BEAVER VALLEY POWER STATION UNIT 2

STARTUP REPORT SUPPLEMENT 1

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

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LIST OF ABBREVIATIONS

ACU	Air Conditioning Unit
BOP	Balance of Plant
BVPS	Beaver Valley Power Station
CO_2	Carbon Dioxide
FSAR	Final Safety Analysis Report
HFT	Hot Functional Testing
HVAC	Heating Ventilation and Air Conditioning
I&C	Instrumentation and Control
KV	1,000 Volts
NIS	Nuclear Instrumentation System
NSSS	Nuclear Steam Supply System
RCC	Rod Cluster Control
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RTD	Resistance Temperature Detector
Th	Reactor Coolant Hot Leg Temperature
VDC	Voltage - Direct Current

1.0 INTRODUCTION

The first supplement to the Beaver Valley Power Station Unit 2 (BVPS-2) Startup Report covers the period of testing deferred after Commercial Operations between November 17, 1987 and February 15, 1988. This supplement report is prepared in accordance with Regulatory Guide 1.16, "Reporting of Operating Information - Appendix A, Technical Specifications", and addresses the results of deferred testing identified in the BVPS-2 Final Safety Analysis Report during this period. Those tests which were deferred, but not completed by February 15, 1987, will also be identified in this report, but a comprehensive discussion on these tests will be provided when they are completed. Another supplement report will cover those tests completed subsequent to February 15, 1988.

The unit was declared Commercial at 0900 hours on November 17, 1987 following completion of the 100 hour Reliability Demonstration Test (IST-2.01A.08). A reactor trip caused by a turbine trip occurred at 1406 hours on November 17, 1987. The underlying cause of the reactor trip was a thrust bearing failure signal which was accidentally initiated by an I&C Technician bumping and tripping the power supply switch to the turbine thrust bearing circuit supervisory instrument. The plant went critical on November 21, 1987, and was back at approximately 100% power on November 24, 1987. The plant ran uninterrupted at approximately 100% power for 65 days until a reactor trip occurred on January 27, 1988 at 0152 hours. The reactor trip was caused by a failure in the 4KV "A" Bus. A plant cooldown was subsequently initiated for a Mode 5 Maintenance Outage. On January 28, 1988 at 1920 hours, an "Alert" was declared due to failure of the Control Room Annunciator System caused by a very small fire in an Annunciator Bay Cabinet in the Control Building. The emergency classification was exited at 2245 hours following corrective actions. Upon completion of the Mode 5 Maintenance Outage, the plant returned to approximately 100% power on February 14, 1988. Section 3.0 of this supplement report contains a Post-Commercial Operations Chronolog for additional information.

2.0 DEFERRED POST-COMMERCIAL OPERATIONS TEST PROCEDURES

The test procedures found in this section could not be completed prior to Commercial Operations, and were deferred as concurred with by the Onsite Safety Committee and formally identified to the NRC. Several of the tests had scheduled deferred completion dates of December 31, 1987. A few of them could not be completed by that date and were deferred again. All remaining test procedures which could not be completed in the time frame of this supplement report have a scheduled completion date of the first refueling. This section will discuss test results for those test procedures completed after Commercial Operations, but prior to February 15, 1988. Another supplement report will be issued subsequent to the completion of any remaining testing after February 15, 1988 and prior to May 15, 1988.

2.1 Full Power Demonstration Test (IST-2.01A.08)

The Full Power Demonstration Test successfully demonstrated the reliability of the Nuclear Steam Supply System (NSSS) and verified warranted thermal output while maintaining the plant at 95 to 100% power for 100 continuous hours. This test was partially completed prior to Commercial Operations, and consisted of two parts: A 100 hour reliability demonstration test, and two separate 4-hour performance measurement tests done concurrently with the 100 hour reliability demonstration test at 40 to 50 hours and 90 to 95 hours into the 100 hour warranty run. At 0752 hours on November 17, 1987, just prior to declaration of Commercial Operations, the 100 hour reliability demonstration and 4 hour performance measurement test were successfully completed at approximately 95 to 100% power. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 7.6.11 of the original Startup Report.

The two 4-hour performance measurement tests at 99 to 100% power with steam generator blowdown flow isolated were unable to be performed at the specified conditions prior to Commercial Operations due to chemistry problems. However, the 4-hour test runs were performed at greater than 97% power and with steam generator blowdown in service. These performance measurements were determined to meet the intent of the test. However, it was still deemed desirable to perform a 4-hour run at conditions closer to warranty values (99 to 100% power if possible and with steam generator blowdown flow isolated). This run was deferred until after Commercial Operations with a required completion date of December 31, 1987.

On December 15, 1987, a 4-hour performance measurement test with steam generator blowdown flow isolated was satisfactorily completed at approximately 99% power as read on the nuclear instrumentation (approximately 97% power calculated). All of the required primary and secondary plant parameters were obtained and found to be acceptable.

2.2 Alignment of NIS (IST-2.02.01)

The NIS consists of eight independent channels: two source range channels, two intermediate range channels and four power range channels. Each of the three ranges (source, intermediate and power) provides some form of overpower reactor trip protection. The three ranges overlap, providing continuous protection from the source range (lowest neutron flux) through the power range. Each power range detector is separated into two ion chamber sections which transmit independent current signals. These two signals are proportional to upper and lower core neutron fluxes.

This test was satisfactorily completed prior to Commercial Operations except for determination of the power range channel detector current vs. high voltage saturation curves. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 7.4.2 of the original Startup

Report. The power range channel detector current vs. high voltage saturation curves could not be determined prior to Commercial Operations and were deferred with a required completion date of December 31, 1987.

On November 24, 1987, with the plant at approximately 100% power, the high voltage power supply of each power range channel was varied to ensure that the setting of 800 VDC was on the plateau region of the voltage curve. All acceptance criteria was met.

2.3 Verification of Plant Performance Following Plant Load Rejection/Trip From Power (IST-2.04.06)

Beaver Valley Power Station, Unit 2, was designed with the capability of sustaining a 100% full load rejection without a turbine trip or a reactor trip. This test performed a full load rejection from approximately 100% power prior to Commercial Operations, but did not satisfy all acceptance criteria. A detailed discussion about the full load rejection can be found in Section 7.2.5 of the original Startup Report.

The other portion of this test was to perform a turbine trip from 100% power. Data obtained from an inadvertent turbine trip from approximately 100% power prior to Commercial Operations was evaluated and found to be acceptable to satisfy the performance of the turbine trip portion of this test. A discussion about the turbine trip can be found in Section 7.2.5 of the original Startup Report.

As discussed in Section 7.2.5 of the orignal Startup Report, data collected during the inadvertent turbine trip and during the unsuccessful full load rejection turbine trips, could not be used for the Reactor Coolant Hot Leg Resistance Temperature Detector (RTD) time response evaluation. Retest 04-002 was generated to obtain the required RTD response time during the next inadvertent reactor trip from 100% power. Since the plant was declared Commercial on the day this retest was initiated, the retest and IST-2.04.06 were both deferred until prior to the first refueling. I&C was directed to connect a memory type strip chart recorder to the Th RTD outputs at the primary process racks to gather the required data for Westinghouse during the next reactor trip from 100% power. The recorder would automatically start upon a reactor trip, and Westinghouse would use this information to determine plant RTD time response. An inadvertent reactor trip occurred on November 17, 1987, subsequent to Commercial Operations, but prior to installing the strip chart recorder. Consequently, the RTD response time data was not obtained during this trip.

On January 27, 1988, an inadvertent reactor trip from approximately 96% power occurred due to loss of one Reactor Coolant Pump (2/3 Low Flow in one loop above 30% power). The recorder for collection of the overall RTD response time data functioned properly and collected the data necessary for RTD response time evaluation. The data was forwarded to Westinghouse for evaluation, but was determined not usable for the purpose of

RTD response time evaluation. The analysis assumptions for development of RTD response time criteria is that the full reactor coolant pump flows are maintained in all loops for the duration of the required RTD response time (7-10 seconds). The flow increase or decrease in any one loop can thus affect the RTD bypass flow and can invalidate the acceptance criteria.

At the time of this report, the data required by Retest 04-002 had not been obtained. Until this data can be obtained during another inadvertent reactor trip from approximately 100% power, the plant will continue to operate with reduced overpower and overtemperature setpoints. The results of Retest 04-002 will be discussed in another supplement report subsequent to completion of the retest.

2.4 Effluent Radiation Monitor Test (IST-2.43.01)

This test sampled selected effluent and process radiation monitors at 0-5%, 30%, 50%, 75% and 100% power during power ascension testing. Performance of the effluent and process radiation monitors was verified by comparison of selected inservice radiation monitor readouts to corresponding grab sample radiochemical analysis performed by gamma spectroscopy. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 7.6.8 of the original Startup Report.

One monitor, Gaseous Waste Surge Tank Transfer Monitor [2GWS-RQI101], could not be sampled prior to Commercial Operations and was deferred with a required completion date of December 31, 1987. The monitor did not have a convenient representative sample point to enable grab sample analysis/monitor readout comparison as required by the test. A special system lineup was developed to permit representative sampling downstream of the monitor. On December 22, 1987 with the plant at approximately 100% power, a grab sample was obtained for the Gaseous Waste Surge Tank Transfer Monitor [2GWS-RQI101]. No isotopes were identified in the grab sample, and all acceptance criteria was met.

2.5 Nuclear Power Range Calibration (BVT 2.1-2.2.3)

During the performance of the Startup Testing Program (IST-2.01A.10) at the 100% power plateau, a test change was made to perform BVT 2.1-2.2.3 in place of IST-2.03.02, "Measurement of Core Parameters During Steady State Conditions". The need to perform BVT 2.1-1.2.2, "Incore/Excore Axial Imbalance Monthly Check", at 100% power was also deleted. BVT 2.1-1.2.2 would have normally been performed in conjunction with IST-2.03.02 to check the calibration of the power range detectors. Due to results from these two tests at the 90% power plateau, it was decided that a calibration would be required at the 100% power plateau resulting in the aforementioned test change.

A Full Core Flux Map was obtained by BVT 2.1-8.3.1, "Incore Moveable Detector Flux Mapping Test", at 100% power and verified

that core peaking factors were acceptable. BVT 2.1-2.2.3 could not be performed prior to Commercial Operations. It was deferred until prior to November 27, 1987, and subsequently deferred with a required completion date of December 31, 1987.

On December 8, 1987, BVT 2.1-2.2.3, "Nuclear Power Range Calibration" was satisfactorily completed. A series of Quarter Core Flux Maps were performed at various axial flux differences. These maps were used to establish a linear relationship between incore axial offset and the excore detector currents. The calibration parameters were then developed for each of the Nuclear Power Range Instrumentation Channels. Each channel was calibrated using the appropriate Maintenance Surveillance Procedure. All acceptance criteria was met, and the testing performed in place of IST-2.03.02 was satisfied.

2.6 Verification of Reactor Plant Setpoints (PO-2.01A.03)

The initial reactor plant setpoints were verified by using the latest plant documentation and/or actual instrumentation module settings ensuring the equipment was aligned for the initial startup setpoint values. All setpoints fell within the required Technical Specification limitations. Final setpoint verification was started with the plant at 100% power, but could not be completed prior to Commercial Operations because several systems did not have the final setpoint values in place. The remainder of this test was deferred with a required completion date of the first refueling.

At the time of this supplement report, gathering of final setpoint values was still in progress. The results of final setpoint verification will be discussed in another supplement report after obtaining all final setpoint values.

2.7 Fuel Pool Cooling System Test (PO-2.20.01)

This test was satisfactorily completed prior to core load with the exception of Retest 20-003 which will measure Fuel Pool Cooling Pump 21A vibration the next time the Spent Fuel Pool is filled. Engineering resolution for high pump vibration during original testing modified the motor support stand by welding on stiffening plates. The pump motor was retested yielding acceptable vibration levels. The pump and motor were then recoupled, but the Spent Fuel Pool had already been drained. The Spent Fuel Pool will not be refilled until just prior to the first refueling so the test was deferred with a required completion date of prior to the first refueling.

At the time of this supplement report, refilling of the Spent Fuel Pool had not yet been started. The results of Retest 20-003 will be discussed in another supplement report subsequent to completion of the retest.

2.8 Spent Fuel Pool and Refueling Cavity Leak Test (PO-2.20.02)

This test was satisfactorily completed prior to core load with the exception of Retests 20-001 and 20-002. Retest 20-001 was generated when the gates between the Fuel Pool and Cask Area and between the Fuel Pool and Fuel Transfer Canal exhibited considerable leakage at the bottom seals. Repairs were made to both gates but the retest could not be performed until the next time the Spent Fuel Pool was filled. Retest 20-002 was generated when the Spent Fuel Pool instrumentation test could not be performed due to unavailability of the Spent Fuel Pool level transmitters. This retest required the Spent Fuel Pool to be filled to its high level. The Spent Fuel Pool will not be refilled until just prior to the first refueling so both retests were deferred with a required completion date of prior to the first refueling.

At the time of this supplement report, refilling of the Spent Fuel Pool had not yet been started. The results of Retests 20-001 and 20-002 will be discussed in another supplement report subsequent to completion of the retests.

2.9 Fuel Handling Equipment Test (PO-2.66.01)

This test verified control logic and demonstrated operability of the Fuel Handling Equipment and provided a functional demonstration of a simulated fuel transfer between the Fuel Building and Reactor Containment. Fuel Handling Equipment testing was satisfactorily completed to support core load although portions of the test were not done due to unavailability of equipment. Those portions of the test not available for testing prior to core load were completed prior to Commercial Operations except for testing of the RCC Change Fixture (Retest 06-005). A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 8.4 of the original Startup Report. Testing of the RCC Change Fixture (Retest 06-005) was deferred with a required completion date of prior to the first refueling.

At the time of this supplement report, testing of the RCC Change Fixture had not yet been started. The results of Retest 06-005 will be discussed in another supplement report subsequent to completion of the retest.

2.10 Cranes and Lifting Equipment Test (PO-2.66.02)

Control logic testing for the Reactor Containment Polar Crane and operability of its auxiliary hoist under load was successfully completed prior to core load. Polar Crane main hoist operability under load was checked during its load test and satisfactorily completed during reactor vessel head installation. Retest 66-007 was generated to test an indicating light on the telescoping work platform which was inoperative when in the maximum down position. Outstanding rework on the Spent Fuel Cask Crane was not completed prior to core load because it was thought to be safer to do it

without fuel in the Fuel Storage area. Retest 66-007 and the remainder of the test which tests the Spent Fuel Cask Crane, were deferred with a required completion date of prior to the first refueling.

At the time of this supplement report, electrical maintenance to repair the indicating light on the Polar Crane telescoping work platform, and testing of the Spent Fuel Cask Crane had not yet been performed. The results of Retest 06-007 and Spent Fuel Cask Crane testing will be discussed in another supplement report subsequent to ompletion of testing.

2.11 Verification of Performance Calculations (SOV-2.05A.03)

This test was performed at 30, 50, 75 and 100% power plateaus during Startup, and verified that the computer-generated performance calculations, Nuclear Steam Supply System (NSSS), and Balance of Plant (BOP) programs were accurate at these power levels. Deficiencies at lower power levels were cleared at subsequent power levels or Maintenance Work Requests were issued against deficiencies to perform troubleshooting with any required retests to be performed by existing plant procedures.

This procedure only satisfied a portion of the BVPS-2 Final Safety Analysis Report (FSAR) test objective that was required to be performed. This limited scope was justified by the fact that a comprehensive set of initial operating procedures for verifying the accuracy of the plant performance calculations was being developed and performed by the Computer Integration Group. These tests perform thorough verifications of all the programs and calculations related to the plant performance applications of the process computer system. The tests are designed in accordance with accepted software validation and verification standards, using test data sets to prove the accuracy of the program output. The accuracy of the field sensors was verified by the Phase 1 testing program. The accuracy of the raw value conversion into engineering units was verified by SOV-2.05A.03 as mentioned above. The total of final test results after completion, will fully satisfy all FSAR test objectives. The Computer Integration Group is continuing the testing per the Initial Operating Procedures. Deferral to beyond Commercial Operations was approved with the estimated completion date for this testing prior to initial criticality after the first refueling.

At the time of this supplement report, testing by the Computer Integration Group had not yet been completed. All test results will be discussed in another supplement report following completion of all testing.

2.12 Boron Recovery System Test (SOV-2.08A.01)

Portions of this test were completed prior to core load, but unavailability of the Charging System precluded completion of the entire test prior to core load. The remainder of the test was deferred until after core load and was required to be completed

prior to the need to process Reactor Coolant System (RCS) letdown. Testing was satisfactorily completed during Mode 5 with the exception of Retests 08A-002, 003, and 004. Retest 08A-002 (Retest of the Degas Trim Cooler to obtain acceptable heat transfer data), and Retests 08A-003 and 004 (Check of auto operation of the Temperature Control Valves to verify control of system temperature) were not completed at the time Commercial Operations was declared. These retests were scheduled to be completed when the "A" and "B" degasifiers were placed in service. The system was available to process RCS letdown. Both degasifiers were placed in Hot Standby Mode. They automatically shifted into service when feed flow was increased, then automatically shifted to Hot Standby when feed flow was secured, thus demonstrating the ability to process RCS letdown.

On December 1, 1987, with the "A" and "B" degasifiers in service, all three retests were performed with full available letdown yielding satisfactory results.

2.13 Solid Waste Disposal System Test (SOV-2.18.01)

This test was partially performed prior to core load and deferred until needed to provide solid waste disposal capabilities at BVPS-2. As of Commercial Operations, only a portion of the test was satisfactorily completed. A discussion on that portion completed prior to Commercial Operations can be found in Section 8.8 of the original Startup Report.

Transfer of Spent Resin from the Spent Resin Holding Tank to the Decanting Station was satisfactorily completed by December 8, 1987. During testing, the Decant Metering Pump exhibited high flow. Pump flow rate was adjusted, and the pump retested with satisfactory results. Testing of the Steam Generator Evaporator Bottoms Drumming Station Recirculation and Feed System was satisfactorily completed by February 15, 1988. The Evaporator Bottoms Metering Pump exhibited high flow which was subsequently resolved following pump stroke adjustment and retest.

Design changes, procurement of parts, and clearing of deficiencies precluded completion of remaining testing during the period covered by this supplement report. The remainder of the test will be completed as needed to provide solid waste disposal capabilities at BVPS-2. At present, the ability to dispose of radioactive solid waste disposal is still possible through cross-ties with BVPS-1. Test results will be discussed in another supplement report upon completion of remaining testing and resolution of deficiencies.

2.14 Gaseous Waste System Test (SOV-2.19.02)

This test was partially performed prior to core load, but deferred until needed during power ascension testing because supporting systems were not ready to support required testing. Prior to Commerical Operations, the logic and performance tests of the Boron Recovery Degasifier Gaseous Waste System including the

overhead gas compressors were satisfactorily completed. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 8.9 of the original Startup Report.

The After Condenser Gaseous Waste Subsystem testing could not be completed prior to Commercial Operations due to modifications to the condenser air ejector exhaust portions of the system. Deferral of this portion of the test was approved with completion required subsequent to the modifications and prior to the first refueling. The modifications involved adding blowers between the air ejectors and the charcoal delay beds, and were completed in December, 1987.

Proper operation of the After Condenser Gaseous Waste Subsystem including performance data for the Air Ejector Blowers was satisfactorily completed by December 23, 1987. Both Air Ejector blowers exhibited high vibration which was thought to be due to the high background vibration caused by large condensate piping in the area. Operations and Engineering are currently performing further analysis of the high background vibration. Any further testing, if required, will be done under approved station procedures.

2.15 Measurement of Steam Generator Moisture Carryover (SOV-2.2.A.01)

The purpose of this test was to verify that the average Steam Generator Moisture Carryover does not exceed 0.25% with the plant operating at 99 to 100% power. Performance of this test could not be completed prior to Commercial Operations and was deferred with a required completion date of December 31, 1987.

On December 4, 1987 with the plant operating at 99-100% power as indicated by Nuclear Instrumentation, radioactive Sodium-24 tracer was injected into each steam generator. Grab samples for isotopic analysis were taken on each main steam line, the common feedwater supply line, and each steam generator liquid space to provide the primary data for calculating percent moisture carryover. Calculated percent moisture carryover was 0.0234%, which was more than a factor of 10 lower than the maximum allowable limit of 0.25%. Because this moisture carryover was so low, optional additional testing provided by the test (reduced power range of 96 to 100%, and/or reduced steam generator level at approximately 40% with power between 99 and 100%) was not performed with Westinghouse Technical Advisor concurrence. This optional testing would normally have been performed if results of the initial testing were borderline or unsatisfactory, which was not the case.

Isokinetic sample flow rates could not be achieved for each of the main steam line samples. Westinghouse was consulted for recommended corrective action. Their recommendation was to redetermine moisture carryover using blowdown sample R factors, which did not require isokinetic sample flow rates, in place of the R factors which are determined independently from isokinetic main steam line samples. Recalculated moisture carryover equaled

0.0237%, which agreed extremely well with 0.0234% moisture carryover determined by using the main steam line R factors. The conclusion drawn from this was that the sampling technique (i.e., the reduced sample flow rates) for the main steam line samples was adequate since it had virtually no impact on the final moisture carryover calculated.

It should be noted, that at the time of this test, an evaluation was in progress to determine the accuracy of the feedwater flow measurements used in the plant calorimetric to arrive at the reactor plant power level. With this evaluation in progress, there was some question as to whether the required plant power level of 99-100% was achieved for the test. From a review of the calorimetric history of the plant (both operations and testing), it was determined that the worst case possibility was that the plant power level could have been as much as 2.5% below the test requirement. This issue was addressed to Westinghouse for evaluation; their response was that a 2.5% power increase would cause approximately a 10% increase in moisture carryover. With the order of magnitude that this test passed (.024% carryover), it was determined that the .25% acceptance criteria would have been met even in the worst case scenerio relative to power level.

2.16 Automatic Steam Generator Water Level Control Test (SOV-2.24C.01)

This test was performed at various modes and power levels during the Startup Testing Program. A detailed discussion on that portion of the test completed prior to Commercial Operations can be found in Section 7.3.3 of the original Startup Report.

During Startup at the 30, 50, 75, and 100% power plateaus, each steam and feedwater flow transmitter output signal was compared to the associated calorimetric flow computed from test gauges in accordance with IST-2.02.06, "Thermal Power Calorimetric Test". At each power level, the feedwater and steam flow rates which were calculated did not agree with the calorimetric flow rate criteria. A copy of the test data was forwarded to I&C to make the necessary adjustments to both the feedwater and steam flow transmitters. These adjustments and the remainder of the test were not completed prior to Commercial Operations, and were deferred with a required completion date of the first refueling. The last section in this test will obtain additional flow data at 100% power to determine the need for further adjustments, and to demonstrate repeatability of the feedwater and steam flow transmitters at 30, 50, 75, and 100% power during a subsequent plant startup.

At the time of this report, I&C had not made the necessary adjustments to both the feedwater and steam flow transmitters. This still precludes the completion of the remainder of this test. Note that I&C had determined that there was no problem with a steam flow/feed flow mismatch and recommended that plant operation continue until final adjustments and checks can be performed. Test results will be discussed in another supplement report upon completion of the remainder of testing.

2.17 Steam Generator Blowdown System Test (SOV-2.25.01)

This test was completed prior to Commercial Operations except for clearing of minor deficiencies which occurred prior to Commercial Operations, and verification of operating parameters for the Cleanup Ion Exchangers and the "B" Steam Generator Blowdown Evaporator. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 8.11 of the original Startup Report. The remainder of the test was deferred with a required completion date of the first refueling.

The Cleanup Ion Exchanger was tested following Commercial Operations, but at the time of this supplement report, resolution of deficiencies against the Cleanup Ion Exchanger were still pending. Test results will be discussed in another supplement report upon completion of remaining testing and resolution of deficiencies.

2.18 Auxiliary Boilers Test (SOV-2.27.02)

Portions of this test were satisfactorily completed prior to core load. The remainder of the test was deferred due to modifications that required an auxiliary boiler outage. Control logic and operating parameters for various components in the Auxiliary Boiler System were satisfactorily completed prior to Commercial Operations. The "A" and "B" Auxiliary Boiler Feedwater Pumps exhibited high vibration during the performance runs of the "A" and "B" Auxiliary Boilers. In addition, the "B" Boiler was unable to obtain 100% boiler capacity. These deficiencies were not cleared prior to Commercial Operations and were deferred with a required completion date of the first refueling. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 8.12 of the original Startup Report.

Additional performance runs on both the "A" and "B" Auxiliary Boilers were performed following repair of firebox refractory in both auxiliary boilers after Commerical Operations with the vendor present to verify design capacity and to clear remaining deficiencies. Both the "A" and "B" Auxiliary Boilers performed satisfactorily meeting their required boiler capacities of 150,000 lbs/hr. The "A" Auxiliary Boiler Feedwater Pump still exhibited high vibration even after pump re-alignment by Maintenance. Engineering evaluation requested that the pump be run uncoupled from the motor, and vibration readings checked again. On February 10, 1988, Maintenance obtained vibration readings with the pump and motor uncoupled. Maintenance accepted the present vibration as-is and determined that no repairs or rework were necessary. A spare motor was stocked for any future corrective action. The "A" and "B" Boiler Furnace outlet temperatures were high. Engineering evaluation in conjunction with the boiler vendor, Babcock & Wilcox, determined that the high exit gas temperatures were not a problem because the carbon steel flue can withstand considerably higher temperatures. They also determined that although the temperatures were high, which indicates that the efficiency is below guaranteed, operation of the boilers can continue. This

test was considered complete, but Engineering is pursuing that the boiler vendor obtain additional data/inspections. Any additional data required as a result of Engineering's endeavors will be performed in accordance with approved station procedure.

2.19 Main Plant Carbon Dioxide System Test (SOV-2.33A.01)

This test was partially performed prior to core load, but could not be completed and was deferred until prior to September 30, 1987. A fire watch was set up in those areas where equipment was required to be operable. Testing continued and was deferred again with a required completion date of October 31, 1987. A discussion on deferred testing and on that portion of the test completed prior to Commercial Operations can be found in Section 8.13 of the original Startup Report.

Three C02 System Fire Protection Zones (Zones 1, 2 and 3) required retesting which could not be completed by the latest deferral date of October 31, 1987. Retesting of these three zones was deferred with an expected completion date of December 31, 1987. Retesting could not be completed prior to Commercial Operations because of required additional hardware modifications due to ventilation interface problems which acted as leakage paths, preventing acceptable C02 concentration levels at all sample points in the zones. These modifications included replacement of fire dampers to prevent overpressurization and reduce leakage, upgrading of door seals, an additional 24 ton supplementary C02 storage tank to provide adequate reserve capacity for Zone 1, and piping changes prior to additional C02 concentration and logic testing for these zones. The completion date for these areas was limited by the procurement and delivery of additional dampers, and the completion of identified modifications.

C02 concentration and logic retesting of C02 Fire Protection Zones 1, 2, and 3 were satisfactorily completed by December 30, 1987. In addition, Zone 3 (Cable Tunnel, Cable Vault, and Rod Control Area) was interlocked with its sub-area Zone 7 (Relay Room), and the automatic function of this interlock successfully tested. Logic testing of the manual actuation interlock for Zones 3 and 7, and for the new 24 ton C02 reserve tank and associated components were not completed at that time and deferred with an expected completion date of January 31, 1988.

On January 29, 1988, final acceptance testing of the new 24 ton C02 reserve tank and logic testing of the manual actuation interlock between Zones 3 and 7 were successfully completed. Modifications to implement the manual actuation interlock between Zones 3 and 7 are currently underway and it is anticipated that this work will be completed in the near future. No further logic testing of this modification is required.

Those test deficiencies generated during C02 system testing and still outstanding after January 31, 1988, were reviewed and determined not to impair operation of this fire protection system.

These deficiencies were subsequently closed following engineering disposition and/or field repairs.

2.20 Plant Communications Test (SOV-2.40A.01)

The Fuel Load Dedicated Calibration Jack System was satisfactorily completed prior to core load. Operability of the Communications System was proven prior to core load with the remainder of the test deferred until prior to Commercial Operations. The Intra Plant Page/Party System, audibility of the "Standby" and "Evacuation" alarms, and Plant Telephone System (PAX lines) were tested prior to Commercial Operations with several test deficiencies. Several broken telephones required repair. Background noise levels and evacuation alarm decibel levels throughout the plant did not meet the required acceptance criteria. Engineering was given the data and requested to evaluate and resolve the audibility problems. Completion of the test was then deferred until prior to December 31, 1987, and subsequently to the first refueling.

At the time of this supplement report, PAX telephone repairs and proper orientation and repair of speakers through the site precluded completion of any testing. All test results will be discussed in another supplement report upon completion of testing.

2.21 Fuel Building, Decontamination Building, and Pipe Tunnel Area HVAC Systems Test (SOV-2.44B.02)

This test was partially performed prior to core load with completion deferred until prior to the first refueling. Testing of the Decontamination Building and Pipe Tunnel Area Ventilation Systems was satisfactorily completed prior to Commercial Operations. A discussion on that portion of the test completed prior to Commercial Operations can be found in Section 3.1.5 of the original Startup Report. The Fuel Building Ventilation System was also tested prior to Commercial Operations, but deficiencies still needed to be resolved prior to the first refueling. Although deficiencies still existed, the system was operational and provided proper cooling ventilation to required components for power operations.

Subsequent to declaration of Commercial Operations, all deficiencies related to the Fuel Building Ventilation System were resolved. A unit heater which ran intermittently had its fan motor replaced and was operationally checked out to be satisfactory. The Fuel Building Air Conditioning Unit (ACU) exhibited high fan vibration and speed. Engineering evaluation of fan speed declared it acceptable. Maintenance was requested to balance the the ACU fan to correct for high vibration, but declared the fan/motor assembly operation acceptable as-is. Maintenance decided to stock a spare fan/motor assembly for any future corrective maintenance. The overall heat transfer rate for the Fuel Building ACU cooling coils did not meet the acceptance criteria. Engineering evaluation declared the heat transfer rate acceptable, but stated that the cooling coils should be inspected

and cleaned as necessary. This work was transferred to Maintenance for completion, and this test was considered satisfactorily completed. On February 23, 1988, the cooling coils were inspected by Maintenance and found to be clean. Monitoring of the performance of this cooling coil will be performed by approved station procedures.

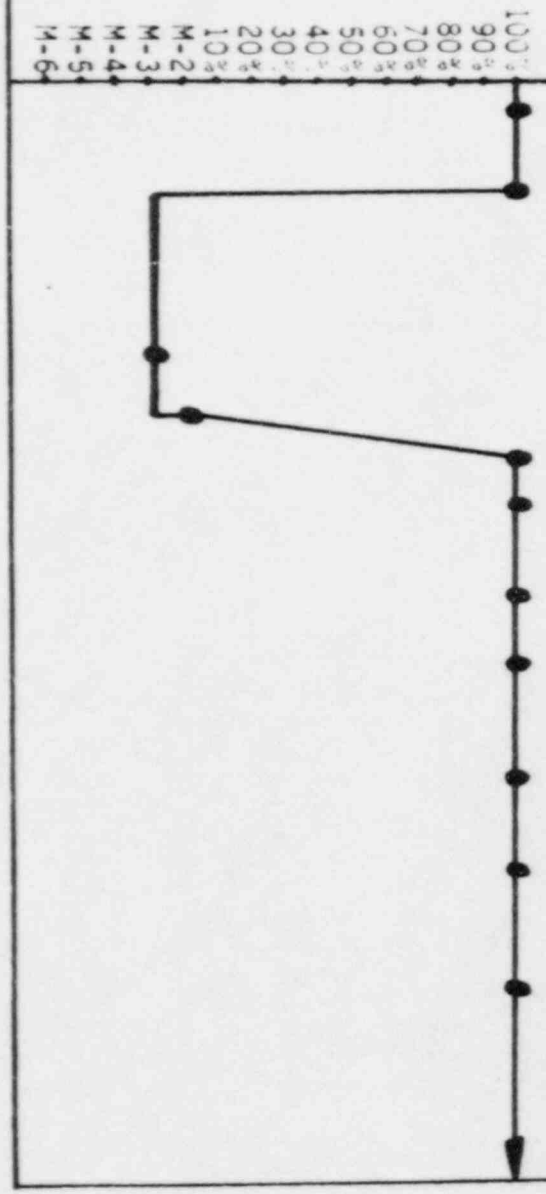
2.22 Non-QA Category I Heat Tracing Sytem Test (SOV-2.45D.01)

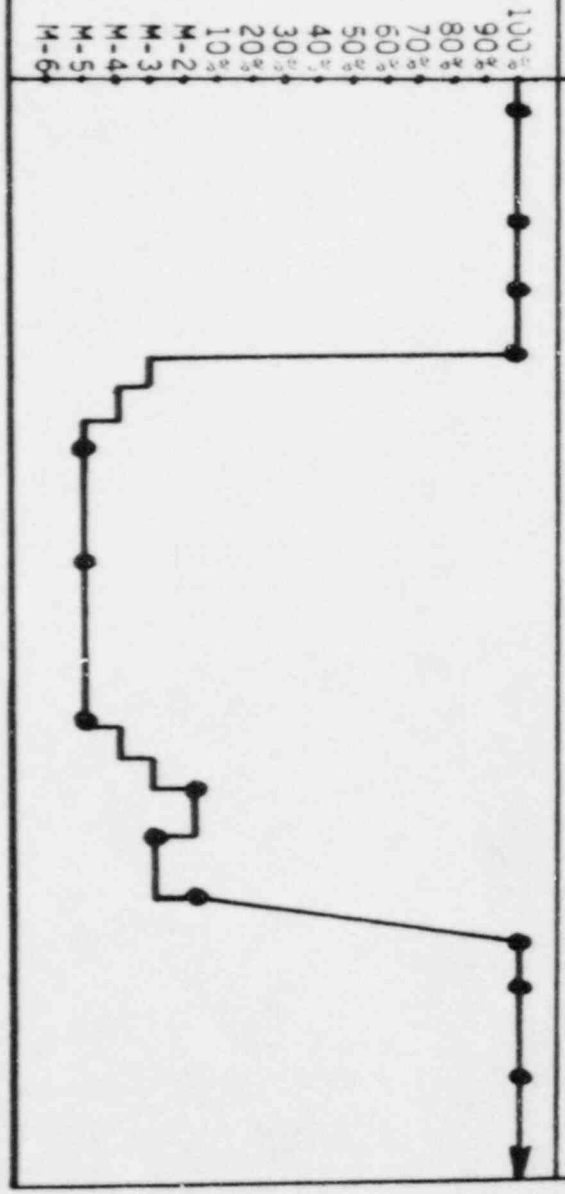
Testing of control logic and the ability to maintain system fluid temperatures within design specifications for the following systems was completed following Commercial Operations:

Quench Spray System
Water Treatment Demineralizer System
Condensate System
Steam Generator Blowdown System
Solid Waste Disposal System
Chemical & Volume Control System
Gaseous Waste Disposal System
Containment Vacuum System
Reactor Coolant System

The test had been deferred several times due to incomplete testing and deficiencies with the system. The current required completion date is prior to the first refueling. Several deficiencies still exist following completion of testing. At the time of this supplement report, clearing of test deficiencies on the various Heat Trace Systems was still in progress. Final test results will be discussed in another supplement report subsequent to clearing of all Heat Trace test deficiencies.

3.0 POST-COMMERCIAL OPERATIONS CHRONOLOG

PLANT CONDITIONS	EVENT	DATE
	COMMERCIAL OPERATIONS DECLARED. PLANT AT APPROXIMATELY 100% POWER.	11/17/87 @ 0900 hours
	REACTOR TRIP DUE TO A TURBINE TRIP CAUSED BY A THRUST BEARING FAILURE SIGNAL WHICH WAS ACCIDENTALLY INITIATED BY AN I&C TECHNICIAN BUMPING AND TRIPPING THE POWER SUPPLY SWITCH TO THE TURBINE THRUST BEARING CIRCUIT SUPERVISOR INSTRUMENT.	11/17/87 @ 1406 hours
	COMPLETION OF THE STARTUP TESTING PROGRAM TEST (1ST-2.01A.10).	11/18/87
	REACTOR CRITICAL.	11/21/87
	PLANT BACK AT APPROXIMATELY 100% POWER.	11/24/87
	COMPLETION OF POWER RANGE DETECTOR HIGH VOLTAGE CHECKS AT 100% POWER (VII.K, 1ST-2.02.01).	11/24/87
	COMPLETION OF THE BORON RECOVERY SYSTEM RETESTS (08A-001, -002, -003, SOV-2.08A.01).	12/1/87
	COMPLETION OF MEASUREMENT OF STEAM GENERATOR MOISTURE CARRYOVER AT 100% POWER (VII.A, SOV-2.21A.01)	12/5/87
	COMPLETION OF OBTAINING A FLUX MAP AND NUCLEAR POWER RANGE CALIBRATION AT 100% POWER (BVT 2.1-2.2.3)	12/8/87
	COMPLETION OF TESTING CAPABILITIES TO TRANSFER SPENT RESIN FROM THE SPENT RESIN HOLDING TANK TO THE DECANTING STATION (VII.B, SOV-2.18.01).	12/8/87
	COMPLETION OF A 4-HOUR PERFORMANCE MEASUREMENT TEST AT 100% POWER WITH BLOWDOWN ISOLATED (VII.A, 1ST-2.01A.08).	12/15/87

PLANT CONDITIONS	EVENT	DATE
	COMPLETION OF TESTING THE FINAL RADIATION MONITOR IN THE EFFLUENT RADIATION MONITOR TEST AT 100% POWER (VII.E, IST-2.43.01).	12/22/87
	COMPLETION OF THE GASEOUS WASTE SYSTEM TEST (VII.E, SOV-2.19.02)	12/23/87
	COMPLETION OF THE AUXILIARY BOILER TEST (SOV-2.27.02).	1/18/88
	REACTOR TRIPPED FOLLOWING A FAILURE IN THE 4KV "A" BUS. A PLANT COOLDOWN WAS SUBSEQUENTLY INITIATED FOR A MODE 5 MAINTENANCE OUTAGE.	1/27/88 @ 0152 hours
	COMPLETION OF RESOLVING ALL DEFICIENCIES TO COMPLETE THE FUEL BUILDING, DECON BUILDING, AND PIPE TUNNEL AREA HVAC SYSTEM TEST (SOV-2.44B.02).	1/28/88
	A UNIT 2 "ALERT" WAS DECLARED DUE TO FAILURE OF THE CONTROL ROOM ANNUNCIATOR SYSTEM CAUSED BY A VERY SMALL FIRE IN AN ANNUNCIATOR BAY CABINET. THE EMERGENCY CLASSIFICATION WAS EXITED AT 2245 HOURS FOLLOWING CORRECTIVE ACTIONS.	1/28/88 @ 1920 hours
	COMPLETION OF THE MAIN PLANT CO2 SYSTEM TEST (SOV-2.33A.01)	1/29/88
	REACTOR CRITICAL.	2/10/88
	PLANT RETURNED TO MODE 3 DUE TO A PACKING LEAK (~7 gpm) ON [2RCS*MOV537].	2/10/88
	REACTOR CRITICAL.	2/12/88
	PLANT BACK AT APPROXIMATELY 100% POWER.	2/14/88
	COMPLETION OF EVAPORATOR BOTTOMS DRUMMING STATION RECIRCULATION AND FEED SYSTEM TESTING (VII.D, SOV-2.18.01)	2/15/88
	PLANT CONTINUING 100% POWER OPERATION.	2/15/88