JANUARY 9 1981

Docket No. 50-293

Mr. A. Victor Morisi
Boston Edison Company
M/C NUCLEAR
800 Boylston Street
Boston, Massachusetts 02199

RECEIVED
FEB 02 1981
U.S. NUCLEAR REGULATORY COMMISSION

Dear Mr. Morisi:

SUBJECT: ORDER FOR MODIFICATION OF LICENSE CONCERNING BWR SCRAM DISCHARGE SYSTEMS

This letter transmits an Order for Modification of License which requires prompt implementation of certain actions to assure the safe operation of BWR's with inadequate Scram Discharge Volume - Instrument Volume (SDV-IV) hydraulic coupling. The licensee should, to the extent practical, design the Automatic Dump System to be independent of the air pressure instrumentation for manual scram. A copy of the Order is being filed with the Office of the Federal Register for publication.

Sincerely,

Original signed by

Thomas A. Ippolito, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosure:
Order

cc w/encl:
See next page

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OFFICE		DL ORB2					
SURNAME		HANNON					
DATE	1/9/81	1/9/81					

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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Mr. A. Victor Morisi
Boston Edison Company

cc:

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Pilgrim Station Manager
Boston Edison Company
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Plymouth, Massachusetts 02360

Energy Facilities Siting Council
14th Flour
One Asburton Place
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Henry Herrmann, Esquire
Massachusetts Wildlife Federation
151 Tremont Street
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Plymouth Public Library
North Street
Plymouth, Massachusetts 02360

Massachusetts Department of Public Health
ATTN: Commissioner of Public Health
600 Washington Street
Boston, Massachusetts 02111

Water Quality & Environmental Commissioner
Department of Environmental Quality
Engineering
100 Cambridge Street
Boston, Massachusetts 02202

Mr. David F. Tarantino
Chairman, Board of Selectmen
11 Lincoln Street
Plymouth, Massachusetts 02360

Director, Criteria and Standards
Division
Office of Radiation Programs (ANR-460)
U. S. Environmental Protection Agency
Washington, D. C. 20460

Resident Inspector
c/o U. S. NRC
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Plymouth, Massachusetts 02360

U. S. Environmental Protection
Agency
Region I Office
ATTN: EIS COORDINATOR
JFK Federal Building
Boston, Massachusetts 02203

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

7590-01

In the Matter of BOSTON EDISON COMPANY (Pilgrim Nuclear Power Station, Unit No. 1)	)))))	Docket No. 50-293

ORDER FOR MODIFICATION OF LICENSE

I.

The Boston Edison Company (licensee) is the holder of Facility Operating License No. DPR-35 which authorizes the operation of the Pilgrim Nuclear Power Station, Unit No. 1, at steady state reactor power levels not in excess of 1998 megawatts thermal (rated power). The facility consists of a boiling water reactor located at the licensee's site near Plymouth, Massachusetts.

II.

During a routine shutdown of Browns Ferry Unit No. 3 on June 28, 1980, 76 of 185 control rods failed to fully insert in response to a manual scram from approximately 30% power. All rods were subsequently inserted within 15 minutes and no reactor damage or hazard to the public occurred. However, the event did cause an in-depth review of the current BWR Control Rod Drive Systems which indentified design deficiencies requiring both short and long-term corrective measures. These measures are set forth in the Generic Safety Evaluation Report - BWR SCRAM DISCHARGE SYSTEM, dated December 1, 1980, prepared by the NRC staff. One of the deficiencies identified was a failure mode of the control air system, which can conceivably cause an inability to scram

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the control rods. Sustained low pressure in the control air system could result in complete or partial opening of multiple scram outlet valves before opening of the scram inlet valves, causing the Scram Discharge Volume (SDV) to fill rapidly, thus leaving a relatively short time for the operator to take corrective action before scram capability is lost. It appears that an event of this general type (but with no adverse consequences) actually occurred at the Quad Cities Unit 1 reactor on January 3, 1977.

IE Bulletin 80-17 (Supplement 3) requires an immediate manual scram when low pressure occurs in the Control Rod Drive (CRD) air system or when other indications occur, such as multiple rod drift alarms or a marked change in the number of control rods that are at high temperature. Beginning on December 1, 1980, protection was also provided by continuous monitoring of the SDV as required by IE Bulletin 80-17 (Supplement 1). However, since only a short time could be available for the operator to successfully initiate a reactor scram, a question remains as to the adequacy of equipment and procedures. This continuous monitoring system and operator response provide important protection against water accumulation in the SDV headers under slow fill conditions; however it does not address completely all the potential loss of air events. In addition, a human factors evaluation determined that reliance on the operator to successfully carry out a manual scram within a limited time frame may not be assured. Therefore, in the short term in order to provide prompt added protection for credible degraded air conditions in BWR control air supply systems, it is necessary that an automatic system be operable to initiate control rod insertion by rapidly dumping the control air system header if the air pressure decreases below a prescribed value. The NRC staff is developing revised design and safety criteria for a long term solution to this problem.

III.

The Generic Safety Evaluation Report (SER) of December 1, 1980, recommended that this automatic air header dump system be installed within two months. As a result of questions as to whether a reliable system could be installed within two months, the staff continued to review this requirement. We have performed a more detailed risk assessment which has shown a lower probability for the loss of scram capability due to a loss of air than our original estimate. We have also reevaluated the human factors involved in carrying out the requirements of IE Bulletin 80-17 (Supplement 3) which requires a manual scram of the reactor on alarms related to the loss of air pressure in the air system. These alarms provide some added assurance that the operator can trip the reactor before the scram discharge volume fills.

As a result of these analyses I have determined that the public health, safety and interest require that the automatic air dump system be in operation within 90 days of the date of this Order and that operation during this period does not present an undue risk to the public health and safety. I have further determined based on staff evaluations of installed air systems, and on staff discussions with industry representatives that a 90-day period will allow adequate time for design, procurement, fabrication, installation, and testing for an automatic air dump system of the type prescribed in this Order.

As discussed above, although (1) the failure of the control air system is a low probability event, (2) the actions already required provide a significant measure of assurance that such an event will not occur and (3) the criteria for a long term fix are currently being developed, I have determined that the public health and safety require the additional measures prescribed by this Order and their implementation on this short time schedule. However, in view of the immediacy of the need for this system, the system being mandated by this Order is not being made subject to the requirements of Appendices A and B to 10 CFR Part 50.

IV.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, including Sections 103 and 161i, and the Commission's rules and regulations in 10 CFR Parts 2 and 50, IT IS ORDERED THAT EFFECTIVE IMMEDIATELY, Facility Operating License No. DPR-35 is hereby amended to add the following provisions:

(1) An automatic system shall be operable to initiate control rod insertion on low pressure in the control air header, which meets the following criteria:

(a) The system shall automatically initiate control rod insertion at 10 psi or greater above scram outlet valve opening pressure;

(b) The system shall not degrade the existing safety systems (e.g., reactor protection system);

(c) The system shall allow for scram reset;

(d) The design shall consider the potential for inadvertent or unnecessary scrams;

(e) Any required power supply should not be subject to any failure mode which could also initiate the degraded-air conditions, unless it can be demonstrated that an automatic scram will occur promptly because of the failure mode of the power supply;

(f) The system is not subject to the requirements of Appendices A and B of 10 CFR 50;

(g) There shall be a documented independent design review of the system;

(h) Before the system is declared operable, a documented pre-operational test of the system will be successfully completed; and

(i) The system shall be functionally tested at each Unit shutdown, but need not be tested more than once each 90 days.

(2) After April 9, 1981, the Automatic Dump System as described above shall be operable in all modes other than shutdown and refueling or the unit shall be placed in a cold shutdown condition within 72 hours unless system operability is restored.

V.

The licensee or any person whose interests may be affected by this Order may request a hearing within 20 days of the date of publication of this Order in the Federal Register. Any request for a hearing will not stay the effective date of this Order. Any request for a hearing shall be addressed to the Director, Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555. A copy of the request should also be sent to the Executive Legal Director, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555. If a person other than the licensee requests a hearing, that person shall set forth with particularity the nature of their interest and the manner in which such interest may be affected by this Order.

VI.

If a hearing is held concerning this Order, the issue to be considered at the hearing shall be:

Whether the licensee should be required to have the automatic system required by Section IV to be operable by April 9, 1981.

Operation of the facility on terms consistent with this Order is not stayed by the pendency of any proceedings on the Order.

FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Dated: JANUARY 8 1981
Bethesda, Maryland