as specified in 10 CFR 50.4, containing a brief description of any departures from the DCD, including a summary of the safety evaluation of each [29]departure. An applicant or licensee shall also submit updates to the DCD to ensure that the DCD contains the latest material developed for both Tier 1 and Tier 2 information. The requirements of 10 CFR 50.71(e) for safety analysis reports must apply to these updates. These reports and updates must be submitted at the frequency specified below:

(1) During the interval from the date of application to the date of issuance of either a construction permit under 10 CFR ~~part~~ Part 50 or a combined license under 10 CFR ~~part~~ Part 52, the report and any updates to the DCD may be submitted along with amendments to the application.

(2) During the interval from the date of issuance of either a construction permit under 10 CFR ~~part~~ Part 50 or a combined license under 10 CFR ~~part~~ Part 52 until the applicant or licensee receives either an operating license under 10 CFR ~~part~~ Part 50 or the Commission makes its findings under 10 CFR 52.103, the report must be submitted [30]~~quarterly~~ semiannually. Updates to the DCD must be submitted annually.

27/ The addition to Section 9(a)(1) reflects that changes might be made in the DCD Introduction as well as Tier 1 and Tier 2.

28/ The addition to Section 9(a)(2) clarifies that the technical specifications in question are in the license, not the proposed technical specifications in Chapter 16 of Tier 2. See NEI Comments, Att. B, § IX.

29/ Editorial change.

30/ The change in Section 9(b)(2) reflects a more reasonable reporting interval. See NEI Comments, Att. B, § VII.D.

(3) Thereafter, reports and updates to the DCD may be submitted annually or along with updates to the safety analysis report for the facility as required by 10 CFR 50.71(e), or at such shorter intervals as may be specified in the license.

(c) Retention Period. The [31]plant-specific DCD, and the records of changes to and departures from the plant-specific DCD, must be maintained until the date of termination of the construction permit or license.

10. [32]Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)

An applicant for or holder of a combined license (COL) that references the design certification rule for the System 80+ Standard Plant Design shall perform and demonstrate conformance with the ITAAC prior to fuel load. With respect to activities subject to an ITAAC, an applicant for a COL may proceed at its own risk with design and procurement activities, and a holder of a COL may proceed at its own risk with design, procurement, construction, and preoperational activities, even though the NRC Staff may not yet have agreed that any particular ITAAC has been satisfied. In the event that an activity is subject to and in noncompliance with an ITAAC, the applicant for or holder of a COL shall either take corrective actions to successfully complete that ITAAC or request and obtain NRC approval of a change in or exemption from the ITAAC in accordance with the design certification rule for the System 80+ Standard Plant Design.

In accordance with 10 CFR 52.103(g), the Commission must find that the acceptance criteria in the ITAAC are met prior to operation. After the Commission has made the finding required by Section 52.103(g), the ITAAC do not constitute regulatory requirements for subsequent plant modifications. However, subsequent modifications must comply with Tier 1 Design Descriptions, unless changes are made in the Tier 1 Design Descriptions in accordance with the change processes in the design certification rule for the System 80+ Standard Plant Design. Furthermore, after the NRC has issued its finding in accordance with 10 CFR 52.103(g), the ITAAC do not, by virtue of their inclusion in the Design Control Document, constitute requirements for the COL holder or for renewals of the COL.

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[31] The changes in Section 9(c) reflect that the DCD in question is not the generic DCD, but the plant-specific version being maintained by each plant.

[32] The addition of Section 10 reflects the provisions in the DCD Introduction which has been approved by NRC. See NEI Comments, Att. B, § VI. These provisions should be added to the design certification rule only if the DCD Introduction is not incorporated by referenced into the design certification rule. See footnote 1.

11. [33]ITAAC Implementation and Verification.

In order to provide a basis for the NRC to make the findings required by §§ 52.99 and 52.103(g), the licensee shall notify the NRC that the required inspections, tests, and analyses specified in the ITAAC have been successfully completed and that the corresponding acceptance criteria have been met. The NRC shall verify that the inspections, tests, and analyses referenced by the licensee have been successfully completed and, based solely thereon, find that the prescribed acceptance criteria have been met. The NRC shall publish notice of successful completion of inspections, tests, and analyses in the Federal Register as required by § 52.99.

n1 "System 80+" is a trademark of Combustion Engineering, Inc.

~~[34]n2 For the standard design, the footnote reference in 10 CFR 50.48(a) to Branch Technical Position Auxiliary Power Conversion System Branch APCSB9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," will be to the July, 1981 version.~~

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[33] The addition of Section 11 clarifies the requirements for implementation and NRC's verification of ITAAC. See NEI Comments, Att. B, § III.

[34] The deletion of note 2 is necessary since the applicable regulation contained in Section 5(c)(6)(i) has been deleted. See NEI Comments, Att. B, § II. See also footnote 12.

ATTACHMENT B

PROPOSED DESIGN CERTIFICATION RULE

FOR THE SYSTEM 80+ STANDARD PLANT DESIGN

(WITH ABB-CE'S CHANGES INCORPORATED)

This attachment contains the proposed design certification rule for the System 80+ Standard Plant Design, as it would appear if ABB-CE's changes (identified in Attachment A) were incorporated.

Appendix B To Part 52 -- Design Certification Rule
for the System 80+™ Standard Plant

1. Scope.

This Appendix constitutes the standard design certification for the System 80+[n1] Standard Plant design, in accordance with 10 CFR Part 52, Subpart B. The applicant for certification of the System 80+ Standard Plant design was Combustion Engineering, Inc. (ABB-CE).

2. Definitions.

As used in this part:

(a) Design control document (DCD) means the master document that contains the DCD Introduction, Tier 1 and Tier 2 information that is incorporated by reference into this design certification rule.

(b) Tier 1 means the portion of the design-related information contained in the DCD that is certified by this design certification rule (hereinafter Tier 1 information). Tier 1 information consists of:

(1) Definitions and general provisions;
(2) Certified design descriptions;
(3) Inspections, tests, analyses, and acceptance criteria (ITAAC);
(4) Significant site parameters; and
(5) Significant interface requirements.

The certified design descriptions, interface requirements, and site parameters are derived from Tier 2 information, but may be more general than the provisions in Tier 2. Compliance with the more detailed Tier 2 material provides a sufficient method, but not the only acceptable method, for complying with the more general design provisions in Tier 1. However, the methods and provisions specified in Tier 2 shall be followed unless a change is made in accordance with the change processes specified in the design certification rule for the System 80+ Standard Plant Design.

The Design Descriptions in Tier 1 pertain only to the design of the structures, systems and components of a System 80+ Standard Plant Design and not to their operation, maintenance and administration. In the event of an inconsistency between Tier 1 and Tier 2, Tier 1 shall

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[n1] "System 80+" is a trademark of Combustion Engineering, Inc.

govern. Design activities for structures, systems, and components outside the scope of the System 80+ Standard Plant Design may be performed using site-specific design parameters.

(c) Tier 2 means the portion of the design-related information contained in the DCD that is approved by this design certification rule (hereinafter Tier 2 information). Tier 2 information includes:

(1) The information required by 10 CFR 52.47;
(2) The information required for a final safety analysis report under 10 CFR 50.34(b);
(3) Supporting information on the inspections, tests, and analyses that will be performed to demonstrate that the acceptance criteria in the ITAAC have been met. Compliance with Tier 2 is a sufficient, but not necessarily the only, method for complying with the ITAAC. The provisions and methods specified in Tier 2 shall be followed unless a change is made in accordance with the change process specified in the design certification rule for the System 80+ Standard Plant Design;
(4) COL Information Items, which identify certain matters that need to be addressed by an applicant or licensee referencing the design certification rule for the System 80+ Standard Plant Design. The purpose of these COL Information Items is to identify the type of information that must be addressed in plant-specific Safety Analysis Reports (SARs) that reference the design certification rule for the System 80+ Standard Plant Design. These COL Information Items do not establish requirements; rather, they identify an acceptable set of information, but not the only acceptable set of information, for inclusion in a plant-specific SAR. An applicant may deviate from or omit these COL Information Items provided that the deviation or omission is identified and justified in the plant-specific SAR. After issuance of a construction permit or license, the COL Information Items have no further effect for that licensee; instead, the corresponding provisions in the plant-specific SAR become applicable;
(5) Conceptual designs for those portions of the plant that are outside the scope of the System 80+ Standard Plant Design, which are described and designated as out-of-scope in various locations within Tier 2. As provided by 10 CFR 52.47(a)(1)(ix), these conceptual designs are not a part of the design certification rule for the System 80+ Standard Plant Design, and do not impose requirements applicable to a license, nor to an application for a license, that references the design certification rule for the System 80+ Standard Plant Design;
(6) References to the System 80+ Standard Safety Analysis Report, which shall not be construed as incorporating its sections, or the information therein, within Tier 2; and
(7) Proposed technical specifications for the portion of the plant within the scope of the standard design. These proposed technical specifications are applicable to an applicant for a combined license or an operating license referencing this design certification rule, and shall be incorporated in the technical specifications in the license, except as changed pursuant to the provisions in Section 8 of this design certification rule that apply to changes in Tier 2 information. Changes in the proposed technical specifications by a license applicant are subject to NRC review and approval and a hearing as part of the license proceeding. After issuance of a combined license or operating license, the proposed technical specifications in Tier 2

have no further effect to that licensee, and the technical specifications in the license are effective.

Tier 2 does not include proprietary information from the Standard Safety Analysis Report for the System 80+ Standard Plant. The proprietary references or their equivalent must be included or referenced as part of the license application that references the design certification rule for the System 80+ Standard Plant.

(d) Tier 2* means the portion of the Tier 2 information which cannot be changed without prior NRC approval by letter or other written document. This information is identified in the DCD. The restrictions on changes to Tier 2* information expire at first full power for a plant that references this design certification rule. Thereafter, changes to the Tier 2* information shall be controlled in the same manner as changes to other Tier 2 information.

(e) All other terms in this rule have the meaning set out in 10 CFR 50.2, 10 CFR 52.3, or Section 11 of the Atomic Energy Act of 1954, as amended, as applicable.

3. [Reserved].

4. Contents of the design certification.

(a) The System 80+ Design Control Document, ABB-CE, Revision 2, [dated,] is incorporated by reference. This incorporation by reference was approved by the Director of the Office of the Federal Register on [Insert date of approval] in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the System 80+ DCD may be purchased from the National Technical Information Service, Springfield, VA 22161. Copies are also available for examination and copying at the NRC Public Document Room, 2120 L Street NW, Washington, DC 20555, and for examination at the NRC Library, 11545 Rockville Pike, Rockville, Maryland 20582-2738.

(b) An applicant for a construction permit, operating license, or combined license that references this design certification shall reference both Tier 1 and Tier 2 of the System 80+ DCD. However, the ITAAC in Tier 1 are not applicable to an applicant for a construction permit or operating license.

(c) If there is a conflict between the System 80+ DCD and either the application for design certification for the System 80+ Standard Plant design or NUREG-1462, "Final Safety Evaluation Report Related to the Certification of the System 80+ Standard Plant Design," dated August 1994 (FSER), then the System 80+ DCD is the controlling document.

5. Exemptions and applicable regulations.

(a) The System 80+ Standard Plant design is exempt from portions of the following regulations, as described in the FSER (index provided in Section 1.6 of the FSER):

(1) Section VI(a)(2) of Appendix A to 10 CFR Part 100 - Operating Basis Earthquake Design Consideration;
(2) Section (f)(2)(iv) of 10 CFR 50.34 - Separate Plant Safety Parameter Display Console;
(3) Section (f)(2)(viii) of 10 CFR 50.34 - Post-Accident Sampling for Hydrogen, Boron, Chloride, and Dissolved Gases;
(4) Section (f)(3)(iv) of 10 CFR 50.34 - Dedicated Containment Penetration;
(5) Section III.A.1.(a) of Appendix J to 10 CFR Part 50 - Containment Leakage Testing; and
(6) Sections (f)(2)(vii), (viii), (xxvi), and (xxviii) of 10 CFR 50.34 - Accident Source Terms.

(b) Except as indicated in paragraph (a) of this section, the regulations that apply to the System 80+ Standard Plant design are those regulations in 10 CFR Parts 20, 50, 73, and 100 (August 1994), that are applicable and technically relevant, as described in the FSER.

6. Issue resolution for the design certification.

(a) The Commission has found that the structures, systems, components, and design features of the System 80+ Standard Plant design as described in the DCD and FSER satisfy the relevant Commission regulations and provide adequate protection of the health and safety of the public. Inherent in this finding is the determination that additional or alternative structures, systems, components, design features, design criteria, testing, analyses, or justifications are not necessary for the System 80+ Standard Plant design. The lack of need thereof is, accordingly, also considered a matter resolved in connection with issuance of this design certification rule.

(b) All nuclear safety issues associated with the information in the FSER, DCD, application for design certification of the System 80+ Standard Plant, including the System 80+ Standard Safety Analysis Report, docket of the application for design certification of the System 80+ Standard Plant, and the rulemaking record for design certification of the System 80+ Standard Plant, are resolved within the meaning of 10 CFR 52.63(a)(4). Within the scope of the standard design as discussed in the FSER and DCD, the NRC may not require an applicant or licensee to:

(1) provide structures, systems, components, or design features not discussed in the FSER or DCD; or

(2) provide additional design criteria, testing, analysis, or justification for structures, systems, components, or design features discussed in the FSER or DCD;

except in accordance with the change processes and other provisions in this design certification rule.

(c) All environmental issues associated with the information in the NRC's Environmental Assessment for System 80+ Standard Plant design or the severe accident design alternatives in Revision 2 of the Technical Support Document for the System 80+ Standard Plant dated January 1995, are resolved within the meaning of 10 CFR 52.63(a)(4).

(d) Any change made in accordance with the change process set forth in Section 8 of this design certification rule is resolved within the meaning of 10 CFR 52.63(a)(4).

(e) The matters listed above shall be considered resolved in all subsequent proceedings, including proceedings for issuance of a combined license, construction permit, or operating license; permit or license amendment proceedings; design certification and license renewal proceedings; proceedings under 10 CFR 52.103; and enforcement proceedings.

7. Duration of the design certification.

This design certification may be referenced for a period of 15 years from [insert date 30 days after publication of the final rule in the Federal Register], except as provided for in 10 CFR 52.55(b) and 52.57(b). This design certification remains valid for an applicant or licensee that references this certification until their application is withdrawn or their license expires, including any period of extended operation under a renewed license.

8. Change process.

(a) Tier 1 information.

(1) Generic (rulemaking) changes to Tier 1 information are governed by the requirements in 10 CFR 52.63(a)(1).
(2) Generic changes to Tier 1 information are applicable to all plants referencing the design certification as set forth in 10 CFR 52.63(a)(2).
(3) Changes from Tier 1 information that are imposed by the Commission through plant-specific orders are governed by the requirements in 10 CFR 52.63(a)(3).
(4) Exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1).

(b) Tier 2 information.

(1) Generic (rulemaking) changes to Tier 2 information are governed by the requirements in 10 CFR 52.63(a)(1).

(2) Generic changes to Tier 2 information are applicable to all plants referencing the design certification as set forth in 10 CFR 52.63(a)(2).

(3) The Commission may not impose new requirements by plant-specific order on Tier 2 information of a specific plant referencing the design certification while the design certification is in effect under §§ 52.55 or 52.61, unless:

(i) A modification is necessary to secure compliance with the Commission's regulations applicable and in effect at the time the certification was issued, or to assure adequate protection of the public health and safety or the common defense and security; and

(ii) Special circumstances as defined in 10 CFR 50.12(a) are present.

(4) An applicant or licensee who references the design certification may request an exemption from Tier 2 information. The Commission may grant such a request only if it determines that the exemption will comply with the requirements of 10 CFR 50.12(a). The granting of an exemption on request of an applicant must be subject to litigation in the same manner as other issues in the construction permit, operating license, combined license, or permit or license amendment hearing.

(5) (i) An applicant or licensee who references the design certification may depart from Tier 2 information, without prior NRC approval, unless the proposed change involves a change to Tier 1 or Tier 2* information, as identified in the DCD, the technical specifications in an operating license or combined license, or an unreviewed safety question as defined in paragraphs (b)(5)(ii) or (b)(5)(iii) of this section. When evaluating the proposed change, an applicant or licensee shall consider all matters described in the DCD, including generic issues and shutdown risk for all postulated accidents including severe accidents, but excluding the information in Chapter 19 of Tier 2 other than the information in Section 19.15.

(ii) A proposed departure from Tier 2 information, other than severe accident issues identified in Section 19.15, shall be deemed to involve an unreviewed safety question if:

(A) The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the DCD may be increased;

(B) A possibility for an accident or malfunction of a different type than any evaluated previously in the DCD may be created; or

(C) The margin of safety as defined in the basis for any technical specification in an operating license or combined license is reduced.

(iii) A proposed departure from information associated with severe accident issues identified in Section 19.15 of Tier 2 shall be deemed to involve an unreviewed safety question if:

(A) There is a substantial increase in the probability of a severe accident such that a particular severe accident previously reviewed and determined to be not credible could become credible; or

(B) There is a substantial increase in the consequences to the public of a particular severe accident previously reviewed.

(iv) Departures from Tier 2 information made in accordance with Section 8(b)(5) above, technical specification changes, and Tier 2* changes that do not involve an unreviewed safety question do not require an exemption from this design certification rule.

(c) Other requirements of this design certification rule.

(1) Generic (rulemaking) changes to the provisions in this Appendix or to the DCD Introduction are governed by the requirements of Subpart H of 10 CFR Part 2.

(2) An applicant or licensee may request an exemption from the provisions in this Appendix or the DCD Introduction in accordance with 10 CFR 50.12(a).

(d) Generic Changes to the DCD by the Design Certification Applicant

(1) Changes to Tier 1 - Any change to Tier 1 proposed by the design certification applicant shall be the subject of a request for proposed rulemaking in accordance with the provisions of subsection (a) of this Section.

(2) Changes to Tier 2 - Prior to the first license application that references the DCD, the design certification applicant may make a change to Tier 2, unless the proposed change involves a change in Tier 1 or an unreviewed safety question. Any change by the design certification applicant to Tier 2* information designated in the DCD shall be subject to prior NRC Staff approval.

(i) The design certification applicant shall submit reports of any change in Tier 2 to the NRC. The reports shall describe the change and provide a summary of a safety evaluation which provides the basis for the determination that the change does not involve an unreviewed safety question.

(ii) For changes made hereunder, the design certification applicant shall submit to the NRC an update to the DCD on a replacement-page basis, which shall indicate the area changed, e.g., a bold line vertically drawn in the margin adjacent to the portion changed, and a page change identification (date of change or change number, or both).

(iii) A change made hereunder shall be considered resolved under 10 CFR 52.63(a)(4) unless the NRC determines, within six months of submission of the change, that the change involves an unreviewed safety question as defined in Section 8(b)(5) above.

(iv) A license applicant shall reference and utilize the updated DCD, unless the license applicant makes a change in accordance with the other provisions of this Section.

9. Records and Reports.

(a) Records.

(1) The applicant for this design certification shall maintain a copy of the DCD that includes all generic changes to the DCD, including Tier 1 and Tier 2 information.

(2) An applicant or licensee that references this design certification shall maintain records of all changes to and departures from the DCD pursuant to Section 8 of this appendix. Records of changes made pursuant to Section 8(b)(5) must include a written safety evaluation which provides the bases for the determination that the proposed change does not involve an unreviewed safety question, a change to Tier 1 or Tier 2* information, or a change to the technical specifications in the operating license or combined license.

(b) Reports. An applicant or licensee that references this design certification shall submit a report to the NRC, as specified in 10 CFR 50.4, containing a brief description of any departures from the DCD, including a summary of the safety evaluation of each departure. An applicant or licensee shall also submit updates to the DCD to ensure that the DCD contains the latest material developed for both Tier 1 and Tier 2 information. The requirements of 10 CFR 50.71(e) for safety analysis reports must apply to these updates. These reports and updates must be submitted at the frequency specified below:

(1) During the interval from the date of application to the date of issuance of either a construction permit under 10 CFR Part 50 or a combined license under 10 CFR Part 52, the report and any updates to the DCD may be submitted along with amendments to the application.

(2) During the interval from the date of issuance of either a construction permit under 10 CFR Part 50 or a combined license under 10 CFR Part 52 until the applicant or licensee receives either an operating license under 10 CFR Part 50 or the Commission makes its findings under 10 CFR 52.103, the report must be submitted semiannually. Updates to the DCD must be submitted annually.

(3) Thereafter, reports and updates to the DCD may be submitted annually or along with updates to the safety analysis report for the facility as required by 10 CFR 50.71(e), or at such shorter intervals as may be specified in the license.

(c) Retention Period. The plant-specific DCD, and the records of changes to and departures from the plant-specific DCD, must be maintained until the date of termination of the construction permit or license.

10. Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)

An applicant for or holder of a combined license (COL) that references the design certification rule for the System 80+ Standard Plant Design shall perform and demonstrate conformance with the ITAAC prior to fuel load. With respect to activities subject to an ITAAC, an applicant for a COL may proceed at its own risk with design and procurement activities, and a holder of a COL may proceed at its own risk with design, procurement, construction, and preoperational activities, even though the NRC Staff may not yet have agreed that any particular ITAAC has been satisfied. In the event that an activity is subject to and in noncompliance with an ITAAC, the applicant for or holder of a COL shall either take corrective actions to successfully complete that ITAAC or request and obtain NRC approval of a change in or exemption from the ITAAC in accordance with the design certification rule for the System 80+ Standard Plant Design.

In accordance with 10 CFR 52.103(g), the Commission must find that the acceptance criteria in the ITAAC are met prior to operation. After the Commission has made the finding required by Section 52.103(g), the ITAAC do not constitute regulatory requirements for subsequent plant modifications. However, subsequent modifications must comply with Tier 1 Design Descriptions, unless changes are made in the Tier 1 Design Descriptions in accordance with the change processes in the design certification rule for the System 80+ Standard Plant Design. Furthermore, after the NRC has issued its finding in accordance with 10 CFR 52.103(g), the ITAAC do not, by virtue of their inclusion in the Design Control Document, constitute requirements for the COL holder or for renewals of the COL.

11. ITAAC Implementation and Verification.

In order to provide a basis for the NRC to make the findings required by §§ 52.99 and 52.103(g), the licensee shall notify the NRC that the required inspections, tests, and analyses specified in the ITAAC have been successfully completed and that the corresponding acceptance criteria have been met. The NRC shall verify that the inspections, tests, and analyses referenced by the licensee have been successfully completed and, based solely thereon, find that the prescribed acceptance criteria have been met. The NRC shall publish notice of successful completion of inspections, tests, and analyses in the Federal Register as required by § 52.99.