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POWER BUILDING
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WILLIAM O. PARKER, JR.
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TELEPHONE: AREA 704
373-4083

September 24, 1980

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. B. J. Youngblood, Chief
Licensing Projects Branch No. 1

Re: McGuire Nuclear Station
Docket Nos. 50-369, 50-370

Dear Mr. Denton:

The attached is provided in response to Mr. Robert L. Tedesco's letter of August 26, 1980 which requested information regarding the containment emergency sump. If you have additional questions regarding this matter, please advise.

Very truly yours,

William O. Parker, Jr.

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Attachment

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McGuire Nuclear Station
Response to NRC Request for Information
Containment Emergency Sump Debris

1. In addition to insulation debris resulting from LOCA effects, debris can be generated within the containment from other sources, such as (1) degraded materials (paint chips), and (2) items which are taken into and left in the containment following maintenance and inspection activities.

   Describe how the house keeping program for McGuire will control and limit debris accumulation from these sources. The objectives are to assure that debris capable of defeating the post-LOCA core cooling functions are identified and removed from the containment. The response should include references to specific procedures or other means to assure that "as licensed" cleanliness will be attained prior to initial operation and prior to each resumption of operation.

   Response

   The area inside containment is designated as a Level V cleanliness area. This means that the area must be maintained sufficiently clean so that work activities can be performed efficiently and the requisite quality of the components in the area can be maintained. Excess material is not allowed to accumulate in these areas. These requirements are contained in McGuire station procedures.

   Additionally, prior to establishing containment integrity, a visual inspection of the containment is conducted as required by Technical Specifications. On at least an 18-month cycle, a detailed inspection of the containment emergency sump is performed. This requirement is also contained in the Technical Specifications.

2. Address the degree of compliance of McGuire with the following recommendations which is also set forth as item C.14 of Regulatory Guide 1.82:

   "In-service inspection requirements for coolant pump components (trash racks, screens, and pump suction inlets) should include the following:

   a. Coolant sump components should be inspected during every refueling period downtime, and

   b. The inspection should be visual examination of the components for evidence of structural distress or corrosion."

   Response

   Both of the requirements are contained in the McGuire Technical Specifications.

3. Both cavitation and air entrainment could be expected to cause pump vibration and oscillations in system flow rate and pressure. Show that the operator will be provided with sufficient instrumentation and appropriate indications to allow and enable detection of these problems. List the instrumentation available giving both the location of the sensor and the readout.

   The incidence of cavitation, air entrainment or vortex formation could be reduced by reducing the system flow rate. The operator should have the capability to perform indicated actions (e.g., throttling or terminating flow, resort to alternate cooling system, etc.). Show that the emergency operating instructions and the operator training consider the need to monitor the long-term performance of the recirculation system and consider the need for corrective actions to alleviate problems.

   Response

   In the event problems such as pump cavitation or air entrainment occur in the LPI recirculation system, instrumentation and controls provided in the main control room allow the operator to recognize the problem and take appropriate corrective action. Cavitation or air entrainment would result in system flow rate and pressure oscillations that are monitored in the control room by the following instrumentation:

   RHR Heat Exchanger 1A Outlet Flow
   RHR Heat Exchanger 1B Outlet Flow
   RHR Pump 1A Discharge Pressure
   RHR Pump 1B Discharge Pressure

   Additionally, annunciator alarms are provided in the control room for low system flow in either train of RHR as measured on the discharge side of the RHR pumps.

   Remote manual controls are provided in the main control room and on the auxiliary shutdown panel to allow throttling of RHR Pumps 1A and 1B discharge flow control valves. By throttling system flow, the operator can reduce the effects of cavitation and air entrainment.

   Emergency procedures for all accidents specifically address actions necessary to get the plant to a stable condition. Normally, this would be done within the first day. Beyond that time frame, there are no specific procedural steps. However, for any significant event the entire Duke Power Company emergency response organization would be activated and would be monitoring plant conditions closely and making the necessary decisions regarding need for any corrective actions or changes in plant status. Accordingly, it is felt that emergency procedures and operator training specifically directed at long-term performance of the recirculation system are unnecessary.

4. Does McGuire utilize similar materials in the containment during power operation for purposes such as reactor cavity annulus biological shielding (e.g., sand tanks or sand bags) or reactor cavity blow out sand plugs?

Response

McGuire does not use any loose material inside the containment for shielding material during operation of the unit nor are there any reactor cavity blow out plugs.

5. Discuss the potential for paint chips degrading ECCS performance.

Response

Due to the location of the McGuire containment sump screen, in the pipe tunnel outside the polar crane wall, it is unlikely that paint chips would reach the screen. The flow paths to the sump screen are spare piping sleeves located in the crane wall near containment floor level. Therefore, lighter paint chips floating on the water surface are unable to reach the sump screen. Heavier chips which settle to the containment floor inside the crane wall also are unable to reach the sump screen due to the low approach velocity (0.24 fps), as determined by ARL from sump model testing. However, if paint chips were able to reach the sump screen, a fine screen (0.25 inch mesh size) is provided to prevent degradation of ECCS performance. Sump model tests were performed by ARL with up to 50 percent screen blockage (67.5 ft^2 screen surface area) without degrading ECCS performance. The containment spray nozzles, which have 3/8 inch spray orifices, are not subject to clogging by particles less than 1/4 inch maximum dimension. All other valves, pumps and heat exchangers have sufficient clearances to pass particles of less than 1/4 inch.