March 24, 2005

Mr. L. William Pearce
Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Post Office Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NO. 2 (BVPS-2) - ISSUANCE OF AMENDMENT RE: ELIMINATION OF PERIODIC PRESSURE SENSOR AND PROTECTION CHANNEL RESPONSE TIME TESTING (TAC NO. MC3894)

Dear Mr. Pearce:

The Commission has issued the enclosed Amendment No. 147 to Facility Operating License No. NPF-73 for the Beaver Valley Power Station, Unit No. 2 (BVPS-2). This amendment consists of changes to the Technical Specifications (TSs) and related Bases pages in response to your application dated July 23, 2004, as supplemented December 8, 2004.

The amendment revises the BVPS-2 TSs to eliminate periodic response time testing requirements on selected sensors and selected protection channel components and permit the option of either measuring or verifying the response times by means other than testing.

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

Sincerely,

/RA/

Timothy G. Colburn, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-412

Enclosures: 1. Amendment No. 147 to NPF-73
2. Safety Evaluation

cc w/encls: See next page

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ACCESSION NO. ML050410070 *SE input dated 01/12/05. No substantive changes made.

OFFICE	PDI-1/PM	PDI-2/LA	EEIB/SC	PDI-1/SC	OGC
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DATE	2/28/05	3/07/05	01/12/05	3/22/05	3/16/05

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Beaver Valley Power Station, Unit Nos. 1 and 2

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PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 147
License No. NPF-73

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

   A. The application for amendment by FirstEnergy Nuclear Operating Company, et al. (the licensee), dated July 23, 2004, as supplemented December 8, 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 Facility Operating License No. NPF-73 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 147, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. FENOC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 24, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 147

FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

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
1-4	1-4
1-5	1-5
3/4 3-1	3/4 3-1
3/4 3-15	3/4 3-15
B-I	B-I
B 3/4 3-2	B 3/4 3-2
B 3/4 3-3	B 3/4 3-3
B 3/4 3-4	B 3/4 3-4
B 3/4 3-5	B 3/4 3-5
B 3/4 3-6	B 3/4 3-6
B 3/4 3-7	B 3/4 3-7
B 3/4 3-8	B 3/4 3-8
B 3/4 3-9	B 3/4 3-9
B 3/4 3-10	B 3/4 3-10
B 3/4 3-11	B 3/4 3-11

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 147 TO FACILITY OPERATING LICENSE NO. NPF-73

PENNSYLVANIA POWER COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

FIRSTENERGY NUCLEAR OPERATING COMPANY

BEAVER VALLEY POWER STATION, UNIT NO. 2 (BVPS-2)

DOCKET NO. 50-412

1.0 INTRODUCTION

By application dated July 23, 2004, as supplemented by letter dated December 8, 2004, the FirstEnergy Nuclear Operating Company (FENOC, the licensee), requested changes to the Technical Specifications (TSs) for BVPS-2. The supplement dated December 8, 2004, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 31, 2004 (69 FR 53109).

The proposed changes would revise the BVPS-2 TSs to eliminate the periodic response time testing (RTT) requirements on selected sensors and selected protection channel components and permit the option of either measuring or verifying the response times by means other than testing. Related Bases pages are included.

2.0 REGULATORY EVALUATION

The current standard TSs require nuclear power plants to periodically perform RTT for instrument channels in the reactor protection system (RPS), emergency core cooling system (ECCS), and isolation actuation system (IAS). The intent of these tests is to ensure that changes in instrumentation response time beyond the limits assumed in the plants's safety analyses are detected and combined with instrument calibrations, to ensure that the instrumentation is operating correctly.

The Institute of Electrical and Electronics Engineers (IEEE) Standard 338-1987, which is endorsed in Regulatory Guide (RG) 1.118, Rev. 2, defines a basis for eliminating RTT.

Specifically, Section 6.3.4 of the standard states in part the following basis:

> "Response time testing of all safety-related equipment is not required if, in lieu of response time testing, the response time of the safety system equipment is verified by functional testing calibration checks or other tests, or both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics that are detectable during routine periodic tests."

The Westinghouse Owner's Group (WOG) performed two analyses to assess the impact of elimination of RTT for instruments and instrument loops. These analyses also discussed alternate test methodologies which would show that the instrumentation was functioning correctly. The first of these analyses was WOG's Licensing Topical Report, WCAP-13632, "Elimination of-Pressure Sensor Response Time Testing Requirements," dated August 1995, which was approved by the NRC staff's safety evaluation report (SER) dated September 5, 1995. The second, WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," dated December 1995, was approved by NRC staff SER, dated October 6, 1998. Each of these SERs stipulated certain conditions that individual plant licensees must meet when implementing the guidelines in WCAP-13632 and WCAP-14036 on a plant-specific basis. The licensee has used these WCAPs to justify the proposed changes. The NRC staff's acceptance and the licensee's amendment request are based on these WCAPs.

3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment, which are described in the licensee's submittal. The detailed evaluation is provided in the following subsections.

3.1 TS Changes

There are two types of RTT elimination changes contained within the FENOC request. The first is to eliminate periodic pressure sensor RTT in accordance with WCAP-13632 and the second change is to eliminate protective channel RTT for the reactor trip system (RTS) and engineered safety feature actuation system (ESFAS) in accordance with WCAP-14036.

For the first change, the licensee proposes to no longer perform RTT on the following sensors:

Barton 752 Differential Pressure Transmitter
Barton 763 Gauge Pressure Transmitter
Barton 763A Gauge Pressure Transmitter
Barton 764 Differential Pressure Transmitter

These sensor types were listed in the NRC staff SER dated September 5, 1995, approving WCAP-13632. Since the NRC staff has already reviewed the generic analysis, no further review of these sensor types is required, and the licensee needs only to meet the conditions for plant-specific amendments.
For the second change, the licensee proposed elimination of RTT for the RTS and

ESF systems, and instead will depend upon calibration and other periodic testing, as described in WCAP-14036, in order to determine the proper operation and functioning of the above system instrumentation. In those cases where the TSs require the licensee to verify that a protective system can meet its protective function in a prescribed time, a bounding response time will be added to those portions of the protective system actually tested for response time in order to determine the total system response time. The requirement to actually measure the response times would be eliminated, and instead, the response times will be verified by summing allocated times for sensors, the process protection system, the nuclear instrumentation system, and the logic system. These allocated values will be added to the measured times for the actuated devices and compared to the overall analysis limits.

The proposed TS change is to revise the TS definitions for "Engineered Safety Feature Response Time" and "Reactor Trip System Response Time" to provide for verification of response time for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

The specific sections of the BVPS-2 TSs to be changed are as shown below.

3.1.1 Definitions Section, 1.22, REACTOR TRIP SYSTEM RESPONSE TIME, page 1-4.

Proposed Change: Add two sentences to the definition. The definition currently states:

> The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its trip setpoint at the channel sensor until loss of stationary gripper coil voltage.

With the addition of the proposed sentences, the definition will state:

> The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

Evaluation: Addition of these sentences will allow the licensee to verify the component response times rather than perform an actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, and the NRC staff's SER approving that report, and are, therefore, acceptable.

3.1.2 Definitions Section, 1.23, ENGINEERED SAFETY FEATURE RESPONSE TIME, page 1-5.

Proposed Change: Add two sentences to the definition. The definition currently states:

> The ENGINEERED SAFETY FEATURE RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

With the addition of the proposed sentences, the definition will state:

> The ENGINEERED SAFETY FEATURE RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

Evaluation: Addition of these sentences will allow the licensee to verify the component response times rather than perform an actual RTT. These changes are in accordance with the WCAP-14036-P, Revision 1, and the NRC staff's SER approving that report, and are, therefore, acceptable.

3.1.3 Section 3/4.3.1, REACTOR TRIP SYSTEM INSTRUMENTATION, SURVEILLANCE REQUIREMENTS, paragraph 4.3.1.1.3, page 3/4 3-1.

Proposed Change: Modify the paragraph to use the term "verify" rather than "demonstrate" or "test". The paragraph currently states:

> 4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Neutron detectors are exempt from response time testing. Each test shall include at least one logic train such that both logic trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

With the modifications, the paragraph will state:

> 4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip

function shall be verified to be within its limit at least once per 18 months. Neutron detectors are exempt from response time testing. Each verification shall include at least one logic train such that both logic trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

Evaluation: These modifications will allow the licensee to verify the component response times rather than perform an actual RTT. These changes are in accordance with the WCAP-14036-P, Revision 1, and the NRC staff's SER approving that report, and are, therefore, acceptable.

3.1.4 Section 3/4.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION, SURVEILLANCE REQUIREMENTS, paragraph 4.3.2.1.3, page 3/4 3-15.

Proposed Change: Modify the paragraph to use the term "verify" rather than "demonstrate" or "test". The paragraph currently states:

> 4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESF function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one logic train such that both logic trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per N times 18 months where N is the total number of redundant channels in a specific ESF function as shown in the "Total No. Of Channels" Column of Table 3.3-3.

With the modifications, the paragraph will state:

> 4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESF function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one logic train such that both logic trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESF function as shown in the "Total No. Of Channels" Column of Table 3.3-3.

Evaluation: These modifications will allow the licensee to verify the component response times rather than perform an actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, and the NRC staff's SER approving that report, and are, therefore, acceptable.

3.1.5 Bases Section on REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION, pages B 3/4 3-2 and B 3/4 3-3.

Proposed Change: In the 5th paragraph, replace the word "measurement" with the word "verification." Delete the 8th paragraph, and replace it with two new paragraphs. The 8th paragraph currently states:

> Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times.

The replacement paragraphs state:

> Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.
>
> WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" and WCAP-15413, “Westinghouse 7300A ASIC-Based Replacement Module Licensing Summary Report” provide the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.
>
> WCAP-15413 provides bounding response times where 7300 cards have been replaced with ASICs cards.

Evaluation: These changes describe the rationale which allows the licensee to verify the component response times by using approved methodology instead of performing an actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, as approved by the NRC staff SER, and are, therefore, acceptable.

It should be noted that the replacement of one component approved for elimination of RTT with a similar component will require an RTT prior to installation. This is in accordance with condition A below. The replacement of one component approved for elimination of RTT with a different component also approved for elimination of RTT will also require an RTT prior to installation, but will not require resumption of periodic RTT surveillances. The replacement of

one component approved for elimination of RTT with a different component not approved for elimination of RTT will require resumption of periodic RTT surveillances. These replacements, including replacement with ASIC-based replacement modules as described in WCAP-15413, will require a screening or review, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.59, and if necessary, NRC staff review and approval.

3.2 Verification of Plant-Specific Conditions

The NRC staff stipulated several conditions in the SER approving WCAP-13632 which must be met by an individual licensee referencing the topical report before that licensee's plant-specific TS change request could be approved and implemented. From the licensee's submittal, the NRC staff verified that the licensee has met or will meet the applicable conditions as follows:

A) Condition: Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value.

Licensee's Response: "Consistent with the proposed TS changes (including the associated Bases for TS 3/4.3.1. and TS 3/4.3.2.), the applicable plant procedures will include revisions which stipulate that pressure sensor response times must be verified by performance of an appropriate response time test prior to placing a new sensor into operational service and re-verified following maintenance that may adversely affect sensor response time."

Evaluation: This response fulfills the condition in the NRC staff SER, and is, therefore, acceptable.

B) Condition: For transmitters and switches that use capillary tubes, perform an RTT after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

Licensee's Response: "BVPS Unit 2 has no pressure sensors (transmitters or switches) that use capillary tubes in any Reactor Trip System (RTS) or Engineered Safety Features Actuation System (ESFAS) application for which RTT is required. Therefore, no procedure changes or enhanced administrative controls are required. If BVPS Unit 2 replaces any of these sensors in the future with sensors using capillary tubes, then BVPS Unit 2 will implement plant procedure changes (and/or other appropriate administrative controls) prior to application of the WCAP methodology to assure the sensors are response time tested after initial installation and after any maintenance or modification activity that could damage the capillary tubes."

Evaluation: Since BVPS-2 does not use transmitters and switches that use capillary tubes, this condition is not applicable. The commitment to meet this condition if transmitters and switches that use capillary tubes are used in the future is acceptable.

C) Condition: If variable damping is used, implement a method to assure that the

potentiometer is at the required setting and cannot be inadvertently changed or perform hydraulic RTT of the sensor following each calibration.

Licensee Response: "BVPS Unit 2 has no pressure transmitters with variable damping installed in any RTS or ESFAS application for which RTT is required; therefore, no procedure changes or enhanced administrative controls are required. If BVPS Unit 2 replaces any transmitters in the future with variable damping capability, then BVPS Unit 2 will implement procedure changes and/or establish appropriate administrative controls prior to application of the WCAP methodology to assure the variable damping potentiometer cannot be inadvertently changed."

Evaluation: Since BVPS-2 does not use sensors that use variable damping, this condition is not applicable. The commitment to meet this condition if sensors with variable damping are used in the future is acceptable.

D) Condition: Perform periodic drift monitoring of all Model 1151, 1152, 1153, and 1154 Rosemount pressure and differential pressure transmitters, for which RTT elimination is proposed, in accordance with the guidance contained in Rosemount Technical Bulletin No. 4, and continue to remain in full compliance with any prior commitments to NRC Bulletin 90-01, Supplement 1. As an alternative to performing periodic drift monitoring of Rosemount transmitters, licensees may complete the following actions: (1) ensure that operators and technicians are aware of the Rosemount transmitter loss-of-fill-oil issue and make provisions to ensure that technicians monitor for sensor response time degradation during the performance of calibrations and functional tests of these transmitters, and (2) review and revise surveillance testing procedures, if necessary, to ensure that calibrations are being performed using equipment designed to provide a step function or fast ramp in the process variable and that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of the transmitter under test, thus allowing, with reasonable assurance, the recognition of significant response time degradation.

Licensee Response: "BVPS Unit 2 has no Rosemount transmitters that are installed in any RTS or ESFAS application that requires response time testing, and therefore no periodic drift monitoring of Rosemount transmitters, for which response time testing elimination is proposed, is required."

Evaluation: Since BVPS-2 does not use Rosemount transmitters for which periodic drift monitoring is required, this condition is not applicable.

The NRC staff confirmed that the licensee submittals referenced in their response are consistent with the above condition. Therefore, this response fulfills the condition in the NRC staff SER, and is, therefore, acceptable.

The NRC staff SER approving WCAP-14036 also had a condition which must be met by the individual licensee referencing the topical report before the guidance could be implemented in plant-specific TS change proposals. The condition is as

follows:

Condition: Since the performance of RTT is a TS requirement, licensees referencing WCAP-14036 must submit a TS amendment to eliminate that requirement for the identified equipment. In that amendment request, the licensee must verify that the failure modes and effects analysis (FMEA) performed by the WOG is applicable to the equipment actually installed in the licensees facility, and that the analysis is valid for the versions of the boards used in the protection system.

Licensee Response: "FENOC has reviewed the plant equipment installed in BVPS Unit 2. Table 1 provides the listing of equipment installed in Unit 2 that is applicable to the generic analysis contained in WCAP-14036-P-A, Revision 1. The [FMEA] documented in WCAP-14036-P-A, Revision 1, is applicable to the equipment installed in BVPS Unit 2 and the analysis is valid for the versions of the boards used in the protection system with the following clarification. Some versions of 7300 cards installed (or planned to be installed) in BVPS Unit 2 are cards that have been re-designed since the original [FMEA] was performed for WCAP-14036-P-A (see Table 1, Note 3). These newer cards have been evaluated by Westinghouse for RTT elimination. The results of this evaluation for the newer NLP, NSA and NAL cards concluded that the differences in the re-designed cards are insignificant with respect to the conclusions of the original [FMEA] and that the [FMEA] and bounding response times documented in WCAP-14036-P-A, Revision 1, is applicable to these newer cards. A new FMEA was performed for the re-designed NRA cards. This [FMEA] was based on the original NRA [FMEA] methodology used for WCAP-14036-P-A, Revision 1. The Westinghouse evaluation concluded that the newer NRA cards meet the bounding response times listed in WCAP-14036-P-A, Revision 1."

Evaluation: The SER approving WCAP-14036 approved specific versions of the 7300 cards. Three of those cards, the NLP, NSA and NAL cards have been modified, and therefore the original FMEA may not be applicable. Two of these changes have been previously approved. The 6NPL card has been modified into 11NPL, and the 4NSA card has been modified into 6NSA. These two changes were previously approved in the March 12, 2002, SER (Agencywide Documents Access and Management System (ADAMS) Accession No. ML020770614) approving a Virgil C. Summer Nuclear Station, RTT elimination, and, therefore, no additional review is required. The 9NAL card has been modified into 10NAL. The licensee, in its December 8, 2004, RAI response, provided an analysis of the modifications. The NRC staff has reviewed that analysis and agrees the

modifications do not invalidate the conclusions of the original FMEA, and the 10 NAL card response time is still bounded by the original value.

The 4NRA card previously approved in the original SER on WCAP-14036 will initially be used by the licensee, but in note 3 in Table 1 of the July 23, 2004, submittal, the licensee stated that a 5NRA or 6NRA card may be installed later. These versions were not previously approved; however, the licensee stated that the 5NRA and 6NRA cards had been evaluated by Westinghouse in a new

FMEA and the bounding response times in WCAP-14036 were valid for these versions of cards. The NRC staff, in the October 25, 2004, request for additional information (RAI) (ADAMS Accession No. ML042800320), requested copies of the Westinghouse FMEA. These proprietary copies of the Westinghouse FMEA were provided by the licensee as Enclosure 2 of the December 8, 2004, RAI response. The NRC staff has reviewed the two FMEAs, one on the 5NRA card and one on the 6NRA card, and agrees that the bounding response times shown in the original WCAP-14036 are still valid.

3.3 Bounding Response Times

In addition to the above conditions, when a plant accident analysis determines that a mitigation system is required to actuate in a certain response time, the testing for that response time is generally required by the TSs. The proposed license amendment request would eliminate some of the testing previously required. The two topical reports mentioned above provide adequate justification that calibrations and other surveillance testing will prove that the instruments are functioning properly. When the testing is not done to a portion of the instrument loop, but the TS requires the verification of assumptions made in the accident analysis, some assumed or bounding value for the untested portion of the loop must be added to the tested portion, to arrive at a total system response time. WCAP-14036 included those maximum or bounding response times for the equipment which was analyzed in that report. WCAP-13632 did not have similar bounding response times approved for the sensors which were addressed in that topical report.

The bounding sensor response time values table shown below and the notes to the table were included as Table 1 in the July 23, 2004, licensee submittal.

Table 1
Beaver Valley Power Station, Unit 2
Process Channel & Actuation Logic Response Time Allocations
Reactor Trip System

FUNCTION	SENSOR	TIME (Note 1)	7300/NIS STRING (Note 3)	TIME (Note 5)	SSPS RELAYS (Note 6)	TIME (Note 7)
Power Range, Neutron Flux	Detectors Exempt	N/A	NIS FMEA	65 ms	Input	20 ms
Power Range, Neutron Flux, Hi-Negative Rate	Detectors Exempt	N/A	NIS FMEA	200 ms	Input	20 ms
OTDT (Vary Tavg)	Weed N9004E-2B/ Weed N9004S-2B	(Note 2)	NRA+NSA+NSA+ NSA+NAL (Note 4)	400 ms	Input	20 ms
OTDT (Vary Delta T)	Weed N9004E-2B/ Weed N9004S-2B	(Note 2)	NRA+NSA+NSA+ NAL (Note 4)	400 ms	Input	20 ms
OTDT (Vary Press)	ITT Barton 763/763A	420 ms	NLP+NSA+NSA+ NAL	400 ms	Input	20 ms
OTDT (Vary Flux)	Detectors Exempt	N/A	NIS (1 ms)+NSA +NCH+NSA+NAL	401 ms	Input	20 ms
OPDT (Vary Tavg)	Weed N9004E-2B/ Weed N9004S-2B	(Note 2)	NRA+NSA+NSA+ NSA+NSA+NAL (Note 4)	400 ms	Input	20 ms
OPDT (Vary Delta T)	Weed N9004E-2B/ Weed N9004S-2B	(Note 2)	NRA+NSA+NSA+ NAL (Note 4)	400 ms	Input	20 ms
PZR. PRESS. LO	ITT Barton 763/763A	420 ms	NLP+NAL	100 ms	Input	20 ms
PZR. PRESS. HI	ITT Barton 763/763A	420 ms	NLP+NAL	100 ms	Input	20 ms
RCS FLOW LO	ITT Barton 752	200 ms	NLP+NAL	100 ms	Input	20 ms
SG LEVEL LO-LO	ITT Barton 764	400 ms	NLP+NAL	100 ms	Input	20 ms
RCP UNDER-VOLT.	Gould 211N6171 (47D)	(Note 2)	N/A	N/A	Input	20 ms
RCP UNDER-FREQ.	E-MAX SFR-2/59-12A	(Note 2)	N/A	N/A	Input	20 ms
CONTAINMENT PRESS. HI	ITT Barton 764	400 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
PZR. PRESS. LO	ITT Barton 763/763A	420 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
STEAM LINE PRESS. LO	ITT Barton 763/763A	400 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
CONT. PRESS HI-HI	ITT Barton 764	400 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
SG LEVEL HI-HI (FEEDWATER ISOLATION)	ITT Barton 764	400 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
CONT. PRESS. INT	ITT Barton 764	400 ms	NLP+NAL	100 ms	Input + Master	88 ms

STEAM LINE PRESS RATE -HI NEG	ITT Barton 763/763A	400 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
SG LEVEL LO-LO	ITT Barton 764	400 ms	NLP+NAL	100 ms	Input + Master + Slave	88 ms
UNDERVOLTAGE RCP	Gould 211N6171 (47D)	(Note 2)	N/A	N/A	Input + Master (Note 8)	52 ms

Table 1 Notes

1. Allocated sensor response times for the ITT Barton 752, 763 (763A) and 764 pressure sensors specified in Table 1 are based on historical records (method 1) of acceptable RTT obtained from the BVPS response time testing program. The sensor response times for all sensors except the containment pressure sensors were obtained using the Analysis and Measurement Services (AMS) noise analysis method. The containment pressure sensor response times were obtained using a hydraulic RTT method. The historical response time data used as the bases for the allocated response times were the AMS sensor response time measurement tests performed on October 1998, August 2000, January 2002 and August 2003 and the containment pressure sensors hydraulic RTT performed between February 1995 and August 2003. The highest response time measured for the ITT Barton sensors were as follows: Barton 752 - 160 ms; Barton 763 (763A) - 370 ms; Barton 764 - 380 ms.

2. Allocated response times not used for these variables. The components will continue to be tested as required.

3. 7300 cards installed are 4NCH, 4NRA (5NRA and 6NRA may be installed later in 2004), 11NLP, 6NSA and TONAL or older artwork levels. The WCAP-14036-P-A R1 evaluation for RTT elimination was based on 4NCH, 4NRA, 6NLP, 4NSA and 9NAL or older artwork levels versions of the 7300 cards. The newer versions of the 7300 cards used at BVPS Unit 2 have been evaluated by Westinghouse and the bounding response times reported in WCAP-14036-P-A R1 are valid for these versions of cards. The NIS components installed were evaluated in Section 4.6 of WCAP-14036P-A R1.

4. Card string includes a Lead/Lag card set to zero. Therefore, this card will continue to be periodically [response time tested] and the response time contribution included in the total channel response time in accordance with WCAP-14036-P-A R1, Section 8.0.

5. The allocated response times are derived from Table 8-1 of WCAP-14036-P-A R1. If ABRMs are installed in the future, response times listed will be adjusted to account for the ABRM installed using the response times listed in Table 9-1 of WCAP-15413.

6. SSPS Input and Master relays are Midtex Series 156 and Potter & Brumfield KH series relays. SSPS Slave relays are Westinghouse AR relays and Potter & Brumfield MDR relays. Values are tabulated from Section 4.8 of WCAP-14036-P-A R1.

7. The allocated response times for the SSPS reactor trip functions (input relay) and ESFAS functions (input relay, master relay and slave relay) are derived from Table 8-1 of WCAP-14036-P-A R1. For ESFAS functions, the time shown only accounts for one slave relay in the circuit. For circuits containing two slave relays in series, an additional 36 msec. must be added.

8. Slave relay actuation is time delayed, and, therefore, will continue to be tested to verify timer operation.

The NRC staff has reviewed these values and the methods by which the values were determined, and has found them to be acceptable. Approval of allocated response times for ITT Barton pressure sensors is discussed in Section 3.4 of this SE.

3.4 Use of Anticipated Response Times other than Manufacturer's Design Response Times

The licensee stated that in some instances, manufacturer's design response time data is not available. In those instances, the licensee proposed using a response time value based upon actual values measured during past RTT at BVPS-2. The licensee provided the data for actual response times in its December 8, 2004, RAI response.
These administrative values for actual response time were established based upon review of the operating historical response time data. The NRC staff determined a statistically valid administrative value by determination of the mean and 2 sigma standard deviation values of a given response time (a value which represents 95% confidence level by definition). The NRC staff then determined the one-sided tolerance limit factor for a normal distribution for a 95/95% confidence level. This was done using guidance in NUREG-1475, "Applying Statistics," Table T-11b: One sided tolerance limit factor for a normal distribution.

The results of these calculations are as shown below:

Sensor	ITT Barton 763
Function	Pressurizer Pressure
Mean	0.358 seconds
Standard deviation (Std Dev)	0.016 seconds
Sample Size	11
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.736
One-sided tolerance limit	0.402 seconds
BVPS administrative response time value	0.420 seconds

Sensor	ITT Barton 752
Function	RCS Flow
Mean	0.126 seconds
Std Dev	0.017 seconds
Sample Size	36
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.158
One-sided tolerance limit	0.163 seconds
BVPS administrative response time value	0.200 seconds

Sensor	ITT Barton 764
Function	Steam Generator Level
Mean	0.283 seconds
Std Dev	0.043 seconds
Sample Size	36
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.158
One-sided tolerance limit	0.376 seconds
BVPS administrative response time value	0.400 seconds

Sensor	ITT Barton 763
Function	Main Steam Pressure
Mean	0.022 seconds
Std Dev	0.018 seconds

Sample Size	36
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.158
One-sided tolerance limit	0.062 seconds
BVPS administrative response time value	0.400 seconds
Sensor	ITT Barton 764
Function	Containment Pressure
Mean	0.062 seconds
Std Dev	0.040 seconds
Sample Size	13
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.675
One-sided tolerance limit	0.161 seconds
BVPS administrative response time value	0.400 seconds

In each case, the BVPS-2 administrative response time value is more conservative than the one-sided tolerance limit, and, therefore, the licensee's values are acceptable.

3.6 Conclusion

Based upon the above review, the NRC staff concludes that the licensee has implemented the provisions of the topical report SERs for RTT elimination and satisfied the applicable plant-specific conditions in accordance with the approved WCAP-13632 and WCAP-14036. Therefore, the NRC staff concludes that the proposed BVPS-2 TS modifications for selected instrument RTT elimination are acceptable.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 changes surveillance requirements. The NRC staff has determined that the amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (69 FR 53109). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

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