



Commonwealth Edison

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April 8, 1988

Mr. A. Bert Davis
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Zion Station Units 1 and 2
Byron Station Units 1 and 2
Braidwood Station Units 1 and 2
Response to NRC Bulletin No. 88-02
NRC Docket Nos. 50-295/304, 50-454/455
and 50-456/457

Reference: (a) NRC Bulletin 88-02, dated February 5, 1988
(b) W.E. Morgan letter to A.B. Davis, dated March 24, 1988
concerning CECO response to NRC Bulletin 88-02.

Dear Mr. Davis,

This letter supercedes referenced letter (b) correcting typographical errors that were identified after review of our submittal.

We apologize for any inconveniences this may have caused.

The above referenced (a) NRC Bulletin requested that holders of operating licenses or construction permits for Westinghouse (W)-designed nuclear power reactors with steam generators having carbon steel support plates implement actions specified within the bulletin to minimize the potential for a steam generator tube rupture event caused by a rapidly propagating fatigue crack such as occurred at North Anna Unit 1 on July 15, 1987.

Commonwealth Edison has completed its review pursuant to the request outlined in NRC Bulletin 88-02 for Zion, Byron and Braidwood Nuclear Power Stations. The information is attached in Enclosure 1.

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April 8, 1988

To the best of my knowledge and belief, the statements contained above are true and correct. In some respect these statements are not based on personal knowledge, but obtained information furnished by other Commonwealth Edison employees, contactor employees, and consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

Please address any questions that you or your staff may have concerning this response to this office.

Respectfully,

Wayne E Morgan

W.E. Morgan
Nuclear Licensing Administrator

sj

cc: Resident Inspectors - Z/By/BW
Document Control Desk

Subscribed and Sworn to
before me this 8th day
of April, 1988

Julius J. Mayo
Notary Public

ATTACHMENT 1

Introduction

The Commonwealth Edison Company operates six PWR nuclear power reactors containing Westinghouse designed steam generators. The oldest of these units are Zion Units 1 & 2 which have Series 51 steam generators with carbon steel support plates. Byron Units 1 & 2 have Westinghouse model D-4 and D-5 steam generators respectively. Braidwood Units 1 & 2 have Westinghouse Model D-4 and D-5 steam generators respectively. The Byron/Braidwood Unit 1, model D-4 steam generators have carbon steel support plates while the Byron/Braidwood Unit 2, model D-5 steam generators have stainless steel support plates.

For the purposes of the Commonwealth Edison response to NRC Bulletin 88-02, responses are required for Zion Units 1 & 2 and Byron Unit 1 and Braidwood Unit 1. These Units all have carbon steel support plates and were designed by Westinghouse. Two of these units are new, denting has not been found, therefore monitoring or detailed stability analysis is not required by the Bulletin for Byron 1 and Braidwood 1. Byron Unit 2 and Braidwood Unit 2 have model D-5 steam generators which do not require a response per the Bulletin. It is our assessment that an enhanced leakage monitoring program and a flow induced vibration evaluation is required for Zion Units 1 & 2. This evaluation will be completed with the results being reported to the NRC on or before September 1, 1988.

This report is organized in terms of specific actions completed or planned in response to Bulletin 88-02 for each of the Commonwealth Edison affected Units.

Evaluation of Current Status

Evaluations described below have been conducted for each of the affected Commonwealth Edison Units as requested in sections A and B of NRC Bulletin 88-02.

Braidwood Unit 1

Braidwood 1 is in the first cycle of operation. Eddy current examination data gathered during the first refueling outage (May, 1989) as well as subsequent examinations will be reviewed for evidence of denting at the uppermost support plate on both the hot and cold leg sides. If there is evidence of denting this data will be compared with baseline data to determine if the denting was service induced. If there is presence of service induced denting, a review will be performed to determine the depth of AVB penetration for each row.

Because there is no indication of service induced support plate corrosion, no further evaluations of Braidwood Unit 1 are planned nor are required as part of NRC Bulletin 88-02.

Byron Unit 1

The Byron Unit 1 first refueling outage steam generator inspection data was reviewed for evidence of denting at the top tube support plate. Dents identified based upon the review of the eddy current results are being compared with the preservice inspection eddy current data. It is believed that the dents identified are the result of fabrication or preservice maintenance, not the result of support plate corrosion. This review should be completed by March 30, 1988 and the results will be reported in a supplemental response to this bulletin. Further actions required in response to this bulletin will also be reported in the supplemental response.

Future inspection procedures will be revised to ensure that, prior to startup after a refueling outage, the eddy current examination results will be reviewed for the presence of denting. Should any new denting appear an increased leakage monitoring program will be implemented.

Zion Units 1 and 2

Zion Station has reviewed the most current available data for denting at the top tube support plate for rows 2 through 12. These units have operated successfully since 1973 with a 100% eddy current inspection of the hot leg tube end through the cold leg seventh support plate being complete each refueling outage since 1984. While the number of tubes having dents at the top support plate is relatively small, several tubes have indications at this location. Therefore, the assumption has been made that the tube support plate crevice at the top tube support plate is plugged in both Zion Units 1 and 2.

Based on this assessment, Bulletin 88-02 requires that two specific actions be taken; 1) that an enhanced primary to secondary leak rate monitoring program be implemented and 2) that a program be implemented to minimize the probability of rapidly propagating fatigue failures such as occurred in North Anna Unit 1. Actions complete, planned or underway are described in the following sections of this report.

Primary to Secondary Leak Rate Monitoring

Byron 1/Braidwood 1

As denting has not occurred in these units primary to secondary leakage monitoring will be conducted according to the Technical Specifications of these stations.

Zion Units 1 & 2

Current Monitoring

The program at Zion Station for monitoring primary-to-secondary leakage consists of radiation monitors and sampling as described below.

Radiation Monitors

The following radiation monitors are available and recorded:

Steam Generator Blowdown	1(2)RE0019
Condenser Air Ejector	1(2)RE0015

The alarm setpoint for the steam generator blowdown is 600 counts per minute for both units and the alarm setpoint for the condenser air ejector is 600 counts per minute for Unit 2 and 1000 counts per minute for Unit 1.

Actions for the radiation monitors high alarming include taking grab samples of blowdown to identify the leaking steam generator and grab samples from the condenser air ejector gas. Activity is determined by isotopic analysis.

Actions for monitors being out of service include analyzing grab samples from steam generator blowdown or condenser air ejector on a shiftly basis until the affected monitor is returned to service.

Sampling

The following samples are taken and analyzed for isotopic and gross beta activity as indicated:

Steam Generator Blowdown	once per week
Air Ejector Exhaust	once per week
Primary Coolant	daily

The above data can be used to calculate primary-to-secondary leakage rate or as a trending and identification tool as needed.

Enhanced Monitoring Program

Zion Station will perform an evaluation to determine the correlation between radiation monitor indication (cpm) and total leakage (gpd) to determine whether the alarm set points are sensitive enough to detect when leakage may be approaching the characteristics of the Leak Rate versus Time curve supplied in Bulletin 88-02. Zion Station believes that current set points will alarm well before a 200 gallon per day leak is reached. If one of these alarms activates, samples are taken immediately upon notification from the Operating Shift. This evaluation to establish a correlation between counts per minute and gallons per day shall be completed by June 1, 1988.

Zion Station will analyze samples from blowdown on a daily basis and the results shall be trended by the Chemistry Department. If leakage increases by 25 gallons per day in one steam generator, another sample will be taken and analyzed. If the results of the first test are confirmed, then samples of that steam generator will be analyzed and trended every four hours with the Station Duty Officer notified of the condition. Samples will be taken at this frequency until leakage stabilizes. If the leakage continues to increase and is following the curve provided in the Bulletin, the Station shall reduce power to 50% within 1 hour of when leakage reaches 200 gallons per day. This should assure that the requirements of the Bulletin are met.

The detailed report required by this Bulletin shall include a revised leak monitoring program based on the results of the evaluation. The program described above may be altered pending the review of the evaluation, however, this program shall remain in implementation until Zion receives approval on the alternate plan which will be submitted in the detailed report.

The enhanced monitoring has been implemented at Zion Station through changes in station procedures.

Fatigue Failure Assessment Program

Zion 1 and 2

A program is being implemented per requirements of Bulletin 88-02 section C.2, to minimize the probability of rapidly propagating fatigue failure at Zion Unit 1 and 2. This program includes a reevaluation of the most recent eddy current inspection data to determine the depth of penetration of the antivibration bars and assess the degree of denting in rows 2 through 12 of each of the Zion Steam Generators. An outline of the planned program is as follows:

- 1) Reevaluate the June, 1987 Zion Unit 2 eddy current data,
- 2) Reevaluate March, 1988 Zion Unit 1 eddy current data,
- 3) Map the antivibration bar penetration
- 4) Assess the stability ratios for the most limiting tube locations of the eight Zion Station generators
- 5) Issue a final report for items 1 through 4 and the leakage correlation of the Zion in line radiation monitors.

The report described in item 5 will be issued to the NRC by September 1, 1988.