



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

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MEMORANDUM FOR: James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing

FROM: Vincent S. Noonan, Chief
Equipment Qualification Branch
Division of Engineering

SUBJECT: ENVIRONMENTAL QUALIFICATION OF EQUIPMENT IMPORTANT TO SAFETY
REQUEST FOR ADDITIONAL INFORMATION - FORT ST. VRAIN

The staff has reviewed the environmental qualification (EQ) information provided by Public Service Company of Colorado (PSC) for Fort St. Vrain (FSV). In order to complete the Safety Evaluation Report on environmental qualification for FSV, the following information is required:

- 1) Submit a description of the sequence of events affecting or involving operator action that take place during a turbine building hot reheat pipe rupture. This description should include the operator actions necessary, the equipment that operates as a result of the operator actions, the elapsed time before the required actions are complete, the information available to the operators to inform them of the need to take the actions, and the sequence of events if the operators fail to take the required action.
- 2) The best information currently available for LWRs indicates that an acceptable time for operator action commences at 10 minutes after an event initiation, with an additional minute for each discrete operator action. Since FSV is an HTGR, different action times may be appropriate for evaluation of events analyzed as a basis for licensing. Submit a detailed justification that provides assurance that the operators will, for all likely operating contingencies, take the required actions within 4 minutes. To aid the staff in making a determination of the relative consequences of delayed operator action, provide the temperature curves developed assuming that the operators commence isolation at 10 minutes.
- 3) Even though access to any location in the plant is possible before and "shortly" following an accident, the staff's position is that the aging requirements of the DOR Guidelines do apply to FSV. If electrical equipment, safety-related or nonsafety-related, is relied upon to remain functional during and following design basis events then that equipment must be qualified for the environmental conditions at that location. Any age related degradation which would prevent the equipment from operating as required must be identified and the equipment replaced or repaired as necessary. For the reasons stated above, submit a summary of the FSV maintenance/surveillance program. Include a description of the methods used to maintain the qualification of safety related equipment, including use of manufacturer's recommended preventive maintenance requirements and use of aging considerations.

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- 4) Confirm that an operability time has been established for each item of safety related electrical equipment that is in a harsh environment and is required to operate or not fail following an accident. The accidents analyzed should include all accidents which will cause a significant adverse environment to electrical equipment.
- 5) The previous FSV justification for not using replacement parts qualified to 10 CFR 50.49 is inadequate. Regulatory Guide 1.89, Rev. 1, June 1984 paragraph C6 lists those reasons that the staff regards as adequate. Indicate which reasons FSV considers applicable.
- 6) Submit all applicable JCO's that are currently being relied upon and confirm the following for each JCO associated with equipment that is assumed to fail:

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

- 7) The licensee should confirm that in performing its review of the methodology to identify equipment within the scope of 10 CFR 50.49(b)(2) that the following steps have been addressed:
 - a. A list was generated of safety-related electrical equipment as defined in paragraph (b)(1) of 10 CFR 50.49 required to remain functional during or following design basis accidents. These accidents are the only design-basis accidents which result in significantly adverse environments to electrical equipment which is required for safe shutdown or accident mitigation. The list was based on reviews of the Final Safety Analysis Report (FSAR), Technical Specifications, Emergency Operating Procedures, Piping and Instrumentation Diagrams (P&IDs), and electrical distribution diagrams;
 - b. The elementary wiring diagrams of the safety-related electrical equipment identified in Step a were reviewed to identify any auxiliary devices electrically connected directly into the control or power circuitry of the safety-related equipment (e.g., automatic trips) whose failure due to postulated environmental conditions could prevent required operation of the safety-related equipment and;
 - c. The operation of the safety-related systems and equipment were reviewed to identify any directly mechanically connected auxiliary systems with electrical components which are necessary for the required operation of the safety-related equipment (e.g., cooling water or lubricating systems). This involved the review of P&IDs, component technical manuals, and/or systems descriptions in the FSAR.

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- d. Nonsafety-related electrical circuits indirectly associated with the electrical equipment identified in Step a by common power supply or physical proximity were considered by a review of the electrical design including the use of applicable industry standards (e.g., IEEE, NEMA, ANSI, UL, and NEC) and the use of properly coordinated protective relays, circuit breakers, and fuses for electrical fault protection.
- 8) Provide confirmation that all design basis events which could potentially result in a harsh environment, including flooding, were addressed in identifying safety-related electrical equipment within the scope of 10 CFR 50.49(b)(1).
9. Confirm that the electrical equipment within the scope of 10 CFR 50.49(b)(3) is all R.G. 1.97 Category 1 and 2 equipment or that justification for continued operation has been provided for any such equipment not included in the environmental qualification program.

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