

NOTATION VOTE

RESPONSE SHEET

RELEASED TO THE PDR

2/20/91
date

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initials

TO: SAMUEL J. CHILK, SECRETARY OF THE COMMISSION

FROM: COMMISSIONER CURTISS

SUBJECT: SECY-90-377 - REQUIREMENTS FOR DESIGN
CERTIFICATION UNDER 10 CFR PART 52

APPROVED DISAPPROVED ABSTAIN

NOT PARTICIPATING REQUEST DISCUSSION

COMMENTS:

See attached comments.

9102220127 910102
PDR COMMS NRCC
CORRESPONDENCE PDR

John R. Curtiss
SIGNATURE

RELEASE VOTE

February 1, 1991

DATE

WITHHOLD VOTE

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ENTERED ON "AS" YES No

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Commissioner Curtiss' comments on SECY-90-377:

I believe the staff has done an excellent job of carrying out the Commission's direction to develop recommendations concerning the level of design detail that should be required to support the issuance of a design certification. I commend the staff for their efforts in bringing this difficult issue, which is central to the successful implementation of Part 52, into sharp focus.

As a general observation, I believe that, in addressing the issue of design detail, and the related issues of ITAAC, the structure and content of design certification rulemakings, issue finality, and flexibility, it is important to bear in mind the overall objective of Part 52 -- a stable and predictable nuclear power plant licensing process -- and the specific principles that underlie the concept of design certification as a vehicle for achieving this objective. These principles are as follows:

- The Commission must be able to reach final conclusions on all safety issues associated with a certified design at the time of the design certification rulemaking, such that if a plant is built and operated in any manner that is fully consistent with the explicit provisions of the design certification, as confirmed by a finding of compliance with specified inspections, tests, analyses, and acceptance criteria (ITAAC), then there is reasonable assurance that substantive safety issues pertaining to the design will not arise.
- The adequacy of a certified design cannot be contested in any subsequent COL proceeding wherein the design is referenced.
- The only safety issues which may be raised following issuance of a COL are those related to whether a plant referencing a certified design complies with ITAAC, as specified in the design certification.
- Once a design is certified, the ability of the Commission to effect changes to the design is sharply circumscribed.

With the foregoing principles in mind, I have considered each of the issues addressed in SECY-90-377. My views follow:

Level of Design Detail

For a meaningful discussion on the question of what level of design detail is necessary to ensure that the Commission can reach final conclusions on all safety issues, a clear understanding of the role of ITAAC is essential.¹ The Commission has previously spoken on the provisions of Part 52 concerning ITAAC, stating that --

. . . ITAAC are to provide reasonable assurance that a plant which references the design is built and will operate in accordance with the design certification and thus are not to be used to reach a final conclusion on any safety question associated with the design.²

As is obvious from this directive, ITAAC are to be confirmatory in nature, with the express purpose of demonstrating compliance with a certified design concerning which the agency has already reached final conclusions on all safety issues. Consistent with this directive, ITAAC, therefore, should be wholly derivable from the design information separately captured in the certification; ITAAC should not be used to further prescribe how the certified design is to be completed. In short, ITAAC must be sufficient to confirm that a plant has been built and will operate in conformance with the design certification.

Given the role and nature of ITAAC, the design information captured in a design certification rulemaking must be sufficient to provide reasonable assurance that safety issues will not arise when a design is completed in any manner that is fully consistent with the explicit provisions of the design certification. That is to say, the Commission must be able to reach final conclusions on all safety issues associated with the design without relying on assumptions concerning the specific manner in which the certified design is translated into a final design, except, of course, that the final design will be fully consistent with the design information captured in the design certification. Further, the Commission's final conclusions should not rely upon an assumption that it is indeed possible to build and operate a plant in accordance with all of the terms of the design

¹ While the fundamental role and nature of ITAAC are already clearly established in Part 52, it should be recognized that policy questions concerning the details of ITAAC formulation may arise in the future and require additional Commission guidance.

² See Staff Requirements Memorandum, Briefing on Level of Design Detail for Part 52, January 9, 1991.

certification, but instead upon a finding to that effect.³

The rigorous requirements of Part 52 for final conclusions on all safety issues at the time of design certification, coupled with our past experience under Part 50, suggest quite clearly that there is indeed a safety and licensing imperative for the development of extensive design detail prior to certification in order to support such findings. Under Part 50, the design information submitted in an operating license application evolved as the design was detailed, finalized, and constructed by the applicant, as well as reviewed, audited, and physically inspected by the NRC staff, resulting in an application that was adequate to support the agency's final safety findings with respect to the design covered in the application, prior to issuance of an operating license. Under Part 52, this same result must be achieved with respect to a design certification application, prior to the granting of a design certification.⁴ The design

³ By memorandum dated January 28, 1991, the EDO advised that the development of additional design detail beyond that required for the staff to make its safety determination would increase the staff's confidence that a plant can be built and operated in accordance with the design. It is not clear to me whether the staff was making a distinction between the level of design detail necessary for a finding of reasonable assurance with respect to the safety of a plant which, prospectively, is built and operated in accordance with a design certification, versus that level of detail which is necessary for a finding of reasonable assurance that a plant can be built and operated in accordance with a design certification. If so, any such distinction, which is perhaps a vestige of the manner in which safety findings were segmented under the two-step Part 50 process, is inappropriate under Part 52, since the finality of Commission safety determinations hinges not only on the question of whether there is reasonable assurance that a plant built and operated in accordance with the terms of a design certification will be acceptably safe, but also on the question of whether there is reasonable assurance that a plant can indeed be built and operated in accordance with the terms of the design certification. The level of design detail developed for design certification must be sufficient to enable the Commission to answer both of these questions in the affirmative at the time that the certification is granted.

⁴ To elaborate on this point, under Part 50, the applications that ultimately provided the basis for final agency safety findings evolved based upon feedback concerning the "revealed" manner in which the design, as initially described in the application, was actually translated into a final design and then constructed. Correspondingly, inspections, tests, analyses, and acceptance criteria that supported final agency findings with

certification application must be accurate, complete, internally consistent, and otherwise sufficient to resolve all safety issues associated with the design, as required by 10 CFR 52.47.

To this end, 10 CFR 52.47(b) specifies that for evolutionary designs and, in the absence of a prototype demonstration, for non-evolutionary designs, certification applications must provide an essentially complete nuclear power plant design.⁵ 10 CFR 52.47(a)(2) requires, in part, that the design information contained in the certification application for all types of designs be sufficiently detailed to permit preparation of procurement specifications and construction and installation specifications by the applicant and, where necessary for the Commission to make its safety determination, information normally contained in certain specifications is to be made available to the staff for its review. In making a distinction between "information sufficiently detailed to permit preparation of" and "information normally contained in certain", the Commission recognized that some degree of flexibility in completing the design was necessary and desirable to accommodate variations in actual, as-procured hardware characteristics, but that in areas

respect to the adequacy of designs licensed under Part 50 evolved as the designs were finalized and as data were gathered concerning actual plant design and performance during the construction, construction test, preoperational test, and startup test phases. Vendors and affiliated architect engineers were driven to develop the information providing this feedback to the applications by the fact that plants had been ordered and were being built and tested. In contrast, under Part 52, the agency is required to render final safety decisions concerning the adequacy of plant designs and the sufficiency of ITAAC before the granting of a design certification, without benefit of feedback that would be provided by the construction and testing of an actual plant (i.e., without knowledge beforehand of the manner in which the design would be translated into a final design, beyond that which is acquired in connection with review of the application).

⁵ In the Statements of Consideration accompanying Part 52, an "essentially complete nuclear power plant" is defined as a design which includes all structures, systems and components which can affect safe operation of the plant except for site-specific features such as the service water intake structure and the ultimate heat sink. In addition, the Statements of Consideration specify that an essentially complete design is a design that has been finalized to the point that procurement specifications and construction and installation specifications can be completed and made available for audit if it is determined that they are required for Commission review in accordance with 52.47(a).

particularly critical to safety, the Commission's safety determinations could require that final design information normally contained in certain actual specifications be included in the staff's review. The Commission therefore intended that, for all non-site-specific structures, systems, and components (SSCs) that can affect safe operation of the plant, the design information contained in the application would reflect a design which is complete, except to the extent that further adjustment to the design within established design envelopes for such SSCs would be necessary -- during what the staff has referred to as the design reconciliation process -- in order to accommodate variations in actual as-procured hardware characteristics.

To summarize, I believe that design certification applicants should be required to develop design detail to the extent necessary to provide the Commission with reasonable assurance that the design information ultimately captured in the certification is indeed sufficient to permit the Commission to make the final findings required by 10 CFR 52.47 (i.e. reasonable assurance with respect to the safety of the design to be certified and reasonable assurance that a plant can indeed be built and operated in accordance with the design certification). The level of design detail supporting a design certification must be sufficient to ensure that if a plant is built and operated in any manner which is fully consistent with the explicit provisions of the design certification, as confirmed by a finding of compliance with ITAAC, there is reasonable assurance that substantive safety issues pertaining to the design of the plant will not arise. Consistent with 10 CFR 52.47(b) and 10 CFR 52.47(a)(2), for all non-site-specific SSCs that can affect safe operation of the plant, the information contained in the application should reflect a design that is complete, except to the extent that some further adjustment to the design within established design envelopes for such SSCs will be necessary to accommodate actual, as-procured hardware characteristics.

With respect to the lead design certification application, I would direct the staff to reconsider, in light of the foregoing, what, if any, additional design information must be developed by design certification applicants for capture in the design certification or otherwise to ensure the accuracy and adequacy of the design certification application such that the agency can make the final safety findings required of it under Part 52. If, for this purpose, the staff finds it necessary or desirable to specify the design information which must be developed in terms of classes of design products, and the structures, systems, or components to which they apply, I would have no objection to such an approach. The staff should be proactive in requesting that the applicant develop the necessary information in order to avoid unnecessary delays in the staff's review. [For subsequent design certification applications, see the discussion under "Regulatory Guides", below.]

Furthermore, in view of the timing and finality of Commission safety determinations under Part 52, the staff should not confine its review to the traditional approach employed by NRR licensing reviewers under Part 50, but should instead seek to adapt the supplementary tools developed for the evaluation of designs under Part 50, such as IDIs, IDVPs, SSFIs, etc., to provide reasonable assurance that the proper integration of the many individual design requirements into the design is possible and, in fact, sufficient to ensure that all safety issues are resolved.

One final observation: In implementing the above guidance, the staff should be mindful that in order for Part 52 to succeed, the pre-design certification burden placed upon a design certification applicant -- and, for that matter, the staff and the Commission itself -- cannot and should not be underestimated. While the burden may be significant, the ratio decidendi of the process is that this burden be shouldered only one time for each design, rather than each time a facility is licensed. Considerations such as the potential cost of developing a design to the required level of detail or the potential that the design certification rulemaking may become increasingly burdensome for the applicant and staff should not, in my view, be factors in the Commission's deliberations.

Two-Tiered Approach

I approve the staff's recommendation for a "Two-Tiered" approach. Although I do not believe that standardization should be the sole basis for including information in either Tier, I do believe that a high degree of design detail, and hence standardization, will be a practical result of satisfying the requirements of Part 52. Collectively, the information contained in Tiers 1 and 2 should be sufficient for the Commission to reach conclusions on all safety issues associated with the design, as required by 10 CFR 52.47. Tier 1 should contain the ITAAC and design information that the staff believes is so fundamental to the agency's safety findings that were it to be modified in any significant respect, staff safety findings could be seriously called into question or could otherwise require additional staff review. In my view, it is premature at this time to provide more specific guidance on where to draw the line between Tier 1 and Tier 2. To ensure continuity and consistency in the staff's safety review efforts, however, decisions on what information should reside in each Tier should be made in parallel with the staff's review, so that an initial staff position on this matter is available at the time of issuance of the FDA.

Issue Finality

I approve the staff's proposal that matters covered in Tiers 1 and 2 be accorded issue finality in accordance with 10 CFR 52.63(a)(4). A finding that information ultimately incorporated in Tiers 1 and 2 is sufficient for the Commission to make the findings required by 10 CFR 52.47 would mean that any additional design information which was not incorporated in Tiers 1 or 2 as a result of the staff's review is not relevant to the staff's safety determination and thus -- (1) is not subject to challenge in later proceedings involving the certified design; and (2) would not be binding on COL applicants and licensees referencing the certified design.

Flexibility

I approve the staff's proposal to include provisions similar to 10 CFR 50.59 in each rule certifying a design to permit the holder of a combined license that references the design to make changes to Tier 2 information. I am unpersuaded that such provisions should be available to the design certification applicant or a combined license applicant for use prior to the issuance of a COL. Frivolous changes to the design between design certification and COL issuance can contribute to unpredictability at the COL stage without an accompanying safety benefit and should be discouraged. Significant improvements to the certified design can be incorporated during this time by amending the design certification rule. Once a COL is issued, a licensee referencing the certified design will have the flexibility to make warranted changes to Tier 2 information, albeit at the risk of such changes being subject to challenge and a hearing at the preoperational stage.

Regulatory Guides

I approve the staff's proposal to develop, in parallel with the review of the lead design certification application, regulatory guidance setting forth the level of design detail that must be developed in order to achieve design certification, as well as an acceptable method for the formulation of ITAAC. As the staff proceeds with this effort, I would ask that the staff keep the Commission apprised of its progress.

I do not have a preference as to whether this guidance is captured in Regulatory Guides, revisions to the Standard Review Plan, or a combination of both. What is important is that to the extent that such guidance can be developed in a generic manner -- something that only experience with the lead application will likely tell -- future design certification applicants will certainly benefit by our providing timely and uniform guidance on

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these matters to maximize regulatory stability and predictability in the design certification process.