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September 19, 1977

Mr. Donald K. Davis, Acting Chief
Operating Reactors - Branch 2
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Unit 2
Reactor Vessel Control Rod Drive
Nozzle Inspection Program
NRC Docket No. 50-237

References (a): D. K. Davis letter to R. L. Bolger, dated August 23, 1977.

(b): M. S. Turbak letter to D. K. Davis, dated May 26, 1977.

Dear Mr. Davis:

Reference (a) requested Commonwealth Edison's feedwater nozzle and control rod drive (CRD) return nozzle inspection programs 90 days prior to the next refueling outage for each BWR facility. Our recommended feedwater nozzle inspection program for Dresden Unit 2 has been transmitted by letter from M. S. Turbak to D. K. Davis, dated June 23, 1977. Our CRD return nozzle inspection program was outlined to the NRC Staff at a meeting in Bethesda, MD, on August 2, 1977.

A major factor in establishing our CRD return nozzle inspection program is the existence of a thermal sleeve in the Dresden Unit 2 CRD nozzle. This thermal sleeve is the same design as the Quad-Cities Unit 1 sleeve for which a drawing was transmitted by Reference (b). The Dresden Unit 2 CRD inspection program will include the following activities:

1. UT Examination of the Nozzle Blend Radius

The nozzle blend radius will be inspected using a technique developed for inspection of feedwater nozzles. The technique has been described in several submittals to the NRC, and most recently in a letter to D. K. Davis from M. S. Turbak, dated June 23, 1977. A replica of the CRD return nozzle will be used as the calibration standard for this inspection. The specific procedure to be used for the Dresden Unit 2 inspection will be available for review at Dresden by NRC Inspectors. We are confident this inspection technique will detect any axial cracks that penetrate through the cladding into base metal.

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As described in Reference (b), a somewhat similar inspection was performed satisfactorily at Quad-Cities Unit 1 during spring, 1977.

2. UT Examination of Reactor Vessel Below Nozzle

The vessel wall will be examined in the area below the nozzle. To the extent physically practicable, this inspection will extend to a distance approximately eight (8) inches below the nozzle centerline.

3. UT Examination of Safe Ends and Safe End Welds

This inspection will be done using standard ISI procedures. If significant thermal cycling is occurring, it is likely to be evidenced by thermal fatigue cracking in the safe end or safe end welds.

4. TV Camera Inspection of Thermal Sleeve

This inspection will be performed to confirm the integrity of the thermal sleeve.

In addition to the above inspection program, it is planned to make the modifications necessary to terminate the flow of CRD return water to this reactor vessel nozzle. Terminating this flow will eliminate thermal cycling of the nozzle.

It is our judgment that this inspection and modification program provides suitable assurance that the unit will operate safely for another fuel cycle. The basis for this judgment is:

1. The majority of plant experiences involving CRD nozzle cracks were on plants not equipped with thermal sleeves.

2. The design of the Dresden Unit 2 thermal sleeve will minimize thermal cycling of the nozzle blend radius. The thermal sleeve incorporates a flange which covers the blend radius, and the thermal sleeve is welded in place which precludes the flow of cold water in the annulus between the thermal sleeve and the nozzle.

3. The crack propagation rate for nozzles without thermal sleeves is relatively slow based on the number of stress cycles per refueling cycle and the sensitivity of the UT inspection technique.