September 23, 2004

MEMORANDUM TO: James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Victor Nerses, Sr. Project Manager ***/RA/***
Project Directorate I, Section 2
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 FACSIMILE TRANSMISSION, DRAFT REQUEST FOR ADDITIONAL INFORMATION (RAI) TO BE DISCUSSED IN AN UPCOMING CONFERENCE CALL (TAC NO. MC3100)

The attached draft RAI was transmitted by facsimile on September 23, 2004, to Mr. David Dodson, Dominion Nuclear Connecticut, Inc. (DNC). This draft RAI was transmitted to facilitate the technical review being conducted by the staff and to support a conference call with DNC in order to clarify certain items in the licensee's submittal. This draft RAI is related to DNC's submittal dated April 15, 2004, regarding an application requesting approval to change the carbon dioxide (CO2) fire extinguishing system from automatic to manual actuation. Review of the RAI would allow DNC to determine and agree upon a schedule to respond to the RAI. This memorandum and the attachment do not convey a formal request for information or represent an NRC staff position.

Docket No. 50-423

Enclosure: Draft Request for Additional Information

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DRAFT

REQUEST FOR ADDITIONAL INFORMATION

MILLSTONE POWER STATION, UNIT NO. 3

(TAC NO. MC3100)

By April 15, 2004, letter, Dominion Nuclear Connecticut, Inc., on behalf of Millstone Power Station, Unit 3 (MP3), requested a license amendment concerning the fire protection system in the Unit 3 Cable Spreading Area. Specifically, the license amendment involves changing the carbon dioxide (CO2) fire extinguishing system from automatic to manual actuation. The staff is reviewing this analysis using the acceptance guidelines from Regulatory Guide (R.G.) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to Licensing Basis."

The Nuclear Regulatory Commission (NRC) staff has reviewed the information the licensee provided to support the change to the licensing basis. In order for the staff to complete its evaluation, the following additional information is requested:

1. The cover letter of the submittal, states:

> "During original plant licensing, MP3 requested a deviation from the requirements of the Branch Technical Position (BTP) CMEB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," Revision 2, July 1981, to allow an automatic CO2 fire suppression system to be installed in the Cable Spreading Area (CSA) in lieu of the recommended fixed water suppression system."

The original NRC guidance for fire suppression in the CSA is for a fixed water suppression system. MP3 requested and received approval to change from a fixed water system to an automatic CO2 fire extinguishing system. The current requested amendment is requesting to change this automatic CO2 fire extinguishing system from automatic to manual. How is MP3 tracking cumulative changes that may affect vulnerabilities? (See R.G. 1.174, Section 3.3.2)

b. Control Room Evacuation Procedure

Page 16 of attachment 1 of the submittal states:

> "In the event a control room evacuation becomes necessary due to a fire in the CSA, the operators will need to proceed to areas adjacent to the CSA to perform an alternate plant shutdown."

The submittal does not provide the criteria for when control room staff will go to the alternate shutdown panel. Fire damage may affect control room indications in unexpected ways, perhaps even providing nominal readings while plant systems are in a degraded condition. Is staffing the alternate shutdown panel proceduralized (for example, is the panel staffed upon fire detection in the CSA)? At what point will operators go to the alternate shutdown panel?

ATTACHMENT

c. Sensitivity Study for Various Fire Sizes

Attachment 3, Page 19, Table 8, includes the following information:

Scenario	Critical HRR (kW)	Time to Dam [min]
CSA1	1300	11
CSA2	115	15
CSA3	50	15

Larger fires are less frequent, but may cause damage before fire brigade activities could be effective. The analysis appears limit its consideration to the smallest potentially damaging fire. Larger fires, although rarer, may challenge the suppression capability and the CCDP to a greater extent than a smaller, more common fire and thus may result in higher overall risk. Provide a sensitivity analysis to show that the fire size chosen is limiting. For example, what would be the result if CSA3 had a larger fire that caused damage well before plant staff could perform manual suppression? Use the most limiting fire size identified in the sensitivity analysis.

d. CSA Cabinets

Sheet 10, of Attachment 3 states:

"Therefore, fires these two isolation panels do not damage additional equipment and no fire scenario related to the isolation panels is required to be postulated."

Describe the isolation cabinets in the CSA, including plant SSC's that could be affected by the panel being fire damaged or spurious actuations in the panel. Provide an explanation of why damaging equipment in one cabinet would not challenge safe shutdown. Provide an analysis that a fire originating in one cabinet could not spread to nearby cabinets or cable trays along the cables connected directly to the isolation panels. Also, provide analysis that a fire in one cabinet could not affect adjacent cabinets.

e. Smoke Effects on Fire Brigade Operations

Attachment 1, Page 5, states:

"The following fire fighting equipment is installed in the CSA or nearby areas."

Attachment 1, Page 29, states:

"Dry hose stations and continuous flow hose reels are provided in sufficient numbers and locations within the CSA such that all trays can be reached."

With the fire protection equipment located within the fire area, how has the licensee evaluated fire brigade access to the equipment, considering that there may be smoke within the room? For some room fires the phenomena of smoke stratification may occur, where smoke

collects at an elevation below the ceiling of the room. This stratified smoke may obscure fire fighter vision. How has smoke stratification been considered in the fire brigade's effectiveness?

f. Gaseous Suppressant Propagation

Attachment 1, Page 3, states:

"Based on past experience (1999), a CO2 discharge in the CSA has the potential to increase CO2 levels in areas adjacent to the CSA."

Modifying the system to make it manually actuated will reduce the likelihood of spurious actuation. Also, by making the system a backup suppression system, the fire brigade will be less likely to actuate it. If the fire brigade actuates the system, how has the enclosure been tested to assure that the fire suppressant gas will not propagate to other fire areas and interfere with operator access (travel) to alternate shutdown panel?

g. Operator Preparation for Mock Evacuation

Attachment 1, Page 17, States:

"A mock evacuation of the control room after a simulated discharge of CSA CO2 was accomplished with operators wearing SCBA."

How many operators participated in the mock evacuation? Under what conditions was the evacuation conducted, e.g., were the operators aware of the exercise and "prepared" for it or, was it done without operators' prior knowledge? Was some type of "emergency scenario" staged to cause the evacuation? How extensive was the evacuation, i.e., did the operators continue the exercise to the switchgear rooms and simulate alternate shutdown actions using SCBAs or other fixed breathing equipment? Were they required to communicate with the SCBAs on and, if so, were they able to do so without undue difficulty? If communication was not required, why not? Did the mock evacuation consider delayed access or alternate means to access the switchgear rooms and alternate shutdown areas considering fire fighting activities, smoke spread, and other environmental and plant condition/activities that may challenge the operators to successfully perform alternate safe shutdown actions?

What is the basis for being able to generalize the performance results from the mock evacuation to remaining operators (crews) that were not tested?

h. Walkdown Information

Attachment 1, Page 21, States:

"An initial validation (walk-through) of the revised EOP for a CSA fire and subsequent control room evacuation was performed in January 2003.

Attachment 1, Page 21, specifically states in Bullets 4 and 5:

"Verifying the power operated relief valves (PORVs) were closed at the auxiliary shutdown panel in the west switchgear room was completed in 14 minutes and 16 seconds which was within the acceptable 15 minute time frame. . . Establishing

reactor head vent letdown was accomplished in 24 minutes and 46 seconds which was within the 30-minute acceptance criteria."

In addition to the five items (Attachment 1, page 21) described as accomplished successfully at the auxiliary shutdown panel, what other manual actions are required at the panels to achieve safe shutdown? Were these actions also performed as part of the walkdown to assure successful completion? If so, what were the times associated with the completion of these actions? Were required manual actions performed within the time limits to assure safe shutdown without collateral damage to equipment?

Describe the access path to the alternate shutdown panel and any other locations that may require access for a fire in the CSA. How many shutdown locations must be accessed? How many operators are required?

The difference between the time to complete the actions described in bullets 4 and 5, are 44 seconds and 5 minutes and 14 seconds, respectively. How do the alternate shutdown activities compare with the manual actions criteria in IP 71111.05, Enclosure 2? Given this was a one-time demonstration by one particular crew under non-hazardous conditions, what confidence is there that any crew could perform the required activities during a fire within the time required? How is the reliability of crew performance assured for possible fire conditions that might be encountered? Was a time margin between the performance time and the minimal required time addressed that would provide confidence that any crew could reliably perform the actions under realistic fire conditions? If such a margin was considered, please describe the analysis.

i. Full Crew Complement

Attachment 1, Page 21, States:

"An initial validation (walk-through) of the revised EOP for a CSA fire and subsequent control room evacuation was performed in January 2003. Two operators and two fire brigade members simulated a control room evacuation after a simulated CSA CO2 discharge."

The walkdown was conducted with two operators; is this essentially half the maximum number of operators that are needed to perform shutdown actions (see Attachment 1, Page 16)? With a "full crew complement," how much time will the crew take to accomplish the required manual actions to safely shutdown the plant from the auxiliary shutdown panel and how was the time determined? Provide a list of operator actions that impact the application, their error probabilities, and how they were estimated.

j. Reactor Coolant Pump (RCP)

Fire Protection Evaluation Report, Section 7.4, States:

"Failure of the three charging pumps coincident with the failure of the three component cooling water pumps due to fire is considered an incredible event."

Based on the statement in the Fire Protection Evaluation Report, it is unclear how the licensee protects the RCP seals if there were a CSA fire. Provide technical analysis of how operators will mitigate coincident loss of component cooling water pumps and charging pumps

due to CSA fire. When concluding the coincidence of the two triple failures was incredible, was the possibility of two concurrent triple common-cause failures (i.e., one among the three charging pumps and one among the three CCW pumps) addressed, or were failures assumed to be independent? Please provide any evaluation of the "incredibility" that you performed.

k. CDF and LERF Summary

Provide an assessment of the change to CDF and LERF, including a description of the significant contributors to the change.