July 20, 2004

Mr. William Pearce
Vice President
FirstEnergy Nuclear Operating Company
Post Office Box 4
Shippingport, Pennsylvania 15077

SUBJECT: BEAVER VALLEY POWER STATION UNITS 1 & 2 - NRC INSPECTION REPORT 05000334/2004007 and 05000412/2004007

Dear Mr. Pearce:

On June 10, 2004, the U. S. Nuclear Regulatory Commission (NRC) completed an engineering team inspection at Beaver Valley Power Station, Units 1 and 2. The enclosed report presents the results of that inspection, which were discussed at an exit meeting on June 10, 2004, with Mr. Tom Cosgrove and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety, and compliance with the Commission's rules and regulations and with the conditions of your license. The inspection consisted of system walkdowns; examination of selected procedures, drawings, modifications, calculations, surveillance tests and maintenance records; and interviews with station personnel.

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web-site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Lawrence T. Doerflein, Chief
Systems Branch
Division of Reactor Safety

Docket Nos.: 50-334, 50-412
License Nos: DPR-66, NPF-73

Enclosure: Inspection Report 05000334/2004007; 05000412/2004007
w/Attachment: Supplemental Information

cc w/encl:
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R. Mende, Director, Nuclear Work Management
T. Cosgrove, Director, Nuclear Engineering/Projects
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket/Report No:	05000334/2004007;05000412/2004007
License No:	DPR-66, NPF-73
Licensee:	FirstEnergy Nuclear Operating Company (FENOC)
Facility:	Beaver Valley Power Station, Units 1 and 2
Location:	Post Office Box 4 Shippingport, Pennsylvania 15077
Dates:	May 24 - 28 and June 07 - 10, 2004
Inspectors:	P. Kaufman, Senior Reactor Inspector, DRS (Team Leader) H. Gray, Senior Reactor Inspector, DRS S. Pindale, Senior Reactor Inspector, DRS T. Cerne, NRC Consultant J. Bobiak, Reactor Inspector, DRS S. Lewis, Reactor Inspector, (Trainee) DRP R. Cooney, USNRC Contractor
Approved by:	Lawrence T. Doerflein, Chief Systems Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000334/2004007 and IR 05000412/2004007; 05/24/2004 - 06/10/2004; Beaver Valley Power Station, Units 1 and 2; engineering team inspection.

This inspection was conducted by five Region I inspectors, one NRC consultant and one NRC contractor. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Safety System Design and Performance Capability (IP 71111.21)

a. Inspection Scope

The inspectors selected the Unit 1 feedwater system, including auxiliary feedwater (AFW), and the Unit 2 480 Volt AC and 125 Volt DC power systems for its review of the design and performance capability of safety systems at Beaver Valley Power Station Units 1 and 2. The inspection also included a sample of some supporting/supported components that interface with the selected systems. The systems were selected because of their risk significance in initiating events, mitigating systems, and barrier integrity. In addition, the risk insights and probabilistic risk assessment (PRA) information relative to the selected systems were used to focus inspection activities on components and procedures that would mitigate the effects of postulated events. Components selected for a detailed design basis review are discussed, as applicable, in the following paragraphs. The inspection procedure used for this effort was IP 71111, Attachment 21.

The inspectors reviewed design and licensing basis documents for the Unit 1 feedwater and AFW systems and Unit 2 480 Volt AC and 125 Volt DC power systems, and the component functional requirements during normal operation and accident mitigation. The design and licensing documents reviewed for the systems included the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), and the design basis document for each system. In addition, the inspectors reviewed component vendor manuals, engineering analyses and calculations, equipment qualification records, instrument setpoints, plant procedures, system modifications, piping and instrument drawings, electrical schematics, instrumentation and control drawings and logic diagrams.

The operational readiness, configuration control, and material condition of the systems and components were assessed by reviewing applicable operating procedures, component maintenance records, preventive maintenance procedures, the PRA analysts daily evaluation of the effects of planned and emergent maintenance on plant risk and the coordination of this effort with the 12 week rolling maintenance schedule, test procedures and system health reports, and by conducting system walkdowns. The inspectors reviewed this equipment to ensure availability, reliability, and functional capability had been maintained.

The inspectors selected several major risk significant components within the Unit 1 feedwater, AFW, Unit 2 480 Volt AC and 125 Volt DC power systems for in-depth inspection. The components included the Unit 1 steam driven and two motor driven auxiliary feedwater pumps, several motor-operated valves, power operated relief valves (PORVs), and the refueling water storage tanks (RWST) for both Units. The verification process for the RWST level measuring instrumentation calibration was reviewed.

The inspectors reviewed the current status of the PORVs and their related block valves and compared these to the plant technical specification requirements. The adequacy of the actuating means and the PORV testing methods were reviewed. The PRA significance of having one or more of the three PORVs for either unit inoperative or their associated block valves closed was also evaluated.

The electrical inspection consisted of a review of calculations and other documents listed in the documents reviewed section of this report and a walkdown of the Unit 2 480 Volt AC and 125 Volt DC power systems. In addition, the inspectors reviewed electrical aspects of the Unit 1 feedwater and AFW systems.

The inspectors reviewed selected electrical calculations and analyses, and instrument setpoint calculations to verify that the assumptions were appropriate, that proper engineering methods and models were used and there was adequate technical basis to support the conclusions. The inspectors reviewed the design capability of major components of the systems including feedwater pumps, motor- driven auxiliary feedwater pumps, motor operated valves (MOVs), storage batteries, battery chargers and 480 Volt transformers and busses. The inspectors performed independent calculations to evaluate the adequacy of selected design calculations and verified that recent plant modifications would not adversely affect the Unit 1 feedwater, AFW, Unit 2 480 Volt AC and 125 Volt DC power systems. The inspectors reviewed calculations that verified the adequacy of the Class 1E battery capacity for the 2 hour load cycle, adequate voltage at all loads, sufficient interrupting capacity for all circuit interrupting devices and that adequate coordination existed between supplies and downstream components.

The 480 Volt AC Class 1E system for Unit 2 was also reviewed via walkdowns of the principal components and review of pertinent calculations that assured that voltage at the loads was adequate for a large number of cases reviewed during various grid conditions and during starting of large motors. Short circuit calculations verified that the components were capable of interrupting their fault currents. A review of coordination curves also assured that adequate coordination exists between bus supply and feeder breakers.

Electrical aspects of the Unit 1 feedwater and AFW systems were reviewed to assure adequate voltage exist at components of the systems. Electrical control and logic diagrams were reviewed for the major components and valves to assure that interlocks and permissives were in accordance with system requirements. Short circuit calculations were reviewed to assure that circuit breakers were of adequate capacity.

The mechanical inspection of the Unit 1 feedwater and auxiliary feedwater (AFW) systems consisted of walkdown inspections of the equipment to assess the material condition of the systems and components and confirm the existence of adequate controls over nonconforming material and any hazards (e.g., seismic II/I configurations) that could compromise the design function of safety-related system components. The inspectors reviewed how design change work had been implemented and controlled, particularly with regard to system operability status, to verify system and component

availability for the performance of design functions. In addition, field inspections were conducted with particular emphasis upon train separation, physical independence, and other common mode concerns that the design features were intended to address. Also, certain AFW system modifications (e.g., relocation of the steam admission valves to the Terry Turbine) were checked not only for compliance with the relevant design-basis criteria, but also for any potential adverse impact upon other important safety equipment in the proximate area.

The inspectors interviewed various plant personnel responsible for system status, licensing basis controls, and the implementation of modifications to verify the adequacy of programs and procedures addressing the adequacy of design-basis considerations in the system alignments and work control practices.

The inspectors reviewed the system interactions among the AFW, main steam, demineralized water and river water supply, and containment isolation systems, evaluating component performance during normal plant operations and accident scenarios. During this review, consideration was given to design basis events, including a single active or passive failure, loss of offsite power and seismic events, missile hazards and potential transients (e.g., water hammer). In addition, the inspectors reviewed the applicable system procedures which control system alignment and operational activities during normal evolutions, as well as the abnormal and emergency procedures which the licensed operators would implement following a design basis event. The inspectors reviewed applicable design basis documents, operations and surveillance test procedures, and the training lesson plans to evaluate the consistency between the assumptions made in the design and the expected system response, as controlled by the procedural directions provided to the operations personnel. The inspectors also conducted plant system walkdowns to verify the adequacy of the feedwater and AFW system design with respect to the approved design configuration (e.g., operations manual valve diagrams), as-built details (e.g., pipe hanger drawings), system modifications (e.g., valve relocation, piping changes, and class breaks), and engineering changes (e.g., pump/valve modifications).

The inspectors reviewed surveillance test procedures and test results, including in-service testing (IST), for the AFW system. The system operability status during certain surveillance activities (e.g., overspeed trip test of the turbine driven AFW pump) was discussed with the cognizant operations personnel. Additionally, design requirements for periodic testing of the AFW pump recirculation valves (FCV-1FW-102,103A, 103B) were discussed with operations and design engineering personnel to ensure proper consideration of AFW flow losses and pump protection. The inspectors also reviewed the AFW pump room temperature controls and the qualification of selected safety-related components (e.g., pump 1-FW-P-2) to confirm adequate operational controls were in place to compensate for weather and single-failure conditions, without a reliance on nonsafety-related equipment, during design basis events.

The inspectors also performed a review of selected systems and components supporting the AFW system to verify that the system configuration was consistent with the design basis. The main steam safety valve setpoints were checked for consistency

with AFW discharge head requirements. Also, where the field configuration required procedures to operationally align the support function (e.g., river water to auxiliary feedwater), the procedures were reviewed and system engineering and operations personnel were interviewed to determine the readiness of implementing the required contingency actions. The implementation of commitments made to the NRC for compliance with certain provisions in regulatory guidance documents (e.g., Generic Letter 89-13) were sampled and verified as part of the applicable licensee control programs.

The Beaver Valley simulators for Units 1 and 2 were also visited and walkdowns were conducted with simulator instructors to verify simulator fidelity with specific plant controls, particularly where field modifications had been effected. The inspectors discussed with the training personnel certain operational scenarios involving the AFW system and use of alarm response and emergency operating procedures (EOP). The inspectors also raised questions with the trainers regarding condition reports documenting specific procedural and timing issues with the AFW system operation. The responses to these questions were used to confirm that proper emphasis was placed upon emergency response assumptions in the training scenarios, as well as to determine the technical adequacy and clarity of the procedures being used by the licensed operators.

Licensing basis documents involving the Unit 1 feedwater and AFW systems were also reviewed by the inspectors to check for proper integration into operations and surveillance procedures and training plans. The inspectors reviewed specific design features at Beaver Valley involving the river water system as a backup supply of water to the primary plant demineralized water storage tank (DWST) volume. The procedural controls and operator training, as well as the physical configuration of the components, were examined, as applicable, to verify compliance with the design basis assumptions for the availability of AFW flow during the most limiting accident scenario. With respect to certain unique design features like the de-energized open AFW discharge isolation valves (HCV-1FW-158, A, B, C), the inspectors checked for adequate control of the design and licensing basis, including compliance with the containment isolation general design criteria in 10 CFR 50, Appendix A. The inspectors also reviewed the capability, both procedural and training, of the operators to perform certain EOP directed actions, given the environmental conditions and time available that is assumed for the design-basis accident requiring AFW response.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in identifying and resolving problems associated with the Unit 1 feedwater and auxiliary feedwater, and the Unit 2 480 Volt AC distribution and 125 Volt DC power systems. The inspectors reviewed condition reports, Licensee Event Reports (LERs), and work orders to assess plant performance and licensee corrective actions. In addition, the inspectors reviewed condition reports associated with the self-assessment of these systems which was completed in May 2004. This review was to verify that identified issues were appropriately entered into the corrective action program for timely resolution or resolved.

Regarding procedural quality, the inspectors reviewed the process for effecting corrective actions where procedural revision was required. Several of the condition reports listed with a "*" in Attachment 1 that were generated as a result of this inspection were noted to require procedural changes as part of the corrective measures. The types of procedures reviewed included: system operating and surveillance test procedures, alarm response procedures, and abnormal and emergency operating procedures. Discussions with the cognizant operations and engineering personnel revealed proper consideration of the identified problem's "extent of condition" (e.g., affect of a Unit 1 procedural problem on a Unit 2 system) and recognition of the need for additional followup of corrective actions for procedural revisions with respect to training and reference material.

b. Findings

No findings of significance were identified.

4OA6 Exit Meeting Summary

The inspectors presented the inspection results to Mr. Tom Cosgrove and other members of FirstEnergy management at the conclusion on the inspection on June 10, 2004. Proprietary information examined during the inspection was identified and returned to the licensee at the conclusion of the inspection.

ATTACHMENT 1

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

FirstEnergy Nuclear Operating Company

W. Pearce	Vice President
T. Cosgrove	Director, Nuclear Engineering/Projects
M. Manoleras	Manager, Nuclear Engineering, Design Engineering
P. Sena	Manager, Nuclear Operations
F. Oberlitner	Lead Nuclear Engineer, Design Engineering
B. Sepelak	Supervisor, Nuclear Regulatory Compliance
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J. Ankney	Senior Nuclear Electrical Design Engineer
B. Boyle	Unit 1 River Water System Engineer
S. Buffington	Leaf Piping/Stress Staff Engineer
G. Cacciani	Design Engineer
S. Checkets	Unit 2 Operations Superintendent
J. Devine	Senior Staff Design Electrical Advisor
C. Eberle	Supervisor of Operations Procedures
R. Ernfield	Simulator Tester
J. Habuda	Unit 1 Feedwater System Engineer
D. Hoover	Structural Design Engineer
R. Hruby	Manager of Nuclear Safety Engineering
M. Kogelschatz	Unit 1 Operations Shift Manager
C. Mancuso	Supervisor of Mechanical Engineering
E. McFarland	Simulator Trainer
S. Mukherjee	Staff Nuclear Engineer
B. Murtagh	Staff Nuclear Design Engineer
M. Ressler	Staff Nuclear Analysis Engineer
K. Schweikart	System Engineer

State of Pennsylvania

L. Ryan, Division of Nuclear Safety

U.S. Nuclear Regulatory Commission

L. Doerflein	Chief, Systems Branch, RI DRS
P. Cataldo	Senior Resident Inspector
G. Smith	Resident Inspector
D. Merzke	Acting Resident Inspector

LIST OF DOCUMENTS REVIEWED

Design and Licensing Basis Documents

1DBD-13	Design Basis Document for Containment Depressurization System, Rev. 8
1DBD-24A	Design Basis Document of Steam Generator Feedwater System, Rev. 5
1DBD-24B	Design Basis Document for Auxiliary Feedwater System, Rev. 6
2DBD-37	Design Basis Document for 480 V Distribution System, Rev. 4
2DBD-39	Design Basis Document for 125 VDC Power System, Rev. 4

UFSAR Sections

5.2.6.1, 5.3.3
8.3.1, 8.3.2, 10.3.5

Technical Specifications

TS 3/4.7.1.1, TS 3/4.7.1.2, TS 3/4.7.1.3
TS 3/4 8.1, 3/4 8.1.2, 3/4 8.2.3, 3/4 8.2.4
TS 3/4.4.11

Flow Diagrams

8700-RM-18A	Flow Diagram, Feedwater, Rev. 41
8700-RM-421-1	Main Steam, Rev. 14
8700-RM-424-1	Feedwater System, Rev. 11
8700-RM-424-2	Feedwater System, Rev. 9
8700-RM-424-3	Feedwater System, Rev. 13

Valve Operator No. Diagrams

8700-RM-421-1	U1 Main Steam System, OP Manual Fig No 21-1, Rev. 14
8700-RM-424-2	Feedwater System, including demin water storage tank, Rev. 9
8700-RM-424-3	U1 Feedwater System, OP Manual Fig No 24-3, Rev. 13
8700-RM-424-N	Notes and Reference Data OP Manual Fig No 24-N, Rev. 6
8700-RM-406-1	Reactor Coolant System, U1 OP Manual Fig No 6-1, Rev. 13
8700-RM-406-2	Reactor Coolant System, U1 OP Manual Fig No 6-2, Rev. 17
8700-RM-406-3	Reactor Coolant System, U1 OP Manual Fig No 6-3, Rev. 5

Operations Procedures

1OM-6.4.A	Reactor Coolant Pump Startup, Rev. 21
1OM-15.4.AAI, Issue 4	Control at Shutdown Panel, Rev. 1
1OM-24.1.B, Issue 4	Summary Description (Feedwater), Rev. 1
1OM-24.1C	Major Components (Feedwater), Rev. 4
1Om-24.1D, Issue 4	Instrumentation and Controls, Rev. 1
1OM-24.1.E, Issue 4	Specific Instrumentation and Controls, Rev. 4

1OM-24.2.A, Issue 4	Precautions and Limitations, Rev. 1
1OM-24.4AE	Swapping the Discharge Header for [1FW-P-2] Turbine Driven Auxiliary Feed Pump, Rev. 0
1OM-24.4.A	Steam Generator Feedwater System Startup, Rev. 4
1OM-24.4.D	Placing the Second Steam Generator Feed Pump In Service, Rev. 6
1OM-24.4.AAF, Issue 3	Primary Plant Demin Water Storage Tank Level Low Wt 104-A1, Rev. 0
1OM-24.4.AAG, Issue 3	Primary Plant Demin Water Storage Tank Level Low-Low Wt 104-A1, Rev. 0
1OM-24.4.AAH, Issue 3	Primary Plant Demin Water Storage Tank level Low Wt 104-A2, Rev. 0
1OM-24.4.AAI, Issue 3	Primary Plant Demin Water Storage Tank Level Low-Low Wt 104-A2, Rev. 0
1OM-24.4B, Issue 4	Feeding Steam Generators Using the Bypass Flow Control Valves, Rev. 2
1OM-24.4O, Issue 3	Chemical Addition to Primary Plant Demin Water Storage Tank, Rev. 1
1OM-24.4S, Issue 4	Steam Binding in Auxiliary Feedwater System, Rev. 2
1OM-24.4.V, Issue 3	[1FW-P-2] Trip Throttle Valve Resetting, Rev. 1
1OM-24.4W, Issue 3	Emergency Use of [1FW-P-2] Turbine-Driven Auxiliary Feed Pump, Rev.1
1OM-31.4.D	Startup of A Cooling Tower Pump, Rev. 3
1OM-44B.4.AAI, Issue 3	Aux Feedwater and Quench Spray Pump Compartment Temperature High-Low, Rev. 0
1OM-52.4A	Raising Power from 5% to Full Load Operation, Rev. 46
1OM-53A.1.E-0, Issue 1C	EOP - Reactor Trip or Safety Injection, Rev. 6
1OM-53A.1.E-3, Issue 1C	EOP - Steam Generator Tube Rupture, Rev. 5
1OM-53A.1.2-S (ISS1C)	Monitoring AFW Pump Performance During Loss of Station Instrument Air, Rev. 1
1OM-53B.4.E-2,Issue 1C	Faulted Steam Generator Isolation Background, Rev. 2
1OM-53C.4.1.6.4AOP	Steam Generator Tube Leakage, Rev. 15
1OM-53A.1.FR-H.1(ISS1C)	U1 Response to Loss of Secondary Heat Sink
1OM-54.3.L5	Surveillance Verification Log, Rev. 40
2BVT 1.39.9	Station Battery [BAT*2-4] Performance Discharge Test, Issue 2, Rev. 3
2BVT 1.39.13	Spare Charger [BAT*CHG 2-7] Load Test, Issue 2, Rev. 3
2BVT 1.39.16	Rectifier/Charger [RECT*VITBS2-3] Load Test, Issue 2, Rev. 3
2MSP-39.05-E	Battery No. 2-1 Inspection and Interconnection Resistance Check, Issue 4, Rev. 5
2MSP-E-39-001	Vital Bus Batteries, Test and Inspection, Issue 4, Rev. 11
2MSP-E-39-300	Vital Bus Weekly Battery Inspection, Issue 4, Rev. 15
2OM-39.4.D	Start-up and Shut-down of Spare Battery Charger, Rev. 8
2OM-39.4.I	Water Addition to Station Batteries, Rev. 2
2OM-44.C.4.D	Containment Air Recirculation System Start-up, Rev. 12
2OM-44.C.4.E	Containment Air Recirculation System Running, Issue 1, Rev. 7

2OM-44.C.4.G	Control Rod Drive Mechanism Shroud Cooling System Start-up, Issue 1, Rev. 3
2OM-44.F.4.AAD	Emergency SWGR Ventilation Auto-Start/Auto-Stop, Issue 1, Rev. 8
2OM-53C.4.2.37.1	Loss of 480V Bus 2N or 2P
ECA-0.0	Loss of All AC Power, Issue 1C, Rev. 4
ECA-0.1	Loss of All AC Power Recovery Without SI Required, Issue 1C, Rev. 2

Surveillance Test Procedures

1OST-24.1	SG Aux Feed Pumps Discharge Valves Exercise, Rev. 11
1OST-24.2	Motor Driven Auxiliary Feed Pump test [1FW-P-3A], Rev. 24
1OST-24.3	Motor Driven Auxiliary Feed Pump Test [1FW-P-3B], Rev. 25
1OST-24.4	Steam Turbine Driven Auxiliary Feed Pump Test [1FW-P-2], Rev. 27
1OST-24.5A	SG Auxiliary Feed Pump 3A Operability Test, Rev. 3
1OST-24.5B	SG Auxiliary Feed Pump 3B Operability Test, Rev. 3
1OST-24.5C	SG Auxiliary Feed Pumps Operability Test, Rev. 4
1OST-24.8	Motor Driven Auxiliary Feed Pumps Check Valves and Flow Test, Rev. 18
1OST-24.9	Turbine-Driven AFW Pump [1FW-P-2] Operability Test, Rev. 29
1OST-24.10	Auxiliary Feedwater System Monthly Verification, Rev. 5
1OST-24.13	Overspeed Trip Test of Turbine Driven AFW Pump [1FW-P-2], Rev. 6,
1OST-24.14A	Main Feed Containment Isolation valve [MOV-1FW-156A] Exercise Verification, Rev. 6,
2OST-39.1A	Weekly Station Battery Check [BAT*2-1], Rev. 13

Completed Surveillance Tests

1OST-24.9	Turbine-Driven AFW Pump [1FW-P-2] Operability Test, Rev. 27, (performed 4/26/03)
1OST-24.4	Steam Turbine Driven AFW Pump Test [1FW-P-2], Rev. 27 (performed 5/13/04)
1OST-24.2	Motor Driven AFW Pump Test [1FW-P-3A], Rev. 24 (performed 4/13/04)
1OST-24.8	Motor Driven AFW Pumps - Check Valves and Flow Test, Rev. 17 (performed 4/22/03)

Drawings/Change Notices

8700-6.24-3829	SH 1, Auxiliary Feedwater Recirculation Cable Vault, Rev. 3
8700-6.24-3829	SH 6, Seismic Anchor, FW-TK-2, Rev. 1
8700-RE-21HD	Elementary Diagram Feedwater, SH 5 of 7, Rev. 18
8700-RE-21HE	Elementary Diagram Feedwater, SH 6 of 7, Rev. 17
8700-RM-421-1	Valve Operator. No. Diagram - Main Steam, Rev. 14

8700-RM-424-1	Valve Operator. No. Diagram - Feedwater System, Rev. 10
8700-RM-424-2	Valve Operator. No. Diagram - Feedwater System, Rev. 9
8700-RM-424-3	Valve Operator. No. Diagram - Feedwater System, Rev. 9
10080-RB-84A	Flow Diagram, Ventilation & Air Conditioning, Rev. 15
10080-RB-84K	Flow Diagram, Ventilation & Air Conditioning, Rev. 7
10080-RE-1AR	125 VDC One Line Diagram sheet 1, Rev. 19, sheet 2, Rev. 21, sheet 3, Rev. 13, sheet 4, Rev. 5, sheet 5, Rev.7
10080-RE-1AW	One Line Diagram Vital Bus System, Rev. 18
10080-RE-1C	Equipment One Line Diagram, Rev. 12
10080-RE-1F	4160 volt One Line Diagram sheet 3, Rev. 19
10080-RE-1J	480 V US One Line Diagram sheet 3, Rev. 12
8700-RE-1F	4160 volt One Line Diagram sheet 3, Rev. 19
8700-RE-1K	480 volt One Line Diagram sheet 4, Rev. 23
8700-RE-21GZ	Elementary Diagram Feedwater, sheet 1, Rev. 7
8700-RE-21HA	Elementary Diagram Feedwater, sheet 2, Rev. 8
8700-RE-21HB	Elementary Diagram Feedwater, sheet 3, Rev. 8
8700-RE-21HC	Elementary Diagram Feedwater, sheet 4, Rev. 7
8700-RE-21HD	Elementary Diagram Feedwater, sheet 5, Rev. 18
8700-RE-21HE	Elementary diagram Feedwater, sheet 6, Rev. 17
8700-RE-21HK	Elementary Diagram Feedwater, sheet 7, Rev. 18
8700-RE-21HY	Elementary Diagram Main Steam, sheet 2, Rev. 18
8700-RE-21JT	PORV Power Inputs, sheet 7
8700-LSK-5-13A	Logic Diagram Steam Generator AFW Pump Motor Driven, Rev. 19
8700-LSK-5-13B	Logic Diagram Steam Generator AFW Pump Turbine Driven, Rev.19
8700-LSK-5-13C	Logic Diagram Steam Generator AFW Control & Stop Valves, Rev. 14
11700-LSK-5-13D	Logic Diagram Steam Generator AFW Pump Recirc Valves, Rev. 18
12241-ESK-128A	480 Volt Bus 2N Breaker 3B
12241-ESK-128B	480 Volt MCC*2-E03 Feeder Breaker
12241-ESK-130B	125VDC BAT*2-1&2-2 to DC* SWBD 2-1&2-2
12241-ESK-130F	125VDC BAT*2-3 & 2-4 to DC* SWBD 2-3 & 2-4
AA-No 8700-RV-34A	Demin Water Storage Tank WT-TK-10. S&W Dwg No 11700-RV-34A-5
8700-RM-411-2	U1 PI&D- SI System w/N_2 Input. OP FIG No 11-2, Rev. 12
10080-E-11L Sh. 1	125V DC CKTS for U2 PORVs, Rev. 13

Time Current Characteristic Curves (coordination curves)

Plans, Policies and Programs

Unit 1 and 2, ADM-0702, Station Blackout Program, Rev. 0
EOP Executive Volume, Issue 1C, Step Description Table for E-2, Rev. 2
ET Orientation Training, TPT-5259, Issue 2, Steam Generator Feedwater System, Rev. 0
Unit 1 In-service Testing (IST) Program for Pumps and Valves, Rev. 11
Unit 1 & 2 River Water/Service Water System Control and Monitoring Program, Rev. 8
Training Material, 3LRTS-E.2.001, License Operator Retraining, Steamline Break and Loss of DC Bus
Training Material, 3LRT-TEAMSKILLS.001, Licensed Operator Retraining, Rev. 1
Training Material, 1SQS-24.1, Licensed Operator Training - Feedwater Systems, Rev. 1

Calculations

8700-DEC-0229	Instrument Scaling Calculation, Primary Plant Demineralized Water Storage Tank Total Volume Calculation, Rev. 0
8700-DMC-2219	Water Volume (PPDWST) Required for 9-Hours at Hot Standby, Rev. 0
8700-DMC-2228	AFW Design Pressure and Temperature, Rev. 0
8700-DMC-2230	AFW Pumps (FW-P-2, FW-P-3A, 3B) Minimum Recirculation Flow Rates, Rev. 0
8700-DMC-2651	AFW Pump Room Temperature Transient, Rev. 1
8700-DMC-2402	AFW System Design Bases, Rev. 1
8700-E-20	5KV & 480 volt cable-cable size evaluation for short circuits, Rev. 0 thru Rev. 0A2
8700-E-202	DC Panel Load to U1 PORVs 455 C1, C2 and SOVs, Rev. 0
8700-E-221	4160 & 480 volt Load Management and Voltage Profile Calculations
10080-E-068	Station Service and Load analysis, Rev. 4
10080-E-074	Station Service Fault Analysis, Rev. 4, Add. 1
10080-E-201	DC System Management BAT*2-1/BAT*CHGR 2-1 Rev. 1 thru Rev.1, Add. 6
10080-E-202	DC System Management BAT*2-2 /BAT*CHGR 2-2 Rev. 1 thru Rev.1, Add. 6
10080-E-203	DC System Management BAT*2-3, Rev. 2, Add. A11
10080-E-204	DC System Management BAT*2-4, Rev. 2, Add. A2, Add. 3
10080-E-207	Short Circuit Analysis Class 1E DC System, Rev. 1 thru Rev.1, Add. 3
10080-E-221	4160 & 480 volt Load Management and Voltage Profile Calculations relating to bus 2AE, Rev. 0 thru Rev. 0, Add. 5
12241-B-211	Hydrogen Evaluation in Battery Rooms 2-1, 2-2, 2-3, 2-4, 2-5, and 2-6, Rev.1
M-53	AFW Flow with Isolated Steam Generator, Rev. 0

Vendor Technical Manuals

Instructions for Type UTT-B Tap Load Changer by Westinghouse, dated January 1980
08700-02.018-001, Terry Corporation - Terry Steam Turbine Manual, Rev. S, 12/19/02
08700-02-040-0040, Flowserve (Ingersoll Rand Company) - Steam Generator AFW Pumps Instruction, Rev. R, 9/23/02

Design Change Packages

DCP 388	Relocate TV-MS-105A, B to Main Steam Valve Room, Rev.1
DCP 1423	Deletion of Auto-Start Signal for Auxiliary Feed Pump from Steam Driven Feed Pump, Rev. 0

DCP 1730 SOV-FW102, 103A, 103B, and SOV-RC519, SOV-SV100A, 100B Changeout, 6/26/91
DCP 1843 Replacement of Level Transmitter LT-WT-104A2 Located on WT-TK-10, Rev. 0
DCP 1925 Relocation of Instrument Air Supply Line Tap off for ARW Pumps Recirculation Control Valves, 5/31/93
DCP 2170 AFW Turbine Overspeed Trip Linkage Upgrade, Rev. 1
ECP-02-0364 canceled 9/25/03
ECP-02-0157 Beaver Valley 2 MCCB Replacement Project 2002
ECP-02-0244 Tap changes on Unit 1 to allow starting of large motors on the Unit Station Service Transformer
ECP-02-0793 Beaver Valley 1 Feedwater Flow Transmitter Replacement

System Health Reports

BVPS Unit 1 Main Feedwater for 4th Quarter 2002, 4th Quarter 2003, & 1st Quarter 2004
BVPS Unit 1 Auxiliary Feedwater for 4th Quarter 2002, 4th Quarter, 2003, & 1st Quarter 2004
BVPS Unit 2 125 VDC Control System, System 39, 1st Qtr 2004, 4th Quarter 2002, 4th Qtr 2003
BVPS Unit 2 480 Volt Station Service System, System 37, 4th Quarter 2002, 4th Qtr 2003, 1st Quarter 2004
BVPS Unit 2 480 Volt Station Service System, system 37 1st Qtr 2004
BVPS Unit 1 Reactor Coolant System 6, 1st Quarter 2004
BVPS Unit 1 River Water, System 30, 1st Quarter 2004
BVPS Unit 1 Compressed Air System 34, 1st Quarter 2004
BVPS Unit 1 Misc. Ventilation System 44F, 1st Quarter 2004

Work Orders

00-53688
00-53689
00-027930
02-014114

Logs

Auxiliary Feed Pump Room Temperature, 6/25/99 - 3/25/04

Self -Assessments

Design and Performance Capability Review, Unit 1 Main Feedwater and Auxiliary Feedwater Systems & Unit 2 480 Volt AC and 125 Volt DC Systems, May 2004
Beaver Valley Power Station Unit 1 Probabilistic Risk Assessment, Rev. 0

Miscellaneous

Engineering Memo 74927 Low volts at PORVs operating on battery power
Engineering Evaluation 10080-E-120-2A2
Engineering Evaluation 8700-E-120-0A1
Duquesne Light Company Letter, ND3MEA:0805, dated 2/8/95, SWOPI Recommendations 7 and 24, River/Service Water Emergency Supplies to Aux Feedwater and Fuel Pool
Licensee Event Reports, LER 80-073/01P, dated 10/3/80 and LER 82-033/03L, dated 10/8/82
Simulator Discrepancy Reports (SDR) 1358, FW-P-2 Operation at Low Steam Pressure; 1415, Simulator AFW Flow is Higher than Plant Post Reactor Trip; and 1417, Flow is not Limited for B & C S/G Aux Feed Flow to IPC/SPDS
Stone & Webster Filed Quality Control Procedure, QC-6.5, Revision B, Inspection of Pipe Hangers
TER200766, Turbine Driven AFW Pump Discharge Relief Valve, Rev.1
Westinghouse Letter, DLW-92-238, dated 10/27/92, Small Break LOCA Evaluation for Auxiliary Feedwater Pump Actuation
Specification for Steam Generator AFW Pumps for Beaver Valley Power Station - Unit 1, Rev. 3 (1/16/70)
Updated Inservice Testing Program, Feburary 20, 2004
Letter, Ingersoll-Rand Pumps to Duquesne Light Co. (AFW Pump, IR Model 3HMTA-8), December 12, 1991
Surveillance and Test Engineering Results Report (BVT 1.2-2.24.6, AFW [1FW-P-3A] Flow Test), dated December 26, 1980
1\2PMP-36TR-Transformer-1E, Issue 4, System Transformers Inspection, Rev. 3
1/2CMP-24FW-T-2-1M, Replacement of the AFW Pump Turbine Emergency Overspeed Trip Tappet Assembly, Rev.1
Risk Informed Inspection Notebook for Beaver Valley, Unit 1, Rev.1
Risk Informed Inspection Notebook for Beaver Valley, Unit 2, Rev.1
Maintenance Risk Summaries for the weeks of May 2004 and June 7, 2004
Maintenance Strategy - SAP data segment for System 24 (FW, AFW) and MS to AFW Turbine
Maintenance Rule functional failure reports for system U1-system 24A and U2 - system 37
Analysis No. 10080-E-201, dated 10/21/93, pages 55-57 on PORV Voltage, Rev.1
U1 top 200 components sorted by P.A. (RAW) significance, Model BV1Rev3, file MCRE
U2 top 200 components sorted by P.A. (RAW) significance, Model BV1Rev3B, file MCRE3B
Root Cause Analysis report- CR- 03-08164, PORV Block Valve 1RC-535 failed to stroke closed
U1 OP Manual 1OM-6.1.C, pages 26-28 on PORV operation, Rev. 4
M-45, AFW System Head Losses, Minimum Operating Point and NPSH, Rev. 3 (10/21/88)
System Improvement Plan, Unit 1, Main Steam System 21

Condition Reports

00-0203	00-1569	00-1593	00-3295	00-4457
00-0754	00-1589	00-2037	00-4076	01-0666

01-1049	02-03773	03-05708	04-04826	*04-04848
01-2520	02-05273	03-05776	04-04828	*04-04860
01-6792	02-05557	03-06716	04-04831	*04-04526
01-7081	02-10027	03-07113	*04-04432	*04-04801
01-7279	02-10755	03-08164	*04-04523	*04-04810
01-8375	02-11143	03-12264	*04-04524	*04-04816
02-00596	03-01249	04-03623	*04-04538	*04-04827
02-01603	03-02166	04-04170	*04-04541	*04-04857
02-01793	03-04284	04-04413		
02-02514	03-05303	04-04432	*04-04581	

(Note ” * ” = Generated as result of this inspection)

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
CR	Condition Report
DBD	Design Basis Document
DCP	Design Change Package
DWST	Demineralized Water Storage Tank
IST	In-Service Test
LER	Licensee Event Report
MOV	Motor Operated Valve
P&ID	Piping and Instrumentation Drawings
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Assessment
RWST	Refueling Water Storage Tanks
SDP	Significance Determination Process
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report