



**Boston Edison**

Pilgrim Nuclear Power Station  
Rocky Hill Road  
Plymouth, Massachusetts 02360

I&E Bulletin 80-13

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BECo Ltr. #2.97-038

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

Docket No. 50-293  
License No. DPR-35

SUPPLEMENTARY INFORMATION ON  
INSPECTION OF CORE SPRAY PIPING INTERNALS AT PILGRIM

Reference: BECo Letter No. 97.033, "Inspection of Core Spray Piping Internals at Pilgrim", dated March 18, 1997.

By referenced letter, Boston Edison Company submitted to the NRC a 30-day report of the results of Pilgrim core spray piping and sparger inspections and evaluations of flaw indications. The report was provided for NRC review and approval prior to restart of Pilgrim Nuclear Power Station, as required by NRC Bulletin 80-13. In a telephone call on March 20, 1997, the NRC staff requested additional information to complete their review. The attachment to this letter provides the requested information.

If you have any questions regarding the information contained in this letter, please contact Walter Lobo at (508) 830-7940.

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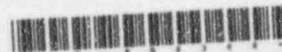
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Attachment: BECo Response to NRC Request for Additional Information.

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## ATTACHMENT

### BOSTON EDISON COMPANY RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

#### BACKGROUND

By Letter No. 97-033, dated March 18, 1997, Boston Edison Company submitted to the NRC a 30-day report of the results of Pilgrim core spray piping and sparger inspections and evaluations of flaw indications. In a telephone call on March 20, 1997, the NRC requested additional information (RAI) to complete their review of flaw evaluations. This request for additional information is addressed below.

#### A. Information on P9 Welds

The P9 welds are inaccessible for visual and UT examinations since they are located within the collar in the core spray piping just before it enters the shroud. This weld is shop-fabricated and ground flush on the inside (i.e., pipe OD surface). No record has been found that indicated the P9 welds were solution annealed. However, general practice at that time did not require solution annealing after welding. The smooth surface of these welds indicate a lack of crevices. Considering the small loads imposed, these welds are no more IGSCC susceptible than comparable pipe welds.

#### B. Weld with Flaw and Incomplete Coverage

Six welds with flaw indications are identified in Table 1 on Page 19 of GE Report, GE-NE-B13-01869-028, Rev. 0 (see BECo Letter No. 97-033). The first five welds (1P8B, 1P5, 2P8B, 3P8B and 3P5) received full (better than 90%) UT coverage. Weld No. 4P8B received approximately 74% UT coverage. The impact of a potential flaw in the 26% uninspected portion of 4P8B weld is bounded by the worst flaw indications in 1P8B weld. The GE Report on flaw evaluations demonstrates core spray system integrity and performance are not compromised for continued operation of Pilgrim during the next fuel cycle (12) by the flaw indications in the 1P8B weld.

#### C. Uncertainty in Flaw Measurement and Evaluations

The nominal lengths of flaw indications as determined by UT were used in the fracture mechanics evaluation. An explicit application of a UT uncertainty value was judged unnecessary for the following reasons:

- All of the indications detected at the collar welds are on the shroud side, but the fracture mechanics evaluation conservatively assumed the indications are in the collar which is thinner.
- The BWRVIP has not recommended that uncertainty be applied to the ultrasonic measurements as applied to core spray piping. Qualification testing on realistic mockups was recently completed for General Electric's CSI-2000 automated examination tool.

Measurements of controlled cracks associated with the downcomer slip joint welds and with the thermal collar-to-shroud weld indicated good correlation with actual crack lengths. For cracks that were detected without passing the sound beam through weld metal, length measurements were conservative almost without exception (one flaw was undersized by one millimeter). For cracks on the far side of a weld, on average, the crack length was slightly undersized.

- The conservatism in the flaw analysis and the explicit safety factors are sufficient to offset UT uncertainty, if any. Although uncertainties were considered in the shroud inspections due to the unique methods used, the UT measurement method of core spray piping is considered conventional requiring no special provisions for uncertainty.