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

MAR 8 1982

50-293

MEMORANDUM FOR: Harold R. Denton, Director, NRR
John G. Davis, Director, NMSS
Robert B. Minogue, Director, RES
Richard C. DeYoung, Director, IE
Guy H. Cunningham, Executive Legal Director
Joseph J. Fouchard, Director, PA
Ronald C. Haynes, Regional Administrator, Region I

FROM: Carlyle Michelson, Director
Office for Analysis and Evaluation
of Operational Data

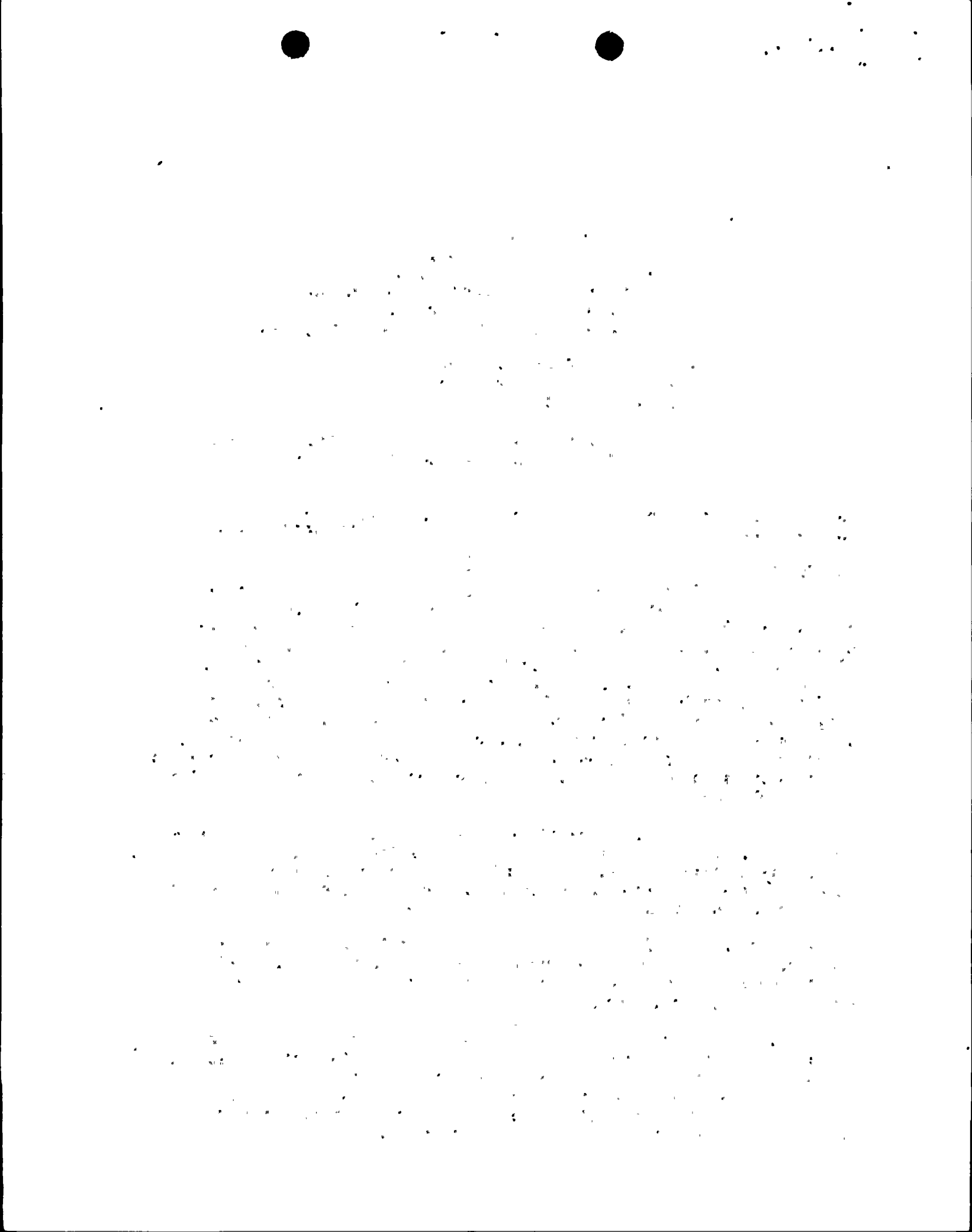
SUBJECT: PROPOSED ABNORMAL OCCURRENCE - MAJOR DEFICIENCIES IN MANAGEMENT CONTROLS AT A NUCLEAR POWER PLANT

Enclosed is a draft Commission Paper with a proposed Federal Register Notice in regard to a potential abnormal occurrence pertaining to several instances of serious deficiencies in management controls at Pilgrim Unit 1. The first involved noncompliance with provisions of 10 CFR 50.44, together with a material false statement made to the NRC. The second concerned operation of the facility in violation of a Technical Specification for the containment integrity limiting condition for operation. The third concerned operation of the primary containment at various times between plant startup in 1972 and September 26, 1981 with the drywell temperature greater than the value specified in the FSAR and no adequate safety evaluation performed as required by 10 CFR 50.59. The first two incidents were the subject of a Notice of Violation and Proposed Imposition of Civil Penalties in the amount of $550,000, issued on January 18, 1982. At the same time, an Order modifying the license was issued in regard to improving management controls of licensed activities. The third incident was cited as an item of noncompliance.

This proposed AO writeup is based on two separate suggested AOs submitted by Region I. The first writeup submitted by Region I pertained to the first two events described above; the second writeup pertained to the third event. AEOD has edited them into one separate AO since the root cause of both seems to be serious deficiencies in management controls.

The item is proposed for reporting based on Example I.D.3 ("For All Licensees") of the abnormal occurrence policy statement; i.e., serious deficiency in management or procedural controls in major areas can be considered an abnormal occurrence.

Your review, comments, and written (or telephone) concurrence are requested by close of business, March 14, 1982. It is planned to include this event in the First Quarter CY 1982 Report to Congress. Region I and IE are requested to update the status of the licensee's reply to the Order. Region II and NRR are requested to provide updating material regarding the licensees exceeding the drywell temperature limit.



If you have any questions or wish to discuss details, please contact P. Bobe or J. Crooks of my office at 492-4426 and 492-4425, respectively.

Carlyle Michelson

Carlyle Michelson, Director
Office for Analysis and Evaluation
of Operational Data

Enclosure:
Draft Commission Paper

cc w/enclosure:
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For: The Commissioners

From: William J. Dircks
Executive Director for Operations

Subject: ABNORMAL OCCURRENCE RECOMMENDATION - MAJOR DEFICIENCIES IN MANAGEMENT CONTROLS AT A NUCLEAR POWER PLANT

Purpose: Approval of an abnormal occurrence determination.

Discussion: Enclosed is a draft Federal Register notice describing as an abnormal occurrence several instances of serious deficiencies in management controls at Pilgrim Unit 1. The first involved noncompliance with provisions of 10 CFR 50.44, together with a material false statement. The second concerned operation of the facility in violation of a Technical Specification for the containment integrity limiting condition for operation. The third concerned operation of the primary containment at various times between plant startup in 1972 and September 26, 1981 with the drywell temperature greater than the value specified

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in the FSAR and no adequate safety evaluation performed as required by 10 CFR 50.59. The first two incidents were the subject of a Notice of Violation and Proposed Imposition of Civil Penalties in the amount of $550,000, issued on January 18, 1982. At the same time, an Order modifying the license was issued in regard to improving management controls of licensed activities. The third incident was cited as an item of noncompliance.

This item is proposed for reporting based on Example I.D.3 ("For All Licensees") of the abnormal occurrence policy statement; i.e., serious deficiency in management or procedural controls in major areas can be considered an abnormal occurrence.

Recommendation: That the Commission:

1. Approve the subject proposed abnormal occurrence together with its associated Federal Register Notice and
2. Note that following approval, the Office of Congressional Affairs will notify the appropriate Congressional Committees of the intent to publish the Federal Register Notice.

Scheduling: While no specific circumstances require Commission Action by a particular date, it is desirable to disseminate abnormal occurrence information to the public as soon as possible. It is expected that Commission action within

two weeks of receipt of this draft proposal would permit publication in the Federal Register about 10 days later.

William J. Dircks
Executive Director for Operations

Enclosure:
Draft Federal Register
Notice

[7590-01]

NUCLEAR REGULATORY COMMISSION

ABNORMAL OCCURRENCE

MAJOR DEFICIENCIES IN MANAGEMENT CONTROLS

AT A NUCLEAR POWER PLANT

Section 208 of the Energy Reorganization Act of 1974, as amended, requires the NRC to disseminate information on abnormal occurrences (i.e., unscheduled incidents or events which the Commission determines are significant from the standpoint of public health and safety). The following incident was determined to be an abnormal occurrence using the criteria published in the Federal Register on February 24, 1977 (42 FR 10950). Example I.D.3 ("For All Licensees") in Appendix A notes that serious deficiency in management or procedural control in major areas can be considered an abnormal occurrence. The following description of the incident also contains the remedial actions taken.

Date and Place - On January 18, 1982, the NRC issued a Notice of Violation and Proposed Imposition of Civil Penalties for $550,000, together with an Order Modifying the License, to Boston Edison Company (licensee) for alleged management control deficiencies, involving control of combustible gases inside containment and maintenance activities pertaining to the reactor core isolation cooling system, for the Pilgrim Nuclear Power Station (Pilgrim Unit 1). On February 4, 1982, the licensee was further cited for various violations, including inadequate management controls for operation of the plant with drywell temperatures in excess of design values. Pilgrim Unit 1 utilizes a boiling water reactor and is located in Plymouth County, Massachusetts.

Nature and Probable Consequences - There were three events at Pilgrim Unit 1 which indicated serious deficiencies in management controls.

The first involved noncompliance with the provisions of 10 CFR 50.44. On May 29, 1981, the NRC was notified by the licensee that Pilgrim Unit 1 was not in compliance with the provisions of 10 CFR 50.44 regarding the control of post accident combustible gas mixtures in containment.

On November 28, 1978, 10 CFR 50.44 became effective and required that licensees of light water reactors conduct analyses regarding hydrogen evolution following certain postulated accidents and make appropriate design and equipment modifications such that the combustible gases would be controlled. Pilgrim Unit 1 was required as a minimum to have a system capable of purging the containment to the atmosphere. The purging system was required to meet certain design criteria which included equipment redundancy to assure system function in the event of single component failure or loss of offsite power. However, the facility operated from November 28, 1978 until June 5, 1981 with a containment atmosphere combustible gas control system which did not meet all the requirements of 10 CFR 50.44. The ignition of an uncontrolled accumulation of combustible gases inside containment during certain postulated accident conditions could result in deflagration and a pressure surge of the containment atmosphere having the potential to breach the containment and release substantial quantities of radioactive material to the environment.

Associated with this violation was a material false statement, described below, involving failure of the licensee to notify the NRC of deficiencies after the licensee became aware of them.

The second event concerned operation of the facility in violation of a Technical Specification limiting condition for operation for primary containment integrity. On September 12, 1981, during electrical maintenance

activities, operating personnel de-energized electrical power supplies, which partly disabled the automatic isolation control logic electrical circuits for both of the redundant containment isolation valves in the reactor steam supply pipe to the reactor core isolation cooling system. This resulted in a loss of redundancy provided in the design of the electrical circuits to assure automatic closure of these valves during certain postulated accidents. Failure of these valves to close when required could result in the release of significant amounts of radioactive materials into the environment. The facility was operated in this condition until September 16, 1981 (for a total of about 89 hours) when the misoperation was discovered by the NRC Resident Inspector.

The third event concerned operation of the unit at various times between plant startup in 1972 until September 26, 1981 with the primary containment drywell temperature greater than the maximum value specified in the Final Safety Analysis Report (FSAR). Even through the licensee had been aware of the situation for several years, there was no evidence that a safety evaluation had been made as required by 10 CFR 50.59. This apparent lack of management attention was probably the root cause of the following incident which occurred on September 26, 1981. During a routine reactor shutdown and cooldown for refueling, level oscillations of reactor water level instruments were observed. These oscillations occurred four times at approximately 20 minute intervals. Each of these instrument oscillations resulted in a high level automatic isolation of turbines followed by a low level automatic reactor scram and primary containment isolation.

Following the initial oscillation, the operators conducted an isolation verification, a check of redundant level indication and a survey to determine any loss of coolant inventory. A check was also made of the drywell and

coolant temperatures. The 0-400" shutdown wide range level instrument showed no oscillation and the survey produced no indication of any loss of coolant from the reactor. The drywell temperature at the highest elevation was 240°F and the coolant temperature was 220°F. It was concluded that the actual reactor water level was normal at the time of the initial instrument oscillation. There was no impact on the general public or plant employees as a result of this event. There were no pipe breaks or radioactive releases and the automatic safety features functioned as required resulting from the sensed level indications.

Cause or Causes - The root cause of the three events described above are attributed to serious deficiencies in management controls of licensed activities.

For the first event, a series of major deficiencies in management controls resulted in a protracted failure of the Pilgrim facility to comply with the provisions of 10 CFR 50.44. When 10 CFR 50.44 became effective, the containment atmosphere control system actually installed at Pilgrim Station did not meet all required design requirements. This condition existed due to management's failure to conduct a proper design review of the capabilities of the existing atmosphere control system. This deficiency was not initially identified to the NRC. However, apparently as a result of an October 30, 1979 NRC letter requesting details of Pilgrim's compliance with 10 CFR 50.44, the licensee took steps to design and install a modification to the system which would bring Pilgrim into compliance. This modification was installed during the May 1980 outage; however, because of a failure of management to initiate an essential procedural change, the modified system was never fully operational until June 5, 1981.

Prior to installation of the system modification, the licensee had erroneously formally informed the NRC on October 19, 1979 that Pilgrim Unit 1 was in full compliance with the requirements of 10 CFR 50.44 with existing installed equipment. At the time this was apparently not true. The failure of licensee management to properly determine system capabilities via a thorough design analysis of the installed system (as compared with the requirements of 10 CFR 50.44) led to the erroneous report to the NRC. Further, when the licensee subsequently discovered in early 1980 that the installed system did not meet the requirements of 10 CFR 50.54, the licensee did not so inform the NRC and correct the apparent false statement made in the October 19, 1979 letter.

For the second event, the case involved a breakdown in the control of planned maintenance activities. There was a failure to properly review and control safety-related activities at the facility. The reduction in the level of safety was discovered and identified to the licensee's staff by the NRC resident inspector at the site.

For the third event, the problem of apparent erroneous level oscillations was determined to be caused by flashing of the level instrument reference legs at reduced reactor pressure because of the high drywell operating temperature (240°F). The maximum drywell operating temperature is specified to be 148°F in the Pilgrim Final Safety Analysis Report. Drywell temperatures higher than this specified limit are attributed to ineffective drywell cooling due to a degraded condition of the drywell ventilation system (ducting, coolers, cooling water). The high drywell temperatures and degraded condition of the cooling systems had been observed by Pilgrim station operating personnel on many occasions previously and are considered to have allowed to continue as a result of inadequate preventive maintenance and management controls in this area.

Actions Taken To Prevent Recurrence

Licensee - For the first event, when the licensee discovered the error, steps were taken to correct the unauthorized maintenance and restore the modified portion of the containment atmosphere control system to an operable status. Also, a procedural revision was made to permit effective remote operation of the system. The plans for long term corrective action on the part of Boston Edison as required by the NRC had not been submitted at the time of the writing of this report, since the 30 days allowed for licensee response had not elapsed.

For the second event, when the NRC Resident Inspector discovered the deficiency and notified the licensee, the licensee restored the partially disabled containment isolation control logic electrical circuits to be fully operable.

For the third event, corrective maintenance is being performed on the drywell cooling systems to restore the original design capacity during the current refueling outage. Drywell equipment insulation is being repaired and additional instrumentation is being installed to monitor the drywell temperature and performance of the cooling systems. In addition, the licensee is conducting special inspections, tests, and evaluations for possible detrimental effects on safety-related equipment subjected to this sustained abnormally high temperature environment. To date certain instrument limit switches and electrical cable were found to be affected and are being replaced.

NRC - Based on the first two events, and previous deficiencies in regulatory performance, the NRC concluded that continued operation of the plant over

the long term required significant changes in the control of licensed activities. As a result, the NRC issued an Order on January 18, 1982 requiring Boston Edison Company to develop and submit for NRC review and approval a plan to improve the management attention being given to the safe operation of the plant. The order required Boston Edison Company to submit within 30 days plans for an independent appraisal of the management organization and for systematically reviewing the status of safety-related activities. The plan also had to include recommendations for improvements in management of the plant. Together with the Order, the NRC issued a Notice of Violation and Proposed Imposition of Civil Penalties in the amount of $550,000.

For the third event, the NRC has conducted inspections and is reviewing this event and the progress of the licensee's corrective actions. An NRC meeting was held on December 18, 1981 where licensee representatives described their plans and schedules for resolution of this major problem. At this meeting, the licensee was directed to propose Technical Specifications limiting drywell teperatures and provide a safety evaluation which describes the basis for operations with drywell temperatures exceeding maximum design values. This information was supplied to the NRC and is being reviewed. This event was included in a citation for violations in a letter from Region I to the licensee dated February 4, 1982.

Future reports on the findings and investigations will be made, as appropriate, in the quarterly Report to Congress on Abnormal Occurrences (NUREG-0900 series.)

Dated at Washington, D.C. this day of 1982.

Samuel J. Chilk
Secretary of the Commission