OPPD

Omaha Public Power District
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June 6, 1988
LIC-88-464

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

References: 1. Docket No. 50-285

2. Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," dated March 17, 1988

Gentlemen:

SUBJECT: Response to NRC Generic Letter 88-05

Omaha Public Power District (OPPD) recently received Reference 2. The subject Generic Letter requested a written reply, submitted under oath or affirmation pursuant to the provisions of 10 CFR 50.54(f), concerning "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants."

As requested, OPPD is submitting the enclosed response. This response describes our program as it presently exists. OPPD recognizes that improvements in our program may be necessary to ensure complete compliance with the NRC staff position. This issue is currently being reviewed by OPPD to determine how best to upgrade our existing program. A plan for upgrading our program along with a schedule for its implementation will be provided by July 31, 1988. If you have any questions, please contact us.

Sincerely,

R L Andrews

R. L. Andrews
Division Manager
Nuclear Production

RLA/rh

Attachments

c: LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Avenue, N.W.
Washington, DC 20036

R. D. Martin, NRC Regional Administrator, Region IV
P. D. Milano, NRC Project Manager
P. H. Harrell, NRC Senior Resident Inspector

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Omaha Public Power District	)	Docket No. 50-285
(Fort Calhoun Station,	)	
Unit No. 1)	)	

AFFIDAVIT

R. L. Andrews, being duly sworn, hereby deposes and says that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached response to Generic Letter 88-05 dated June 6, 1988; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

RL Andrews

R. L. Andrews
Division Manager
Nuclear Production

STATE OF NEBRASKA)
) ss
COUNTY OF DOUGLAS)

Subscribed and sworn to before me, a Notary Public in and for the State of Nebraska on the 6th day of June, 1988.

GENERAL NOTARY - State of Nebraska
MELVA L. EVANS
My Comm. Exp. 2-11-92

Melva L. Evans
Notary Public

ENCLOSURE

Response to NRC Generic Letter 88-05

Omaha Public Power District (OPPD) has addressed the concerns identified in the NRC's Generic Letter 88-05 through various Fort Calhoun Station procedures. OPPD has demonstrated its sensitivity to this issue by the example of its past response to boric acid leakage incidents. In particular our response to the 1980 incident, described in IE Information Notice 80-27, where boric acid was found to have severely reduced the diameter of a number of Reactor Coolant Pump closure studs demonstrates our commitment to operate Fort Calhoun in a safe and reliable manner.

OPPD recognizes that there are some specific points identified in the subject Generic Letter which are not systematically addressed by our program. OPPD is currently studying this issue to determine how best to improve our program, and will submit a schedule for the implementation of these improvements by July 31, 1988.

The following provides specific information on how our existing program addresses the four items delineated in the subject Generic Letter.

Item 1

A determination of the principal locations where leaks that are smaller than the allowable Technical Specification limit can cause degradation of the primary pressure boundary by boric acid corrosion. Particular considerations should be given to identifying those locations where conditions exist that could cause high concentrations of boric acid on pressure boundary surfaces.

Response

OPPD considers any mechanical closure of the Reactor Coolant System (RCS) as a location where leakage may occur. These locations include bolted closures, valve packing, and mechanical seals, and can be identified utilizing Fort Calhoun's component and piping system drawings. Special Procedure SP-CSF-1, developed in response to our consideration of IE Bulletin 82-02, identifies the principal locations of closures with carbon steel fasteners in systems containing borated water, and provides for an inspection of these fasteners.

In addition to bolted closures, the other locations of the vessels (RCS) pressure boundary where carbon steel is found include the reactor vessel, pressurizer, and the two steam generators. Surveillance Test ST-RLT-1, the Reactor Coolant System Leak Test, identifies these pressure vessels as areas to be inspected for signs of leakage during the performance of this test following a refueling outage.

Item 2

Procedures for locating small coolant leaks (i.e., leakage rates at less than Technical Specification limits). It is important to establish the potential path of the leaking coolant and the reactor pressure boundary components it is likely to contact. This information is important in determining the interaction between the leaking coolant and reactor coolant pressure boundary material.

Response

Fort Calhoun Procedure ST-RLT-3 quantifies the leakage from the RCS by calculating total RCS inventory and the volume control tank inventory at two points in time, and taking the difference for the total leakage. This value includes leakage to the reactor coolant drain tank and pressurizer quench tank through closed collection systems, and is termed known leakage. Unknown leakage is the difference between total and known leakage.

ST-RLT-3 is performed daily during plant operation. Recent values for total leakage are approximately 0.18-0.20 gpm with calculated valves for unknown leakage varying from -0.04 to 0.14 gpm. The uncertainty in this procedure has not been quantified at this time. OPPD is currently transferring the leak rate calculation to the new plant computer and will determine the maximum error of the output values when this is completed. The long term goal is to increase the accuracy of this procedure by reducing the number of manual inputs to the program.

Prior to a plant start-up following a refueling outage or a cold shutdown in which the RCS was opened, an RCS leak test is performed (ST-RLT-1) to verify the integrity of the system. This test provides for a visual inspection of the RCS with the system pressurized to a minimum of 2150 psia.

The four reactor coolant pumps and the reactor vessel have two concentric gaskets (O-rings for the reactor vessel) with the annulus between the gaskets connected to pressure transmitter to detect any leakage past the inner gasket. These pressure transmitters are annunciated in the control room. Operating Procedure OP-10 provides operators with instructions for responding to annunciators.

An independent means of detecting leaks in the containment structure is to monitor the containment sump discharge. However, this amount could include leakage from other systems as well as borated water systems. Other RCS leak detection methods are provided by the Containment Air Particulate Monitor, RM-050; the Containment Gas Monitor, RM-051; and the Dew Point Monitor. Of these additional monitors, RM-050 is the most sensitive instrument available for the detection of a reactor coolant leak in the containment.

Administrative procedures which describe operators' duties state that periodic inspections of equipment assigned will be made and conditions noted are to be documented in logs provided. Fort Calhoun Health Physics and Operations personnel make periodic entries into the containment for radiological surveys and inspections to power operations. However, these entries are limited in scope due to radiological health concerns. Upon reactor shutdown, a more thorough inspection is made of the containment and particularly the reactor coolant system. If a primary system leak is detected, a maintenance order is issued to document the condition and initiate corrective actions. OPPD is studying this issue in an effort to determine if more explicit procedural guidance is needed.

Item 3

Methods for conducting examinations and performing engineering evaluations to establish the impact on the reactor coolant pressure boundary when leakage is located. This should include procedures to promptly gather the necessary information for an engineering evaluation before the removal of evidence, such as boric acid crystal buildup.

Response

When leakage from the RCS is located, immediate steps are taken to correct the situation. If the leakage event appears to have safety implications, a Station Incident Report is initiated. Administrative Procedure A-R-4 provides instructions for the preparation and disposition of Station Incident Reports. These reports are a vehicle for accumulating information and ensuring the proper evaluation and disposition of an event.

In addition, Nuclear Production Division Quality Procedure NPD-QP-18 provides for the mobilization of a Management Investigative Safety Team (MIST) to organize and direct the evaluation of an event, including the efforts to collect and document all applicable information pertinent to the event and its evaluation. MIST is activated at the discretion of the Manager - Fort Calhoun Station or the Division Manager - Nuclear Production, whenever an event occurs at Fort Calhoun Station that has safety implications and requires an extensive and detailed evaluation.

Item 4

Corrective actions to prevent recurrence of this type of corrosion. This should include any modifications to be introduced in the present design or operating procedures of the plant that (a) reduce the probability of primary coolant leaks at the locations where they may cause corrosion damage and (b) entail the use of suitable corrosion resistant materials or the application of protective coatings/claddings.

Response

OPPD is not currently planning any modifications that have as their purpose the intent to reduce primary coolant leaks or mitigate their effects. OPPD has demonstrated, by our past response to primary coolant leaks, to be sensitive to this issue. An example, is our response to the reactor coolant pump closure studs wastage problem, discussed in IE Information Notice 80-27 and LER 80-010. OPPD took immediate actions to preclude the possibility of the event repeating by installing pressure transmitters to detect the leakage. Upon consulting with Byron Jackson, the RCP manufacturer, a different type of gasket was recommended to replace the inner gasket. The new gaskets were constructed of heat treated Inconel with grafoil filling and offered greater spring back to allow for a better seal. OPPD subsequently installed the new gaskets on the Reactor Coolant Pumps, and has not detected a corrosion problem with these closure studs since.