Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

May 12, 1976

Mr. Dennis L. Ziemann, Chief
Operating Reactors - Branch 2
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Quad-Cities Station Units 1 and 2
Feedwater Nozzle Blend Radii Inspection
NRC Dkts. 50-237, 50-249, 50-254, and 50-265

Reference (a): D. L. Ziemann letter to R. L. Bolger dated April 6, 1976, NRC Dkts. 50-237, 50-249, 50-254, and 50-265

Dear Mr. Ziemann:

Enclosures 1 and 2 provide the information requested in Reference (a).

The actual inspection and repair information has been provided for the 1975 repairs for Dresden Unit 2.

Reports of the 1975 Dresden Unit 3 and Quad-Cities Unit 2 as well as the 1976 Quad-Cities Unit 1 feedwater nozzle inspection will be provided to you by separate correspondence.

One (1) signed original and 39 copies are provided for your use.

Very truly yours,

G. A. Abrell
Nuclear Licensing Administrator
Boiling Water Reactors

Enclosure (1): Information concerning feedwater nozzle blends on Dresden Units 2 and 3, NRC Dkts. 50-237/249.

Enclosure (2): Information concerning feedwater nozzle blends on Quad-Cities Units 1 and 2, NRC Dkts. 50-254/265.

NRC Dkts. 50-237
50-249

INFORMATION CONCERNING FEEDWATER NOZZLE BLENDS ON DRESDEN UNITS 2 AND 3

The following information is supplied in response to an NRC request dated April 6, 1976, concerning cracks in the feedwater nozzle radius blends at Dresden Units 2 and 3. The response to questions submitted in the above mentioned letter are provided below.

1.a, b

Unit	Inspection Date	Inspection Method
2	January 1975	Liquid Penetrant
3	May 1975	Liquid Penetrant
2	March 1976	Ultrasonic TV Camera, Ultrasonic and Liquid Penetrant (1/2 nozzle)

1.c The Unit 2 inspection in January 1975 revealed a total of about 400 linear indications. There were approximately 40 indications which penetrated the base metal and, although found in all areas of the blend radii, they generally favored the upper and lower sections. A maximum cavity depth from the clad surface was 1/2 inch and the maximum penetration into the nozzle base material was 1/4 inch. Hand-held grinders were used to remove metal in the localized area of the indication. Grinding was done in 1/16 inch increments and after each increment, a dye-penetrant test was conducted to verify whether the indication had been removed. The cross-sectional area of reinforcement removed at the worst grind location was 0.481 square inches.

Subsequent inspections of the Unit 2 feedwater nozzles took place in March and April, 1976. In March, an underwater TV camera inspection of all four nozzles was done from inside the vessel as well as an ultrasonic inspection from outside, utilizing a standard General Electric procedure for the latter.

Additional examinations were performed in April. A second ultrasonic exam was conducted utilizing the Breda technique which again showed no reportable indications. Also, a dye-penetrant exam was made on the accessible portion of the lower half of one nozzle (240°). The exam revealed nine small linear cracks, the longest being 1/8 inch. The two longest indications were ground out before reaching a depth of seventy thousandths of an inch. The remaining seven cracks were not ground out.

The inspection of the Unit 3 feedwater nozzles in May 1975 revealed a total of 150 linear indications with about 21 base metal penetrations. The maximum cavity depth from the clad surface was 3/8 inch and 1/8 inch into the base metal. While base metal penetrations were found all around the blend radius, they tended to favor the upper and lower areas. Hand-held grinders were used to remove metal in the localized area of the indication. Grinding was done in 1/16 inch increments and after each increment, a dye-penetrant test was conducted to verify whether the indication had been removed. After the indications were removed, the grind areas were

smoothly blended with adjacent metal surfaces and a final dye-penetrant exam completed. The cross-sectional area of reinforcement removed at the worst grind location is 0.144 square inches.

2. Not applicable.

3. The next planned television and ultrasonic inspection of the Unit 3 feedwater nozzles is scheduled for September 1976, and Unit 2 is currently scheduled for dye-penetrant examination in the Fall of 1977.

4. Unit 2 experienced 19 start up/shutdown cycles between the inspections done in January 1975 and March 1976. The total number of cycles on Unit 2 has been 120. Since the last inspection on Unit 2 in May 1975, the unit has seen 8.5 start up/shutdown cycles. The total number of cycles on Unit 3 has been 90.5.

5. It is our normal operating procedure to minimize the number of start up/shutdown cycles and minimize rapid temperature changes in the final feedwater temperature. On the basis of concerns related to the discovery of cracks in the feedwater nozzle blend radii, a program to review operations during start up and shutdown will be undertaken. If appropriate procedural changes are identified, they will be implemented.

6. Minimum pressurization temperatures which will preclude brittle failure with a postulated through wall flaw have been calculated for reactor vessel pressures including inservice hydrostatic testing pressures. The more conservative of the minimum pressurization temperatures determined from these calculations or the Technical Specifications will be used for inservice hydrostatic testing.

NRC Dkts.
50-254
50-265

INFORMATION CONCERNING FEEDWATER NOZZLE BLENDS ON QUAD-CITIES UNITS 1 AND 2

The following information is in response to the NRC April 6, 1976 letter pertaining to Quad-Cities Station's feedwater nozzle problems. The numbers in the margins refer to the numbered questions provided by the NRC.

1(a),(b),(c)

The date of inspections, inspection method, results and subsequent actions have been previously submitted to the NRC in an Unusual Event Report (NJK-75-148) dated March 21, 1975, to Mr. John F. O'Leary, Directorate of Licensing Regulation, for Unit 2 and RO 50-254/76-6 for Unit 1.

1(c) The cross-sectional area of reinforcement removed at the worst grind-out location was about 0.255 square inches. No subsequent inspections have to be performed.

2. Not applicable.

3. The feedwater spargers and radii will be visually inspected inplace during the next scheduled refueling outage; Unit 2 is planned for September 1976 and Unit 1 for March 1977.

4. The number of startup/shutdown cycles performed to the date of the initial inspections were 33 on Unit 1 and 36 on Unit 2. Unit 1 has been cycled 3 times since its having been repaired and Unit 2 has been cycled 10 times since its having been repaired.

5. The interference fit is designed to eliminate intermittent feedwater flow. No additional changes have been planned or taken in plant operation.

6. The reactor pressure vessel pressure-temperature limits state that the reactor vessel shall be vented and power operation shall not be conducted unless the reactor vessel temperature is equal to or greater than that shown in a Technical Specification Figure (which is 190°F and increasing with integrated neutron exposure). The reactor vessel shall not be pressurized above 250 psig unless the reactor vessel temperature is equal to or greater than 190°F when fuel is in the reactor vessel.

For isothermal inservice hydrostatic tests, full test pressures shall be permissible on the vessel above the limiting pressurization temperature as shown on a Technical Specification Figure (which is 190°F and increasing with integrated neutron exposure). For isothermal inservice hydrostatic tests conducted between 140°F and the limiting pressurization temperature, test pressures shall be limited to 1/2 of the vessel operation pressure (500 psig).