PHILADELPHIA ELECTRIC COMPANY

PHILADELPHIA

PEACH BOTTOM ATOMIC POWER STATION

UNIT NO. 2

DOCKET NUMBER 50-277

REPORT OF PLANT START-UP FOLLOWING

FIFTH REFUELING OUTAGE

FEBRUARY 1982

SUBMITTED TO

THE UNITED STATES NUCLEAR REGULATORY COMMISSION

PURSUANT TO

FACILITY OPERATING LICENSE NO. DPR-44

PHILADELPHIA ELECTRIC COMPANY

Peach Bottom Atomic Power Station
Unit No. 2
Docket Number 50-277

REPORT OF PLANT START-UP FOLLOWING FIFTH REFUELING OUTAGE
FEBRUARY 19, 1982

SUBMITTED TO
THE UNITED STATES NUCLEAR REGULATORY COMMISSION
PURSUANT TO
FACILITY OPERATING LICENSEE DPR-44

Preparation Directed By:
W. T. Ullrich, Superintendent
Peach Bottom Atomic Power Station
RD #1
Delta, PA 17314

TABLE OF CONTENTS

INTRODUCTION

The Peach Bottom Technical Specification 6.9.1 Routine Reports requires submittal of a startup report following any outage in which certain safety related events may occur. Installation of fuel of a different design is one of these events. This report, prepared to meet the Technical Specification requirement, describes the startup program implemented to provide assurance that the safe operation of the plant was not diminished by the activities of the fifth refueling outage.

The Peach Bottom Unit 2 was out of service from February 19, 1982, to June 25, 1982, to accommodate a maintenance and refueling outage. During this 116 day outage, 224 bundles of the (8x8) design, 49 (8x8R), 2 (LTA), and 1 (P 8x8 R) were replaced with 276 bundles of the (P 8x8 R) fuel design. The reactor was returned to service on June 25, 1982, and reached full power on July 12, 1982. Start-up tests were performed before and during the return to power.

The startup tests identified in the F.S.A.R. were addressed and those which involve areas which were affected by outage activities were included and are summarized herein. Additional special tests connected with specific outage activities were also included in the program and are discussed in this report. The successful implementation of this startup program insures that the Unit 2 refueling outage has resulted in no conditions or system characteristics that in any way diminish the safe operation of Unit 2.

The tests and data referenced in this report are on file at the Peach Bottom Atomic Power Station.

STARTUP REPORT

Peach Bottom Atomic Power Station

UNIT NO. 2

1. VERIFICATION OF SHUTDOWN MARGIN

An 'in-sequence' SDM determination was performed during the initial reactor startup in the A sequence. The actual shutdown margin was 2.09% delta K/K, as compared with a Technical Specification minimum value of 0.38% delta K/K + R, where R = .29% delta K/K. This test was performed on June 25, 1982.

2. CONTROL ROD OPERABILITY AND SUBCRITICALITY CHECK

Each control rod was withdrawn and inserted. Subcriticality was verified per surveillance test ST 10.8. The test was completed on June 24, 1982, prior to start-up.

3. LPRM CALIBRATION

LPRM calibrations were successfully performed at approximately 34% Rated Thermal Power (RCTP), on July 3, 1982 and at 98% RCTP on July 14, 1982 per surveillance test ST 3.4.1.

4. REACTIVITY ANOMALIES

Surveillance test ST 3.7, "Reactivity Anomalies", was successfully performed on July 19, 1982. The predicted number of control rod notches inserted at rated conditions was 600 with a ± 1% delta Keff range of 800 to 400 control rod notches inserted. The actual number of control rod notches inserted was 444, which satisfies the ± 1% delta Keff criteria.

5. CORE VERIFICATION

Post alteration core verification began on May 20, 1982, in accordance with surveillance test ST 12.10, "Core Post-Alteration Verification" with the exception of the bundles surrounding cell 26-23. Cell 26-23 could not be verified at that time due to an assembly being dropped in that cell. The seating verification revealed several assemblies to be improperly seated at this time. On May 29, 1982, cell 26-23 and the surrounding bundles were verified and all previously identified improperly seated bundles in the core were reseated and reverified. All fuel bundles were verified to be correctly located, seated, and oriented prior to Cycle 6 startup and operation.

6. COLD CRITICAL ROD PATTERN PREDICTION

The cold critical rod pattern prediction comparison surveillance test ST 3.9 was successfully performed for Unit 2. The predicted core keff was 1.002 and the actual core keff was 1.003 for a difference of -.001. The difference is -0.1% and satisfies the $\pm$ 1% test acceptance criteria.

7. CORE POWER SYMMETRY AND TIP REPRODUCIBILITY TEST

Two sets of core power symmetry and TIP reproducibility test data were analyzed for sequence 'A' conditions on July 22, 1982 and August 4, 1982 at rated power. The total TIP uncertainty was 4.99% and 4.77% for the two sets; therefore, the test criteria that the total TIP uncertainty not exceed 8.7% is satisfied. The maximum deviation between symmetrically located pairs was 12.3% and 12.6% for the two data sets respectively, which satisfies the 25% acceptance criteria.

8. CONTROL ROD DRIVE SCRAM TIMING

All 185 control rods were scram timed satisfactorily following all core alterations at nominal reactor pressure of 1000 psig, in accordance with surveillance test ST 10.7. The test was begun on June 11, 1982 and all rods were scram timed with the exception of control rods 06-39 and 46-19. These two control rods could not be tested at that time due to position indicating probe (PIP) problems. Following repairs, these two control rods were scram timed on July 2, 1982, completing the test and satisfying all Technical Specification requirements.

9. CRD SCRAM DISCHARGE VOLUME MODIFICATIONS (MOD 655)

The two inch piping between the scram discharge volumes and the instrument volume was replaced with piping equal in cross sectional area to that used for the discharge volume. This was done so that no restrictions will exist between the two discharge volumes and the instrument volume and there will be no dependence on the vent and drain system for the proper detection of water.

The piping for the level detection instrumentation was rerouted such that it connects directly with the instrument volume to minimize the effects of transient loading on the level instrumentation resulting from vent and drain valve operation.

Relief valve RV-34 was removed from the instrument volume drain line to eliminate the potential for release of reactor coolant following failure of this valve.

Redundant isolation valves on the discharge volume vent and drain line were installed in series with the existing valves. Each valve is provided with its own pilot solenoid valve, which are actuated by the RPS system. Following a scram reset, the valves remain closed until opened from the Control Room.

A pre-operational test of the system was completed May 25, 1982.

This modification was required by I&E Bulletin 80-17 and is now completed for both Unit 2 and Unit 3.

10. REACTOR WATER LEVEL FULL RANGE RECORDERS (MOD 576A)

Mod 576A fulfills the NUREG 0737 requirements for reactor water level monitoring over the range of normal water level to the bottom of the fuel. There are two recorders in the Control Room. Each recorder has two channels, one for wide-range reactor level (-165" to +50") and one for fuel-zone level (-325" to 0"). The recorder inputs are obtained from Mod 576A.

11. AUTO SWAP OVER OF RCIC SUCTION (MOD 635)

Mod 635 added controls to automatically transfer RCIC pump suction to the torus from the condensate storage tank (C.S.T.) on low C.S.T. level. Two level instrument loops in a one out of two logic are used. The modification satisfies NUREG 0737 requirements.

12. POST ACCIDENT MONITORING OF TORUS LEVEL (MOD 584B)

Mod 584B replaces existing torus water level instruments 2914 with new instruments qualified for post accident monitoring. This mod satisfies NUREG 0737 "Clarification of TMI Action Plan Requirements". It was installed during the spring/summer 1982 refuel outage on Unit #2 and by July 8, 1982 on Unit #3.

13. HIGH RANGE CONTAINMENT RAD MONITORS (MOD 587)

This modification involved the installation of four containment radiation monitors with a range of 1×10^8 R/hr. The detectors are located in the drywell at elevation 142' at the 352 degrees, 279 degrees, 122 degrees, and 350 degrees azimuths. Radiation levels in the drywell are recorded and alarmed in the Control Room and on the process computer printout.

The purpose of this modification is to provide post accident drywell radiation information for emergency plant implementation.

14. MSRV/SAFETY VALVE ACOUSTIC MONITORING (MOD 575)

This modification involved the installation of a direct method of indicating the position of the safety/relief valves and an indication and alarm system based on acoustic monitoring techniques. Each valve has its own channel of instrumentation consisting of a sensor mounted on the valve inside primary containment, a pre-amp mounted in the Reactor Building, an electronics module mounted in the Cable Spread Room, as well as indicating lights in the Control Room. Red and green indicating lights indicate actual valve position for each valve, and an alarm and amber light indicate each valve that has opened. The plant process computer also records valve opening and closing.

15. REMOVAL OF MOD 641 AND 680 (MOD 964)

Mod 964 removed all alarms, indication, and actuation devices installed by Mod 641 (Scram Discharge Volume Water Level Continuous Monitoring System) and Mod 680 (Auto-Scram on Low Air Header Pressure). Both of these mods were installed during the 4th refueling of Unit #2 as a result of NRC Bulletin 80-17. Mod 655 corrected the S.D.V. system during this outage such that 641 and 680 are no longer needed. Mods 641 and 680 were removed and the revised back-up scram valve logic was successfully tested on June 23, 1982.

16. DRYWELL PRESSURE INSTRUMENTS (MOD 584A)

Mod 584A provides instrumentation capable of monitoring containment pressure conditions during the course of an accident. Four, quality assured, environmentally and seismically qualified instrument channels were installed to monitor drywell pressure. The outputs of these pressure transmitters are recorded on two control room recorders. Each record has two ranges (5 to 25 psia) and (0 to 225 psig). This pre-op was successfully completed for Unit #2 on July 2, 1982.

17. ADS N2 SUPPLY HEADERS (MOD 625E)

Mod 625E installed two seismically qualified ring headers inside the drywell. The connecting piping and valves to the five ADS relief valves were installed to provide a 100 day back-up N2 supply to the ADS valves.