



Department of Energy
Washington, D.C. 20545

Docket No. 50-537
HQ:S:82:129

DEC 01 1982

Mr. Paul S. Check, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Check:

SUMMARY FOR EQUIPMENT QUALIFICATION DISCUSSIONS, NOVEMBER 23, 1982

The purpose of this letter is to summarize the resolution of items discussed between the Nuclear Regulatory Commission and the Clinch River Breeder Reactor Plant project on November 23, 1982.

Enclosure 1 contains the resolution and commitments regarding the items discussed. Enclosure 2 is the list of participants.

Any questions regarding the information provided or further activities can be addressed to Mr. R. Wishau (FTS 626-6378) or Mr. A. Meller (FTS 626-6355) of the Project Office Oak Ridge staff.

Sincerely,

John R. Longenecker
Acting Director, Office of
Breeder Demonstration Projects
Office of Nuclear Energy

2 Enclosures

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RESOLUTION OF EQUIPMENT QUALIFICATION ITEMS

11/23/82

1. Application of SSST - The applicant will prepare and present to NRC the basis for requiring equipment qualification to Design Basis Accident environments rather than the SSST environment. The basis will include detailed consideration of the following factors:
 - . Technical adequacy (including margin) of the applicant's proposed program to assure equipment operability during and after accidents;
 - . Conservatism embodied in the proposed approach relative to accidents not currently included in the design basis.
 - . Significant cost considerations between qualifying equipment to a DBA rather than qualifying to the SSST environment (or protecting the equipment from the SSST environment).

We're working toward a presentation for later in December.

2. One Hour Time Margin - QR 270.1 has been modified as attached (1) to show compliance with NUREG-0588 One Hour Time Margin except for specific cases which will be qualified to appropriate margins and justified on a case by case basis. PSAR modification will follow.
3. Mechanical Equipment Qualification - Question Response 270.3 and the PSAR Section 3.11 will be modified to reflect in greater detail the project's mechanical qualification activities. The details discussed are attached (2).
4. Documentation - Question Response 270.10 will be modified by December 10, to include documentation of mechanical and seismic qualification programs.
5. The applicant recognizes its responsibility to assure that qualification requirements are being met by equipment vendors.

CRBRP RESPONSE ONE HOUR TIME MARGINQuestion QCS 270.1 (3.11)

The NRC staff position of environmental qualification of electrical equipment is discussed in NUREG-0588. Discuss your compliance with these requirements. If you intend to use WARD-D-0165, "CRBRP Requirements for Environmental Qualification of Class 1E Equipment", identify any differences between IEEE 323, 1974 and the NUREG-0588 Category 1 requirements and discuss how the CRBRP design complies with the NUREG-0588, Category 1 requirements.

Response

The CRBRP program for environmental qualification of safety-related electrical equipment, WARD-D-0165, is consistent with the objectives and requirements delineated in NUREG-0588, Rev. 1 "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment", except as noted below.

Differences in CRBRP reactor technology and plant configurations exist and, as a result, some specific LWR requirements delineated in NUREG-0588 are not applied to CRBRP. These differences are: the use of liquid metal sodium for the reactor coolant; a low pressure coolant system with no mechanism for a highly pressurized containment; the absence of steam, containment spray, and the mechanism for water flooding within the containment; environmental separation of the upper containment from the lower containment; and placement of redundant heat transport loops in separate cells resulting in independent loop environmental conditions (environments in one loop do not propagate to the cells of another loop).

Paragraph 2.4 of the NUREG-0588, Category 1 requirements, discuss "Other Qualification Methods". In this regard, CRBRP requirements permit type testing, analysis, prior operating experience and/or a combination of these techniques for equipment qualification. An evaluation of the adequacy of the proposed method would be done before using analysis or operating experience in lieu of testing. Also an evaluation would be done to determine the necessary extent of any partial type tests required to be provided in support of these methods.

In addition to the design differences stated above, CRBRP does not apply two NRC staff positions stated in NUREG-0588. The first exception deals with the radiation source term used for qualifying Class 1E equipment located within the containment. NUREG-0588 specifies the worst radiation environment as an instantaneous release from the fuel to the atmosphere of 100 percent of the noble gases, 50 percent of the iodines, and 1 percent of the remaining fission products. CRBRP uses the normally expected radiation environment over the equipment qualified life plus that associated with the most severe design basis accident during or following which the equipment must remain functional. The worst case radiation DBA is the In-Containment Primary Sodium Storage Tank failure during maintenance.

The second exception concerns the application of time margin to safety-related equipment which performs its safety function within a short time period into the event (i.e., less than 10 hours). In NUREG-0588 a minimum qualification time margin of 1 hour is specified. CRBRP requires that equipment be qualified for the environment in which it must perform its safety function for the time duration specified for the safety response plus time margin per IEEE 323-1974. Failure of any equipment after its qualification time (whether longer or shorter than 1 hour) will not result in unsafe plant conditions.

QCS270.1-1

CRBRP is in general compliance with the 1 hour time margin requirement, however, CRBRP expects that specific exceptions to the one hour time margin will be necessary. Each exception will be justified on a case by case basis.

Amend. 68
May 1982

DETAILS DISCUSSED FOR ITEM 3

- Identify all safety-related mechanical equipment.
- Define the enveloping environments applicable to each piece of safety-related mechanical equipment, including the duration.
- Incorporate these environments and functional requirements into the equipment specifications.
- Develop criteria based on the ASME code, the active pump and valve requirements, and the seismic design requirements.
- Review designs for material compatibility with the accident environments.
- Define the maintenance and testing required during operation to ensure that the equipment will be able to perform its safety function throughout the lifetime of the plant.
- Documentation will be provided as described in the response to Question 270.10.

PARTICIPANTS
EQUIPMENT QUALIFICATION
November 23, 1982

| <u>Name</u> | <u>Organization</u> |
|-----------------|-----------------------------|
| - Al Meller | CRBRP-PO/PMC |
| S. M. Kowkabany | Burns & Roe |
| E. R. Wittry | CRBRP-PO |
| M. S. McKeown | W-OR |
| R. G. LaGrange | NRC/NRR/DE/EQB |
| Rich Stark | NRC |
| Hukam Garg | NRC/DE/EQB |
| D. Elias | CRBRP-PO |
| Neil Brown | GE (WLLCO) |
| Will Carraway | Westinghouse - CRBRP (O.R.) |
| Roger Wishau | CRBRP-PO |
| Dallas Hicks | CRBRP-PO |
| George Clare | Westinghouse, Oak Ridge |
| Larry W. Bell | NRC/NRR/DSI/AEB |
| Robert Wright | NRC/NRR/DOE/EQB |