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March 10, 2006
L-06-035

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit Nos. 1 and 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Supplemental Information – EPU Implementation Plan & Power Ascension Testing: License Amendment Request Nos. 302 and 173 (Unit No. 1 TAC No. MC4645/Unit No. 2 TAC No. MC4646)

On October 4, 2004, FirstEnergy Nuclear Operating Company (FENOC) submitted License Amendment Request (LAR) Nos. 302 and 173 by letter L-04-125 (Reference 1). This submittal requested an Extended Power Uprate (EPU) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2.

Attachments 1 and 2 of this submittal provide supplemental information that pertains to the EPU LAR.

- Attachment 1 contains the updated EPU implementation plan & power ascension testing program projected for BVPS-1 & BVPS-2.

- Attachment 2 contains updated information to correct core damage frequency (CDF) values provided previously in FENOC Letter No. L-06-018 (Reference 2).

The additional information provided by this transmittal has no impact on either the proposed Technical Specification changes or the no significant hazards consideration transmitted by Reference 1.

The regulatory commitments contained in this submittal are listed in Attachment 3. Also provided in Attachment 3 are revisions to previous commitments relative to the schedule for completion of the modifications associated with the main feedwater valve internals and main steam / feedwater flow transmitters for BVPS-2. If there are any questions or if additional information is required, please contact Mr. Gregory A. Dunn, Manager – FENOC Fleet Licensing, at (330) 315-7243.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on March 10, 2006.

Sincerely,

James H. Lash

Attachments:

1. EPU Implementation Plan & Power Ascension Testing for BVPS-1 & BVPS-2
2. BVPS-1 CDF Results: Revised Table 1
3. List of Revised Commitments

References:

1. FENOC Letter L-04-125, License Amendment Request Nos. 302 and 173, dated October 4, 2004.
2. FENOC Letter L-06-018, Supplemental Response in Support of License Amendment Request Nos. 302 and 173.

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

Attachment 1 of L-06-035

EPU Implementation Plan & Power Ascension Testing for BVPS-1 & BVPS-2

The extended power uprate (EPU) implementation plan projected for BVPS-1 and BVPS-2 consists of a staged implementation of EPU to the fully uprated reactor power level of 2900 Megawatts thermal (MWt) from the current reactor power level of 2689 MWt. Following NRC review and approval of the EPU LARs and issuance of the EPU License Amendments, the implementation of safety-related equipment modifications and Technical Specification changes are required to support implementation of the EPU License Amendments.

The key plant modifications required to support the EPU License Amendments for BVPS-1 and BVPS-2 are scheduled to be implemented as follows:

Plant Modifications Required to Implement EPU License Amendments	**Projected Schedule**	
	BVPS-1	BVPS-2
BVPS-1 Steam Generator Replacement	1R17, Spring 2006	N/A
Charging Pump rotating assemblies replacement	Completed	2R12, On-Line Cycle 13
Overpower delta Temperature / Overtemperature delta Temperature (OPDT/OTDT) Instrumentation change to incorporate lead-lag filters	Completed	NA
Instrumentation Setpoint and Scaling changes	1R17, Spring 2006 and On-Line - Cycle 18	2R12, Fall 2006
*Modify Main Feedwater Control Valve Internals (Valve Trim Replacements)	1R17, Spring 2006 (prior to power increase)	Prior to power increase > 2770MWt* (approximately 103%)
*Main Steam (MS) and Main Feedwater (FW) Flow Transmitter Replacements	1R17, Spring 2006 (prior to power increase)	Prior to power increase > 2770MWt* (approximately 103%)

*NOTE: The main feedwater valve trims and main steam / feedwater flow transmitters for BVPS-2 have been evaluated and sufficient margin exists in the existing trim size and transmitter ranges to support operation at a power increase of 2770MWt (approximately 103%). As a result, a revision to previous commitment dates identified in the EPU LAR, Attachment D of FENOC letter L-04-125 (Reference 1) is necessary relative to the due date for completion of the main feedwater valve trims and main steam / feedwater flow transmitters for BVPS-2 (previously identified as required to be completed "prior to power level increase"). Attachment 3 contains the revised commitment due dates for completion of these modifications for BVPS-2.

Based on the above projected implementation schedules, the BVPS-1 EPU License Amendment will be implemented on-line during Cycle 18 (following refueling outage 1R17) within 120 days of issuance of the amendment. The BVPS-2 EPU License

Amendment will be implemented during the BVPS-2 refueling outage 2R12, prior to the first entry into Mode 4. BVPS-1 and BVPS-2 will continue to operate at the current reactor power level of 2689 MWt until the balance of plant (BOP) equipment modifications that are needed to support operation at higher power levels are implemented, as identified in the EPU LAR (Reference 1).

The phased implementation approach to the fully uprated reactor power level (2900 Mwt) will occur in two (2) stages. The 1st stage will increase Rated Thermal Power (RTP) to 2770 Mwt, approximately 3% above the current RTP of 2689 MWt. The 1st stage power ascension will be implemented in one power ascension step of 3%. The 2nd stage will increase the core RPT to 2900 Mwt. (approximately an additional 5% above the initial 3% power increase). This 2nd stage power ascension will be implemented in two steps of 2.5% each. Each stage will be implemented as the required modifications are completed which enable the units to produce the increased electrical output. The phased approach will provide a firm foundation for establishing the plant response at each power level incremental increase and establish operating experience prior to reaching the extended power level of 2900MWt.

The power ascension testing program was initially described in the EPU LAR submittal, L-04-025, Enclosure 2 Chapter 13 (Reference 1) and Attachment D of the Supplemental Response submittal L-05-026 (Reference 2). Additional information was also provided in responses to Request for Information (RAI) Questions N.7 and N.13 (FENOC submittal letter L-05-078 – Reference 3). The information relative to the EPU implementation plan and power ascension testing plan and plateaus identified in this submittal supersedes, in part, the information previously provided in the above referenced submittals.

The following summarizes the projected power ascension and testing approach for each unit.

BVPS- 1:

The BVPS-1 Containment Conversion (CC), Best Estimate LOCA (BELOCA), and the Replacement Steam Generator (RSG) License Amendments will be implemented during refueling outage 1R17 at the current licensed Rated Thermal Power (RTP) level of 2689 MWt. The Extended Power Uprate (EPU) power ascension will occur following 1R17. Figure 1 provides a profile of the projected power ascension and testing plateaus for BVPS-1.

The 1st stage will be implemented on-line during Cycle 18 (following 1R17) by increasing RTP to 2770 MWt.

The 2nd stage will be implemented in a subsequent operating cycle (following 1R18) to increase the RTP to the uprated reactor power level of 2900 MWt. This implementation will be completed in two steps of approximately 2.5% each.

The test plan will include provisions for recording and analyzing data at each power incremental increase to confirm that response is as expected and acceptance criteria are met. The power ascension testing program requires that plant data be recorded at approximately 2550 MWt (95% of 2689 MWt) and at 2689 MWt during power ascension following 1R17. This data will be used as a "baseline" to predict operating values at 2770 MWt. The baseline data will also take into consideration the changes as a result of

the RSG. The 1st stage of power ascension will be conducted in a controlled manner, monitoring required parameters to expected ranges and acceptance criteria. Various parameters will be assigned levels of significance, to aid in determining the appropriate response if a parameter differs from expectations. The test plan will be approved and implemented prior to power ascension.

Similar actions will be taken during the 2nd stage of power ascension. Data recorded at the power level of 2770 MWt will be used to predict expected values during power ascension to 2900 MWt. Power will be increased to 2830 MWt and held while data is taken to assure that the unit is safe for power ascension to 2900 MWt. As was done for the 1st stage, the power ascension will be monitored at each step to confirm that the values are as predicted and meet acceptance criteria.

Table 1 shows the BVPS-1 tests performed at each power level increment based on the EPU LAR (Reference 1) Chapter 13 Test Abstracts.

BVPS- 2:

The BVPS-2 Containment Conversion (CC) and BELOCA License Amendments will be implemented during refueling outage 2R12. The EPU power ascension will begin following 2R12 and will also be implemented as a phased approach in two stages. Figure 2 provides a profile of the projected power ascension and testing plateaus for BVPS-2.

Prior to the BVPS-2 shutdown for 2R12, data will be recorded at the current reactor power level of 2689 MWt. This data will be used as a "baseline" to predict operating values at 2770 MWt (3% increase). During power ascension from the refueling outage 2R12, plant data will be recorded at approximately 2550 MWt (95% of 2689 MWt) and then at 2689 MWt. This data will be used to predict values at 2770 MWt during subsequent power ascension. Power will be increased in a controlled manner, and required parameters will be monitored. As stated above for BVPS-1, parameters are assigned levels of significance to aid in determining the appropriate response if a parameter differs from expectations and does not meet acceptance criteria. Upon reaching 2770 MWt, parameters will be monitored to confirm that the expectations and acceptance criteria have been met.

During a subsequent refueling outage, a new high pressure (HP) turbine rotor, similar to that installed in BVPS-1, will be installed in BVPS-2 to allow increasing power above 2770 MWt. Following return to power after the subsequent refueling outage, data will be recorded at 2770 MWt. Power will be increased to 2830 MWt and held while data is taken to assure that the unit is safe for further power ascension to 2900 MWt. As was done for the 1st stage, the power ascension will be monitored at each step to confirm that the values are as predicted and meet acceptance criteria.

Table 2 shows the BVPS-2 tests performed at each power level increment based on the EPU LAR (Reference 1) Chapter 13 Test Abstracts.

References:

1. FENOC Letter L-04-125, License Amendment Request Nos. 302 and 173, dated October 4, 2004.
2. FENOC Letter L-05-026, Supplemental Information Supporting License Amendment Request Nos. 302 and 173.
3. FENOC Letter L-05-078, Responses to a Request for Additional Information in Support of License Amendment Request Nos. 302 and 173.

Figure 1 - Power Ascension Profile & Testing Plateaus (BVPS-1)
(NOTE - Timelines Not Drawn To Scale)

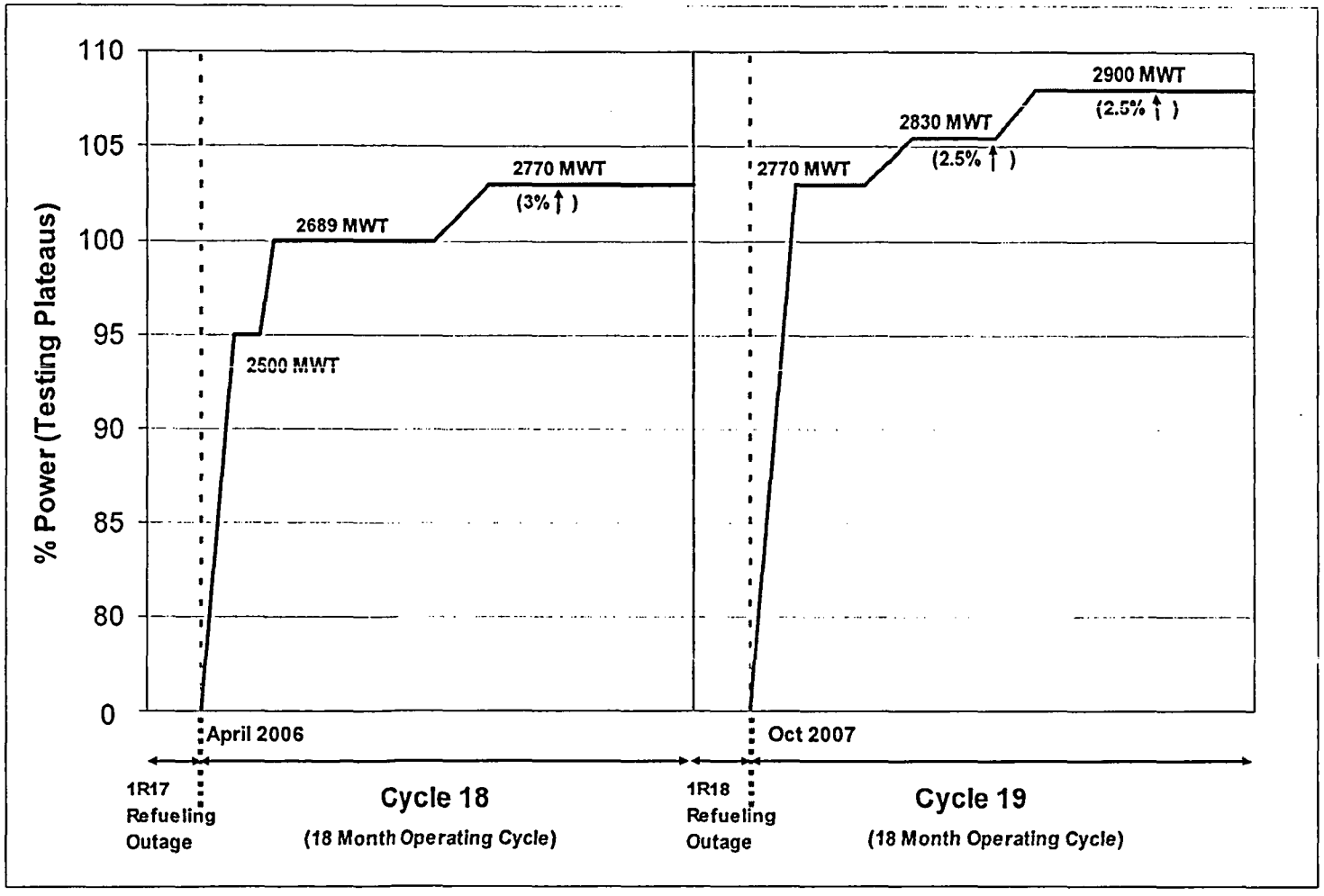

TABLE 1
Extended Power Uprate Test Plan (BVPS-1)

Test / Modification	Test Description	Prior to	Rated Thermal Power (RTP) Level			
			2689	2770	2830	2900
Start-Up Adjustment to the Reactor Control System	Test Abstract 13-2		X	X	X	X
Full Power Demonstration Test	Test Abstract 13-3			X		X
Alignment of Nuclear Instrumentation System	Test Abstract 13-4		X	X	X	X
Alignment of Process Temperature Instruments	Test Abstract 13-5	Startup	X	X	X	X
Thermal Power Calorimetric Measurements	Test Abstract 13-6		X	X	X	X
Incore / Excore Detector Calibration for Axial Offset Measurement	Test Abstract 13-7		X	X		X
Measure of Core Parameters During Steady State Conditions	Test Abstract 13-8		X	X		X
Pressurizer Level Control	Test Abstract 13-9	Startup	X	X	X	X
System Vibration Testing for Extended Power Uprate	Test Abstract 13-10		X	X	X	X
Reactor Coolant System Flow Measurement	Test Abstract 13-11			X		X
Primary Sampling System Test	Test Abstract 13-12			X		X
Turbine Plant Sampling System Performance Test	Test Abstract 13-13			X		X
Containment Penetration Cooling System Test	Test Abstract 13-14		X	X	X	X
Automatic Steam Generator Water Level Control Test	Test Abstract 13-15	Startup	X	X	X	X

TABLE 1
Extended Power Uprate Test Plan (BVPS-1)

Test / Modification	Test Description	Prior to	Rated Thermal Power (RTP) Level			
			2689	2770	2830	2900
Turbine Plant Component Cooling Test	Test Abstract 13-16		X	X	X	X
Cooling Tower Performance Test	Test Abstract 13-17		X	X	X	X
Main Transformer Performance Test	Test Abstract 13-18		X	X	X	X
Plant Communications Test	Test Abstract 13-19			X		X
Plant Radiation Survey and Verification of Shielding Effectiveness	Test Abstract 13-20			X		X
Containment Air Recirculation System Test	Test Abstract 13-21		X	X	X	X
BVPS-1 High Pressure Turbine Rotor Replacement	Test Abstract 13-23	Startup	Completed			X
Charging Pump Rotating Assembly Replacement	Test Abstract 13-24	EPU LAR Imp	Complete			
Charging Pump Re-Throttling	Test Abstract 13-25	EPU LAR Imp	Complete during 1R17			
BVPS-1 Fifth Point Heater Drain Control Valves Trim Replacement	Test Abstract 13-26	Startup	X	X	X	X
BVPS-1 Feedwater Control Valves Trim Change	Test Abstract 13-27	Startup	X	X	X	X
Instrument & Control Set Point and Re-scaling Changes	Test Abstract 13-30	Startup	X	X	X	X

Figure 2 - Power Ascension Profile & Testing Plateaus (BVPS-2)
(NOTE - Timelines Not Drawn To Scale)

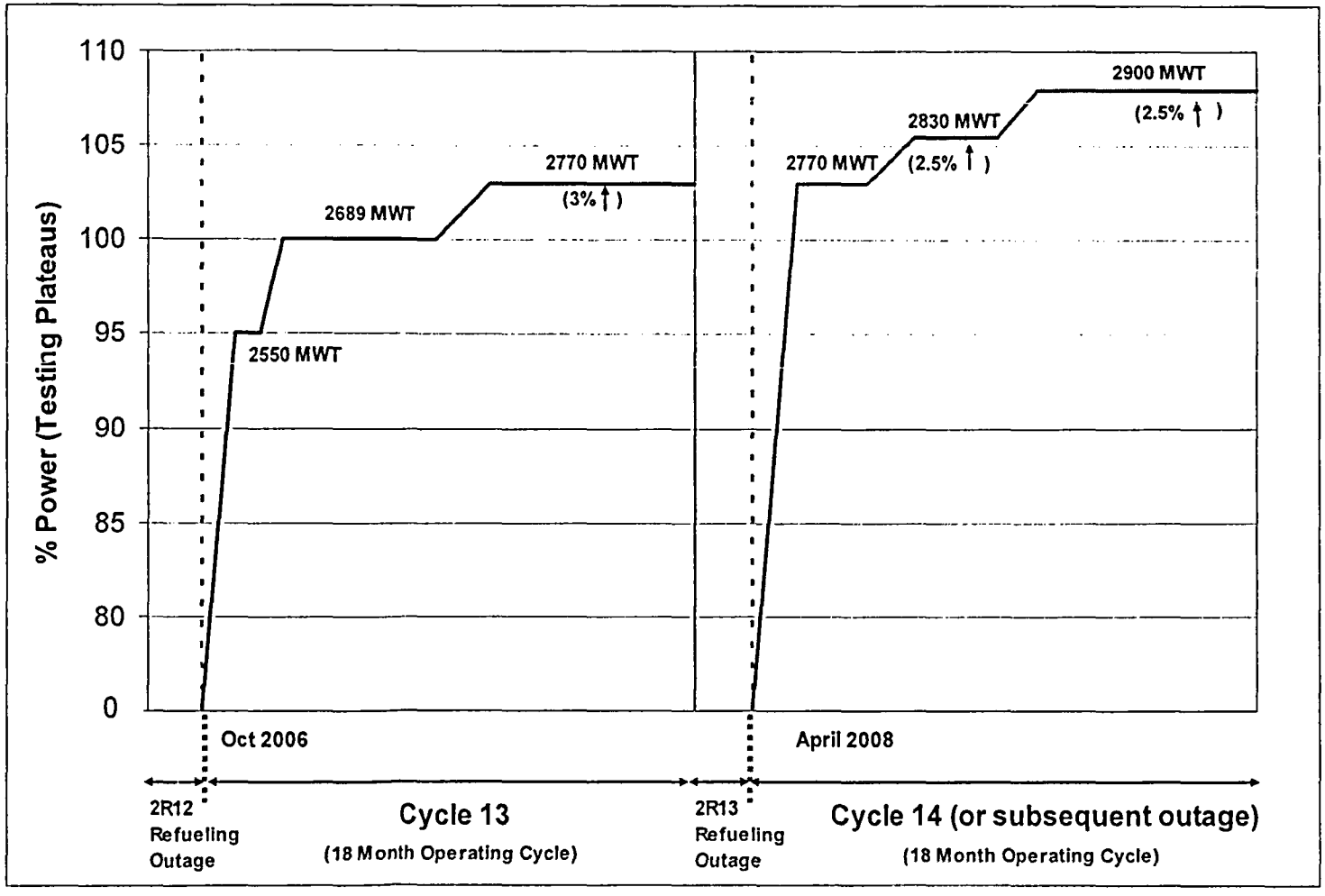

TABLE 2 Extended Power Uprate Test Plan (BVPS-2)						
Test / Modification	Test Description	Prior to	Rated Thermal Power (RTP) Level			
			2689	2770	2830	2900
Start-Up Adjustment to the Reactor Control System	Test Abstract 13-2		X	X	X	X
Full Power Demonstration Test	Test Abstract 13-3			X		X
Alignment of Nuclear Instrumentation System	Test Abstract 13-4		X	X	X	X
Alignment of Process Temperature Instruments	Test Abstract 13-5	Startup	X	X	X	X
Thermal Power Calorimetric Measurements	Test Abstract 13-6		X	X	X	X
Incore / Excore Detector Calibration for Axial Offset Measurement	Test Abstract 13-7		X	X		X
Measure of Core Parameters During Steady State Conditions	Test Abstract 13-8		X	X		X
Pressurizer Level Control	Test Abstract 13-9	Startup	X	X	X	X
System Vibration Testing for Extended Power Uprate	Test Abstract 13-10		X	X	X	X
Reactor Coolant System Flow Measurement	Test Abstract 13-11			X		X
Primary Sampling System Test	Test Abstract 13-12			X		X
Turbine Plant Sampling System Performance Test	Test Abstract 13-13			X		X
Containment Penetration Cooling System Test	Test Abstract 13-14		X	X	X	X

TABLE 2
Extended Power Uprate Test Plan (BVPS-2)

Test / Modification	Test Description	Prior to	Rated Thermal Power (RTP) Level			
			2689	2770	2830	2900
Automatic Steam Generator Water Level Control Test	Test Abstract 13-15	Startup	X	X	X	X
Turbine Plant Component Cooling Test	Test Abstract 13-16		X	X	X	X
Cooling Tower Performance Test	Test Abstract 13-17		X	X	X	X
BVPS-2 Cooling Tower Fill Replacement	Test Abstract 13-17	Startup	X			
Main Transformer Performance Test	Test Abstract 13-18		X	X	X	X
BVPS-2 Main Electrical Transformer Cooler Replacement	Test Abstract 13-18	Startup	X			
Plant Communications Test	Test Abstract 13-19			X		X
Plant Radiation Survey and Verification of Shielding Effectiveness	Test Abstract 13-20			X		X
Containment Air Recirculation System Test	Test Abstract 13-21		X	X	X	X
BVPS-2 High Pressure Turbine Rotor Replacement	Test Abstract 13-23		Needed for increase to above 2770 MWt			X
Charging Pump Rotating Assembly Replacement	Test Abstract 13-24	LAR Imp				
Charging Pump Re-Throttling	Test Abstract 13-25	LAR Imp	Complete 2R12			
BVPS-2 Fourth Point Heater Drain Control Valves Replacement	Test Abstract 13-28	Startup	X	X	X	X
BVPS-2 2ndary Component Cool. Water Orifice Plate Removal	Test Abstract 13-29	Startup	X	X	X	X
Instrument & Control Set Point and Re-scaling Changes	Test Abstract 13-30	Startup		X		X

Attachment 2 of L-06-035

BVPS-1 CDF Results: Revised Table 1

BVPS-1 core damage frequency (CDF) results were provided in Table 1 of FENOC submittal letter L-06-018 dated February 14, 2006. While reviewing the fire sequences at BVPS-2, it was noted that the changes in the Human Error Probability (HEP) for operator action OPROB2 (from the pre-EPU value of 2.49E-02 to the post-EPU value of 2.71E-02) was dominating the risk at BVPS-2 by contributing 6.02E-08 to the total delta Fire CDF value of 6.40E-08. This operator action (OPROB2) is to perform a feed and bleed cooling, given that the operators previously failed to restore main feedwater. When this operator action was compared to the BVPS-1 values, it was noted that the pre-EPU HEP for OPROB2 inadvertently used the post-EPU HEP value of 1.68E-02, instead of the intended value of 1.53E-02. This resulted in no change to the delta Fire CDF for BVPS-1 due to failures of OPROB2. To correct for this, the BVPS-1 pre-EPU Sensitivity PRA model was re-quantified with the OPROB2 HEP set to 1.53E-02.

In addition, the BVPS-1 pre-EPU operator action HEP for OPROS2 (manually actuating SI following a small break LOCA and loss of both trains of SSPS) inadvertently used the pre-EPU HEP value for OPROS1 (same action without a LOCA). This HEP was corrected from 5.86E-03 (the pre-EPU HEP for OPROS1) to 7.01E-03 in the BVPS-1 pre-EPU Sensitivity PRA model, and re-quantified.

The adjustments due to the corrections to the pre-EPU operator actions (OPROB2 and OPROS2) HEP slightly reduced the overall pre-EPU total CDF reported in FENOC submittal letters L-05-192 and L-06-018 from 2.26E-05 to 2.25E-05, and also reduced the Fire CDF from 4.66E-06 to 4.62E-06. Therefore, the revised BVPS-1 delta Fire CDF is now 3.89E-08, which compares more favorably with the BVPS-2 results of 6.38E-08. The results of the BVPS-1 re-quantification are provided below in the revised Table 1, with changes from those values reported previously in FENOC letter L-06-018 shown in bold type.

BVPS-1 Results (Pre-EPU OPROB2 & OPROS2 HEP Corrected)			
Revised Table 1: BVPS-1 CDF Results			
BVPS-1 Risk Measures	**Pre-EPU Sensitivity Model[1] (From L-05-192)**	**Revised Post-EPU Model[1]**	**Change In Risk (EPU - Sensitivity)**
Total CDF (/year)	**2.25E-05**	2.29E-05	**3.36E-07**
Internal CDF (/year)	6.25E-06	6.55E-06	2.97E-07
External CDF (/year)	1.63E-05	1.63E-05	**3.95E-08**
Fire CDF (/year)	**4.62E-06**	4.66E-06	**3.89E-08**
Total LERF (/year)	4.37E-07	4.95E-07	5.83E-08
Note 1: Includes Replacement Steam Generator Tube Rupture Initiating Event Frequency			

Attachment 3 of L-06-035

List of Revised Commitments

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2. The list also includes revised due dates for BVPS Unit No. 2 commitments identified in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Gregory A. Dunn, Manager, Fleet Licensing at 330-315-7243 of any questions regarding this document or associated regulatory commitments.

Commitment	Due Date
BVPS-1 & 2:	
1. The Power Ascension Test Plan will include provisions for recording and analyzing data at each power incremental increase (as noted in Figures 1 and 2) to confirm that response is as expected and acceptance criteria are met.	The Power Ascension Test Plan will be approved and implemented prior to power ascension for each unit.
BVPS-2:	
2. Modify the main feedwater flow control valve internals.	*Prior to BVPS-2 power increase above 2770 MWt (approximately 103%)
3. Replace the main steam flow and main feedwater flow transmitters.	*Prior to BVPS-2 power increase above 2770 MWt (approximately 103%)

*Note: These commitments were previously identified in Attachment D of FENOC Letter L-04-125, License Amendment Request Nos. 302 and 173, dated October 4, 2004.
The changes identified in this document affect only the due dates for completion of the modifications to the main feedwater valve internals and main steam / feedwater flow transmitters for BVPS-1 and BVPS-2 (previously identified as required to be completed "prior to power level increase")