JUL 22 1988

Docket No. 50-293

Boston Edison Company
ATTN: Mr. Ralph G. Bird
Senior Vice President - Nuclear
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, Massachusetts 02360

Gentlemen:

Subject: Inspection No. 50-293/88-11

This refers to your letter dated June 21, 1988, in response to our letter dated May 17, 1988.

Thank you for informing us of the actions taken to resolve the issues identified from the EOP inspection. Your actions taken to resolve several of the items were reviewed in inspection 50-293/88-19. Those not yet examined will be reviewed in a future inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

Robert M. Gallo, Chief
Operations Branch
Division of Reactor Safety

cc:
K. Highfill, Station Director
R. Anderson, Plant Manager
J. Keyes, Licensing Division Manager
E. Robinson, Nuclear Information Manager
R. Swanson, Nuclear Engineering Department Manager
The Honorable Edward J. Markey
The Honorable Edward P. Kirby
The Honorable Peter V. Forman
B. McIntyre, Chairman, Department of Public Utilities
Chairman, Plymouth Board of Selectmen
Chairman, Duxbury Board of Selectmen
Plymouth Civil Defense Director
P. Agnes, Assistant Secretary of Public Safety, Commonwealth of Massachusetts
S. Pollard, Massachusetts Secretary of Energy Resources
R. Shimshak, MASSPIRG
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Massachusetts (2)

IE01

bcc:
Region I Docket Room (with concurrences)
M. Perkins, Management Assistant, DRMA
S. Collins, DRP
R. Blough, DRP
L. Doerflein, DRP
R. Bores, DRSS
D. McDonald, PM, NRR

RI:DRS	RI:DRS	RI:DRS	RI:DRP	RI:DRS
Florek	Evans	Lange	Blough	Gallo
07/20/88	07/20/88	07/20/88	07/22/88	07/22/88

BOSTON EDISON
Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

Ralph G. Bird
Senior Vice President — Nuclear

June 21, 1988
BECo Ltr. #88-097

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

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

Subject: NRC Inspection Report 50-293/88-11

Dear Sir:

Attached is Boston Edison Company's response to the unresolved items described in the subject inspection report.

An excerpt from the appropriate section(s) of the inspection report is first stated, followed by the Boston Edison Company response. The corrective action for each of the items has been satisfactorily completed to support plant operation.

Please do not hesitate to contact me directly if there are any questions.

R.G. Bird

R.G. Bird

CS/bl

Attachment 1: Response to Unresolved Items
Attachment 2: Evaluation of Combustible Gas Control Discrepancy

cc: Mr. William Russell
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Rd.
King of Prussia, PA 19406

Sr. Resident Inspector - Pilgrim Station

8806280290 7PP.

ATTACHMENT 1

Response to Unresolved Items
(Inspection Report 88-11)

NRC Unresolved Item 88-11-01

Excerpt from Inspection Report, Section 4

Comparison of Plant Specific Technical Guidelines, BWR Owners Group Emergency Guidelines and Emergency Operating Procedures (EOP's) -

Plant Specific Technical Guidelines (P-STG)/EOP Review

"All EOPs and those portions of satellite procedures which contained steps based on the P-STGs were compared to the P-STG. The following differences were noted.

"EOP-3: Primary Containment Control"

"PSTG steps PC/H-2.1 (suppression chamber spray), 2.2 (torus or drywell vent), 2.3 (purge), and 2.4 (drywell spray) were reordered in the EOP in the order of: 2.2, 2.3, 2.1, 2.4. The licensee had not previously identified this potential safety-significant deviation. Either analysis of the acceptability of EOP sequence or procedure revision to match the PSTGs is required. This is an unresolved item (50-293/88-11-01)."

BECo Response to Unresolved Item 88-11-01

This condition has been evaluated and determined to not be a safety significant deviation. The detailed evaluation is provided as Attachment 2. This item is a technical inaccuracy and will be corrected as part of the next major revision to the EOPs. This discrepancy is formally captured as verification discrepancy number D-7-2 for EOP-3.

NRC Unresolved Item 88-11-02

Excerpt from Inspection Report, Section 8

"Walkthrough of Emergency Operating Procedures and Satellite Procedures"

"A number of the EOP-related items identified by the inspectors had also been identified by the facility review process and actions were being taken to address the observed problems. However, the facility review of the satellite procedures was still in progress even though the procedures were approved and issued, i.e., they had not yet finished their own walkthrough of the satellite procedures. Furthermore, the operation management agreed to assure that the plant labeling was consistent with the EOPs and satellite procedures. Therefore, pending further NRC review following completion of the facility walkthrough of the satellite procedures and the licensee actions to correct the identified deficiencies, this item will remain unresolved (50-293/88-11-02)."

BECo Response to Unresolved Item 88-11-02

Review of EOP satellite procedures has been completed. The discrepancies identified by the NRC, including those identified in Attachment C of the Inspection Report, and by walkdowns performed by PNPS licensed operators have been corrected.

NRC Unresolved Item 88-11-03

Excerpt from Inspection Report, Section 4

"P-STG/EOP Review"

"EOP-3: Primary Containment Control"

"Primary containment venting was allowed by procedure after torus pressure exceeds 11 psig but before reaching the Primary Containment Pressure Limit (PCPL; 48 psig) irrespective of resultant reactivity release rate. Procedure 5.4.6 stated that venting, irrespective of resultant reactivity release rate, was appropriate only when the primary containment pressure is above the PCPL (or when drywell or torus hydrogen concentration was above 6%). The licensee stated that they will revise the procedures to remove the inconsistency and instruct operators to vent before reaching the PCPL."

"Satellite Procedures Review"

"5 4.6: Post Accident Containment Control (Venting)"

"The procedure directed using both a small vent path (1 or 2 inch valves) and a large path (through 8 inch valves) for containment venting. In some scenarios it may not be necessary to open both sets of valves if after opening only the 2 inch or the 1 inch valves the containment pressure is controlled appropriately. The licensee agreed to revise the procedure or justify not revising it."

"A caution contained the words "If at all possible , ... shall ...". This statement did not provide clear direction to the SRO. The licensee agreed to revise the procedure or justify not revising it."

"Step 2 of Attachment A of this procedure stated that the EOP is applicable when primary containment pressure reaches 2.5 psig, as opposed to above 2.5 psig. The licensee agreed to revise this statement."

"The caution statement about rupture of the ductwork with venting did not include notification of Health Physics The licensee agreed to revise the procedure or justify not revising it."

"Step 2 of Attachment A of this procedure was missing a statement regarding opening the appropriate valves as necessary to perform the step. The licensee agreed to consider revising this statement."

"Step 3 of Attachment A of this procedure did not provide clear direction to the operator on the value of primary containment pressure to terminate torus venting. The licensee agreed to revise the procedure or justify not revising it."

"The items concerning containment venting will be collectively included as part of unresolved items 50-293/88-11-03. See Section 8 for additional containment venting items."

"Excerpt from Inspection Report, Section 8"

"One item identified during the walkthrough of the EOPs was an apparent need for additional training on when to initiate and when to terminate venting of the containment in accordance with the intent of the EPGs and the procedures. Items concerning containment venting will be considered an unresolved item (50-293/88-11-03.)"

BECo Response to Unresolved Item 88-11-03

PNPS Procedure 5.4.6, "Primary Containment Venting and Purging Under Emergency Conditions" - Attachment A, has been revised (Revision 18) to correct all the identified discrepancies.

Operator training on when to initiate and when to terminate venting, in accordance with the intent of the PSTGs, is given as part of training module 87-0-RQ-05A-01-07. The intent of venting is stressed to each operating crew.

NRC Unresolved Item 88-11-04

Excerpt for Inspection Report, Section 11

"EOP Quality Assurance Measures"

"A review was conducted to determine if Quality Assurance Measures are adequate to ensure that high quality EOPs are developed, implemented and maintained."

"The QA measures associated with the development of the EOPs were found to be acceptable, based on discussions with the Quality Engineering Division Manager and Senior Quality Engineer. However, it was concluded that a programmatic approach to ensure the continued quality of the EOPs through audits of the maintenance of the EOPs did not exist in the area of auditing of the EOP program."

"In subsequent discussions with the Vice President, Nuclear Engineering Division and Quality Assurance management, BECo committed to revise the 1988 Internal Audit Schedule to include an annual audit of the EOP program. This audit will be performed as a Safety System Audit in the fourth quarter of 1988. The proceduralization of continued quality assurance measures is an Unresolved Item (50-293/88-11-04)."

BECo Response to Unresolved Item 88-11-04

As indicated in the inspection report excerpt, the 1988 Quality Assurance Audit Schedule was revised to include an annual audit of the EOP program beginning in the fourth quarter of 1988. The Audit Schedule revision was formally approved March 17, 1988.

In addition Quality Assurance Department Procedure No. 18.01, "Preparation, Performance, Reporting and Follow-up of Quality Assurance Department Internal Audits" was revised on April 25, 1988 to reflect, an annual audit frequency for the EOP program.

ATTACHMENT 2

EVALUATION OF THE EOP-PSTG DISCREPANCY

RELATIVE TO

COMBUSTIBLE GAS CONTROL

When primary containment hydrogen and oxygen concentrations reach the deflagration limits (6% and 5%, respectively), the PSTGs require wetwell spraying, venting, and purging in that order (PSTG Steps PC/H-2.1, 2.2, and 2.3). Procedure 5.4.6 (Rev. 17) specifies that venting precede purging. However, EOP-3 (Rev. 0) does not specify that wetwell spraying should precede the vent and purge evolution.

The effect of this discrepancy between the PSTGs and the EOPs may be evaluated by examining all events to which EOP-3 may apply. All such events may be segregated into two classes: those for which the containment remains inerted (i.e., oxygen concentration remains below 5%) throughout the event and those for which it does not. Events within the former class are not affected by the EOP discrepancy because the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are not met. Thus the discrepancy can affect only those events within the latter class.

This smaller set of potentially affected events, those for which the containment does not remain inerted, may be further segregated into two additional classes: those for which the containment is deinerted when the event initiates (e.g., events initiated within one of the 24-hour periods when power operation is permitted without containment inertion) and those for which the containment becomes deinerted during the event. The Boston Edison Company has removed all air sources from within the Pilgrim primary containment. Therefore, with the exception of deliberate deinertion, which is not called for in the EOPs, the primary containment will become deinerted during an event only if its pressure is reduced to the point at which the reactor-building-to-torus vacuum breakers open, drawing air from the reactor building into the wetwell airspace. This will happen only if containment temperatures are reduced to well below those which existed when the event initiated, and the only viable mechanism for effecting such temperature reductions is the prolonged operation of containment sprays. However, the EOPs preclude the use of containment sprays when containment pressure is below 2.5 psig. Thus the Pilgrim systems configuration together with the EOPs preclude the containment from becoming deinerted during an event, so that there are no events within the latter class and the EOP discrepancy can affect only those events within the former.

This smaller set of potentially affected events, those which initiate during a period when the containment has been deinerted, may be further segregated into two classes: those which initiate before the reactor has developed a significant power history (i.e., startup events) and those which initiate afterwards. With no significant power history, the reactor core cannot develop decay heat sufficient to generate enough hydrogen to approach the hydrogen deflagration limit. Events within the former class are therefore not affected by the EOP discrepancy because the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are not met. Thus the discrepancy can affect only the events within the latter class.

This smaller set of potentially affected events, those which initiate during a period when the containment has been deinerted but only after the reactor has developed a significant power history, may be further segregated into two additional classes: loss of coolant accidents (LOCAs) and non-LOCAs. During a LOCA the steam released into the drywell will quickly increase containment pressure to the Suppression Chamber Spray Initiation Pressure (refer to the definition of the SCSIP in Appendix A of the BWORG EPGs), and this will occur before any appreciable hydrogen can be generated. EOP-3 requires initiation of wetwell sprays before containment pressure reaches SCSIP, so that the operator will have been directed to operate wetwell sprays before the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are met. Thus the EOPs will require wetwell spraying before the vent and purge evolution for any event within the former class, so that the EOP discrepancy can affect only those events within the latter.

This smaller set of potentially affected events, non-LOCAs which initiate during a period when the containment has been deinerted but only after the reactor has developed a significant power history, may be further segregated into two additional classes: those for which adequate core cooling is maintained and those for which it is not. If adequate core cooling is maintained then no significant hydrogen generation occurs and the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are not met. Thus the discrepancy can affect only those events within the latter class.

This smaller set of potentially affected events, non-LOCAs, with loss of adequate core cooling which initiate during a period when the containment has been deinerted but only after the reactor has developed a significant power history, may be further segregated into two additional classes: those which generate sufficient hydrogen to reach the deflagration limit and those which do not. Clearly events within the latter class are not affected by the EOP discrepancy because the conditions required for execution of the discrepant step, hydrogen, and oxygen concentrations reaching their deflagration limits, are not met. Thus the discrepancy can affect only those events within the former class.

This smaller set of potentially affected events, non-LOCAs with loss of adequate core cooling, which generate sufficient hydrogen to reach the deflagration limit, and which initiate during a period when the containment has been deinerted but only after the reactor has developed a significant power history, must be further reduced to actually define the set of events which can be affected by the EOP discrepancy. As a minimum, the following subsets of events must be excised:

1. Events in which the RPV is blown down to the suppression pool after the pool has been substantially heated. The EOPs require that the RPV be rapidly depressurized prior to loss of adequate core cooling and, therefore, prior to any significant hydrogen generation. If the RPV is depressurized by blowing down to the suppression pool, then the thermal energy transferred to the pool will raise the wetwell water temperature, which in turn raises the partial pressure of the water vapor in the wetwell airspace and the temperature and partial pressure of the dry gas in the airspace. If the wetwell water temperature is relatively high when the blowdown is initiated, this will be sufficient to raise containment pressure to the Suppression Chamber Spray Initiation Pressure. EOP-3 requires initiation of wetwell sprays before containment pressure reaches the SCSIP, so that the operator will have been directed to operate wetwell sprays before the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are met. Thus the EOPs will require wetwell spraying before the vent and purge evolution for these events.

2. Events in which safety valves open for any appreciable amount of time before significant hydrogen generation occurs. Because the Pilgrim safety valves are unpiped, any continued steam discharge through these valves will raise containment pressure to the Suppression Chamber Spray Initiation Pressure. EOP-3 requires initiation of wetwell sprays before containment pressure reaches the SCSIP, so that the operator will have been directed to operate wetwell sprays before the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are met. Thus the EOPs will require wetwell spraying before the vent and purge evolution for these events.

3. Events in which the main condenser is utilized to control RPV pressure (e.g., the SRVs are inoperable). For these events, any hydrogen generated will be discharged through the offgas system and will therefore not accumulate in the primary containment. Thus the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are not met for these events.

4. Events in which reactor core decay heat cannot be effectively removed from the primary containment for a prolonged period before significant hydrogen generation occurs. Under these conditions, the thermal energy transferred to the pool will raise the wetwell water temperature, which in turn raises the partial pressure of the water vapor in the wetwell airspace and the temperature and partial pressure of the dry gas in the airspace. If this occurs over a prolonged period, this will raise containment pressure to the Suppression Chamber Spray Initiation Pressure. EOP-3 requires initiation of wetwell sprays before containment pressure reaches the SCSIP, so that the operator will have been directed to operate wetwell sprays before the conditions required for execution of the discrepant step, hydrogen and oxygen concentrations reaching their deflagration limits, are met. Thus the EOPs will require wetwell spraying before the vent and purge evolution for these events.

Thus the set of events which may be affected by the EOP discrepancy is bounded by the preceding logic. The probability of occurrence of any event from within the set is vanishingly small and clearly does not warrant correction of this discrepancy in the near term (i.e., before the EOPs undergo their next revision).