March 21, 2005

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - ISSUANCE OF AMENDMENT RE: ACTIVATION OF OSCILLATION POWER RANGE MONITOR TRIP (TAC NOS. MC2219 AND MC2220)

Dear Mr. Crane:

The Commission has issued the enclosed Amendments Nos. 251 and 254 to Renewed Facility Operating License Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Units 2 and 3. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated February 27, 2004, as supplemented September 13, 2004.

These amendments allow for the activation of the trip outputs of the previously installed oscillation power range monitor portion of the power range neutron monitoring system. Specifically, this change revises TS Sections 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," 3.4.1, "Recirculation Loops Operating," and their associated TS Bases, and 5.6.5, "Core Operating Limits Report (COLR)." In addition, the change deletes the Interim Corrective Action requirements from the Recirculation Loops Operating TSs.

A copy of the safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,

/RA/

George F. Wunder, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosures: 1. Amendment No. 251 to Renewed DPR-44
2. Amendment No. 254 to Renewed DPR-56
3. Safety Evaluation

cc w/encls: See next page

March 21, 2005

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - ISSUANCE OF AMENDMENT RE: ACTIVATION OF OSCILLATION POWER RANGE MONITOR TRIP (TAC NOS. MC2219 AND MC2220)

Dear Mr. Crane:

The Commission has issued the enclosed Amendments Nos. 251 and 254 to Renewed Facility Operating License Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Units 2 and 3. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated February 27, 2004, as supplemented September 13, 2004.

These amendments allow for the activation of the trip outputs of the previously installed oscillation power range monitor portion of the power range neutron monitoring system. Specifically, this change revises TS Sections 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," 3.4.1, "Recirculation Loops Operating," and their associated TS Bases, and 5.6.5, "Core Operating Limits Report (COLR)." In addition, the change deletes the Interim Corrective Action requirements from the Recirculation Loops Operating TSs.

A copy of the safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,
/RA/

George F. Wunder, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosures: 1. Amendment No. 251 to Renewed DPR-44
2. Amendment No. 254 to Renewed DPR-56
3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC	PDI-2 R/F	DRoberts	GWunder	ACRS
MO'Brien	JCalvo	JWermiel	OGC	THuag
GHill(4)	GMatakas, RGN-I	TBoyce	HGarg	

ADAMS ACCESSION NUMBER: ML05270020

OFFICE	PM/PD1-2	LA/PD1-2	IROB/SC	SRXB/SC	EEIB/SC	OGC	SC/PD1-2
NAME	GWunder	MO'Brien	TBoyce	FAkstulewicz	EMarinos	SCole	DRoberts
DATE	2/17/05	2/17/05	3/04/05	12/22/05	12/28/05	3/02/05	3/08/05

OFFICIAL RECORD COPY

Peach Bottom Atomic Power Station, Unit Nos. 2 and 3

cc:

Site Vice President
Peach Bottom Atomic Power Station
Exelon Generation Company, LLC
1848 Lay Road
Delta, PA 17314

Associate General Counsel
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Plant Manager
Peach Bottom Atomic Power Station
Exelon Generation Company, LLC
1848 Lay Road
Delta, PA 17314

Regulatory Assurance Manager
Peach Bottom Atomic Power Station
Exelon Generation Company, LLC
1848 Lay Road
Delta, PA 17314

Resident Inspector
U.S. Nuclear Regulatory Commission
Peach Bottom Atomic Power Station
P.O. Box 399
Delta, PA 17314

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Roland Fletcher
Department of Environment
Radiological Health Program
2400 Broening Highway
Baltimore, MD 21224

Correspondence Control Desk
Exelon Generation Company, LLC
P. O. Box 160
Kennett Square, PA 19348

Rich Janati, Chief
Division of Nuclear Safety
Bureau of Radiation Protection
Department of Environmental Protection
Rachel Carson State Office Building
P.O. Box 8469
Harrisburg, PA 17105-8469

Board of Supervisors
Peach Bottom Township
545 Broad Street Ext.
Delta, PA 17314-9203

Mr. Richard McLean
Power Plant and Environmental
Review Division
Department of Natural Resources
B-3, Tawes State Office Building
Annapolis, MD 21401

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

Manager-Financial Control & Co-Owner
Affairs
Public Service Electric and Gas Company
P.O. Box 236
Hancocks Bridge, NJ 08038-0236

Manager Licensing-Peach Bottom
Atomic Power Station
Exelon Generation Company, LLC
200 Exelon Way, KSA -3E
Kennett Square, PA 19348

Peach Bottom Atomic Power Station, Unit Nos. 2 and 3

cc:

Vice President - Licensing and Regulatory
Affairs
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Vice President-Operations Mid-Atlantic
Exelon Generation Company, LLC
200 Exelon Way, KSA 3-N
Kennett Square, PA 19348

Senior Vice President, Nuclear Services
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Director-Licensing and Regulatory Affairs
Exelon Generation Company, LLC
200 Exelon Way, KSA 3-E
Kennett Square, PA 19348

EXELON GENERATION COMPANY, LLC

PSEG NUCLEAR LLC

DOCKET NO. 50-277

PEACH BOTTOM ATOMIC POWER STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 251
Renewed License No. DPR-44

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (Exelon Generation Company), and PSEG Nuclear LLC (the licensees), dated February 27, 2004, as supplemented September 13, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I.

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Renewed Facility Operating License No. DPR-44 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 251, are hereby incorporated in the license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Darrell Roberts, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 21, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 251

RENEWED FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3.3-1	3.3-1
3.3-3	3.3-3
-	3.3-3a
3.3-5	3.3-5
3.3-6	3.3-6
3.3-7	3.3-7
3.4-1	3.4-1
3.4-2	3.4-2
3.4-3	3.4-3
3.4-4	3.4-4
3.4-5	3.4-5
B3.3-7	B3.3-7
B3.3-8	B3.3-8
B3.3-9	B3.3-9
B3.3-12	B3.3-12
-	B3.3-12a
-	B3.3-12b
B3.3-24	B3.3-24
B3.3-25	B3.3-25
B3.3-27	B3.3-27
-	B3.3-27a
B3.3-32	B3.3-32
B3.3-33	B3.3-33
B3.3-34	B3.3-34
B3.3-35	B3.3-35
B3.35a	B3.3-35a
-	B3.3-35b
B3.4-3	B3.4-3
B3.4-4	B3.4-4
B3.4-5	B3.4-5
B3.4-6	B3.4-6
B3.4-7	B3.4-7
B3.4-8	B3.4-8
B3.4-9	B3.4-9
B3.4-10	B3.4-10
5.0-21	5.0-21
5.0-22	5.0-22

EXELON GENERATION COMPANY, LLC

PSEG NUCLEAR LLC

DOCKET NO. 50-278

PEACH BOTTOM ATOMIC POWER STATION, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 254
Renewed License No. DPR-56

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (Exelon Generation Company), and PSEG Nuclear LLC (the licensees), dated February 27, 2004, as supplemented September 13, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Renewed Facility Operating License No. DPR-56 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 254, are hereby incorporated in the license. Exelon Generation Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Darrell Roberts, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT NO. 254

RENEWED FACILITY OPERATING LICENSE NO. DPR-56

DOCKET NO. 50-278

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3.3-1	3.3-1
3.3-3	3.3-3
-	3.3-3a
3.3-5	3.3-5
3.3-6	3.3-6
3.3-7	3.3-7
3.4-1	3.4-1
3.4-2	3.4-2
3.4-3	3.4-3
3.4-4	3.4-4
3.4-5	3.4-5
B3.3-7	B3.3-7
B3.3-8	B3.3-8
B3.3-9	B3.3-9
B3.3-12	B3.3-12
-	B3.3-12a
-	B3.3-12b
B3.3-24	B3.3-24
B3.3-25	B3.3-25
B3.3-27	B3.3-27
-	B3.3-27a
B3.3-32	B3.3-32
B3.3-33	B3.3-33
B3.3-34	B3.3-34
B3.3-35	B3.3-35
B3.3-36	B3.3-36
-	B3.3-36a
B3.4-3	B3.4-3
B3.4-4	B3.4-4
B3.4-5	B3.4-5
B3.4-6	B3.4-6
B3.4-7	B3.4-7
B3.4-8	B3.4-8
B3.4-9	B3.4-9
B3.4-10	B3.4-10
5.0-21	5.0-21
5.0-22	5.0-22

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 251 TO RENEWED FACILITY OPERATING

LICENSE NO. DPR-44 AND AMENDMENT NO. 254 TO RENEWED FACILITY OPERATING

LICENSE NO. DPR-56

EXELON GENERATION COMPANY, LLC

PSEG NUCLEAR LLC

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-277 AND 50-278

1.0 INTRODUCTION

By application dated February 27, 2004, as supplemented by letter dated September 13, 2004, Exelon Generation Company, LLC (the licensee), requested changes to the Technical Specifications (TSs) for Peach Bottom Atomic Power Station, Units 2 and 3 (PBAPS 2 and 3). The September 13, 2004, supplement provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on April 13, 2004 (69 FR 19570).

The proposed changes would allow for the activation of the trip outputs of the oscillation power range monitor (OPRM). The OPRM is designed to detect the onset of reactor core power oscillations resulting form thermal-hydraulic instability and suppress them by initiating a reactor scram via the reactor protection system (RPS) trip logic. The OPRM trip function provides protection of the minimum critical power ratio (MCPR) safety limit in the event of thermal-hydraulic power oscillations. The specific changes make revisions to TS Sections 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," 3.4.1, "Recirculation Loops Operating," and their associated TS Bases, and 5.6.5, "Core Operating Limits Report (COLR)." In addition, the change deletes the Interim Corrective Action (ICA) requirements from the Recirculation Loops Operating TSs. The proposed TS changes follow the example proposed by General Electric (GE) in topical report NEDC-32410P-A, Supplement 1, which the Nuclear Regulatory Commission (NRC) reviewed and approved in a letter to GE dated August 15, 1997.

Current plant operation using ICAs relies on operator action to avoid regions where instability may occur, to exit such regions when necessary, and to detect an actual instability and take mitigating action by manual means. The proposed TS changes will replace procedural actions (i.e., the ICAs) with an automatic detect and suppress function (i.e., the OPRM trip function). The OPRM trip function is both quicker and more reliable at detecting a true reactor instability than are manual procedures. The OPRM also provides a reactor scram trip only if an actual

instability is detected while the current ICAs require reactor shutdown if the plant is in a condition that may result in an instability, regardless of whether or not an instability occurs.

2.0 REGULATORY EVALUATION

Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, contains the General Design Criteria (GDCs) for nuclear power plants. GDC 10, "Reactor design," requires that the reactor be designed with appropriate margin to assure that specified acceptable fuel design limits will not be exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. GDC 12, "Suppression of reactor power oscillations," requires that the reactor be designed to assure that power oscillations which can result in conditions exceeding specified acceptable fuel design limits are either not possible or can be reliably and readily detected and suppressed. GDC 13, "Instrumentation and control," requires that instrumentation shall be provided to monitor variables over their anticipated ranges for normal operations, for anticipated operational occurrences and for accident conditions. Enabling the OPRM trip meets GDCs 10, 12, and 13 by allowing for the automatic detection and suppression of design-basis thermal-hydraulic power oscillations before exceeding the MCPR safety limit.

3.0 BACKGROUND

By letters dated March 1, October 1, October 6, 1999, and June 6, 2000, the licensee proposed to replace the then-existing analog power range monitoring system for PBAPS 2 and 3 with a digital GE nuclear measurement analysis and control (NUMAC) power range neutron monitoring system (PRNMS). The licensee's submittal requested TS changes related to the proposed NUMAC-PRNMS modification. By letter dated October 14, 1999, the NRC approved TS amendments for the average power range monitoring (APRM)part of the NUMAC-PRNMS for BPAPS 3. The license amendment did not include the OPRM function which was to be operated in the "indicate only" configuration for one fuel cycle for testing purposes.

By letter dated February 8, 2001, the licensee had submitted the proposed license amendments to change the PBAPS 2 and 3 TSs to include provisions for enabling the OPRM upscale trip function in the APRM. By letter dated June 29, 2001, GE submitted a 10 CFR Part 21 notification about the concern that stability reload licensing calculations using the generic delta critical power ratio over initial MCPR versus oscillation magnitude (DIVOM) curve could result in OPRM reactor protection system (RPS) trip setpoints which may not provide MCPR safety limit protection. By letter dated December 13, 2001, therefore, the licensee withdrew the amendment request.

By letter dated September 30, 2003, the Boiling Water Reactor Owners Group (BWROG) submitted the resolution for the Part 21 notification. The resolution will require the licensee to use the plant-specific DIVOM curve, which will be generated or confirmed for each reload fuel cycle consistent with the process described in NEDO-32465A which was approved by the staff in a safety evaluation dated March 4, 1996. The plant-specific curves will be reasonably conservative, but not necessarily bounding, for a particular fuel cycle. In conjunction with the 95/95 statistical approach of the licensing methodology, the plant-specific DIVOM curves will result in a high probability that the fuel cladding integrity safety limit will not be violated as a result of anticipated instability events.

In their submittal, the licensee stated that the OPRM system has already been installed at PBAPS 2 and 3, and is currently operated in the indicate-only mode to evaluate the system's performance. Implementation of the proposed TS revisions will enable the licensee to use the trip function of this system.

4.0 TECHNICAL EVALUATION

4.1 OPRM Trip Instrument Description

Under certain conditions, BWRs may be susceptible to coupled neutronic/thermal-hydraulic instabilities. These instabilities are characterized by periodic power and flow oscillations. If the power and flow oscillations become large enough, the fuel cladding integrity MCPR safety limit could be challenged. To deal with these potential instabilities, PBAPS 2 and 3 are currently operating with certain ICAs recommended by GE and approved by the NRC.

To detect core instabilities and provide a reactor scram signal to the RPS, the licensee selected BWROG Stability Option III as the long-term stability system solution (LTSSS) for PBAPS 2 and 3. The LTSSS Option III-approach consists of detecting and suppressing stability-related power oscillations by automatically inserting control rods to terminate power oscillations. The implementation of Option III protects the reactor fuel rods from exceeding the fuel MCPR safety limit during thermal-hydraulic power oscillations.

The GE NUMAC-PRNM system consists of four APRM channels and four voter channels. Trip signals from each of the four APRM channels are sent to all four voter channels. One voter module is dedicated to each RPS trip relay. A reactor trip occurs when two or more of the four APRM functions, or two or more of the four OPRM functions calculate a trip condition. The voters provide votes from the OPRM channel trip outputs that are separate from the APRM trip outputs. For example, an OPRM trip in one channel and an APRM trip in another channel will not result in a reactor trip from two of four voters in a trip state.

Hardware to implement the OPRM upscale trip function in the APRM channel, the OPRM inoperable ("inop") function, and the OPRM 2-out-of-4 voter function are included with the corresponding APRM inop and APRM 2-out-of-4 voter functions. The integration of the OPRM inop with the APRM inop reflects the actual system design (i.e., conditions that cause an inop signal in either an APRM or OPRM trip function cause an inop signal in both functions). Unlike the APRM trip function, however, the OPRM upscale trip function is voted independently from the inop trip in the 2-out-of-4 voter function; thus, an APRM/OPRM inop trip in one APRM channel and an OPRM upscale trip in another channel will result in two half-trips in each of the four voter channels, but no RPS trip. An inop trip in any two APRM and OPRM channels or an OPRM upscale trip in any two channels will result in RPS trip outputs from all four voter channels.

For the APRM flux trip functions, an APRM/OPRM inop trip in one APRM channel and an APRM upscale trip in another channel will result in RPS trip outputs from all four voters. This reflects a somewhat more conservative APRM design in response to channel failures when compared with the OPRM design. This additional conservatism is of limited value in the OPRM design. If the OPRM upscale trips were combined in logic with inop trips to generate RPS trip signals, spurious and unnecessary reactor scrams might result. An automatic trip will occur upon an unexpected systematic failure of multiple APRM channels. This will result in an

APRM/OPRM inop trip in two or more unbypassed channels, regardless of the OPRM upscale (or APRM flux) trip status.

4.2 Specific Technical Specification (TS) Changes

4.2.1 **TS 3.3.1.1 Reactor Protection System (RPS) Instrumentation**

This modification has no impact on any of the existing NUMAC-PRNMS Functions. The OPRM monitoring Function is currently installed and fully functional but is not connected to the associated RPS or trip annunciator circuitry. The only change is to connect the existing OPRM trip outputs in series with the APRM trip outputs. This has the effect of "OR-ing" one OPRM trip output with each of the existing APRM trip outputs to the RPS. These actions are consistent with NEDC-32410P-A, and, therefore, are acceptable.

A new OPRM Upscale Function, 2.f, will be added to TS 3.3.1.1. The OPRM instability detect-and-suppress trip (the new OPRM Upscale function) is a safety-related function and will be required to be operable only with reactor power >25% reactor thermal power (RTP). The required minimum number of operable OPRM channels will be three channels. Adding Function 2.f to ACTION A.2 and CONDITION B. of this TS will make the OPRM Upscale Function the same as for APRM Functions 2.a, 2.b, 2.c, and 2.d to perform reactor protective action. The OPRM Upscale Function will have operability requirements for OPRM cells that a minimum of 2 local power range monitors (LPRMs) per cell be operable and that a minimum of 25 OPRM cells per OPRM channel be operable for channel operability. This is consistent with the "plant-specific" values in NEDC-32410P-A, and, therefore, is acceptable.

New CONDITIONS I. and J. with associated REQUIRED ACTIONS I.1, I.2, and J.1, and COMPLETION TIMES will be added to TS 3.3.1.1. These new CONDITIONS apply when the OPRM channel CONDITION A. REQUIRED ACTIONS and associated COMPLETION TIMES are not met. REQUIRED ACTION I.1 allows a COMPLETION TIME of 12 hours to initiate alternate methods of detecting and suppressing instabilities. REQUIRED ACTION I.2 allows a COMPLETION TIME of 120 days to restore the OPRM operability. CONDITION J. applies if the COMPLETION TIMES for REQUIRED ACTIONS I.1 or I.2 are not met. REQUIRED ACTION J.1 will allow 4 hours to reduce power to less than 25%.

The alternate method required by REQUIRED ACTION I.1 for detection and suppression is intended to establish the ICAs used by the licensee for the past several years, but controlled by plant procedures rather than TSs. An exception to Limiting Condition for Operation (LCO) 3.0.4 is noted for REQUIRED ACTION I.2. This exception note is not discussed in NEDC-32410P-A. The exception allows the licensee to restart the plant in the event of a shutdown during the 120-day completion time for REQUIRED ACTION I.2, consistent with the original intent of NEDC-32410P-A, which was to allow normal plant operations to continue during the recovery time from a hypothesized design problem with the Option III algorithms.

CONDITION I. addresses situations when OPRM trip capability is not maintained. The most likely reason for such a situation would be a common-mode software error, which would affect all four channels of the OPRM. The staff acknowledged in the safety evaluation of NEDC-32410P-A that it would take a significant period of time to arrange a contract with the OPRM software developer, determine the cause of the error, repair the defect, test the software

modification, and implement the software upgrade in the plant. Pursuant to CONDITION I, while the software was being upgraded, the plant would be required by REQUIRED ACTION I.1 to be operated under the ICAs, for up to 120 days. Management attention will be focused on restoring OPRM operability because the plant will be operating in an "active LCO" condition. This proposed change will avoid unnecessary plant shutdowns or processing unnecessary TS changes while maintaining plant safety, and, therefore, is acceptable.

The licensee's proposed REQUIRED ACTION J.1 for CONDITION J. requires the plant to be in Mode 2 in 4 hours if the REQUIRED ACTION and COMPLETION TIME of CONDITION I are not met. According to REQUIRED ACTION J.1 for CONDITION J. in NEDC-32410P-A, Supplement 1, the licensee must reduce thermal power to less than 25% in 4 hours. The licensee's proposed REQUIRED ACTIONS are consistent with the REQUIRED ACTIONS in NEDC-32410P-A, Supplement 1, and, therefore, are acceptable.

Footnote (d) on TS page 3.3-7 which reads "See COLR [*Core Operating Limits Report*] for OPRM period based detection algorithm (PBDA) setpoint limits" will be added to the TSs. This change simply refers the cycle-specific parameter of the PBDA setpoint limit to the COLR, and is acceptable.

Footnote (b) on TS page 3.3-7 will be changed by substituting the equation 0.65 (W - ΔW) + 63.7% for the equation 0.65W +63.7% - 0.65 ΔW in Table 3.3.1.1-1. The equations are mathematically equivalent, but the revised equation is more descriptive of what the instrument is actually doing. This revision is acceptable.

4.2.2 **Surveillance Requirements (SRs)**

The licensee proposed SRs 3.3.1.1.1 (CHANNEL CHECK once-per-12 hours), 3.3.1.1.8 (LPRM calibration once-per-1000 MWD/T), 3.3.1.1.11 (FUNCTIONAL TEST once-per-184 days), 3.3.1.1.12 (OPRM Upscale Function CHANNEL CALIBRATION, including the recirculation-loop flow channel, once-per-24 months), and new SR 3.3.1.1.19 (confirmation of auto-enable setpoints once-per-24 months). These surveillances are equivalent to or more conservative than the corresponding SRs in NEDC-32410P-A, Supplement 1. The PBAPS units have a 24-month refueling interval; therefore, the staff finds the proposed surveillance intervals to be acceptable. The licensee will revise the 3.3.1.1.19 Bases to remove statements regarding operability determinations if the auto-enable setpoint is non-conservative. The purpose of the Bases is to provide the reasons for the TS requirement, not to provide guidance for operability determinations when SRs are not met.

The licensee proposed modifying Note 2 of SR 3.3.1.1.11 to exclude the flow transmitters from the Function 2.f surveillance. Additionally, the licensee proposed adding to Note 3 of SR 3.3.1.1.12, a reference to OPRM Function 2.f. These changes are consistent with NEDC-32410P-A and, therefore, are acceptable.

The new OPRM Upscale Function will have no response time testing SR. The licensee noted that NEDC-32410P-A, describes response time testing as including the output relays for the 2-out-of-4 voter; however, the original PRNM installation licensing submittal justified response time testing from the PRNM panel terminals for PBAPS 2 and 3. This was based on the current response time testing commitments for PBAPS 2 and 3. Since the OPRM upscale trip outputs

are in series with the APRM high-inop trip outputs, no change is required to the 2-out-of-4 voter function response time testing requirements. The OPRM implementation is consistent with that justification, and, therefore, is acceptable.

The new OPRM Upscale Function will have no logic system functional test (LSFT) SR; however, the SR 3.3.1.1.17 Bases description will be modified slightly to add the OPRM and to show that the simulated trip conditions must include the OPRM logic as well as the APRM high-inop logic. This clarification is required because the 2-out-of-4 voter, Function 2.e, votes the OPRM trip independently from the APRM high-inop trip. The Bases description for Function 2.e is modified to document the independent voting of the OPRM and APRM trips. In addition to these, Function 2.e Bases are changed to support the OPRM Upscale Function addition. The additions clarify that the 2-out-of-4 voter function need not be declared inoperable if parts of the 2-out-of-4 logic module hardware that are not part of the 2-out-of-4 voter are found to be inoperable. These changes are consistent with the intent of the logic system testing requirements described in NEDC-32410P-A, and, therefore, are acceptable.

SR 3.3.1.1.17 requires that an LSFT be performed every refueling outage; however, the licensee must do this testing before activating the OPRM upscale trip. This SR is normally performed during an outage because the test creates a full RPS trip. Since the licensee plans to activate the OPRM Upscale Trip Function on line during full-power operation, this SR cannot be performed. The licensee has taken the position that performance of SR 3.3.1.1.17 relative to the initial arming of the OPRM Upscale Voting Function within the 2-out-of-4 voter channel can be considered met through the acceptance testing performed at the factory, the in-plant FUNCTIONAL testing of the hardware, and the internal self-testing performed by the hardware. The licensee justifies this position on the following basis: (1) GE's evaluation determined that the channel functional test performed per SR 3.3.1.1.11 and the automatic self-test of the voting logic provide the full overlap of the LSFT, (2) an equivalent OPRM LSFT was done during the factory acceptance test and a normal LSFT on the APRM high-Inop voting logic testing was done without detecting any problems, and (3) the extensive operating experience at other boiling water reactor (BWR) plants has not resulted in any voting logic test failures. The staff agrees with the licensee's position that the requirements of SR 3.3.1.1.17 are met for the purpose of initial arming of the OPRM trip.

4.2.3 **Setpoints and Allowable Values**

There are no allowable values associated with the OPRM Upscale Function. The OPRM period-based detection algorithm (PBDA) Upscale trip setpoints are determined using the Option Ill licensing methodology described in NEDO-32465-A with the exception that the licensee plans to utilize a plant/cycle-specific DIVOM curve slope in place of the generic DIVOM curve slope. This was necessitated by BWROG's resolution of Part 21 filed by GE. The PBDA trip setpoints, which can change with each new fuel cycle, will be documented in the COLR. TS-related setpoints for the auto-enable (not-bypassed) region are established as nominal setpoints only, as described in the licensee's proposed TS Bases markup and defined in SR 3.3.1.1.19. The minimum operable OPRM cells setpoint (25) is defined by GE analyses based on the licensee's selection of the OPRM cell assignments and a minimum of two LPRMs per cell. The setpoint is established to conform to the licensing bases defined in NEDO-31960-A, July 12, 1993 (including Supplement 1), and NEDO-32465-A, and is consistent with the guidance provided in NEDC-32410P-A. This setpoint, along with the licensee's

selection of a minimum of two LPRMs per cell, is documented in the TS Bases as part of the operability requirements for Function 2.f.

The PBDA algorithm includes several “tuning” parameters. These are established in accordance with PBAPS 2 and 3 procedures as part of the system setup, and are not defined in the TSs but documented in plant procedures.

There are also setpoints for the defense-in-depth algorithms discussed in the OPRM Upscale Function description in the licensee’s proposed TS Bases markup. These are treated as nominal setpoints based on qualitative studies documented in Appendix A of NEDO-32465-A. Use of Appendix A of NEDO-32465-A as a basis for establishing these defense-in-depth settings is consistent with the approach used by other licensees for activating the OPRM Trip Function. These algorithms are not credited in the safety analysis and their settings are documented only in the PBAPS 2 and 3 procedures. The licensee proposed adding a note to Table 3.3.1.1-1 for the OPRM Upscale Function to state that the PBDA setpoint limits are defined in the COLR. Since the OPRM Upscale trip setpoint is cycle-specific, the staff finds it acceptable to have that setpoint in the COLR.

These changes are consistent with the guidance provided in the applicable topical reports listed above, and, therefore, are acceptable.

4.2.4 **TS 3.4.1 Recirculation Loops Operating**

The amendment makes the following changes to TS 3.4.1:

1. removes restrictions on operating regions shown in Figure 3.4.1-1 for both two-loop and single-loop operating conditions in both LCO 3.4.1 and SR 3.4.1.2;

2. removes CONDITIONS A., B., and C., and their associated REQUIRED ACTIONS, as well as removing REQUIRED ACTION F.1, each associated with operation in the Restricted Region and included previously as part of the ICA actions in
LCO 3.4.1;

3. deletes Figure 3.4.1-1 Thermal Power versus Core Flow Stability Regions; and

4. renumbers CONDITIONS D. and E. as CONDITIONS A. and B. and removes references to deleted CONDITIONS.

These changes are associated with the removal of the ICAs and references to them from the TSs. An operational OPRM trip makes the ICAs unnecessary; therefore, these changes to the TSs are acceptable. As noted earlier, the loss of an OPRM function can result in operation under the ICAs; however, they will now be controlled by plant procedure rather than by the TSs.

4.2.5 **TS 5.6.5 Core Operating Limits Report (COLR)**

The licensee proposed 1) to add a new TS 5.6.5.a.5, The Oscillation Power Range Monitor (OPRM) Instrumentation for Specification 3.3.1.1; and 2) to add new TS 5.6.5.b.9,

NEDO-32465-A, “Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology and Reload Applications,” August 1996.

The staff has reviewed the proposed changes and found them acceptable because NEDO-32465-A is an approved licensing Topical Report to support the new proposed TSs 3.3.1.1 and 3.4.1 for determining the setpoint values of the applicable operating limits for the OPRM in the COLR.

Based on our review, the staff concludes that the above described TS changes and associated Bases, involving the implementation of the OPRM portion of the GE NUMAC-PRNM system, for PBAPS 2 and 3 are in accordance with the approved methodology. The changes, therefore, are acceptable.

4.2.6 **Technical Specification Bases Section 3.3.1.1, RPS Instrumentation**

Some PRNM TS Bases changes, besides those required for inclusion of the OPRM Upscale Function, are being implemented to clarify system requirements. Text has been added to the TS Bases discussion for Function 2.b (APRM simulated thermal power - high) to clarify that the basis for the ΔW flow offset is applicable to single-loop operation (SLO). A minor change is being made to Note b in Table 3.3.1.1-1 to give the SLO equation as “0.65 (W-ΔW) + 63.7%” instead of “0.65W + 63.7% - 0.65ΔW.” The change, while mathematically equivalent, states the equation in the form that is actually implemented in the equipment. This change is being made to clarify the system's calculation of this setpoint.

A TS Bases discussion for Function 2.e (2-out-of-4 voter) has been added to clarify that inoperability of parts of the 2-out-of-4 logic module that do not affect the voter Function does not require that the voter Function be declared inoperable. The Bases discussion for SR 3.3.1.1.12 has been revised to clarify that the SR applies also to the recirculation flow loop and includes once-per-cycle correlation adjustments between drive flow and core flow measurements.

The licensee’s proposed TS Bases are consistent with NEDC-32410P-A, Supplement 1.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (69 FR 19570). The amendments also relate to changes in recordkeeping, reporting, or administrative procedures or requirements. Accordingly, the

amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (c)(10). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: T. Huang
H. Garg
C. Schulten

Date: March 21, 2005