



**BOSTON EDISON**

Pilgrim Nuclear Power Station  
Rocky Hill Road  
Plymouth, Massachusetts 02360

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Vice President Nuclear Operations  
and Station Director

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BECO 90-114

U. S. Nuclear Regulatory Commission  
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Docket 50-293

Response to Generic Letter 88-20  
Individual Plant Examination for Severe Accident Vulnerabilities

Generic Letter 88-20 requested each nuclear power plant to perform a systematic examination to identify any plant-specific vulnerabilities to severe accidents and report the results to the NRC. Accordingly, attached is the report of the Pilgrim Nuclear Power Station Individual Plant Examination (IPE) for severe accident vulnerabilities.

Completion of the IPE represents the culmination of several self-initiated efforts undertaken prior to the issuance of Generic Letter 88-20 to enhance Pilgrim Station's capability to address severe accidents. Chief among these efforts was our Safety Enhancement Program (SEP) through which we implemented design and operational modifications to enhance containment performance and decay heat removal capabilities. At the time of NRC issuance of Generic Letter 88-20, Supplement 1, that detailed potential generic Mark I containment performance enhancements, we had already installed a hardened wetwell vent, modified existing plant equipment to provide an alternate source of water injection into the vessel, implemented Revision 4 of the Emergency Procedures Guidelines (EPGs), and installed a backup nitrogen supply system to provide longer term pneumatic control capability to the Automatic Depressurization System. The NRC later issued Generic Letter 89-16 "Installation of a Hardened Wetwell Vent" and used the Pilgrim Station hardened vent modification and associated 10 CFR 50.59 analysis as a recommended example for other Mark I plants to follow.

The Pilgrim Station Probabilistic Risk Assessment (PRA), discussed extensively within the attached report, is the cornerstone on which the IPE was conducted. Our PRA efforts began with the performance of a limited scope IPE using the Industry Degraded Core Rulemaking Program (IDCOR) methodology. As previously mentioned, this was undertaken in advance of the formal NRC requirement to better understand issues relating to severe accident phenomena and to provide us with a decision making tool for the ongoing SEP process. With this effort as a foundation, we committed in our response to Generic Letter 88-20, Supplement 1, to enhance the limited scope IPE using standard probabilistic risk assessment techniques. The resulting evaluation is described as a full scope Level 1 and Level 2 PRA. Also, to realize the maximum benefits, our staff was involved in all aspects of the evaluation.

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The IPE results identified no containment performance vulnerabilities and demonstrated a core damage frequency due to internally initiated events of  $5.8E-05$  per reactor year. Thus, no immediate corrective actions beyond those already undertaken are necessary. We credit the hardware and procedure changes emplaced through our SEP implementation as the primary influence in arriving at these acceptable results.

Additionally, several important insights were derived from the IPE by our staff. These insights, discussed in detail in the report, suggest revisions to the Pilgrim Emergency Operating Procedures and a re-assessment of overly conservative human error rates may substantially increase the estimated probabilities of arresting a core damage accident in-vessel and reduce the probability of the dominant early and late drywell failures. Before implementing potential changes to the Emergency Operating Procedures, we intend to pursue final resolution of these insights through review and discussion with other BWRs on their IPE results and through the BWR Owners' Group. The knowledge gained through resolution of the insights will become an integral part of plant procedures and training programs.

In summary, the results of the IPE confirm the absence of any plant unique vulnerabilities to severe accidents at Pilgrim Station. Implementation of the IPE program and involvement by our staff in all aspects of the evaluation has provided us with a better understanding of the actual state of the plant and its capability to cope with severe accidents.

*E. T. Boulette*  
E. T. Boulette

Commonwealth of Massachusetts)  
County of Plymouth)

Then personally appeared before me, E. Thomas Boulette, who being duly sworn, did state that he is Vice President - Nuclear Operations and Station Director of Boston Edison Company and that he is duly authorized to execute and file the submittal contained herein in the name and on behalf of Boston Edison Company and that the statements in said submittal are true to the best of his knowledge and belief.

My commission expires:

*March 25, 1999*  
DATE

*James D. Kyles*  
NOTARY PUBLIC

JDK/clc/g18820

Attachment: Pilgrim Nuclear Power Station Individual Plant Examination

cc: See Page 3

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