PEACH BOTTOM ATOMIC POWER STATION

UNIT NOS. 2 AND 3

ANNUAL PLANT MODIFICATION REPORT

January 1, 1983 through December 31, 1983

Submitted to

The United States Nuclear Regulatory Commission

Pursuant to

Facility Operating Licenses Nos. DPR-44 & DPR-56

Docket Nos. 50-277 & 50-278

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Preparation Directed By:
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PEACH BOTTOM ATOMIC POWER STATION

ANNUAL PLANT MODIFICATION REPORT

This report for Peach Bottom Atomic Power Station Units No. 2 and 3, License Nos. DPR-44 and DPR-56, is issued in fulfillment of the reporting requirements of 10 CFR 50.59. The report covers modifications that were complete in 1983, including changes made to the facility as the facility is described in the safety analysis report.

For each of the modifications, tests or experiments included in this report, the safety evaluation performed indicated that an unreviewed safety question as defined in 10 CFR 50.59(a)(2) was not created; in that (i) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report was not increased, or (ii) a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report was not created, or (iii) the margin of safety as defined in the basis for any technical specification was not reduced.

Changes to the Technical Specifications were required for some of the modifications, tests or experiments included in this report. Those requiring Technical Specification changes are noted in the descriptions of the applicable modifications, tests or experiments.

UNIT 2

The Replacement of the HPCI Gland Seal Condenser Condensate Pump

A modification to replace the defective HPCI gland seal condenser condensate pump was completed. The replacement pump was an upgraded model from the manufacturer of the original pump. This modification involved cutting and threading the existing suction and discharge piping to accommodate the newer pump's larger dimensions.

Installation of a Fuel Pin Puncturing Process Exhaust Line to SBGT

A modification to install a fuel pin puncturing process exhaust line to SBGT was completed. This modification involved installation of a 2" copper exhaust line from the fuel pool area, where fuel pin puncturing is performed, to the standby gas treatment piping on elevation 195', in the reactor building.

The purpose of the modification is to provide a direct exhaust path to the SBGT system to eliminate airborne releases at the fuel floor during the fuel pin puncturing process.

Motor Control Center Control Fuse Replacement

A modification to replace Motor Control Center (MCC) 120 volt control fuses was completed. This modification involved replacement of the NON type fuses with lower capacity FRN dual element slow blow fuses. The purpose of the modification was to increase the reliability of the control transformers and associated equipment.

The previous MCC control fuses did not adequately protect their supply transformers. Previously, grounded control wiring provided short circuit paths to control transformer secondary wiring which resulted in transformer failures rather than blown control fuses. Additionally, protection against continuous overloads of lower magnitude was not provided. The dual element slow-blow replacement fuse characteristics are such that they allow a time lag on normal current surges and temporary overload conditions.

This modification was completed for both units and common MCC's on May 4, 1983.

Offgas Hydrogen Analyzers (Helium-Immune)

The temporary installation of helium-immune offgas hydrogen analyzers to be used during helium leak testing of the main condenser was completed.

Increased vacuum leakage on the Unit 2 main condensers was observed upon startup of the plant on December 3, 1983, following an extended maintenance outage. Consequently, the offgas holdup pipe flow was higher, resulting in a reduced holdup period and higher release rates to the environment. The application of helium tracer gas and mass spectrometer detection is the most effective means available to identify the sources of vacuum leakage. However, the existing offgas hydrogen analyzers are of the thermal conductivity type which cannot differentiate between helium and hydrogen. An alternate type of hydrogen analyzer which can differentiate between the two gases is required to provide an accurate measure of offgas hydrogen concentration during helim leak rate testing.

A temporary Technical Specification Application was submitted to allow bypassing the mechanical compressor trip function for 8 hours per day for the 30 days starting with the initiation of the

helium leak test as long as hydrogen concentration and recombiner differential temperature are continuously monitored.

Ex-Core Neutron Flux Monitor

A modification dealing with an ex-core neutron flux monitor was completed. This modification involved the temporary installation, during a 1982 outage, of an ex-core neutron flux monitor to determine the feasibility of using such a system to meet the requirements of NRC Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident."

NRC Regulatory Guide 1.97 requires that neutron flux be monitored during and following an accident over the range of 10E6 to 100% power. The instrumentation must meet more stringent design and qualification criteria than are applicable to the present neutron monitoring system. Philadelphia Electric is working with the BWR Owners' Group to develop ways to comply with the requirements of Regulatory Guide 1.97.

One of the tasks performed by the BWR Owners' Group was a calculation of the level of neutron flux leakage through the biological shield at low power levels. Once this value was obtained, a vendor of PWR ex-core neutron flux instrumentation modified their monitor for the expected range of BWR flux levels. The installation of this monitor at Peach Bottom will provide experimental verification of the BWR Owners'Group calculation.

A neutron flux detector and amplifier was mounted inside the drywell. An indicator was installed in an accessible location in the reactor building. During startup, reactor power level was correlated with the output of the neutron flux monitor.

The monitor was removed on September 23, 1983, completing the experiment.

Containment Protection Screens for Purge and Vent Valve Penetrations

A modification to install debris screens on the containment purge and vent valve penetrations was completed on July 22, 1983. This modification involved the installation of debris screens on penetrations N-25, N-26, N-205B and N-219. As reported to the NRC in Philadelphia Electric Company's Peach Bottom Annual Plant Modification Report for modifications completed in 1982, a debris protection screen was inadvertently installed on penetration N-205A (torus vacuum breaker pipe) in 1982 when it should have been installed on penetration N-205B (torus exhaust pipe). During 1983, the debris protection screen was removed from penetration N-205A and installed on N-205B. All debris screens are Q-listed. The purpose of this modification is to ensure that containment purge and vent valve closure will not be prevented by debris which would potentially become entrained in the escaping air and gas following a LOCA.

Extraction Steam Lines - Air Operated Stop Valves

A modification to install air actuated butterfly type stop valves in series with the existing bleeder trip valves on the extraction steam lines to feedwater heaters 3, 4, and 5 was completed on August 28, 1983. This modification involved the installation of nine (9) valves on each unit. One 24-inch valve was installed in each of the extraction steam line to the three 3rd feedwater heaters, one 14-inch valve was installed in each extraction steam line to the three 4th feedwater heaters, and one 18-inch valve was installed in each extraction steam line to the three 5th feedwater heaters. The valves are fail-closed pneumatic stop valves which require an air pressure of 80-100 psig to open. These valves are interlocked to close on high level in the 3rd, 4th and 5th feedwater heaters. The purpose of this modification was to prevent damage to the existing bleeder trip valves by having them perform only a check valve function. In addition, these new stop valves provide added turbine protection from water induction.

This modification was completed on Unit 2 on June 10, 1982, and completed on Unit 3 on August 28, 1983.

Post-Accident Sampling System

A modification to install a General Electric designed post-accident sampling system in the recirculation MG set rooms of Unit 2 and Unit 3 is operational and the Post Implementation Review Information Report, as required by NUREG-0737, was submitted to the NRC on January 31, 1983.

This modification provides the capability of obtaining and handling samples under all expected accident conditions where personnel exposure to radiation will be less than 100 mr/hr. This modification involved the following:

(1) Location of sample stations and auxiliary equipment in the MG set rooms; this equipment includes sample station with lead shield, control panel, water chiller, tracer cylinder, nitrogen cylinder, demin water tank, and inter-connecting piping and tubing.

(2) Sample cooler installation in reactor building adjacent to reactor building penetration previously installed.

(3) Running of new CAD system sample line for post-accident gas samples. These lines are heat traced and insulated.

(4) Installation of liquid and gas sample return lines for returning samples to torus after sample drawn.

(5) Installation of two RHR sample lines downstream of existing RHR sample line isolation valves.

(6) Installation of jet pump sample line from a non-calibrated jet pump instrument line (downstream of its excess flow check valve).

(7) Installation of liquid sample return tie-in to the torus via the core spray full flow test line.

(8) Installation of RBCCW supply and return tie-ins for cooling water of the liquid sample cooler.

(9) Installation of reactor building penetration (10" diameter) in wall of recirculation MG set room to allow for piping and conduit required for sample station operation in the room.

UNIT 3

Main Steam Safety/Relief Valves

A modification to enlarge the base to body flange flexitallic gasket grove outside diameter from 7 15/32" to 7 3/4" was completed. The purpose of the modification is to eliminate the external steam leaks common to these valves. The replacement flexitallic gasket is wound with zinc-plated carbon steel to inhibit base material corrosion.

HPCI Startup Transient Improvement

A modification to the HPCI governor control system, so that the control valves will be partially shut when steam is admitted, was completed. The purpose of this modification was to provide a more controlled opening of the turbine control valves thus increasing the stability of HPCI startup operation.

The modification consists of the installation of a check valve in a line which bypasses the hydraulic pump (type EG-R) during the time when the turbine is not running. This allows control oil at reduced pressure (80 psig) to be supplied to the control valve remote servo from the auxiliary oil pump for control actuation during startup. After the turbine starts, the internal oil pump within the hydraulic actuator takes over and supplies the control oil at the normal pressure (400 psig). The normal oil pressure closes the check valve and the system operates normally. In addition, to get the control system to call for the governor to close on startup, the idle point on the ramp generator is reduced and the ramp slope adjusted to keep the relative ramp time constant.

Replacement of HPCI High Exhaust Pressure Switch

A modification to replace a defective Q-listed pressure switch with a temporary non-Q-listed switch to monitor HPCI high exhaust pressure was completed. The Q-listed switch (PS-23-97B) was water damaged and there was a long lead time in procuring a new Q-listed replacement. A new switch has been ordered and will be installed when it arrives.

The modification involved replacing the present static-o-ring switch with a different model static-o-ring switch. The differences in the specifications of both switches were reviewed by the Plant Operational Review Committee and deemed to be acceptable for use during the period of temporary installation without compromising plant safety.

Recirculation Lube Oil Pump Logic Modification

A modification to the recirculation motor/generator (M/G) lube oil pump logic to eliminate the possibility of running the recirculation M/G set with low-low oil pressure was completed. A flaw was discovered in the logic which required placing a diode in series with contact 5-6 of relay 2A K-31A. The modification allows the logic to conform to the intended design logic of the FSAR.

Replacement of 'D' RHR Heat Exchanger Tube to Shell Differential Pressure Transmitter

A modification to replace the "D" RHR heat exchanger tube to shell differential pressure transmitter was completed. The purpose of the modification was to replace a defective Gemac pressure transmitter, for which spare parts were unavailable, with a new Rosemount transmitter.

The replacement transmitter is Q-listed with no environmental qualifications required. Its purpose is to provide remote alarming only, and provides no active safety-related functions. The only safety-related function of this transmitter is the maintenance of primary containment pressure integrity, for which this Rosemount model has previously been qualified.

Turbine Steam Seal Unloading Valves Sensing Line Modification

A modification to allow testing and calibrating of the turbine steam seal unloading valves during low pressure rotor prewarming was completed. This modification involved installing block and vent valves on each valve's sensing lines. In addition, the existing valve on the top of the valve's diaphragm was removed and capped. With the old piping arrangement, the sensing signal could not be blocked out for proper valve adjustment.

Repair of the 3C HPSW Pump Motor Upper Thrust Bearing Housing Studs

A modification to repair the 3C HPSW pump motor upper thrust bearing housing studs was completed. This modification involved drilling and tapping two of the damaged stud holes from 1/2" to 3/4" and replacing the original studs with 3/4" Grade 5 studs. The purpose of the modification was to repair the damaged alignment studs and return the motor to service.

Replacement of the RCIC Pump Suction Pressure Transmitter

A modification to replace the existing RCIC pump suction pressure transmitter was completed. The purpose of the modification was to replace a defective Gemac pressure transmitter with a new Rosemount transmitter. A direct replacement was unavailable.

This transmitter provides remote indication in the control room and on the emergency shutdown panel. The replacement transmitter meets the old transmitter's design specification. The Rosemount transmitter is Q-listed and performs no active safety functions. The only safety function is the maintenance of the pressure boundary integrity for which the Rosemount model has been previously approved.

Removal of Automatic Controller from HPSW Discharge Valves

A modification to delete the automatic pressure controller from the control circuit for the HPSW discharge valves was completed. This modification involved replacing the automatic controller with a conventional motor operated valve control with a hand switch in the control room. The purpose of the controller was to maintain a positive differential pressure between the HPSW system and the RHR system. This circuit has been jumpered out since the plant went in service due to failure of the system to operate as designed. This modification changes the circuit to agree with the way the plant has been operated. This was completed on Unit 2 during the 1982 refuel outage and the 'A' and 'C' discharge valves were completed during the 1981 refuel outage on Unit 3. The 'B' and 'D' discharge valves were completed during the 1983 Unit 3 refuel outage and successfully pre-oped on June 21, 1983. This completed the entire modification for both units.

Condensate Pump Vibration Monitoring System

A modification to install a vibration monitoring system on the three condensate pumps was completed. The modification involved replacing an existing condensate pump differential temperature monitoring system and installing a new vibration monitoring system. The previous differential temperature monitoring system proved ineffective as a method of detecting accidental operation of a condensate pump with a closed discharge valve. The vibration system will provide instrumentation to aid in the early detection of pump trouble. The Unit 3 pre-op was performed satisfactorily on August 22, 1983.

Feedwater Startup Control Valve

A modification to install a feedwater startup control valve on the 'C' reactor feed pump was completed. The modification involved the installation of a blocking valve, a control valve, connecting piping, and control cable for the operation of the control valve around the 'C' reactor feed pump discharge. The purpose of this modification is to allow a feed pump to continuously feed the reactor vessel through the control valve rather than an 18" gate valve. Installation was completed on Unit 2 during the 1982 refueling outage, and on Unit 3 during the 1983 refueling outage.

This modification will not change the operation of the system except to allow a feed pump to continuously feed the reactor vessel through the control valve rather than through a throttled 18" gate valve. This will improve the reactor water level control and minimize thermal cycling in the feedwater nozzles.

Core Spray Test Line Orifice

A modification to install new and redesigned flow restricting orifices in the Core Spray System test return line to the torus was completed. The Core Spray System test return line flow control valve had experienced moderate to severe vibration over the years resulting in damage to the motor operator and to the valve internals. The cause of the vibration was attributed to cavitation at the existing restricting orifice and at the test valve. The purpose of the modification was to eliminate the cavitation in the existing restricting orifice and test valve. The new orifice was designed for one pump flow.

Recombiner Jet Compressor Condensation Removal

A modification to reduce moisture problems in the offgas system during startup and operation was completed. This modification consisted of replacing the drain line from the recombiner jet compressor drain valve and verifying that the jet compressor drain valve and hi-hi alarm operate properly. The drain line was replaced and rerouted to provide better drainage. This modification was completed satisfactorily on the Unit 3 'A' and 'B' jet compressors on August 29, 1983.

Main Steam Line Flow Instrument Shutoff Valves

A modification to the Main Steam line flow instrument sensing lines was completed. The modification involved installing a second shutoff valve in the sensing line of 24 main steam line

flow instruments. The purpose of the modification was to allow for redundant isolation during calibration or maintenance of these instruments. This modification was completed on Unit 3 on August 3, 1983.

Containment Atmospheric Control System (CACS) Purge and Vent Valves Seismic Qualification

A modification to the CACS purge and vent valves was completed. The modification consisted of upgrading and modifying the local air supply to each containment atmospheric control system purge and vent valve to meet seismic requirements. In addition, this modification provided positive position control on each of these valves to assure that closure against design pressures will occur in the event of a LOCA. The work consisted of installing mechanical stops and setting the stops to permit the valves to open a maximum of 40 degrees. Finally, this modification involved the relocation and/or addition of piping restraints to assure that containment isolation capability will exist during and following a design basis earthquake. A change to the Technical Specifications is required because of the addition of snubbers to the piping system.

This modification was completed on Unit 2 during the 1982 refuel outage and completed on Unit 3 during the 1983 refuel outage.

Replacement of "Pigtail Type" Splices on Instrumentation

A modification dealing with splices on Q-listed instruments throughout the plant was completed. This modification involved the inspection of existing splices of pigtail type leads on safety-related instrumentation. The scope of the work included the replacement of all splices which were not made with environmentally qualified materials or following prescribed methods. Surveillance tests were performed to ensure instrument operability upon completion of each splice replacement. This modification did not change the functions of the involved instruments in any way.

Auxiliary Control Power Monitoring on the 4kV Buses

A modification to provide monitoring of the auxiliary control power on the 4kV buses was completed. This modification provides an alarm in the Control Room indicating a loss of this DC power. The work involved mounting an auxiliary relay, an indicating light and a test pushbutton inside three compartments for each 4kV bus. When the pushbuttons are depressed, the annunciator alarms in the Control Room and the remote indicating light

extinguishes. The modification was successfully pre-operationally tested on March 31, 1983, for Unit 3.

HPCI Suction Pressure Instrumentation

A modification dealing with pressure instrumentation on the HPCI suction line was completed. This modification involved replacing a pressure switch and pressure transmitter with instruments capable of withstanding higher operating pressures. In addition, a pulsation dampener was added to the sensing line for the new pressure transmitter. The purpose of this modification was to ensure that these instruments will operate under transient conditions without instrument failure.

In-Containment Limitorque Motor Operated Valve (MOV) Actuator Components

A modification dealing with in-containment Limitorque motor operated valve (MOV) actuator components was completed. This modification consisted of the inspection and possible replacement of components (drive motors, torque and limit switches, gear frames, etc.) to meet the environmental qualification of Limitorque actuators in response to NRC IE Bulletin 79-01.

During the Unit 3 refueling outage, two motors were replaced as required and on April 26, 1983, they were successfully tested for proper operation.

Safety/Relief Valve Position Indication

A revision to a previously installed modification dealing with direct position indication of safety/relief valves and safety valves was completed. The original modification was required to meet the requirements of Item 2.1.3.A of NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short Term Recommendations." The original modification involved installing an acoustic monitor on each valve, individual preamplifiers, and indicating lights for each valve in the Control Room. However, due to environmental qualification requirements, a revision to the modification was required involving replacement of the acoustic sensors and the associated vendor supplied cable used inside the drywell for the safety/relief valves. Pre-operational and surveillance tests were satisfactorily completed for the revision on August 22, 1983.

Reactor Water Level Transmitter for Full Range Recorders

A modification to install four environmentally qualified reactor water level transmitters was completed. The new transmitters provide inputs to two independent Control Room two-pen recorders which record reactor water level over the range from normal level to the bottom of the fuel. This modification completes the requirements of the guidelines of Item II.F.2 of NUREG-0737, "Clarification of TMI Action Plan Requirements", by providing the redundant water level recorders with environmentally qualified transmitters. A pre-operational test for this modification was satisfactorily completed by June 6, 1983.

Drywell High Radiation Monitoring System

A modification to the drywell high radiation monitoring system was completed. This modification involved preventing the initiation of the high radiation alarm on loss of power. In the past, whenever a loss of power condition occurred, the system logic would cause the "in-op" and "hi-rad" annunciators to alarm. This modification was performed to comply with the requirements of Item 2.1.8.b.3 of NUREG-0578. The system pre-operational test was completed satisfactorily on July 8, 1983.

Degraded 4kV Emergency Bus Protection

A modification to install additional undervoltage relay protection on the 4kV emergency buses was completed. Prior to this modification, only one undervoltage relay per feeder breaker existed on the 4kV emergency buses. This relay was an inverse time relay set to begin actuating when the nominal voltage dropped below 60%. The purpose of this modification was to protect equipment that may be operated within the range of 60 to 90% of nominal voltage for sustained periods of time.

The modification involved installing new undervoltage devices covering the range from 60 to 90% nominal voltage on both feeder breakers of the 4kV emergency buses. These new undervoltage devices alarm in the Control Room on the existing bus undervoltage devices alarm windows. In addition, the new and existing undervoltage devices can now be tested while the bus is on line. The calibration check of the undervoltage devices will be performed monthly in accordance with pending Technical Specification changes through the use of a new test plug connection and test box. The pre-operational test was completed successfully on August 11, 1983, for Unit 3.

Suppression Pool Temperature Monitoring System

A modification supplementing the existing suppression pool temperature monitoring system with redundant suppression pool monitoring systems was completed on August 26, 1983. This modification involved the installation of 13 resistance temperature detectors mounted in the thermowells installed in the torus shell below the minimum water level as required by the Technical Specifications. In addition, this modification included the installation of a computer/indicator/printer and recorder in the Control Room. This modification involved Q-listed material.

The purpose of this modification is to meet the criteria of Section 2.13.8.3, Appendix A of NUREG-0661, "Mark I Containment Long Term Program", which requires a suppression pool temperature monitoring system to ensure that the suppression pool is within the allowable limits set forth in the plant Technical Specification.

This modification resulted in a change to the Technical Specifications to meet the requirements of NUREG-0661, specifically relating to testing frequency, and temperature limits of the suppression pool temperature monitoring system.

Residual Heat Removal Head Spray Piping

A modification to replace the existing RHR head spray piping from the reactor pressure vessel (RPV) top head flange to the drywell flange was completed on August 8, 1983. This modification involved the replacing of the existing removable 304 stainless steel RHR Head Spray flanged pipe spool with a spool fabricated from 316L stainless steel pipe. In addition, a 6-inch carbon steel flange was welded to the end of the pipe spool, which is bolted to the existing RPV flange. A 6-inch 316L stainless steel flange was welded to the other end of the spool. The mating flange to the 6-inch 316L stainless steel flange is a new 316L stainless steel flange. All material is Q-listed. The purpose of this modification is to greatly reduce this line's susceptibility to Intergranular Stress Corrosion Cracking (IGSCC).

Replacement of 3B Recirculation Pump Motor

A modification dealing with the installation of a modified Limerick motor as a replacement for the failed 3B Recirculation Pump Motor was completed. The installation of the modified motor was completed in August of 1981 to allow Unit 3 to startup after

its 4th refueling outage. The final as-installed drawings were issued and the modification was closed out in August of 1983.

General Electric Company had reviewed and analyzed the use of the Limerick motor at Peach Bottom with the following results:

1. Review of the Peach Bottom 3, Cycle 5, reload transient analysis and the loss-of-coolant accident analysis had determined that there was no change in these analyses.

2. A stress analysis, including thermal, weight, and seismic, had been performed and the results were acceptable.

3. Review of the supports and restraints had found them to be acceptable. This review included the lengthening of two snubbers on top of the motor to compensate for the differences in the position of the lugs on the motor.

In addition, General Electric and Philadelphia Electric had reviewed the differences between the replacement motor and the original motor, and the mechanical and electrical interface requirements. All differences and interfaces had been found to be acceptable or were modified as described in the following paragraphs.

The Limerick motor was transported to Peach Bottom, where the lower guide bearing was changed according to FDI 44-73030-1 under General Electric supervision. The main conduit and current transformer box was modified to suit the available space in the drywell. New holes were drilled in the motor stand 15 degrees away from the existing holes to accommodate the new motor. The drilling of new holes has been approved by Byron Jackson (motor manufacturer).

Installation of the Limerick motor on the Peach Bottom 3B pump required a review of motor cooling requirements and several piping changes. The Limerick motor has one cooler while the Peach Bottom motor has two coolers. The single Limerick cooler has larger pipe connections; therefore, minor piping changes were required and new expansion joints were installed. It was determined that the drywell chilled water system had sufficient cooling capacity to handle the increase in load associated with the Limerick cooler.

Proximity probes and accelerometers were mounted on the pump and motor to monitor run-out and vibration during startup and operation.

Upgrading the Hydrogen Seal Oil Vacuum Pump Discharge Piping

A modification to replace the existing hydrogen seal oil vacuum pump piping in order to minimize vacuum pump failures was completed. The hydrogen seal oil vacuum pump discharge piping was improperly sloped, of insufficient diameter and did not contain a necessary loop seal. This modification involves installing new 3-inch piping which has a loop seal close to the vacuum pump and properly supporting the pipe. A sight glass was installed on the loop seal to allow the loop seal level to be monitored. A portion of the new piping will be common to both Units 2 and 3. Shutoff valves with sparkless trim were installed at the tie-in to the common piping so that either unit can be isolated for maintenance. This modification was completed on Unit 3 on September 7, 1983.

Installation of Diverse Water Level Instrumentation for the Scram Discharge Instrument Volume (SDIV)

A modification to replace two of four float type scram discharge instrument volume (SDIV) level switches with two thermal dispersion temperature compensated liquid level sensors was completed. These switches are used to scram the reactor on high SDIV water level. The thermal dispersion switches are installed in separate trip logics of the RPS (trip logic C and D) so that a common mode failure of these switches or the remaining float switches will not prevent a reactor scram on high water level in the scram discharge volume. They are fail safe in that component failure or loss of power will result in a trip signal. The purpose of this modification is to comply with the requirements of the NRC Generic Safety Evaluation Report, "BWR Scram Discharge System", and also NUREG-0460, "Anticipated Transient Without Scram." The system pre-operational test was successfully completed on June 1, 1983.

Additional Loss-of-Field Relay for Main Generator Protection

A modification to install a backup loss-of-field relay and associated timing relay in existing CT and PT circuits of each generator was completed. The relays were mounted on existing generator relay panels and initiate existing auxiliary relays. The pre-operational test for this modification was completed on September 2, 1983.

Mode Switch in Shutdown Scram Circuit Modification

A modification to the circuit that initiates a scram whenever the mode switch is in the shutdown position was completed to correct a potential problem with the reactor protection system. This modification removes contacts 1-2 of relays 5A-K18A and B which eliminates the possibility of a relay race which could result in misalignment of the mode switch to shutdown bypass circuitry. Moreover, this modification ensures a correct relay alignment following a loss of power, thus ensuring the mode switch to shutdown manual scram cannot be bypassed. This modification was performed during the 1983 Unit 3 Refuel Outage and was tested and found to operate as designed on September 7, 1983. This problem was identified in the NRC IE Information Notice No. 80-45, "Potential Failure of BWR Backup Scram Capability".

Reactor Cavity Inner Bellows Drain Piping

A modification to the reactor cavity inner bellows drain piping was completed. This modification involved replacing the open funnel in the reactor cavity inner bellows drain piping with hard piping, installing sight flow glasses in the inner bellows drain line and bellows leak detection piping. The purpose of the modification was to improve the draining of the reactor cavity inner bellows by minimizing the water splash that occurred with the open funnel. This modification will permit rapid draining of the reactor cavity, thus reducing refueling outage critical path time. The minimizing of water splashing provides an ALARA benefit by reducing the potential of contamination of personnel working in the drywell.

Flow was verified with no leaks on Unit 3 on August 31, 1983.

Steam Seal Valve and Header Replacement

A modification to replace a portion of the existing 4-inch steam seal header including valve 5-3 was completed on September 27, 1983. This modification involved the replacement of the existing isolation valve; a 4-inch carbon steel gate valve with a 4-inch carbon steel pressure seal gate valve. In addition, this modification included the replacement of the 4-inch steam seal header supply line from the 4-inch tap just upstream of the #4 main stop valve to the first shutoff valve. The purpose of this modification was to bring this piping and valve into conformance with the original design requirements.

Traversing In-Core Probe Purge Lines, Drive Lines and Associated Isolation Valves

A modification to seismically upgrade the TIP purge lines, drive lines and associated isolation valves to seismic Category I was completed on August 16, 1983. This modification involved the welding of tables supporting the drive line valve guide assemblies to the grating on which they rest, and welding the grating supporting the tables to both the 8-inch wide flange beams spanning the hatchway and the support angles on the perimeter. The purpose of the modification is to correct seismic deficiencies in the TIP system, by upgrading the TIP drive lines and purge lines out to the isolation valves.

Automatic Switchover of Reactor Core Isolation Cooling System Suction

A modification to add controls to automatically transfer the RCIC pump suction from the condensate storage tank to the suppression pool on low condensate storage tank level was completed on April 8, 1983. This modification involved the addition of two condensate storage tank level instrument loops, each consisting of a transmitter and a trip unit, and modifying the controls for suppression pool suction valves MO 13-39 and MO 13-41.

Both these valves will open whenever the condensate storage tank level decreases to five feet above the bottom of the tank, which corresponds to 10,000 gallons of water in the tank. This volume of water was chosen to duplicate the automatic transfer of the high pressure coolant injection system from the condensate storage tank to the suppression pool. Because this change converts manually-opened, containment isolation valves MO 13-39 and MO 13-41 to automatically opened valves, the circuit includes a signal to close both valves whenever a RCIC isolation signal or a low RCIC steam line pressure signal is present. The purpose of this modification is to meet the requirements of Item II.K.3.22 of NUREG-0737, "Clarification of TMI Action Plan Requirements", which requires that the RCIC pump suction should be automatically transferred from the condensate storage tank to the suppression pool on low condensate storage tank level. This modification requires a change to the Technical Specifications, specifically, the addition of the condensate storage tank low level trip function and instrument functional test, to Tables 3.2.B and 4.2.B, respectively.

Control Rod Drive Scram Discharge Volume

A modification to enhance the ability of the CRD Scram Discharge volume to receive and contain water discharged by the control rod

drives during a scram was completed on June 1, 1983. This modification involved: the replacement of the existing two-inch piping between the scram discharge volumes and the instrument volume with 8-inch piping; the installation of redundant isolation valves on the discharge volume vent and drain lines; the removal of relief valve RV-34 on the instrument volume drain line; the redirection of the piping for the level detection instrumentation directly to the instrument volume; the providing of a vent path between the top of the instrument volume and the discharge volume vent system; and the providing of cross connection piping between the discharge volume vent lines.

The purpose of this modification is to meet the requirements of IE Bulletin 80-17, which required review of the design of the existing system. As a result of this modification, changes to the Technical Specifications were required, specifically, the addition of the scram discharge volume vent and drain valves to Tables 3.7.1 and 3.7.4.

RBCW Block Valves for Local Leak Rate Testing

A modification to provide valves on the Reactor Building Cooling Water (RBCW) system to prevent RBCW from contaminating the Turbine Building Cooling Water (TBCW) system and the Drywell Chilled Water was completed. In addition, the containment isolation valves on the RBCW and the Drywell Chilled Water must be local leak rate tested in accordance with 10 CFR 50, Appendix J. To facilitate these tests, block valves and test connections were added at the four Drywell Chilled Water and the two Reactor Building Cooling Water penetrations. The pre-operational test for this modification on Unit 3 was completed successfully on June 17, 1983.

Condensate Filter/Demineralizer System Air Surge Backwash System Modification

The outage portion of a modification to add an air surge backwash system to the existing condensate Filter/Demineralizer system for Unit 3 was completed. The present backwash system, which uses a low pressure air/water scrub method, will be supplemented with the manufacturer's (Graver) high pressure (approximately 150 psig) air surge design.

This modification (the outage portion of the new air backwash system) involves: the installation of a 3-inch carbon steel air header from the radwaste air compressor system to the proposed location of the air compressor skid, an 8-inch carbon steel air header from the air surge receiver tank to the tie-in point above the "E" Condensate Filter/Demineralizer hold pump room, a new

backwash water inlet valve, electrical tie-ins to the existing control panel, a differential pressure switch, and control cables for the new air inlet valves. The pre-operational test for this modification was successfully completed on October 25, 1983. This new backwash, when operating, will clean the condensate filter demineralizer more thoroughly, enabling longer run times. The new air surge system also requires less backwash water than our present low pressure system. This will reduce the amount of liquid waste processed by the waste collector system.

Torus Modifications and Installation of Lifting Beam

A modification to torus attached piping, its associated valves and supports and reactor building structural steel was completed. In addition, the installation of a temporary lifting beam to facilitate movement of material into the Torus Room was completed. The torus was modified to enable it to withstand the hydrodynamic loads due to safety/relief valve discharges and a LOCA. Bechtel analyzed the torus attached piping and provided the designs for any required modifications which included addition, deletion or modification of supports and restraints, rerouting of piping, relocating or replacing valves or valve components and stiffening of reactor building structural steel. Impell Corp. (EDS Nuclear) analyzed the motor-operated valves and provided the designs for any required modifications.

As a result of the modifications, three existing hydraulic snubbers were replaced with mechanical snubbers, five new mechanical snubbers were placed, and one snubber was removed. A Technical Specification Amendment was submitted requesting these snubber changes.

The purpose of this modification is to bring the stresses in the piping and the support loads within the FSAR requirements, and to bring the accelerations on valves within manufacturer's qualified accelerations.

This modification was successfully pre-operationally tested for Unit 3 on September 6, 1983.

Main Generator Accidental Energization Protective Relays

A modification to install an under-frequency relay, an overcurrent relay and associated auxiliary relays in existing current transformer and potential transformer circuits of the main generator was completed. This modification involved mounting the relays on existing generator relay panels. The purpose of this modification is to provide a high speed

protective relay scheme to protect the main generator against accidental energization.

COMMON

Replacement of the Instrument Air Dryer's Pilot Air Line Filter

A modification to replace the instrument air dryer's pilot air line filter was completed. This modification involved replacing the filters in the air line which supplies the desiccant tower purge valves with larger filters. To facilitate future maintenance, the new filter design allows replacement without breaking any air fittings.

The purpose of the modification was to eliminate the high dew point in the instrument air system. The instrument air dryers had experienced problems with their purge cycle caused by an insufficient amount of air to the purge valve operator, which resulted in the incomplete regeneration of the desiccant.

Installation of a Temporary Nitrogen Pressure Rig on the 2A and 3C Fuel Pool Heat Exchangers

A modification to install a nitrogen bottle, a pressure control valve, and temporary piping to the 3/4" tube side vent of the 2A and 3C fuel pool heat exchangers was completed. The purpose of this modification was to provide a nitrogen blanket on the standby heat exchanger, after cleaning, to prevent oxidation. These heat exchangers are maintained in a clean standby condition to assure that the reactor building closed cooling water pump seals are not damaged from fuel pool heat exchanger rust.

Installation of Security Grating on the Emergency Pump Structure Air Vents

A modification to install security grating on the four air vents of the emergency pump structure was completed. The purpose of the modification was to bring the pump structure into compliance with "Vital Area" classification requirements.

Temporary Installation of Demin Water Supply to the Reactor Building Closed Cooling Water (RBCCW) Pump Seals

A modification to install a temporary demineralizer water supply to the RBCCW Pump Seals was completed. This modification was performed to keep dirt away from the RBCCW seals during the

emergency cooling tower test. The demineralizer water, at a higher pressure than RBCCW, is injected into the seals to purge them.

Replacement of the Main Stack Radiation Monitoring Isokinetic Probe

A modification to replace the main stack radiation monitoring isokinetic probe was completed. The modification involved changing the probe nozzles from 5/8" I.D. to 1/2" I.D. This modification was performed to be able to attain the proper isokinetic flow through the system under normal operating conditions as well as accident conditions.

Replacement of Pumps for the Offgas Hydrogen Analyzers

A modification to replace one of the existing recombiner hydrogen analyzer metal bellows pumps with a double-action diaphragm pump was completed on both units. Failures of the existing metal bellows pumps have occurred due to the induction of water into the hydrogen analyzers. The replacement diaphragm pumps have the capability to pump water for short periods of time without failure. There are four hydrogen analyzers on each unit. The replacement of the pumps on only one analyzer on each unit will leave three operational analyzers if there are any problems with the new pumps. If the new pumps prove to be more reliable than the metal bellows pumps, the remaining three Unit 2 analyzers and three Unit 3 analyzers will also be modified.

Smoke Detector Installation

During 1983, work was performed on a modification to install separate smoke and heat detectors, in areas containing safety-related equipment and cables, with fixed combustible loading and no existing detection system. This modification involved satisfying the fire safety criteria outlined in Appendix R, 10 CFR 50.48. This was done by installing 12 separate smoke detector loops and one linear heat detection cable system in areas where safety-related cables were routed. All smoke detector loops were successfully pre-operationally tested on July 8, 1983.

220-08 Line Protection

New reactors were installed on the 220-08 line at Nottingham Substation. In order to keep the startup source breaker (SU-25)

from being overstressed on opening during certain fault conditions, the transfer trips to SU-25 were removed.

In order to clear the load on the 220-08 line, transfer trips were added to the 2SU-E, 2SU-A, and 2SU-B breakers. In addition, studies revealed that, should the 2SU-A or 2SU-B breakers fail to open, damage would occur to the 220-08 line arresters because of the regenerative effect of the large inductive load. To protect the line, additional trip logic was added such that if either 2SU-A or 2SU-B are closed when a transfer trip signal is initiated, the respective A or B bus load breakers are tripped sympathetically.

All installations and testing were completed by October 14, 1983.

Fire Penetration Seals

A modification is in progress to replace existing fire barrier seals with 3-hour rated seals. The purpose modification is to comply with 10 CFR 50, Appendix R, requirements. As of 1/23/84, the modification's engineering survey was 95% complete and construction was 62% complete.

Air Supply to Radwaste Equipment

A modification to provide a separate air supply for selected radwaste systems was completed. This modification involved the installation of two compressors, associated controls, a receiver and piping. The previous service air system supplied process and control air to the liquid and solid radwaste processing system. In the past, system operating transients were experienced and backflow into the service air system resulted in some radioactive contamination of the service air system in other areas of the plant. This modification eliminates the potential of service air contamination from radwaste equipment.

480V and 4kV Breaker Trip Coordination

A modification to change settings on Unit 3 480 volt breakers and protective relays on 4kV breakers was completed. This modification provides breaker coordination such that if a fault occurs, the breaker feeding the faulted piece of equipment will trip before the source breaker for the bus will trip. This will permit equipment required for safe shutdown to operate even though this equipment is fed from the bus that was feeding faulted equipment. This was accomplished on Unit 3 by changing settings on six 480 volt load center breakers and seven protective relays on 4kV breakers. All relays and breakers were

recalibrated by July 18, 1983. The purpose of this modification is to comply with criteria outlined in Appendix R of NRC Regulation 10 CFR 50.

Reactor Building Water Curtain

A modification to provide separation between cables of different shutdown methods was completed. This modification involves the installation of a manually activated water curtain in the west corridor of Unit 2 and 3 Reactor Building, Elevation 135. Operability of the water curtain was verified on May 31, 1983 for Unit 2 and on August 17, 1983, for Unit 3. The modification complied with the IE Information Notice 83-41: "Actuation of Fire Suppression System causing Inoperability of Safety-Related Equipment", dated June 22, 1983.

Separation of Equipment and Associated Cables

A modification to reroute the safety relief valve cables, designate cable as safeguard, and change the safeguard channel designated on two valves was completed. This modification involves rerouting and redesignating cables in order to comply with 10 CFR 50, Appendix R, safe shutdown requirements. Systems affected by the cable reroutes were ADS, HPSW, HPCI and RCIC. A pre-operational test for Unit 3 was successfully completed on January 13, 1984. The Unit 2 work will be completed during the present Unit 2 refueling outage.

Emergency Load Center Curb Installation

A modification to install four 8" high curbs in front of the entrances to the 'B' and 'D' Emergency Load Center barriers on Units 2 and 3 was completed. The purpose of this modification is to prevent the spread of flammable liquid to the E-24, E-424, E-434, and E-234 Emergency Load Centers for Units 2 and 3 from redundant load centers. This was done to comply with 10 CFR 50, Appendix R. Visual verification of curb installation was performed on August 4, 1983.

Emergency Lighting System

A modification to provide eight-hour battery supply to the Emergency Lighting System in specified areas of the plant was completed. This modification provides backup lighting to vital areas of the plant required for safe shutdown. These areas include the Main Control Room Area, Remote Shutdown Panel Area, HPSW Pump Bay, 5th Bay in the Diesel Generator Building,

Emergency Switchgear Room, Cable Spreading Room (in areas of HPCI and RCIC panels) and respective access and egress routes. This capability was demonstrated by the successful completion of a pre-operational test on December 11, 1983. The purpose of this modification is to bring Peach Bottom Atomic Power Station into compliance with Appendix R, 10 CFR 50, Section III.J.

Creation of Fire Zone 147 (Turbine Building Corridor)

A modification to install fire barriers at both ends of the Turbine Building corridor between Unit 2 and Unit 3 on Elevation 135 was completed. This modification involved the installation of a fire door, a block wall above the door frame up to the existing concrete, and 3-hour rated penetration seals in the walls of each barrier. The purpose of this modification is to comply with Appendix R, 10 CFR 50.

ECCS Power Supplies

A modification to replace the Emergency Core Cooling System (ECCS) power supplies E/S 2(3)-02-3-402A, B and E/S 2(3)-02-3-403A, B at Peach Bottom Atomic Power Station Units 2 and 3 with power supplies manufactured by General Electric Company was completed. This modification was caused by reliability problems with existing power supplies manufactured by Elma Engineering. This modification should improve the ECCS power supply reliability. The modification was successfully pre-operationally tested on April 12, 1983.

Separation of Diesel Generator Equipment and Associated Cable

A modification to separate Diesel Generator equipment and cables was completed. Analysis of the diesel generator rooms had identified several items requiring separation. Separation was achieved by rerouting certain cables and providing one redundant control relay per diesel. The pre-operational test was successfully completed on March 31, 1983. The purpose of this modification is to bring Peach Bottom into compliance with criteria outlined in Appendix R of NRC Regulation 10 CFR 50.

Cooling Tower Lift Pump and Fan Load Shed

A modification to load shed all cooling tower lift pump and fan loads, initiated by a simultaneous loss of one off-site startup source with the trip of either unit was completed. The purpose of this modification is to assure that the proper voltage will be maintained on the 4kV emergency buses when the additional load on

the startup source occurs during the 13kV fast transfer of the unit auxiliary loads. This sequence of events had been the only mechanism which could have caused a degraded voltage condition automatically. This modification was successfully pre-operationally tested on June 2, 1983.

Diesel Generator Quick-Start Circuit

A modification to install a "Quick-Start" pushbutton in the Main Control Room for each emergency diesel generator was completed. This modification involved the installation of a manual quick-start circuit for each of the four Emergency Diesel Generators which bypasses the three-minute prelube cycle. Qualified cables were run in Safeguard raceways from the C26A, B, C, and D panels to the 20A1501, 20A1601, 20A1701, and 20A1801 panels, respectively, in the 4kV Emergency Auxiliary Switchgear rooms on Elevation 135'. Should the new quick-start contacts fail open or short to ground, the diesels could still be started manually with the prelube cycle operable. Should they fail closed, the diesels will start automatically. This modification was completed on March 18, 1983.

Replacement of CAD and TIP Purge Isolation Check Valves

A modification to improve the reliability of the CAD injection and TIP purge check valves was completed. This modification provides the capability of leak testing the tip purge check valve. The check valves were replaced with spring loaded, soft-seat NUPRO check valves. This modification was completed on Unit 3 during the Unit 3 refuel outage (October 19, 1983). The unit 2 work is scheduled for the present refuel outage.

Vandenburg Cask Redundant Yoke

A modification to the Vandenburg cask stabilizing band was completed. This modification involved drilling two 1" holes into the horizontal leg (top flange) of the stabilizing band for Vandenburg spent fuel shipping cask. Analysis has concluded that the drilling of two holes into the stabilizing band leg is structurally acceptable in that it will not adversely affect the stabilizing band function or integrity.

The purpose of the modification was to allow easier handling and rigging of the Vandenburg cask stabilizing band.

The drilling of the band was performed in 1981 and the modification's capital authorization was closed-out in 1982.

However, the reporting of this modification was inadvertently omitted from the 1982 annual modification report.

RCIC Turbine Exhaust Pressure Trip Setpoint Change

A modification to change the RCIC turbine exhaust high pressure trip setting from 40 psig to 50 psig was completed. This involved changing the setting on two pressure switches per unit (PS-2-13-72-A&B and PS-3-13-72A&B).

This change was made as a result of a study prepared by General Electric Company for the BWR Owners' Group. The RCIC turbine exhaust pressure trip setpoint increase will increase RCIC availability during small and intermediate break LOCA's, allow the RCIC to provide a backup to HPCI over a range of small breaks, and provide more time for a control room operator to recover other systems if either HPCI and/or ADS were unavailable.

The modification was completed on both units on September 22, 1983.

Temporary Electrical Feed for Temporary Testing Lab

A modification to provide a temporary 480 volt, 150 amp electrical feed for the temporary testing lab in the old Administration Building was completed. The modification involved installing the feed from motor control center (MCC) 00B48 to the test lab, and resetting the MCC feeder breaker from 300 amps to 360 amps. The purpose of the modification is to provide a feed for the temporary testing lab until work is complete in the new Administration Building's maintenance shop. The temporary feed was installed and in service as of December 1, 1983.