NRR-PMDAPEm Resource

From: Wall, Scott
Sent: Monday, December 08, 2014 3:55 PM
To: Anderson, Jon S.; Vincent, Dale M.
Cc: Alley, David; Tsao, John; Pelton, David; Beltz, Terry
Subject: Prairie Island Nuclear Generating Plant, Units 1 and 2 - Requests for Additional Information Related to 10 CFR 50.55a Requests Associated with Testing for Buried Components (MF4835 and MF4836)
Attachments: Prairie Island- RAIs for 10 CFR 50.55a Requests Associated with Testing for Buried Components (MF4835 and MF4836).pdf

Mr. Anderson

By letter dated September 15, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14258A073), as supplemented by letter dated October 20, 2014 (ADAMS Accession No. ML14293A458), Northern States Power Company (NSPM), a Minnesota Corporation, submitted relief requests for Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2. The 10 CFR 50.55a requests numbered 1-RR-5-2 and 2-RR-5-2 are in support of the fifth ten-year interval for the PINGP, Units 1 and 2, Inservice Inspection Program.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by NSPM and has determined that additional information is needed to complete the review. On December 3, 2014, the NRC staff forwarded, via an electronic mail, a draft of the requests for additional information (RAIs) to the NSPM staff. The attachment to this electronic mail contains the finalized RAIs. On December 8, 2014, your staff agreed to response to the finalized RAIs no later than January 22, 2015.

Please note that review efforts on this task are being continued and further RAIs may develop.

Finally, please don't hesitate to contact me if you have any additional questions or concerns.

Sincerely,

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Created By: Scott.Wall@nrc.gov

Recipients:
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REQUEST FOR ADDITIONAL INFORMATION

RELATED TO ALTERNATIVE PRESSURE TESTING FOR BURIED COMPONENTS

RELIEF REQUEST 1-RR-5-2, REVISION 1, AND 2-RR-5-2, REVISION 1

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-282 AND 50-306

By letter dated September 15, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14258A073), as supplemented by letter dated October 20, 2014 (ADAMS Accession No. ML14293A458), Northern States Power Company (NSPM, the licensee), doing business as Xcel Energy, submitted relief requests for Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2. The 10 CFR 50.55a requests numbered 1-RR-5-2, Revision 1, and 2-RR-5-2, Revision 1, are in support of the fifth ten-year interval for the PINGP, Units 1 and 2, Inservice Inspection Program. The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by NSPM and has determined that additional information is needed to complete the review, as described in the attached request for additional information (RAIs).

RAI-RR-2-1:

(a) Provide a piping and instrumentation diagram (P&ID) and piping isometrics that contain the cooling water system (CL). A hand-sketch of the subject piping would also assist the NRC staff to understand the pipe boundaries and proposed pressure tests. On these drawings, please identify the boundary of CL lines 30-CL-20 and 30-CL-23; the direction of the coolant flow so that the suction pipe and discharge pipe are identified; the pipe segments that are buried under buildings and the pipe segments that are buried in the yard (outside of the buildings); and the locations of flow meters and pressure sensors.

(b) Discuss approximate feet of the Line 30-CL-20 and Line 30-CL-23 that are:

(1) buried in the yard (outside of the buildings);
(2) buried under various buildings (i.e., administration building, screen house, and turbine building) where the pipe segments are inaccessible for visual examinations; and
(3) above ground

(c) How many feet of the buried pipe covered by this relief request were replaced in 1992? Confirm that all pipe segments buried in the yard (i.e., outside of the buildings) were replaced but the pipe segments buried under the buildings were not replaced in 1992.

(d) How many feet below the ground surface the piping is buried?

Enclosure

(e) Is the CL system operated continuously (i.e., the pumps running and coolant flows through the inside of the subject piping) during normal operation and shutdown?

(f) Provide the normal operating pressure and temperature of the subject pipes when the pumps are running.

(g) The NRC staff understands that a flow meter is located at the vicinity of the pump discharge nozzle. Discuss whether a flow meter is located at the other end of discharge pipe such that if there is a leak between the pump discharge nozzle and the pipe end, the differences in reading between these two flow meters would indicate the leak rate. Similarly, discuss whether a flow meter is located at the pump suction nozzle and at the suction pipe intake opening.

(h) Discuss whether the diesel driven CL pumps and motor-driven CL pumps are centrifugal pumps.

(i) Discuss whether the relief request covers only the buried portion of the CL piping on the discharge side of the CL pumps and not on the suction side of the CL pumps.

RAI-RR-2-2:

The relief request states that due to the location of the flow rate instruments (downstream of the buried piping), a decrease in pump head during testing may also indicate leakage from the CL system between the pump discharge and flow meter in the turbine building.

(a) Clarify what is significance of a flow meter located in the turbine building in terms of detecting potential pipe leakage and where exactly is the flow meter located at the downstream of the buried piping. As requested in RAI-RR-2-1 (a), a diagram showing the locations of the flow meter along the CL piping would assist in clarifying this question.

(b) It appears that a leakage in the pipe on the pump discharge side can be detected by a decrease in pump head. Discuss how the leakage in the pipe on the pump suction side can be detected.

(c) The decrease in pump head may not be accurate to determine the leak rate because of the measurement uncertainty in the flow meter located at the pump discharge nozzle. To solve this problem, the licensee could install a portable, temporary flow meter at the end point of the discharge pipe (i.e., the entrance to equipment). The difference in reading between the flow meter at the discharge nozzle and the portable flow meter located at the pipe end point would provide more accurate leak rate than that of using the pump curve and a decrease in pump head. However, the licensee stated that sufficient lengths of accessible straight pipe for reliable use of ultrasonic flow meters do not exist. Discuss whether portable flow meters could be installed at the pipe that is on the suction side of the pump to detect leakage on the suction pipe.

(d) Discuss whether a ground penetrating radar or guided wave ultrasonic examination would be used as part of investigation procedures to detect the exact location of the leak. If no, provide justification.

RAI-RR-2-3:

(a) Provide the normal flow rate in the CL piping.

(b) What would be the flow rate that would cause the CL system to be declared inoperable?

(c) Discuss the lowest leak rate that can be detected by the proposed method (i.e., using the decrease in the pump head and the pump curve to obtain the leak rate).

(d) Discuss the minimum leak rate that the visual examination of the ground surface could identify. At that leak rate, discuss whether the CL system would still be considered as operable.

(e) Discuss whether the control room panel has alarms that would indicate the impaired flow in the CL piping such that the operators would take corrective actions. If no such alarm exists in the control room, how a pipe leak would be discovered because the visual examinations of the ground surface is performed only during the quarterly pump testing and during refueling outages.

RAI-RR-2-4:

(a) Confirm that a visual VT-2 examination of the ground surface areas will be examined during the quarterly pump tests.

(b) For the pipe segments that are buried under buildings and cannot be inspected by any means, discuss how the structural integrity of those pipe segments can be ensured.

(c) The decrease in pump head could identify the leak in the piping but that method could not identify the exact location of the leak. The pipe buried under the building is inaccessible for any examinations. Therefore, if the pipe buried under the buildings leaks, how the leak could be identified?

(d) If the pipe segments buried under the buildings leak large quantity of fluid, discuss whether soil disintegration under the buildings would affect the foundation of the building.

RAI-RR-2-5:

The licensee proposed to use American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Case N-776 to perform pressure tests as an alternative. ASME Code Case N-776, Paragraph (b)(1) states that a VT-2 visual examination shall be performed to identify leakage on ground surfaces in the vicinity of the buried components and in areas where leakage might be channeled or accumulated. Paragraph (b)(2) states that a test that determines the rate of pressure loss, a test that determines the change in flow between the

ends of the buried components, or a test that confirms that flow during operation is not impaired shall be performed. Paragraph (b)(3) states that the Owner shall specify criteria for the examinations and tests of (b)(1) and (b)(2).

(a) Discuss the acceptance criteria for the VT-2 examination that will be performed in accordance with N-776(b)(1).

(b) Page 7 of the relief request states that "…[the licensee will] perform a test that confirms that flow during operation is not impaired on the buried portion of CL piping in conjunction with the quarterly testing of the CL pumps…" However, it appears that pages 6 and 7 of the relief request describe a test that uses the pump pressure loss to determine flow loss. Provide additional information on the test that confirms the flow is not impaired. That is, once the pump is determined not to be degraded, describe how a leakage, a leak rate and the exact leaking location can be determined.

(c) Discuss the acceptance criteria of the flow test.