ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

July 16, 1974

Honorable Dixy Lee Ray
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON PILGRIM NUCLEAR POWER STATION UNIT 1

Dear Dr. Ray:

At its 171st meeting, the ACRS reviewed the safety considerations related to the 1974 inservice inspection results for the Pilgrim Station Unit 1 reactor pressure vessel. The matter had been considered previously at a Subcommittee meeting on July 9, 1974. During its review the Committee had the benefit of presentations from Boston Edison Company and its consultants, the AEC Heavy Section Steel Technology Program, and the documents listed.

The mechanized ultrasonic examination of the Pilgrim Station Unit 1 reactor vessel during the current shutdown yielded an ultrasonic reflection signal from the weld between the vessel and the N2B recirculation coolant inlet nozzle, which was greater than the signal found during the manual baseline inspection prior to initial operation. Subsequently, the licensee, Boston Edison, verified this increase in signal by repeating the examination using a manual technique. During the inservice inspection, the licensee examined the N4A feedwater nozzle weld, which also had an indication of a subsurface discontinuity when the baseline inspection was performed. This examination yielded a signal similar to that which had been obtained during the baseline inspection, thus confirming that the mechanized examination technique could provide results comparable to those obtained during the manual baseline inspection. Boston Edison has concluded that the signal change in nozzle N2B can probably be attributed to an alteration in the character of the defect, rather than to an extension of the defect size.

The results from both the recirculation inlet nozzle and the feedwater nozzle ultrasonic examinations were evaluated using the criteria set forth in the 1974 ASME Code Section XI. Under this Code, if the ultrasonic signal is larger than a pre-established value dimensional characterization and analysis of the fracture propagation potential of the indicated defect are required. The defect indications from both nozzles have been shown by studies performed independently by the Boston Edison Company and by the Regulatory Staff to be

within acceptable size limits for the stress and temperature conditions considered in the Pilgrim reactor safety analyses. The neutron fluence in the nozzle regions is too low to alter the fracture toughness of the affected portions of the vessel.

The licensee has agreed to repeat the inspection of the affected vessel regions at subsequent refueling outages and to add acoustic emission sensors at the next refueling outage as an additional monitoring provision. As part of his evaluation of the defect in accordance with the 1974 Code, the licensee has calculated that there will be an insignificant increase in defect size between now and the next scheduled inspection. The Committee recognizes that ultrasonic examinations by several individuals have validated the defect sizes in the two nozzles. Even so, the Committee recommends independent examinations by at least two qualified organizations during the next inspection period to certify defect dimensions and possible changes.

In view of the above considerations, the ACRS believes that the Pilgrim Station Unit 1 reactor may resume normal operation without undue risk to the health and safety of the public.

Sincerely yours,

W. R. Stratton

W. R. Stratton
Chairman

References attached

References:

1. AEC letter from Karl R. Goller to Dr. William R. Stratton dated July 1, 1974, transmitting Safety Evaluation

2. AEC letter from John F. O'Leary to Dr. William R. Stratton dated June 19, 1974

3. Boston Edison Company letter to Dennis L. Ziemann dated June 11, 1974

4. Boston Edison Company letter to J. P. O'Reilly dated May 3, 1974, w/6 attachments

5. Boston Edison Company letter to James P. O'Reilly dated April 29, 1974