

Docket No. 50-278

Philadelphia Electric Company
ATTN: Mr. Edward G. Bauer, Jr., Esquire
Vice President and General Counsel
2301 Market Street
Philadelphia, Pennsylvania 19101

Gentlemen:

Enclosed is a signed original of the "Order for Modification of License" issued by the Commission for the Peach Bottom Atomic Power Station Unit 3. The Order adds a provision to License No. DPR-56 stating that you are authorized to install bypass hole plugs in the lower core plate and that the facility shall not operate subsequent to the installation of bypass hole plugs without authorization by the Office of Nuclear Reactor Regulation. A copy of the Order and the concurrently issued license amendment are being filed with the Office of the Federal Register for publication. Copies of our related Safety Evaluation and the Evaluation dated November 4, 1975 on Peach Bottom Unit 2 are also enclosed.

Sincerely,

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George Lear, Chief
Operating Reactors Branch #3
Division of Reactor Licensing

Enclosures:

1. Order for Modification of License
2. Amendment No.
3. Safety Evaluation of Mechanical Plugs to be Inserted into the Bypass Holes of the Peach Bottom Atomic Power Station Unit 3
4. Safety Evaluation of Mechanical Plugs to be Inserted into the Bypass Holes of Peach Bottom Atomic Power Station Unit 2.

JMcGough
JSaltzman
NDube
PKreutzer
SVarga
CHEbron
AESTeen
ACRS (16)
OPA (Clare Miles)
BAltman
TBAbernathy
JRBuchanan
DEisenhut
Gray files
extra cps (5)

cc: See next page

RL:AD/ORs *KRG*
KRGoller

12/31/77

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SURNAME	E. Verdery: knf	GLear <i>GL</i>	S. JOHINKI	VStello	EGCase	BCRusche
DATE	2/31/76	12/31/75	12/31/75	1/15/76	1/16/77	1/16/76

Philadelphia Electric Company

cc w/enclosures:

Eugene J. Bradley
Philadelphia Electric Company
Assistant General Counsel
2301 Market Street
Philadelphia, Pennsylvania 19101

Raymond L. Hovis, Esquire
35 South Duke Street
York, Pennsylvania 17401

W. W. Anderson, Esquire
Deputy Attorney General
Department of Justice
Second Floor - Capitol Annex
Harrisburg, Pennsylvania 17120

John B. Griffith, Esquire
Special Assistant Attorney
General, Maryland
Annapolis, Maryland 31401

Warren Rich, Esquire
Special Assistant Attorney
General, Maryland
Annapolis, Maryland 21401

Martin Memorial Library
159 E. Market Street
York, Pennsylvania 17401

Troy B. Conner, Jr.
Conner and Knotts
1747 Pennsylvania Avenue, NW
Washington, D. C. 20006

Albert R. Steel, Chairman
Board of Supervisors
Peach Bottom Township
R. D. #1
Delta, Pennsylvania 17314

Wilmer P. Bolton
Chairman, Board of Supervisors
Drumore Township
R. D. #1
Holtwood, Pennsylvania 17532

Mr. R. A. Heiss, Coordinator
Pennsylvania State Clearinghouse
Governor's Office of State Planning
and Development
P. O. Box 1323
Harrisburg, Pennsylvania 17120

Philadelphia Electric Company
ATTN: Mr. W. T. Ullrich
Peach Bottom Atomic
Power Station
Delta, Pennsylvania 17314

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

PHILADELPHIA ELECTRIC COMPANY

(Peach Bottom Atomic Power Station,
Unit 3)

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Docket No. 50-278

ORDER FOR MODIFICATION OF LICENSE

I.

Philadelphia Electric Company (PECO or Licensee) is the holder of Facility Operating License No. DPR-56 which authorizes operation of Peach Bottom Atomic Power Station Unit 3 (Unit 3 or the Facility) at steady-state reactor core power levels not in excess of 3295 megawatts thermal (rated power). The Facility is a boiling water reactor (BWR) located at the Licensee's site in Peach Bottom, York County, Pennsylvania.

II.

1. On July 23, 1975, the Nuclear Regulatory Commission (the Commission) issued an "Order for Modification of License" (40 F.R. 32179 of July 31, 1975) which confirmed a plan for limited additional operation of the Facility. As explained in the Order of July 23, 1975, the Facility's channel box wear, as indicated by the noise-to-signal ratio recorded by the traversing incore probe (TIP), had exceeded the threshold for remedial action. The remedial action, confirmed by the Order, limited operation of the Facility at not more than 40 percent of rated core flow and with a maximum fuel bundle power of 3.35 MWt. In addition, the Order permitted operation up to full flow and power for a brief period of time needed to collect flow vibration data and to conduct fuel preconditioning. The Order further stipulated that the Licensee was to shutdown the facility following approximately 45 equivalent full

flow days from June 2, 1975 unless within that period certain specified tests have been completed which demonstrated the efficacy of the 40% flow limit.

2. By letter dated December 24, 1975,^{1/} the Licensee proposed a plan, previously discussed with the NRC staff, setting forth a course of remedial action, which would allow operation with flow rates above 40 percent of rated flow and maximum bundle power above 3.35 MWt. The plan would involve shutdown of the reactor and appropriate replacement of worn channel boxes and plugging of the core support plate bypass holes.
3. By its letter dated December 29, 1975,^{2/} the Licensee provided details relating to the fuel channel inspection program and the installation of core bypass flow plugs in the lower core plate and supplied analyses to demonstrate the adequacy of the procedures for plug installation.

1/Copies of (1) the December 24, 1975 filing by the Licensee, and (2) the NRC staff Safety Evaluation of Mechanical Plugs to be Inserted in Peach Bottom Unit 3 and the documents referenced therein, are available for public inspection in the Commission's Public Document Room, 1717 H. Street, N. W., Washington, D. C., and are being placed in the Martin Memorial Library, 189 E. Market Street, York, Pennsylvania.

2/The December 29, 1975 filing by the Licensee entitled "Peach Bottom Atomic Power Station Unit 3 Channel Inspection and Safety Analysis with Bypass Holes Plugged" is available for public inspection in the Commission's Public Document Room, 1717 H. Street, N. W., Washington, D. C., and is being placed in the Martin Memorial Library, 189 E. Market Street, York, Pennsylvania.

4. The installation of the core bypass flow plugs in the lower core plate is designed to reduce the instrument tube - channel box interaction that produced unacceptable wear. The Commission's Safety Evaluations for the plant modifications performed on the Duane Arnold and Vermont Yankee reactors, list a total of 75 channels that were inspected for wear during normal refueling outages in seven plants that have instrument thimbles similar to those in Peach Bottom Unit 3, but that do not have flow bypass holes. The bypass flow for these plants enters through clearances in the fuel assembly and fittings which are similar to the proposed Peach Bottom Unit 3 configuration with plugged bypass flow holes. For this configuration, no significant wear was observed at the corners of the channel boxes adjacent to the instrument thimbles.
5. Plugs identical to those proposed for Peach Bottom Unit 3 had previously been installed in the Vermont Yankee and Pilgrim reactors in 1973 and 1974, respectively, to eliminate the vibration of temporary control curtains that caused channel box wear in those reactors. They have also been installed in the Duane Arnold, Vermont Yankee, Cooper and Peach Bottom Unit 2 reactors to mitigate channel box wear. The plugs in the Vermont Yankee reactor were installed in 1973 and, were removed after ten months of successful service, at the time that the temporary control curtains were removed. In addition, the General Electric Company has conducted tests to demonstrate the adequacy of the plug design. These tests included full flow mockup tests which demonstrated negligible leakage flow through the plugged holes. The NRC staff has reviewed the design, the testing, and the previous

experience with the proposed plugs in the Vermont Yankee and Pilgrim reactors, and in its concurrently issued Safety Evaluation of Mechanical Plugs to be Inserted in Peach Bottom Unit 3, the staff concluded that the mechanical design of the proposed bypass flow plugs is acceptable and that the plugs will reduce the vibration of the instrument thimbles caused by flow through the bypass holes and that installation of the plugs should be authorized. Subsequent operation of the facility with the plugs installed is under review. Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations in 10 CFR Parts 2 and 50, IT IS ORDERED THAT Facility Operating License No. DPR-56 is hereby amended by substituting the following provisions for the provisions set out in Appendix A to the Commission's Order for Modification of License dated July 23, 1975:

1. Peach Bottom Atomic Power Station Unit 3 is hereby authorized to install bypass hole plugs in the Facility's lower core plate as specified in the concurrently issued Amendment No. 13. to the Facility License No. DPR-56.

FOR THE NUCLEAR REGULATORY COMMISSION



Ben C. Rusche, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 7th day of January, 1976.



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

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY, AND
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-278

PEACH BOTTOM ATOMIC POWER STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

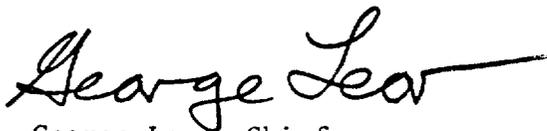
Amendment No. 13
License No. DPR-56

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Philadelphia Electric Company, Public Service Electric and Gas Company, Delmarva Power and Light Company, and Atlantic City Electric Company (the licensees) dated July 9, 1975 and Supplement dated September 10, 1975, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations; and
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.
 - E. An environmental statement or negative declaration need not be prepared in connection with the issuance of this amendment.
2. Accordingly, Facility Operating License No. DPR-56, as amended, is hereby further amended by adding a new paragraph as 2.C.(4) as follows:

"(4) The Licensees are authorized to install bypass hole plugs in the Facility's lower core plate. The Licensees shall not, without prior written approval of the Director, Office of Nuclear Reactor Regulation, return the facility to operation following the installation of the bypass hole plugs.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script that reads "George Lear". The signature is written in black ink and is positioned above the typed name and title.

George Lear, Chief
Operating Reactors Branch #3
Division of Reactor Licensing

Date of Issuance: January 7, 1976



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

SAFETY EVALUATION OF MECHANICAL PLUGS TO BE INSERTED INTO THE BYPASS

HOLES OF PEACH BOTTOM ATOMIC POWER STATION UNIT 3

This memorandum summarizes the NRC staff's evaluation of the mechanical adequacy of core plate bypass hole plugs for insertion into Peach Bottom Unit 3.

The Licensee plans to use the same method and type of plug reviewed by the NRC staff for the Peach Bottom Unit 2⁽¹⁾ reactor.

The plug consists of five basic parts, as shown in Figure 1. Identical plugs have previously been installed at Vermont Yankee, Pilgrim, Duane Arnold, Cooper and Peach Bottom Unit 2. The body provides a means of guiding the device into the bypass flow holes as well as a shoulder to support the plug and form a seal against water flow. The shaft extends through the body. A knob is provided at the top of the shaft to provide a means of grabbing the plug during installation and extraction. At the bottom, the latch is attached to the shaft by a pin. The latch is free to rotate during installation. The spring acts against the body and shaft during normal operation to provide the force necessary to offset the pressure differential acting on the body.

During installation, the plug has its latch rotated 90 degrees from its installed position and withdrawn and locked in the body. The shaft is gripped by the installation tool, and the plug is inserted into the bypass flow holes. The body engages the rim of the hole. The shaft is pushed to its full extension, thus lowering and unlocking the latch below the underside of the core plate. The latch then rotates 90 degrees and bears on the bottom of the core plate. After insertion, the plug is pulled with about 30-pound force to test the placement.

The plug can be removed by gripping the top of the shaft with an extracting tool and applying a force of about 500 pounds. The latch's legs will be plastically deformed and the entire plug withdrawn. The plugs previously installed at Vermont Yankee were removed with no abnormalities or loose pieces reported. The force required for removal varied from 500 to 1300 pounds.

(1) Safety Evaluation of Mechanical Plugs to be Inserted into the Bypass Holes of the Peach Bottom Atomic Power Station Unit 2 issued November 4, 1975.

Based on a review of the design, the test rig, the installation methods and the previously successful operating experience at Vermont Yankee, Pilgrim, and Duane Arnold, we conclude that the plugs will not fail so as to result in loose parts in the core or result in unplugging of the bypass flow holes. Also, we conclude that the installed plugs will preclude unacceptable channel box damage for at least the proposed fuel cycle. Surveillance programs will be required to confirm the nature and extent of any residual tube excitation and resultant effect, if any, on core components.

We have determined that the Order does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the Order involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental statement, negative declaration, or environmental impact appraisal need not be prepared in connection with the issuance of this Order.

Accordingly, we conclude that the installation of the plugs should be authorized. Operation with plugged bypass holes is still under review.

Date: January 7, 1976

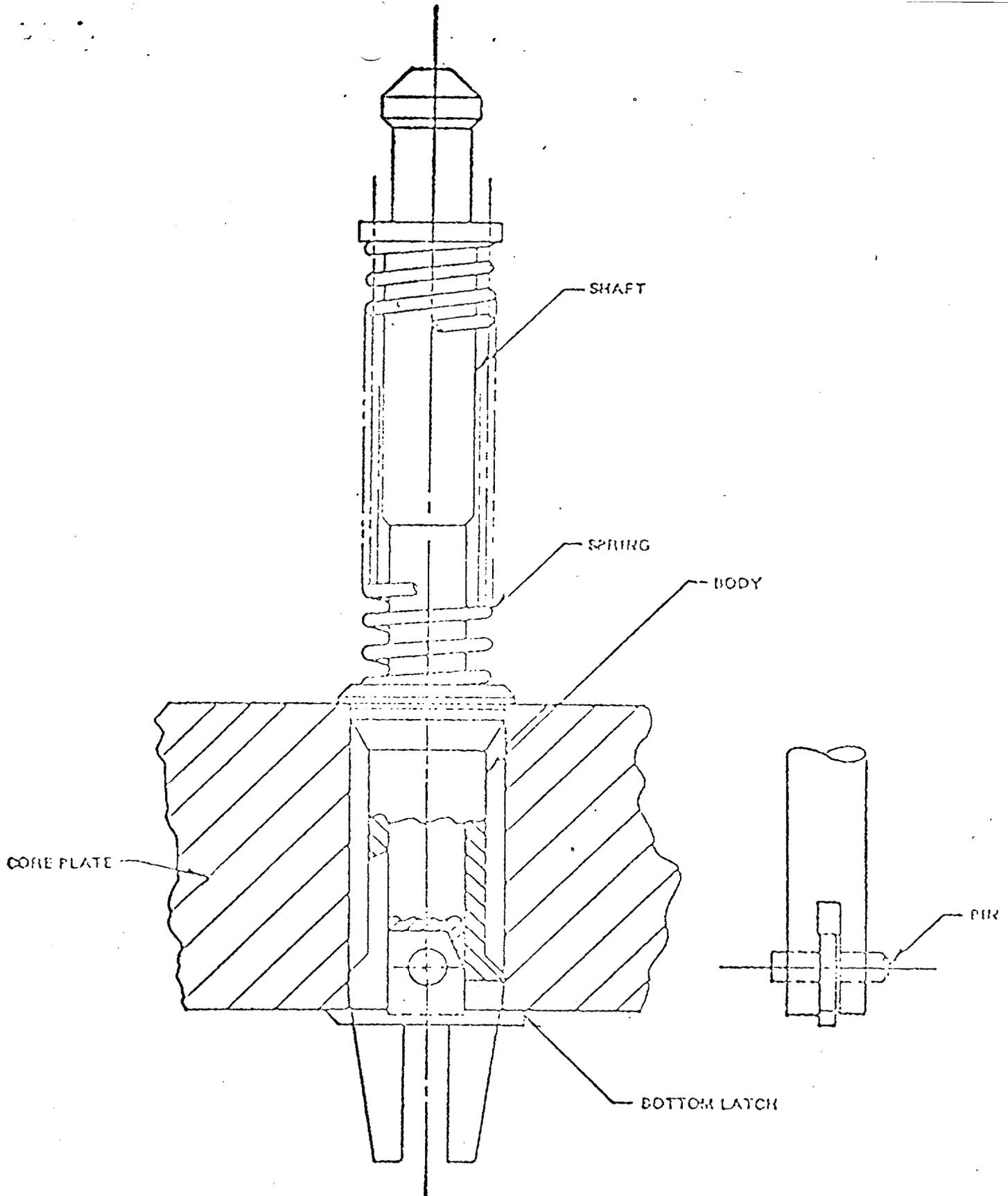


Figure 1. Plug Installed in Core Plate

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

SAFETY EVALUATION OF MECHANICAL PLUGS TO BE INSERTED INTO THE BYPASS
HOLES OF PEACH BOTTOM ATOMIC POWER STATION UNIT 2

This memorandum summarizes the NRC staff's evaluation of the mechanical adequacy of core plate bypass hole plugs for insertion into Peach Bottom Unit 2.

The Licensee plans to use the same method and type of plug reviewed by the NRC staff for Vermont Yankee and for the Duane Arnold Energy Center Plant. (1)(2)

The plug consists of five basic parts, as shown in Figure 1. Identical plugs have previously been installed at Vermont Yankee, Pilgrim, and Duane Arnold. The body provides a means of guiding the device into the bypass flow holes as well as a shoulder to support the plug and form a seal against water flow. The shaft extends through the body. A knob is provided at the top of the shaft to provide a means of grabbing the plug during installation and extraction. At the bottom, the latch is attached to the shaft by a pin. The latch is free to rotate during installation. The spring acts against the body and shaft during normal operation to provide the force necessary to offset the pressure differential acting on the body.

During installation, the plug has its latch rotated 90 degrees from its installed position and withdrawn and locked in the body. The shaft is gripped by the installation tool, and the plug is inserted into the bypass flow holes. The body engages the rim of the hole. The shaft is pushed to its full extension, thus lowering and unlocking the latch below the underside of the core plate. The latch then rotates 90 degrees and bears on the bottom of the core plate. After insertion, the plug is pulled with about 30-pound force to test the placement.

The plug can be removed by gripping the top of the shaft with an extracting tool and applying a force of about 500 pounds. The latch's legs will be plastically deformed and the entire plug withdrawn. The plugs previously installed at Vermont Yankee were removed with no abnormalities or loose pieces reported. The force required for removal varied from 500 to 1300 pounds.

- (1) Safety Evaluation of Mechanical Plugs to be Inserted into the Bypass Holes of the Duane Arnold Energy Center Reactor issued June 18, 1975.
- (2) Safety Evaluation of Mechanical Plugs to be Inserted into the Bypass Holes of the Vermont Yankee Nuclear Power Plant issued August 15, 1975.

Based on a review of the design, the test rig, the installation methods and the previously successful operating experience at Vermont Yankee, Pilgrim, and Duane Arnold, we conclude that the plugs will not fail so as to result in loose parts in the core or result in unplugging of the bypass flow holes. Also, we conclude that the installed plugs will preclude unacceptable channel box damage for at least the proposed fuel cycle. Surveillance programs will be required to confirm the nature and extent of any residual tube excitation and resultant effect, if any, on core components.

Accordingly, we conclude that the installation of the plugs should be authorized. Operation with plugged bypass holes is still under review.

Date: November 4, 1975

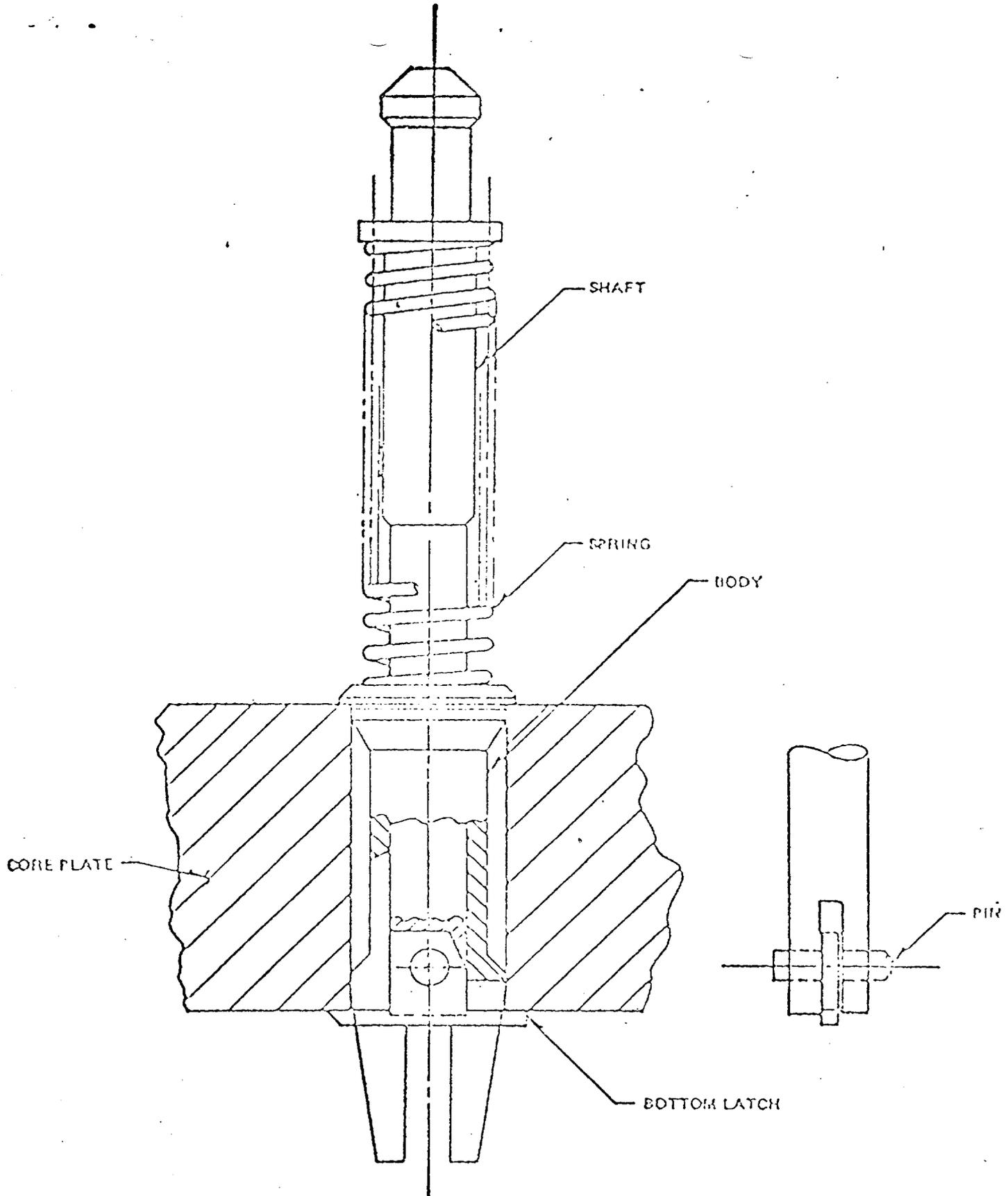


Figure 1. Plug Installed in Core Plate

experience with the proposed plugs in the Vermont Yankee and Pilgrim reactors, and in its concurrently issued Safety Evaluation of Mechanical Plugs to be Inserted in Peach Bottom Unit 3, the staff concluded that the mechanical design of the proposed bypass flow plugs is acceptable and that the plugs will reduce the vibration of the instrument thimbles caused by flow through the bypass holes and that installation of the plugs should be authorized. Subsequent operation of the facility with the plugs installed is under review. Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations in 10 CFR Parts 2 and 50, IT IS ORDERED THAT Facility Operating License No. DPR-56 is hereby amended by substituting the following provisions for the provisions set out in Appendix A to the Commission's Order for Modification of License dated July 23, 1975:

1. Peach Bottom Atomic Power Station Unit 3 is hereby authorized to install bypass hole plugs in the Facility's lower core plate as specified in the concurrently issued Amendment No. to the Facility License No. DPR-56.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by
Ben C. Rusche

Ben C. Rusche, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 9th day of January 1976

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
PHILADELPHIA ELECTRIC COMPANY)
) Docket No. 50-278
(Peach Bottom Atomic Power Station,)
Unit 3))

ORDER FOR MODIFICATION OF LICENSE

I.

Philadelphia Electric Company (PECO or Licensee) is the holder of Facility Operating License No. DPR-56 which authorizes operation of Peach Bottom Atomic Power Station Unit 3 (Unit 3 or the Facility) at steady-state reactor core power levels not in excess of 3293 megawatts thermal (rated power). The Facility is a boiling water reactor (BWR) located at the Licensee's site in Peach Bottom, York County, Pennsylvania.

II.

1. On July 23, 1975, the Nuclear Regulatory Commission (the Commission) issued an "Order for Modification of License" (40 F.R. 32179 of July 31, 1975) which confirmed a plan for limited additional operation of the Facility. As explained in the Order of July 23, 1975, the Facility's channel box wear, as indicated by the noise-to-signal ratio recorded by the traversing incore probe (TIP), had exceeded the threshold for remedial action. The remedial action, confirmed by the Order, limited operation of the Facility at not more than 40 percent of rated core flow and with a maximum fuel bundle power of 3.35 MWt. In addition, the Order permitted operation up to full flow and power for a brief period of time needed to collect flow vibration data and to conduct fuel preconditioning. The Order further stipulated that the Licensee was to shutdown the facility following approximately 45 equivalent full

flow days from June 2, 1975 unless within that period certain specified tests have been completed which demonstrated the efficacy of the 40% flow limit.

2. By letter dated December 24, 1975,^{1/} the Licensee proposed a plan, previously discussed with the NRC staff, setting forth a course of remedial action, which would allow operation with flow rates above 40 percent of rated flow and maximum bundle power above 3.35 MWt. The plan would involve shutdown of the reactor and appropriate replacement of worn channel boxes and plugging of the core support plate bypass holes.
3. By its letter dated December 29, 1975,^{2/} the Licensee provided details relating to the fuel channel inspection program and the installation of core bypass flow plugs in the lower core plate and supplied analyses to demonstrate the adequacy of the procedures for plug installation.

1/Copies of (1) the December 24, 1975 filing by the Licensee, and (2) the NRC staff Safety Evaluation of Mechanical Plugs to be Inserted in Peach Bottom Unit 3 and the documents referenced therein, are available for public inspection in the Commission's Public Document Room, 1717 H. Street, N. W., Washington, D. C., and are being placed in the Martin Memorial Library, 189 E. Market Street, York, Pennsylvania.

2/The December 29, 1975 filing by the Licensee entitled "Peach Bottom Atomic Power Station Unit 3 Channel Inspection and Safety Analysis with Bypass Holes Plugged" is available for public inspection in the Commission's Public Document Room, 1717 H. Street, N. W., Washington, D. C., and is being placed in the Martin Memorial Library, 189 E. Market Street, York, Pennsylvania.

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4. The installation of the core bypass flow plugs in the lower core plate is designed to reduce the instrument tube - channel box interaction that produced unacceptable wear. The Commission's Safety Evaluations for the plant modifications performed on the Duane Arnold and Vermont Yankee reactors, list a total of 75 channels that were inspected for wear during normal refueling outages in seven plants that have instrument thimbles similar to those in Peach Bottom Unit 3, but that do not have flow bypass holes. The bypass flow for these plants enters through clearances in the fuel assembly and fittings which are similar to the proposed Peach Bottom Unit 3 configuration with plugged bypass flow holes. For this configuration, no significant wear was observed at the corners of the channel boxes adjacent to the instrument thimbles.
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