Duquesne Light

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January 6, 1983

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Attn: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Pressurized Thermal Shock-Revised RTNDT Values

Gentlemen:

We have reviewed the calculated values for RTNDT that were submitted to the Commission by the NRC in the draft report entitled "NRC Staff Evaluation of Pressurized Thermal Shock", dated September 13, 1982. This report placed Beaver Valley Unit 1 into the category of plants that would require a flux reduction factor of greater than 2.0 thereby qualifying our facility as one of the lead plants on this issue.

Duquesne Light Company, through the Westinghouse Owner's Group, has been active in the evaluation of the pressurized thermal shock issue with expanded analysis and related tasks which were promulgated in direct response to NRC staff activities in this regard. We have received an interim report on plant specific RTNDT values from Westinghouse which contains values for the nickel content in the circumferential and longitudinal welds that are significantly different from those used by the staff in the September 1982 report. The difference appears to have originated because of the absence of specific values for the nickel content in the circumferential welds in our July 21, 1977 letter. Since that time, specific nickel values have been obtained for CE manufactured reactor vessels welds which utilized RACO3/ACROS B-5 and B4/Linde 0091 or 1092 weld wire flux type combinations which have been shown to have a low nickel chemistry. The intermediate shell to lower shell seam was made with a B4 weld wire and Linde 0091 flux. Therefore, a value of 0.20% nickel for the circumferential weldment should have been used in the RTNDT calculation for the circumferential weld instead of the assumed 0.62% value.

We have calculated the RTNDT value for the circumferential weld to confirm the present RTNDT value specified in the Westinghouse Report based on fluence levels of 3.7E18 N/cm2 and 0.20% nickel based upon the methodology used by the NRC staff as set forth in the above referenced NRC staff report. This calculation is attached and we request that Appendix "P" of the referenced report be revised following your review of this data.

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Based upon the above corrections, we believe that the Beaver Valley Unit 1 reactor vessel circumferential weldments will not reach the screening valve for RTNDT for approximately 29 years if no corrective action is taken.

Our present plans for loading the next fuel and successive cycles in a low leakage loading pattern is expected to permit operation of the plant without exceeding the RTNDT screening value for the circumferential weld for the full vessel lifetime.

On this basis, we believe that the scheduled January 28, 1983 meeting between Duquesne Light Company and the NRC need not be held. We will advise you of any changes that occur with the issuance of the final Westinghouse Owner's Group Report that would represent a difference in the revised RTNDT values.

Very truly yours,

J. J. Carey
Vice President, Nuclear

With Attachment

cc: Mr. W. M. Troskoski, Resident Inspector
U. S. Nuclear Regulatory Commission
Beaver Valley Power Station
Shippingport, PA 15077

U. S. Nuclear Regulatory Commission
c/o Document Managment Branch
Washington, DC 20555

ATTACHMENT "1"

$$RT_{NDT} = {}^{\circ}RT_{NDT} + \Delta RT_{NDT}\ (\text{Guthrie Mean}) + 2\sqrt{\sigma^{\circ 2} + \sigma_{\Delta}^{\circ 2}}\ (1)$$

${}^{\circ}RT_{NDT}$ = the actual value of the initial RTNDT determined from drop weight and Charpy V-notch impact tests performed in accordance with ASME III Code requirements. For welds where this information is not available, the following generic mean values of initial RT_{NDT} may be used:

0°F for Linde 80 weld flux
-56°F for Linde 0091, Linde 124, Linde 1092, and ACROS B-5 weld flux

ΔRT_{NDT} (Guthrie Mean) = the mean value of the adjustment of RTNDT based on the Guthrie (HEDL) trend curve which is a fit of PWR surveillance data

$$[-10 + 470\ Cu + 350\ (Cu \times Ni)]\ (f_{19})^{0.27}$$

and Cu = weight percent copper
Ni = weight percent nickel
f = fluence, n/cm (E 1 MeV)

σ° = the standard deviation value from the ${}^{\circ}RT_{NDT}$ determination

= 17°F for welds where generic mean ${}^{\circ}RT_{NDT}$ values are used or

= 0°F when the actual ${}^{\circ}RT_{NDT}$ value is used.

σ_{Δ}° = the standard deviation for the Guthrie mean trend curve over the fluence range of interest

= 24°F

$$RT_{NDT} = [(-56F)] + [-10 + 470(.37)][350\ (.37)(.20)\ (3.7E18)^{.27}] + [2\sqrt{(17)^2 + (24)^2}]$$

$$RT_{NDT} = [-56F] + [\ 145F] + [59F]$$

RT_{NDT} = 148F for circumferential welds with .37% copper, .20% nickel at a fluence level of 3.7E18 n/cm^2

(1) WOG Letter WOG-82-283, December 3, 1983