October 20, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE DIRECTOR OF NUCLEAR REACTOR REGULATION

In re:	)	
BOSTON EDISON CO. (Pilgrim Station)	)	Docket No. 50-293

JOHN F. DOHERTY'S PETITION/REQUEST FOR SHOW CAUSE ORDER

Pursuant to 10 CFR 2.206 of the Commission's Rules of Practice, John F. Doherty, of 318 Summit Avenue, Suite No.3, Brighton, Massachusetts 02135, (617) 232-3853, now files this Petition/Request for an Order to Show Cause under 10 CFR 2.202, to the Director of Nuclear Reactor Regulation, that the Director institute a proceeding to suspend or revoke the Operating License for the Pilgrim Station (OL Number: DPR-35) by serving the Licensee, Boston Edison Company, with an Order to Show Cause why the said Operating License should not be revoked or suspended due to the hazardous conditions at the Pilgrim Station enumerated in this petition/ request. (infra.)

BASIS FOR THE PETITION/REQUEST

The twenty four items below were developed after review of a technical evaluation report (TER) for the Pilgrim Station, performed by the Franklin Research Center, (NRC Contract No. 03-79-118) and Replies by the Boston Edison Company (BeCo) in a letter from William D. Harrington (BeCo) to Domenic B. Vassallo (NRC) of May 17, 1983 (NRC accession No. 8305200447).

When summed, the several current qualification deficiencies in the items indicate the Pilgrim Station now cannot be safely operated, and that the licensee should be required to show cause under 10 CFR 2.202 and 10 CFR 2.206 why its license to operate should not be suspended until the hazards are corrected or revoked if they are not to be corrected.

The twenty-four items follow:

(1) Rockbestos Corp. manufactured cables are used in the noble gas monitoring system. These cables have been found to have been qualified by testing single conductors only when the cables were multiconductor cables. In addition these cables failed qualification tests due to the formation of voids in oxidized, extruded dielectric which occured during thermal qualification testing. Rockbestos then re qualified using an aged cable jacket in the manufacturing process, however Pilgrim Station does not have such cables in the noble gas monitoring system. In event of a reactor accident the release of Krypton and Radon, two noble gases might well go unmonitored if these cables are not qualified.

(2) Fenwal Temperature switches (Model No. 1700240) are in use in the HPCI pump room to control the HPCI area cooler. The TER states the switches had not been replaced, but the BeCo Justification for Operation (JuCO) indicates replacement was made. However BeCO states the switches are qualified because an LOCA of magnitude sufficient to exceed the qualifications of the switches would be so great as to preclude the mitigation use of the HPCI. This reasoning is based on the idea that all circumstances have been envisioned, rather on conservatism which is the basis of good fortune. Such conservatism should be placed in the device in order to maximize the chances of mitigating the most severe LOCA's since severe LOCAs entail the greatest threat to persons and plant.

(3) The hydrogen analyzer (Comsip Delphi Model KIV)was not qualified in the TER due to insufficient data. BeCO in its May 1983 reply or JUCO states that the radiation testing of the equipment was to 1 x 10^6 rads, while the 40 years plus LOCA dose is identical. Radiation dose to units in sections of a plant are difficult to measure with certainty. For instance, if the broken pipe is aimed at a component the subsequent radiation field will differ from a pipe which happens to point 180° away from the component on break. On aging qualification, BeCO has not committed to any time when its aging qualification will be completed.

(4) The Pilgrim Station uses Barton Model 288 to indicate whether automatic isolation of the RCIC system has occured. Licensee cited material for showing aging qualification has been indicated in the TER as not being similar enough to the case of this model to qualify it. In addition humidity testing was not checked for duration in even these tests.

(5) The Pilgrim Station uses Fenwal Model 1700240 temperature switch in the RHR piping room for clean up leak detection. This safety related switch was indicated in the TER to be not qualified in a post accident (LOCA) radiation environment. BeCO indicates the component has been successfully tested to 1.7 x 10^5 rads. However, exposure will be 2.86 x 10^5 rads at twelve years (1985).[1/] Not withstanding BeCo believes the presence of asbestos in the most limiting

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[1/] That is, when Pilgrim Station has 12 years of operation.

radiation qualification substance in the equipment will enhance operability of the item, plus there will be periodic surveillance. This does not qualify the switch in event of a LOCA. On this same item, the TER found that the licensee referenced document on pressure qualification did not qualify the temperature switch for "various pressure environments". The item is required for detection of a main steam line break (MSLB). While the MSLB is bounded by the double ended pipe break, detection of the MSLB is presumed in its analysis. On ageing, the TER found the licensee referenced document inadequate to demonstrate qualification. BeCo merely states it will continue ageing evaluation, with no commitment as to completion.

(6) The Pilgrim Station uses Conax Corp Model "Modular Type" electrical penetrations for the drywell, which, of course, control containment leakage from the drywell. The licensee submitted a report which the TER cited did not qualify these for ageing, or qualification time. As these devices are located in the center of the containment, they are not easily replaced. The TER states they cannot determine if Teflon or Polysulfone was used in the manufacture of these electrical penetrations, a fact of evident importance to them. The licensee only states it will attempt to provide additional documentation at a future date, and ignored this implied question. This disregard is disturbing in view of the TER's special concern.

(7) Pilgrim Station uses the Barton Model 289A D/P switch to send a low flow trip signal to the control room. The TER states the principal "environmental service condition" is radiation for this component, and that original material submitted for qualification by the licensee was insufficient. The BeCo JUCO cites a test reference report showing 3×10^6 rads qualification where the accident dose plus normal 40 years dose is 1.14×10^7 rads. Hence this item has not been shown to qualify for radiation exposure for up to one-third of the maximum dose it may be required to sustain in the maximum accident. The peak service temperature for this component is 248°F, while the peak qualification temperature is 212°F. BeCo justifies continued operation on the basis that the maximum service temperature is for less than a minute. The ability of the plant operator to know what is going on during a reactor accident is critical to safe shutdown of the plant. If small parts (low mass) in these switches are destroyed by temperatures in excess of 212°F, the information critical as it may be, will be lost in this safety related system.

(8) Pilgrim Station uses the Barksdale Corp Model B2TA12SS pressure switch for the SCRAM-High Pressure signal transmission. The licensee has not qualified these for radiation, and its first submission for the TER did not qualify the switches for humidity and temperature because the test conditions did not envelope the design basis accident conditions. The May 1983, JuCo baldly states the switches are qualified for steam exposure, without citing conditions or results of such tests.

(9) Pilgrim Station uses Limitorque Model SMB3 motorized valve actuators for a block valve for the core spray injection loop. In I &E Inspection Notice 83-72 (Oct. 28, 1983 at p. 15), it states, "Limitorque has verbally stated that the class B insulation motors rated for a 40°C ambient temperature have not undergone qualification testing in accordance with IEEE Standard 382-1972 for the specified normal, accident, and postaccident environment." Failure of these valves due to long term ageing could result in reactor pressurization, or in the LOCA secenario could result in inability to bring in the mitigation effects of the low pressure ECCS systems of Pilgrim Station.

(10) In an enclosure to a letter of May 11, 1983, from Domenic B. Vassallo (NRC) to A. Victor Morisi (BeCo) Mr. Vassallo states by implication that the automatic depressurization system (ADS) accumulators have not been verified as environmentally qualified for harsh environments in that they may not be certain to be leak proof. The ADS system is safety related and a first line of defense in event of ATWS or many reactivity insertion events. Failure of the accumulators, might also result in at least one partially opened safety/relief valve resulting in a small break LOCA event cumulative to a LOCA or PBOC event.

(11) Pilgrim Station utilizes an ASCO Model HVA90405 solenoid valve in the SCRAM solenoid. The SCRAM* system is assumed

*The acronym stands for "Safety Control Rod Axe Man"

to operate in all the accident scenarios of a serious nature to halt fissioning. Moreover, the Commission recently promulgated an ATWS rule which in the case of Pilgrim requires no automatic actuation of the chief back-up system to SCRAM, because of clean-up costs. A partial failure to SCRAM occured at the Browns Ferry-III BWR on June 28, 1980. The use of environmentally unqualified equipment in this significant safety system is unwise, and BeCo should not be permitted to operate unless it can show these ASCO solenoid valves are environmentally qualified.

(12) Solenoid valves in the drywell interior (Target Rock Corp. Model 1/2SMSA01) of Pilgrim Station were cited in the Franklin Research Center TER as not qualified for ageing. These valves are for actuation of the ADS system, an essential system for alleviating LOCA events or reactivity insertion events such as turbine trips without bypass or loss of feedwater heater. Licensee referenced reports (2) were found lacking, and one which was offered was subsequently not received by FRC. Therefore, it is unknown if these valves are qualified and Pilgrim Station has now aged 11½ years. These valves should be shown environmentally qualified for ageing in order for the plant to continue operation.*/

*/ Currently Pilgrim Station is off-line for piping repairs. Operation is planned to resume in October, 1984.

(13) Pilgrim Station uses a Cutler Hammer Corp. Model 6AF685046 motor control center (MCC) in its electrical distribution system. BeCo submitted in its May 1983 letter (enclosure) that this MCC had been radiation qualified to a dosage of 4.6×10^4 rads. This is evidently the permissible tolerance level for nylon. However the FRC TER states (Item #88, P. 5A) that nylon is not the limiting material in view of a letter from Cutler-Hammer reproduced on the same TER page. BeCo gives 1.3×10^5 rads as the 40 year plus accident event maximum service dose. Therefore the MCC is qualified for only 1/3 of the dose that would be expected for the maximum service dose. While it is not given how much of the accident plus 40 years dose is from the accident, it is true the plant has 11½ years of operation, the dose of which, when added to the accident event dose might well exceed the maximum test dose of 4.6×10^4 rads.

(14) Pilgrim Station uses a General Electric Company electric motor in the secondary containment isolation and standby gas treatment processes. The motors (2) were found by FRC to be not qualified for radiation doses which could be expected in the event of DOBs. The TER states the BeCo SCEW sheet requires 2.8×10^7 rads dose, but the units are qualified but to 5.5×10^5 rads. Continued operation where these motors appear greatly unqualified in these systems which are both relied on to prevent radionuclide release appears unjustifiable.

(15) Information on core spray flow is provided to operators at the Pilgrim Station by a General Electric Model 555 Flow Transmitter. The TER and the BeCo submittals are in disagreement as to whether this information performs part of an essential safety function. The FRC found them (2) not qualified for radiation, temperature or ageing. Applicant cites valve position indication (a post-TMI requirement), pump discharge pressure, and motor amperes (which presumably are environmentally qualified) as providing defense in depth. Resolution of this disagreement should be acheived before operation is justified.

(16) Pilgrim Station uses a level switch in the torus to maintain correct water level. BeCo states that these switches are not required to mitigate the effects of a LOCA. Since the switch is used to notify operators the torus trough is too low, it appears safety related. The "trough" is a seal between the torus compartment and the outside atmosphere. In event of an in containment pipe break radiation would be released to the atmosphere if the seal is not maintained. The operator can maintain the seal by information from the switches, so these switches are indeed required to mitigate the effects of an accident.

(17) Pilgrim Station uses Yarway model 4418C level indicating switches in the SCRAM, containment isolation, main steam isolation valve (MSIV) trip, secondary con-

tainment isolation, and recirculation pump trip. Licensee states this device has been analyzed to be able to withstand radiation in the amount of 2×10^6 rads. It further states the 40 year life plus DBA radiation does is 1.86×10^6 rads as justification for continued operation. There is no substantiation of this statement, and none of the references submitted to FRC show radiation testing. (TER, Item #210, p. 5c, 5d). Evaluation of radiation dosage requires many assumptions and is inexact in these circumstances. Where the amount of margin between the "analyzed" tollerance and expected dose is this close, justification for operation is lacking. The TER (p. 5j, of this item) states, ". . . the information provided is not sufficient to evaluate whether the device is qualified for temperature effects over the 30 day period the licensee states it is required...operable." The only test duration was 3½ hours. The licensee in its JUCO states its belief,"'test duration' is not a hardware deficiency." Whether it is or not is academic. Where this device is required to function in the service of these systems and they were to be qualified for 30 days, it is clear the licensee cannot be heard to say that their duration is of no matter. It is not being conservative to assume operation of these systems can be precluded simply because no reuse of them can be forseen in the wake of the initiating accident. With regard to ageing the Licensee makes no commitment in terms of time to qualify these level indicating switches.

(18) Pilgrim Station uses two Yarway Model 4418EC's for reactor vessel water level indication. The TER for this item (Covered in item 210, on p. 5j), indicates that the test duration at elevated temperature qualified these devices for only 3½ hours. The Licensee believes the early part of any DBA which these units must withstand will be of such short duration, that the longer demonstration of operability is unneccessary. However, it is unwise to believe that water level indication will not be important in the BWR vessel more than 3½ hours post-accident. The unexpected path of events at Three Mile Island, indicate that accident recovery may involve long periods of time. In a BWR recovery of correct water level would also be significant in accident mitigation.

(19) Pilgrim Station uses Robertshaw Corp. Model SL702A1 level switches located in the torus area and normally open, closing on high suppression pool level and signaling the operator that a valve should be opened. The TER indicates this switch should be required to meet environmental qualification rules (10 CFR 50.49) because the single alternative for providing this information is not single failure proof and the operator would be required to manually shift to the alternative if this switch were to fail.

(20) BeCo identified to FRC General Electric cable S157279, which was located in the drywell interior for electrical distribution. FRC indicated it thought BeCo had misidentified the cable; to which BeCo replied in its JUCO that it would locate material showing the cable qualified. General Electric indicated there was no such cable number

in its current index. Thus, there is no indication any information on this interior cable's environmental qualifications will be ascertainable.

(21) Pilgrim Station uses four Accelerometers located in the drywell interior for SRV (safety/relief)valve monitoring. The TER was not able to establish any criteria other than to indicate these devices failed at conditions greater than those expected during DBA conditions in Pilgrim Station. Thus it is not established that these will survive accident conditions.

(22) Pilgrim Station uses Fenwal Corp. Model 1700240 for leak detection by temperature in the main steam line, and cleanup systems. The TER considers these devices not qualified for ageing as there was no information on the resin used in the fibreglass insulation provided by the manufacturer.

(23) The Pilgrim Station uses Namco Co. Model EA74050100 limit switches for control room display of containment isolation valve position, main steam isolation valve SCRAM display, and "SR" (safety/relief) valve display according to pp.B-41, and B-67 of the TER. The TER criticizes the heat ageing test submitted by BeCo. On p. 5g (Item 148) the LOCA temperature-time curve indicates the switches will be exposed to more than 10^4 secs of temperature in excess of 200°F., while the environmental qualification test was for a temperature of 200°F. Licensee states, without support, that it will be able to qualify this item in its May, 1983, JUCO.

(24) Pilgrim Station uses General Electric Co. (GECo) Model 238X60NLG electrical penetrations located in the drywell interior whose function is to provide containment integrity while permitting electrical cables to pass to various areas of the plant. FRC reported that contact with GECo which it initiated, indicated that the BeCo submitted documentation of environmental qualification tests applies to the GECo Type 100 penetrations, only. FRC believes the licensee has thus failed to meet DOR Guideline #2 which is reproduced on pg. 5b of item #127 of the TER. The current BECo position is that with later submittals they will be able to qualify these penetrations for ageing, qualification time, and qualification method, but they are currently unqualified.

CONCLUSION

The foregoing twenty-four items with regard to the Pilgrim Station are provided to show that these various qualification deficiencies when summed lead a careful decisionmaker to the conclusion the Pilgrim Station cannot reasonably be expected to be operated safely under the current operating conditions granted the Licensee.

Thus, Petitioner/Requester urges the Director of Nuclear Reactor Regulation to revoke the subject operating License or suspend it until such time as the Licensee

has made changes required to bring the subject safety related equipment in compliance with the Commission's rules and regulations.

Respectfully submitted,

this 30th of October, 1984

John F. Doherty

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