UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CHAIRMAN

February 24, 1994

The Honorable Tom Bevill, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Senate Appropriations Report 102-80 requires the Nuclear Regulatory Commission to submit an annual report to Congress describing the agency's progress in the certification of standardized advanced light-water reactor designs, plans for current and subsequent fiscal years, and the resources necessary to maintain the established schedules. The annual report for 1994 is enclosed.

Since the Commission's July 30, 1991 letter advising you of the NRC schedule for reviewing advanced reactor designs, the NRC and the industry have completed a number of significant tasks, including completion of the NRC safety evaluation report (SER) on the Electric Power Research Institute (EPRI) Utility Requirements Document (URD) for Evolutionary Designs (August 1992) and issuance of the NRC SER on the EPRI URD for passive designs (August 1993) for review by the Advisory Committee on Reactor Safeguards and the Commission. The final SER for the GE Nuclear Energy (GE) advanced boiling water reactor (ABWR) was issued for Commission review in December 1993. The NRC staff has nearly completed its review of the ABB-Combustion Engineering System 80+ design and expects to issue the associated final SER in early 1994. Therefore, we anticipate that final design approval for both the ABWR and System 80+ could be issued in 1994. The staff would then commence design certification rulemaking.

The NRC staff continues its review of the Westinghouse AP600 and GE simplified boiling water reactor (SBWR) designs, including implementation of a process for monitoring the vendors' test programs. In addition, the staff is preparing to conduct confirmatory testing for both passive designs. Recent delays in implementation of portions of the vendors' test program for both the AP600 and SBWR designs may delay the certification schedule for both reactor designs.

The NRC staff will continue putting significant effort into the certification of standardized advanced light-water reactor designs, and the Commission will continue to keep the Subcommittee updated on these activities.

Sincerely,

080040

Ivan Selin

Enclosure:
As stated

cc: Rep. John T. Myers

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CHAIRMAN

February 24, 1994

The Honorable J. Bennett Johnston, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

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Sincerely,

Ivan Selin

Enclosure:
As stated

cc: Senator Mark O. Hatfield

DENA BENNETT: IF YOU NEED AN ENGLISH-LANGUAGE TRANSLATION OF THIS MATERIAL, I WILL BE HAPPY TO COMPLY. CHEERS
IVAN

ANNUAL REPORT ON PROGRESS IN CERTIFIED STANDARDIZED ADVANCED LIGHT WATER DESIGNS

I. EXECUTIVE SUMMARY

This report provides the status of the Nuclear Regulatory Commission's (NRC's) design certification reviews of advanced reactors. The NRC has received the following four applications for standard design approval under Part 52 of Title 10 of the Code of Federal Regulations: the GE Nuclear Energy (GE) advanced boiling water reactor (ABWR) design, the Asea Brown Boveri-Combustion Engineering (ABB-CE) System 80+ design, the Westinghouse Electric Corporation advanced passive AP600 design, and the GE simplified boiling water reactor (SBWR) design. In addition, the Electric Power Research Institute (EPRI) asked the NRC to review the utility requirements document (URD) for evolutionary and passive light-water reactors.

The NRC and the industry have completed a number of significant tasks, including completion of the NRC safety evaluation report (SER) on the EPRI URD for evolutionary designs (August 1992) and issuance of the NRC SER on the EPRI URD for passive designs (August 1993) for the Advisory Committee on Reactor Safeguards (ACRS) and Commission review. The final SER for the GE ABWR was issued for Commission review in December 1993. The NRC staff has almost finished the ABB-CE System 80+ design review, and expects to issue the associated final SER in early 1994. The NRC staff continues its review of the Westinghouse AP600 and GE SBWR designs, including implementation of a process for monitoring the vendors' test programs. In addition, the staff is preparing to perform confirmatory testing for both passive designs. Recent delays in implementation of portions of the vendors' test program for both the AP600 and SBWR designs may delay the certification schedule for both reactor designs.

Although this report addresses the NRC staff efforts on the advanced light water reactor designs, it should be noted that the staff is also involved, to a lesser degree, in advanced non-light water reactor activities. Specifically, the staff is in the preapplication phase for the CANDU reactor design and continues its involvement in the MHTGR and PRISM designs.

II. BACKGROUND

The Commission has long sought to encourage the industry to develop standard designs to improve safety and simplify the licensing process. The Commission has also sought to improve the licensing environment for future nuclear power reactors by minimizing the uncertainty in the regulatory process. To achieve this, the Commission has promulgated 10 CFR Part 52 (54 FR 15372; April 18, 1989) which gives new procedures for licensing, including certification of standardized designs. The Commission published a final rule amending Part 52 (57 FR 60975; December 23, 1992), which conforms the regulation to the provisions of Title XXVII of Public Law 102-486, the "Energy Policy Act of 1992," signed into law on October 24, 1992. Subpart B of 10 CFR Part 52 establishes the requirements and procedures that govern the process by which the Commission will issue rules granting standard design certifications for nuclear power plant designs separate from an application for a construction permit or combined license for such a facility.

Applicants for design certification under 10 CFR Part 52 must submit information that has traditionally been required under 10 CFR Part 50. In addition, they must submit information required under 10 CFR Part 52, such as the resolution of unresolved and generic safety issues; a design-specific probabilistic risk assessment; and proposed inspections, tests, analysis, and acceptance criteria (ITAACs). The ITAACs provide acceptance criteria to verify the basic configuration of systems and requirements regarding the relationship between the certified design and the site-specific design features. The applicant may exclude from the scope of the design certification those portions of the design that are either specific to the site or structures and systems that do not affect the safe operation of the facility.

III. EVOLUTIONARY LWR PROJECT STATUS

- GE ABWR

In September 1987, GE submitted to the NRC its initial application for certification of the ABWR design. The staff issued requests for additional information (RAIs) from February 1988 through December 1990. GE completed its responses to the RAIs in July 1991.

The staff issued the draft safety evaluation report (DSER), which listed more than 300 open items, in a series of six reports between May and October 1991. GE responded to the open items during a period of intensive meetings and sent a large number of submittals, including proposed ITAACs, for the design. Many of the DSER items were resolved. The staff issued its draft final safety evaluation report (DFSER) in October 1992. This document discussed more than 370 mostly new open items, many of which resulted from the partial closure of previously identified open items and about half of which related to the ITAAC review. During 1993, the NRC staff resolved the majority of the issues identified in the DFSER and issued the final safety evaluation report (FSER), with a minimal number of open and confirmatory items, for Commission review in December 1993. Assuming a timely and technically accurate vendor effort, the NRC is prepared to issue a final design approval and commence design certification rulemaking in 1994.

- ABB-CE SYSTEM 80+

From March 1989 to March 1991, ABB-CE submitted material in support of an application for final design approval and design certification of the System 80+ nuclear power plant design. However, this application did not include ITAACs, the reliability assurance program, or a detailed analysis of fire hazards. As a result, subsequent submittals from ABB-CE were made in January 1992, March 1992, and April 1993.

The staff issued its DSER in September 1992. In 1993, the NRC staff and ABB-CE worked to resolve the open issues noted in the DSER in preparation for issuing the FSER. The staff resolved 937 DSER items (open, confirmatory, and combined license (COL) issues) and nearly 1000 post-DSER items (follow-on questions). The staff is scheduled to issue the

FSER to the Commission and ACRS for review in early 1994. The NRC is prepared to issue a final design approval and commence design certification rulemaking in 1994.

- EPRI UTILITY REQUIREMENTS DOCUMENT

EPRI has prepared a compendium of technical requirements, referred to as the "ALWR Utility Requirements Document." These requirements apply to the design of future evolutionary and passive ALWR power plants. Volume I of the URD, "ALWR Policy and Summary of Top-Tier Requirements," is a management-level synopsis of the requirements document, including the design objectives and philosophy, the overall physical configuration and features of a future commercial nuclear power plant design, and the steps that must be taken in order to apply the proposed ALWR design criteria to a functioning power plant. Volume II contains the utility design requirements for an evolutionary nuclear power plant [approximately 1350 megawatts-electric (MWe)]. Volume III contains the utility design requirements for nuclear power plants of approximately 600 MWe that use passive design features and systems. The URD also proposes resolution of unresolved safety issues and generic safety issues and ways of complying with 10 CFR Part 52. Although the URD is not associated with any licensing action, the staff has reviewed it and documented areas in which EPRI's requirements deviate from the current regulations. In addition, the staff's review of the URD served as a vehicle to obtain consistent resolution of policy issues pertaining to the staff's review of ALWR designs.

URD Volume II (Evolutionary LWR): The NRC issued the FSER on EPRI's URD for evolutionary plant designs as NUREG-1242 in August 1992. Because EPRI intends to continue to make changes to the evolutionary requirements document, including conforming changes to follow resolution of passive plant issues, the staff continues to work with EPRI in this area.

URD Volume III (Passive LWR): The NRC issued the DSER on EPRI's URD for passive plant designs in April 1992. EPRI has responded to the issues discussed in the staff's DSER, and the staff has reviewed those responses. The staff issued the FSER to the Commission in November 1993. The staff plans to issue the FSER on the passive designs as Supplement 1 to NUREG-1242 in 1994.

IV. PASSIVE REACTOR PROJECTS

- Westinghouse AP600

Westinghouse Electric Corporation completed its application for a final design approval and design certification of the AP600 design on June 26, 1992. The AP600 is a 600 MWe pressurized water reactor plant in which passive safety systems and features are used for the ultimate protection of the plant. The NRC staff is reviewing the AP600 application material and is requesting additional information from Westinghouse. The staff

is continuing its review and expects to issue a DSER discussing its findings in 1994. However, recent delays in implementing portions of the vendor test program may have an effect on the certification schedule.

- GE SBWR

GE submitted its application for design certification of the simplified boiling water reactor in August 1992, and supplemented its application on February 25, February 28, and May 7, 1993. The SBWR is a 600 MWe advanced reactor design that employs such passive features as gravity flow and natural convection to perform essential safety functions. The staff docketed GE's application for design certification in May 1993. The staff is continuing its review in preparation for issuance of a DSER.

- VENDOR TESTING FOR PASSIVE DESIGNS

Among the requirements for certification of advanced reactor designs, including those using passive features, are demonstrating the performance of each safety feature of the design through either analysis, testing, experience, or a combination thereof, and assuring that sufficient data exist on the safety features to assess the analytical tools used for safety analyses. Since the AP600 and the SBWR designs rely on passive systems for reactor safety, unlike current operating reactors, both vendors have developed testing programs to gain data to satisfy the requirements.

To ensure that the test programs are adequate to produce the necessary data, the NRC staff has developed and is implementing a process for monitoring the vendors' test programs. The staff will also examine the experimental data, when they become available, to ensure that an adequate data base was utilized for assessing and validating the codes used for safety analyses.

Because of recent delays in implementing portions of the vendor test programs, the established testing schedules for both the AP600 and SBWR designs have been revised. The delays may have an effect on the certification schedule for both reactor designs.

- NRC CONFIRMATORY TESTING AND ANALYSIS

The NRC is conducting confirmatory testing for both AP600 and SBWR safety systems. Although all of the test data needed for making licensing decisions on design certification will be produced by the vendors, the NRC determined that confirmatory testing was important to provide the staff with added confidence in its own computer codes.

The confirmatory testing for the AP600 design will be conducted in the modified Rig of Safety Assessment (ROSA) test facility in Japan as a cooperative program with the Japan Atomic Energy Research Institute (JAERI). The ROSA-V test facility has been modified to simulate AP600

safety systems. Testing will be performed during 1994 and 1995. The confirmatory testing for the SBWR design will be conducted in 1995 and 1996 in the Purdue University Multi-Dimensional Integral Test Assembly (PUMA). The PUMA design is near completion. The PUMA facility will be built in early calendar year 1995 and will be ready for testing in the end of calendar year 1995. Approximately 50 tests will be performed at Purdue to cover a broad spectrum of loss-of-coolant accidents (LOCAs) and transients; among these tests will be GE counterpart tests and beyond-design-basis accident tests.

Data obtained from the confirmatory testing, as well as data submitted by the vendors, will be used to assess and validate the NRC computer codes which will then be used to analyze AP600 and SBWR for the purpose of auditing vendor calculations.

V. RESOURCES

The total budgeted resources associated with NRC's efforts in the area of certification of standardized advanced LWR and non-LWR designs are shown below. These numbers include not only the technical review efforts associated with individual advanced reactor designs, but also the research required to develop sound technical bases for evaluating safety issues associated with advanced reactor designs and the preparation of guidelines and regulations necessary for NRC to license and certify advanced reactor designs.

ITEM	FY 1994	FY 1995
Total Funding ($ in M)	$41.7	40.1
Total Staffing (FTE)	182	180

CONGRESSIONAL CORRESPONDENCE SYSTEM
DOCUMENT PREPARATION CHECKLIST

This checklist is be submitted with each document (or group of Qs/As) sent for ing into the CCS.

1. BRIEF DESCRIPTION OF DOCUMENT(S) Ltr to Burrill RIP

2. TYPE OF DOCUMENT X Correspondence ____ Hearings (Qs/As)

3. DOCUMENT CONTROL ____ Sensitive (NRC Only) X Non-Sensitive

4. CONGRESSIONAL COMMITTEE and SUBCOMMITTEES (if applicable)

_____ Congressional Committee

_____ Subcommittee

5. SUBJECT CODES

(a) _____

(b) _____

(c) _____

6. SOURCE OF DOCUMENTS

(a) ____ 5520 (document name _____

(b) X Scan (c) ____ Attachments

(d) ____ Rekey (e) ____ Other _____

7. SYSTEM LOG DATES

(a) 3/4/94 Date OCA sent document to CCS

(b) _____ Date CCS receives document

(c) _____ Date returned to OCA for additional information

(d) _____ Date resubmitted by OCA to CCS

(e) _____ Date entered into CCS by _____

(f) _____ Date OCA notified that document is in CCS

8. COMMENTS

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