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

October 10, 1991

Docket No. 52-002

Mr. E. H. Kennedy, Manager
Nuclear Systems Licensing
ABB Combustion Engineering Nuclear Power
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095

Dear Mr. Kennedy:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON CESSAR-DC, SYSTEM 80+

Enclosed is a request for additional information based on a review by the Division of Licensee Performance and Quality Evaluation of CESSAR-DC Appendix A. The enclosure addresses resolutions for the CE System 80+ generic safety issues (GSIs) and related information missing from the CESSAR-DC application.

By letter dated September 16, 1991, the staff notified ABB Combustion Engineering, Inc. (CE) of seven significant areas that have not been submitted for the staff's review. Specifically, item No. 6, "Reliability Assurance Program," is needed for the staff to complete its review of the CE System 80+ on the schedules approved by the Commission. The staff has concluded that the CE resolution of GSI II.C.4 "Reliability Engineering," based solely on the CE System 80+ probabilistic risk assessment (PRA) and requiring the holder of a combined operating license (COL) to submit a reliability assurance program, is not sufficient for resolving this generic issue.

It is the staff's position, in accordance with SECY-89-013 and 10 CFR 52.47(a)(1)(iv), that a conceptual framework for a program to ensure design reliability should be part of the acceptance criteria for resolution of GSI II.C.4 for evolutionary ALWRs and should be provided by the plant designer as part of the final design approval application. Consequently, the enclosure requests additional information discussing the framework for a reliability assurance program so that the staff may continue the review of this generic issue.

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The reporting and/or record keeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Please respond within 90 days of the receipt of this request.

Sincerely,

Original Signed By:

Thomas V. Wambach, Senior Project Manager
Standardization Project Directorate
Division of Advanced Reactors
and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION
COMBUSTION ENGINEERING SYSTEM 80+
PERFORMANCE AND QUALITY EVALUATION BRANCH
GENERIC SAFETY ISSUE II.C.4; RELIABILITY ENGINEERING

INTRODUCTION

Pursuant to 10 CFR 52.47 (a)(1)(iv), an applicant for standard design certification is required to propose technical resolutions of Unresolved Safety Issues and medium- and high-priority Generic Safety Issues which are identified in the version of NUREG-0933 current on the date six months prior to application and which are technically relevant to the design. Appendix A of the Combustion Engineering Standard Safety Analysis Report - Design Certification (CESSAR-DC), "Closure of Unresolved and Generic Safety Issues" documents CE's resolution of Unresolved Safety Issues (USI) and medium- and high-priority Generic Safety Issues (GSI) which are technically relevant to the System 80+ Standard Design.

By letter to Combustion Engineering dated November 21, 1988, the NRC stated that "the staff is considering matters that go beyond the current Standard Review Plan but that we expect these advanced reactor designs to employ." The reliability assurance program (RAP) is such an area and has undergone considerable change since the time of the CESSAR GSI submittal.

While the specific NRC review bases for a RAP were still evolving at the time of this review, the conceptual framework and the basic approach of a RAP had been discussed in several NRC and industry documents. The guidance provided in these documents formed the basis for the staff review. The staff reviewed CESSAR-DC, Appendix A from the perspective that a RAP should define the framework (objectives, approach, and scope), define the program elements, and describe how the elements will be applied to the plant structures, systems and equipment. The staff's questions on the CE resolution of GSI II.C.4 were developed, in part, from a review of the documents identified in the reference section of this request for additional information.

DISCUSSION

The review of GSI II.C.4 focused on the acceptability of the RAP for the CE System 80+ ALWR. The objective of this review was to determine if a commitment to the framework for a reliability assurance program existed in the initial submittal. The NRC anticipates that a detailed RAP will be provided by an applicant, who will augment the CE System 80+ standard design RAP to reflect plant specific information. The RAP implementation and the specific reliability goals, action levels, and procedures will be reviewed by the NRC staff as part of the interface documents to be submitted when an applicant applies for a license.

Combustion Engineering states in CESSAR-DC Appendix A that the acceptance criteria for resolution of GSI II.C.4 is that plant designers or owner-operators shall perform a Probabilistic Risk Assessment (PRA). Additionally, consistent with the Standardization Rule (10 CFR 52), the assumptions and results of the PRA must be appropriately addressed in an owner-operator reliability program which incorporates such features as determining system availabilities, identifying high component failure rates, determining basic causes for component failures, and identifying possible corrective actions.

In step 4 of the enclosure to the November 21 letter, as well as in the SECY 89-013 discussion on reliability assurance, the staff confirmed that:

> "Certification of a design will be based in part upon a PRA of that design. In that the validity of a PRA is highly dependent on the reliability of systems, structures and components, the staff requires assurance that programs will be implemented which will ensure that the reliability of those systems, structures and components (assumed in analyses) will be maintained throughout plant life. Therefore, a program to assurance design reliability must be provided as part of the FDA application. This program, which will be certified as part of the design, should address items such as (1) the Technical Specifications and ISI/IST, (2) the maintenance program, (3) plant procedures, and (4) security."

The NRC staff is providing the following questions and request for additional information for the CE System 80+ RAP that were not addressed in CE's submittal. CE's response to these questions should allow the staff to complete its review of GSI II.C.4.

QUESTIONS

1. Describe the basic framework of the reliability assurance program (RAP) including the scope, purpose, objective, basic definitions, and elements. The scope of the RAP should include a discussion on selection criteria, such as a graded approach to safety that is based on the PRA and the structures, systems and components (SSC) to prevent or mitigate plant transients.

2. When describing the RAP concepts and elements, include a discussion on performance goals/targets; problem prediction and recognition; problem prioritization and correction; and problem closeout. The discussion for the RAP program elements should be detailed enough to address items such as:

   a. the approach that will be used for assessing reliability in design and operations.

   b. the approach for monitoring reliability performance.

   c. the methodology for comparing reliability to goals/targets.

   d. the approach for prioritizing potential problems that are detected.

   e. the approach for analyzing the cause(s) of important problems.

   f. the approach for determining corrective actions.

   g. the approach for implementing corrective actions.

   h. the approach for verifying that corrective actions are effective.

3. Describe how the RAP will address plant aging concerns.

4. Describe the organizational and administrative aspects for implementing an effective RAP.

5. Describe the approach for providing feedback to the designer when actual plant performance data consistently differs from the designer's PRA/RAP assumptions.

6. Describe the major programmatic interfaces between the RAP and areas such as design, construction, startup testing, operations, maintenance, engineering, safety, licensing, quality assurance and procurement.

7. Provide one example of how the CE RAP would function throughout plant life (e.g., from the design phase through the end of the operating phase) using a specific SSC identified as risk significant in the PRA. In the examples, identify where the interface occurs between the designer's RAP and the applicant's RAP.

8. Will the CE System 80+ RAP differ from the EPRI Requirements Document description of a RAP? If so, describe the differences.

REFERENCES

1. 10 CFR Part 52, "Early Site Permits; Standard Design Certification; and Combined Licenses for Nuclear Power Plants."

2. NUREG 0933, "A Prioritization of Generic Safety Issues" dated July 1991 (the date of GSI II.C.4 was 12/31/88).

3. Letter to Combustion Engineering dated November 21, 1988, "Scope of Design and Scope of Staff Review of CESSAR-DC, System 80+."

4. SECY-89-013, "Design Requirements Related to the Evolutionary Advanced Light Water Reactors (ALWRS)," dated January 19, 1989.

5. Combustion Engineering Standard Safety Analysis Report - Design Certification (CESSAR-DC).

6. EPRI Advanced Light Water Reactor Utility Requirements Document, Volume II, ALWR Evolutionary Plant.

7. Staff Requirements Memorandum dated December 15, 1989, "Staff Requirements-SECY-89-334-Recommended Priorities for Review of Standard Plant Designs."

8. Staff Requirements Memorandum dated March 5, 1991, "SECY-90-353-Licensing Review Basis Document for the Combustion Engineering, Inc. System 80+ Evolutionary Light Water Reactor."

9. Combustion Engineering letters to NRC dated January 22, 1990 and August 28, 1990, "Licensing Review Basis for the System 80+ Standard Design."

10. Combustion Engineering letter to the NRC dated December 21, 1990, "Differences between the EPRI Utility Requirements Document and the System 80+ Standard Design."