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October 7, 1998

U S Nuclear Regulatory Commission
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Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Supplemental Response to Generic Issue 77
Information Relating to Plant Drainage System

By letter dated January 3, 1985, (should be dated 1986) NSP voluntarily transmitted information in response to an NRC request for assistance dated August 6, 1985. Engineering efforts to respond to an NRC resident inspector question regarding some assumptions in the Prairie Island IPE have identified that some of the information provided in our January 3, 1985, letter is incorrect, although based upon the revised information the conclusions of that letter are still valid.

The supplemental response in the Attachment is being supplied voluntarily to correct your records containing our previous voluntary response, since Generic Issue 77 has been resolved in Generic Letter 89-18. This correction is not reportable under the requirements of 10CFR50.9 because the corrected information did not have a significant implication for public health and safety or common defense and security.

If you have any questions related to this supplemental response, please contact John Stanton at 612-388-1121 x4083.

Joel P. Sorensen
Plant Manager
Prairie Island Nuclear Generating Plant

Attachment

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c: Regional Administrator -- III, NRC
NRR Project Manager, NRC
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Attachment

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Supplemental Response to Generic Issue 77 Information Related to Plant Drainage Systems

The modified response to the August 6, 1985, NRC voluntary request for "information related to plant drainage systems" is presented below by repeating the relevant portion of the previous response (January 3, 1985) with modifications indicated by shaded text for additions and struck-through text for deletions:

C.1 Normal Drainage Design and Internal Flooding of the Screenhouse

Figures 12, 13, 14 in Appendix A show where safety related equipment is located in the Screenhouse.

~~This equipment is mounted above floor elevation 695'-0". Only piping and hangers for safety related equipment exist below the floor (elevation 695' C"). All the safety related equipment is located south of column row E. The basement floor is at elevation 670'-0".~~

The plant screenhouse contains the safety related cooling water pumps, non-safety related cooling water pumps, fire protection pumps, plant condenser circulating water pumps, and traveling screens. The plant screenhouse does not contain any high energy systems as defined in the Prairie Island USAR Appendix I. Large failures of the pipe walls for moderate energy systems is not part of the original design basis for Prairie Island. Moderate energy system piping tends to develop a small leakage at defect locations before a large pipe wall fault develops. The strength of materials used in these piping systems, compared to the moderate energy contained in the systems, will tend to propagate flaws very slowly, if at all.

The safety related cooling water pumps and associated equipment located in the plant screenhouse is generally mounted above the 695'-0" floor elevation. All of the safety related equipment is located within the external flood barrier south of column row E. Piping, hangers, and portions of the electrical circuits for this safety related equipment are located in the 670'-0" basement level of the screenhouse. All of the safety related electrical power supply feeds to the plant screenhouse enter in the basement, below the 695'-0" floor, but more than 16' above the 670'-0" basement floor. The electrical supplies run through conduits and cable trays up to termination cabinets above the 695'-0" floor. The cables are all run above the level of the top of the Circulating Water Pump motor, except for the Diesel Driven Cooling Water Pumps Fuel Oil Transfer Pumps local motor starter box.

The Screenhouse floor drainage system consists mainly of a 4" diameter piping. The drain inlets are medium duty cast iron type with threaded outlet and flashing ring (J.R. Smith Mfg. Co., Fig. 2110) unless otherwise noted. The drains discharge to the trench that runs along the south end of the building in the basement which slopes to the sumps. The drains and piping are shown on drawings NF-39298-1 & 2, and NF-38350-4, in Appendix C of this report.

The Screenhouse is served by a collection sump 16'x6'x4'-6" deep (33200 gallons). It is shown in detail and location on drawings NF-38350-2, -9 and -10 (included in Appendix C). The sump contains two 50 GPM sump pumps.

~~Should one of the non safety related pipes in this area fail, the sump is provided with a high level alarm which alarms in the Control Room. The volume of the basement area of the screenhouse is sufficiently large to allow the operators time to isolate the break before any of the safety related equipment would be endangered.~~

During a postulated failure of a Circulating Water pipe, the screenhouse basement, approximately 36'x100', would fill to a depth of 16' within 3 minutes. The Circulating Water pump motor, motor terminals, and exciter would be submerged, resulting in a pump trip. This would stop the water source before the cables above the top of the Circulating Water Pump motor elevation were flooded. Postulated failure of any other piping would yield much lower flow rates which would give the operators ample time to isolate the affected systems.

The Diesel Driven Cooling Water Pumps Fuel Oil Transfer Pumps local motor starter box could be flooded by a postulated failure of the Circulating Water piping. These circuits are just over four feet above the basement floor elevation. Potential flooding of these circuits would prevent automatic transfer of fuel from the Diesel Driven Cooling Water Pump Fuel Oil Storage Tanks to the Day Tanks. These Day Tanks have sufficient capacity below the low level alarm point to provide for seven hours of diesel driven cooling water pump operation. In addition, these Day Tanks can be manually aligned to the safety related fuel oil storage tanks for the Unit 1 Diesel Generators. This is described in USAR section 2.4.3.5.

The plant screenhouse sump should remove all leakage from external floods or internal components. The sump is provided with a high level alarm which alarms in the Control Room. If leakage were to exceed the sump pump capacity, the large sump and then the larger screenhouse basement would slowly fill. The sump level alarm, fuel oil day tank level alarm, and the eight hour supply in the day tanks allow the operators time to take any actions necessary to maintain cooling water pump operation.

Based upon the above revision, the conclusions of the January 3, 1985, letter are still valid for the screenhouse. These conclusions are repeated herein:

"... the drainage systems for these buildings are designed for equipment leakage which occurs during normal operation of the plant and not for large internal flooding conditions resulting from major failures of systems having relatively large capacities of water."

"However, the buildings have the capacity to accommodate large internal floods since it takes time to increase water levels to an elevation where nuclear safety related equipment could be affected" (functionally). "It has been shown by the various references that the operating staff has enough time to react to isolate the systems causing the flood before rising water levels can sustain any" (functional) "damage to nuclear safety related equipment."