

DUQUESNE LIGHT COMPANY

Beaver Valley Power Station

Docket No. 50-334, License No. DPR-66

Report of Facility Changes, Tests  
and  
Experiments For 1983

Prepared by: Mark R. Majeski DATE: 5/11/84

Reviewed by: R. D. [Signature] DATE: 5/17/84  
Superintendent of Licensing &  
Compliance

Approved by: J. A. Sieber DATE: 5/17/84  
General Manager of Nuclear  
Services

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Report of Facility Changes, Tests, and Experiments

The following is a compilation of facility changes, tests and experiments completed or partially completed during the year 1983 at Beaver Valley Power Station Unit 1. This report is provided in accordance with the Code of Federal Regulations, Title 10; Paragraph 50.59, "Changes, Tests and Experiments". The safety evaluation for these changes, tests and experiments determined that there were no unreviewed safety questions.

Design Change No. 19 - Boric Acid Tank Level  
Transmitter Modifications

This design change modified the connections of the Boric Acid Tank Level Transmitters (LT-CH-106, 108, 161 and 163) to facilitate "on line" calibration. The original design of the transmitters had the level sensors attached directly to the tank with 3 inch flanged connections. An isolation valve and spool piece, with vent and drain valves, were inserted at this flanged connection. The spool piece assemblies were provided with seismic pipe supports.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased. The installation of this design change did not change the systems functions as described in the FSAR. The safety evaluation also stated that the possibility of an accident or malfunction of a different type than previously evaluated in the FSAR would not be created. The integrity and operation of the system was not degraded by this change. Maintaining the system pressure boundary is the safety related function of the transmitters and the level indication signal is non-safety related. In addition, Administrative controls are provided to preclude the possibility of inadvertent closing of the isolation valves.

In addition, it was determined that the margin of safety as defined in the basis to any Technical Specification would not be reduced. The Technical Specifications (Section 3/4.1.2) were reviewed and it was determined that a change to the Technical Specifications was not involved since the ability of the boric acid tanks to supply the required amounts of borated water is unaffected.

Design Change No. 139 - Main Steam Valve  
Cubicle Ventilation Modifications

This design change lowered the operating temperature in the Main Steam Valve Cubicle (MSVC) by removing the explosive rupture discs and replacing them with manually operated louvers. During cold weather shutdowns, the louvers may be closed to reduce heat loss from the cubicle. The louvers, in the open position, also provide an exhaust path for the ventilation air supplied by VS-AC-6. This modification also provides a method for sealing off the existing Supplementary Leak Collection and Release System (SLCRS) in the MSVC since maintaining a negative pressure in the cubicle would be impossible with the cubicle open directly to the atmosphere.

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The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. Section D.1.3 of the UFSAR states that the roof of the MSVC has been provided with openings to prevent overpressure and subsequent loss or compromise of building integrity in the event of a high energy line break. The manually operated louvers in the open position, provide the same level of protection from overpressure. Also the louvers are designed to open outward such that any pressure buildup sufficient to jeopardize building integrity will cause the louvers to open. The decision to eliminate radiation monitoring of the MSVC vent has been deemed acceptable since under accident conditions (ie. LOCA and SGTR) radioactive releases through this pathway will be insignificant. The change to the SLCRS does not affect the balance or remaining portion of the system since blocking off the duct in the steam valve cubicle area is a reduction in load to the system. This change will not increase the probability of an accident. The consequences of a design basis LOCA without taking credit for collection and filtration of leakage by the SLCRS has been evaluated by the NRC in their SER dated 10/11/74.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be created. In the event that the manually operated louvers are not opened prior to system operation, and a high energy line break occurs within the MSVC, the louvers will open outward to relieve the pressure. Also the Operations Department, has agreed to insert a step into the start-up procedures requiring the subject louvers to be opened prior to system operation. The louvers have undergone seismic analysis to preclude the possibility of their falling on and damaging safety-related equipment within the MSVC.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced.

T. S. Basis 3/4.7.8 SCLRS states:

"The operability of the SCLRS insures that radioactive materials leaking from equipment following a LOCA are filtered prior to reaching the environment. The operation of this system and the resultant effect on offsite dosage calculations was assumed in the accident analysis."

This statement indicates that the contiguous area (Main Steam Valve Area) will be filtered following a LOCA and with the removal of this system in that area, it will not be done.

However, the NRC has evaluated the effect of not collecting and filtering leakage following a LOCA and found the offsite doses to be within the 10CFR100 limits.

This design change involves a change in the Technical Specifications incorporated in the license. Section 3/4.7.8 of the Technical Specifications should be revised, as discussed in the safety evaluation.



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This design change also involves a change to the Updated FSAR. Appendix D, Section D.1.3 of the Updated FSAR provides evaluation of the effects of a pipe break in the MSVC. The evaluation describes openings in the roof of the MSVC. This should be changed to describe louvers which in the open position will prevent overpressure of the valve cubicle in the event of a pipe break. Also Figure D.5-6 of the Updated FSAR shows rupture disc assemblies in the roof openings of the MSVC. This should be changed to show manually operated louvers in the openings. The design basis accident analyzed in Chapter 14 of the UFSAR needs to be revised to delete credit for SLCRS filtration of containment leakage into the main steam valve cubicle after a LOCA.

Design Change No. 144 - Addition of Air Release  
Valve to Circulating Water System

This design change provides a method of removing trapped air in the circulating water lines. Air in the piping and carryover into the cooling tower pumps is a major cause of lost system performance. An attempt to remove as much air as possible was made by installing air release (burp) valves on the circulating water lines. Each air release valve is accompanied by a check valve and butterfly valve, both of which are located upstream of the respective air release valve. Maintenance Work Request No. 777785 installed eight (8) of the air release valves in manholes no. 8 north and south, and no. 9 north and south. The mark numbers were CW-AR-242, 244, 246, 248, 250, 252, 254 and 256. The initial design scope called for a total of twelve (12) air release valve to be installed. Four (4) other valve sets (surge check, butterfly and air release) remained as "open items" to be installed at a later date. When the "open items" were scheduled to be completed in 1983, the station requested that the "open items" be deleted and the operation of the installed valves improved by purchasing a new type. The valve internals have sustained severe corrosion from exposure to circulating water and silt. The replacement valve is the Crispin Pressure Sewer Valve, model S41B, supplied with stainless steel internals. This tall body valve is designed to keep the corrosive fluids and silt from contacting the valve linkage. This valve is equipped with back flushing attachments which allow the upper internals to be periodically cleaned, if necessary, without removing the valve from service.

Since the original installation, CW-AR-254 and 256 have been removed from the system. CW-AR-250 and 252 have been relocated to manholes adjacent to the crossover pipe. CW-AR-242, 244, 246 and 248 remain in the no. 9 north and south manholes. This design change replaced the installed air release valves (CW-AR-242, 244, 246, 248, 250 and 252) with the new style pressure sewer valves. The Butterfly and surge check valves remained. This design change affected the pressure boundary of the circulating water lines in each of the mentioned manholes.

The safety evaluation stated that, based on the above review, the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased. The safety evaluation also stated that the possibility of an accident or malfunction of a different type than previously evaluated in the FSAR would not be created. This change does not affect the operation of the circulating water system but actually enhances it by removing air which damages the cooling tower pumps.



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The margin of safety as defined in the basis for any Technical Specification is not reduced since the circulating water system is not discussed in the technical specifications.

Design Change No. 189, Modification for Recirculation Spray and Low  
Head Safety Injection Pumps Net Positive Suction Head (NPSH)

This design change incorporated several changes in the Quench Spray (QS), Low Head Safety Injection (LHSI) and Recirc Spray (RS) Systems. These changes will help provide sufficient NPSH to the Recirc. Spray and Low Head SI Pumps.

The only work done in 1983 under this design change involved the replacement of Rupture Discs for the Chemical Injection Pumps which provided pressure relief back to the chemical addition tank. The rupture discs were replaced with qualified Relief Valves.

The safety evaluation for this DCP stated that no unreviewed safety questions exist for the following reasons: the modification does not affect the probability of occurrence of a LOCA because plant systems or plant conditions which could cause a LOCA are not changed. Computer analysis shows adequate containment depressurization system performance, in that the peak containment pressure limit of 45 psia is not exceeded; depressurization still occurs within one hour, and is maintained. Also, Iodine removal capability is not jeopardized. All piping stresses have been analyzed and judged to be within limits.

Design Change No. 286, Charging Pumps  
Vibrational Supports

The purpose of this design change was to install rib plate supports on the drip pockets of the charging pumps. The objective was to reduce vibration of the drip pocket between the pump case and bearing housing at the discharge end of the pump.

The scope of work completed during the third refueling outage was limited to CH-P-1C. Work to be done on CH-P-1B will be done at a later date.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR is not increased. This change should reduce vibration to the shaft and bearings thus making the pumps more reliable. The safety evaluation also stated that the possibility of an accident or malfunction of a different type than previously evaluated in the FSAR is not created. Pump failure is the only possibility and has been previously evaluated. The vibrational supports should reduce the possibility of pump failure by reducing vibration induced pump shaft and bearing failures.

The Technical Specifications were reviewed and it was determined that a change to the Technical Specification was not involved since the ability to maintain the charging pumps at an operable status should be increased.

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Design Change No. 290 - Improve Regulation of the  
480V Emergency Busses

This design change improved the regulation of the 480V Emergency Busses on 1A & 1B System Station Service Transformers by installing automatic load tap changers on the 1B and 1D busses respectively.

The safety evaluation stated that the probability of an accident or malfunction of equipment due to separation of safety related equipment from offsite power is reduced since the new transformers will more reliably maintain the 480V emergency bus voltages above 90%. This is accomplished by maintaining the 4160V busses at a sufficient level. The safety evaluation also stated that the possibility of an accident or malfunction of a different type than the loss of AC analyzed in section 14.1.11 of the FSAR is not created.

In addition, it was determined that the margin of safety described in section 3/4.8 of the Tech. Specs. will not be reduced since the modification adds to the assurance that the proper voltage will be available to supply safety related equipment during both normal operation and accident conditions.

Design Change No. 296 - Plant Variable Computer  
System (PVS); Safety Parameter Display System (SPDS)

This change involves the installation of a PVS in the Emergency Response Facility Building (ERF) and the SPDS in the control room. Consoles from both computer systems are to be located in the ERF, control room, and alternate technical support center.

The scope of work completed so far includes:

- Installation of computer hardware for PVS. Forty-three percent (43%) of the inputs are operable. Remaining inputs to be completed later.
- Consoles for PVS have been installed in the ERF only. Remaining consoles for control room and alternate TSC are to be completed at a later date.
- SPDS computer system is to be installed later.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased.

The PVS and SPDS provide a display of critical plant variables. Inputs derived from the reactor protection circuits are isolated by means of isolation amplifiers or equivalent buffering circuits and have no effect on equipment or sensors that are in use for safety systems as described in Section 7.5.

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The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be created. The computer display systems included in this modification are for process monitoring only and does not control any plant process. Failure of the output of an isolation amplifier will have no effect on the input circuit.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The parameters listed in the Technical Specifications Section 3/4.3, Instrumentation, are not affected by installation of the PVS and SPDS.

Design Change No. 311 - Upgrade Charging Pumps  
1A, 1B and 1C - Lube Oil Modifications

The purpose of this design change was to upgrade Charging Pumps CH-P-1A, 1B and 1C. Modifications consist of an improved seal housing design, lube oil temperature control, and common lube oil cooling systems for each charging pump. The lube oil cooling system design modifies the five existing pump gears rather than providing three new gears.

The scope of work completed during the third refueling outage was limited to the installation of the new seal housing design on CH-P-1C. The remainder of the design change will be completed at a later date.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased. This partial installation of the design change did not change the systems function as described in the FSAR.

The safety evaluation also stated that the possibility of an accident or malfunction of a different type than previously evaluated in the FSAR would not be created. This design should improve the performance of the charging pump lube oil system.

The Technical Specifications (Section 3/4.1.2) were reviewed and it was determined that a change to the Technical Specifications was not involved since the ability of the charging pump to perform its safety related functions is not reduced.

Design Change No. 314 - Check Valve for Control Room  
Emergency Pressurization System Manifold

The purpose of this design change is to protect the control room pressurization air compressors against storage tank back pressure or non-safety related system failures during the tank filling process. In the event of a compressor failure, the storage tank being filled could discharge through the compressor rendering the system inoperable. This check valve provides system isolation without manually closing the isolation valves (VS-16, 17, 18, 19 and 20). The check valve is located between the tee leading to VS-C-3 and the manifold upstream of VS-16, 17, 18, 19 and 20.



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The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased. The safety evaluation also stated that the possibility of an accident or malfunction of a different type than previously evaluated in the FSAR would not be created. This change does not affect the operation of the control room pressurization air compressors but provides protection against storage tank blowdown during the filling process.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced because the installation of the check valve does not decrease the ability to maintain the bottled air pressurization system operable.

Design Change No. 340 - Add Isolation Valves - Engine  
Control Panel Pressure Gages; Add Thermowells - Coolant  
and Lube Oil Temperature Indicators

The purpose of this design change was to install isolation valves in the pressure signal tubing line of each pressure gage mounted on the Emergency Diesel Generator Engine Control Panels. The valves were mounted in the control panels between the gages and the related tubing manifold blocks.

In addition, thermowells were installed on the existing threaded temperature indicator openings so that the temperature indicator can be removed and calibrated without removing the Diesel Generator from service.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased.

Chapters 8 and 14 are not affected by this design change. Specifically Section 8.5.2 of the FSAR does not discuss the use of the temperature and pressure indicators on the D.G. Section 14.1.11 discusses the "Loss of Offsite Power to the Station." This section does not discuss details in instrumentation on the D.G.

Also, it was stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. This change will improve the serviceability of the temperature and pressure indicators and should enhance D. G. availability. Further, the same change is being furnished by the D.G. manufacturer for the Unit 2 D.G. and is recognized to be the best design.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced.

Bases 3/4.8 (Electrical Power Systems) does not establish any criteria for instrumentation on the D.G. Therefore, the margin of safety is not reduced by this design change.

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Design Change No. 351, Replacement of Unqualified Electrical Equipment

IE Bulletin 79-01B required that a review be conducted of certain safety related electrical equipment in BVPS Unit 1 to determine if the equipment was environmentally qualified. This DCP covers replacement, modification and qualification testing of such items required as a result of that review.

The scope of work completed during 1983 involved replacement of the Westinghouse OT2 control switches for motor control centers MC1-E3, E4, E5 and E6.

The safety Evaluation stated that there was no unreviewed safety question because this design change replaces, modifies, or tests items identified as lacking sufficient documentation to assure environmental qualification. The replacement, modification, or qualification testing of such items will not lead to degradation of the systems involved. As new equipment becomes available more work will be done under this DCP in the future.

Design Change No. 366 Emergency Response Facilities  
Category I Interface Equipment

Various QA Category I instrumentation and equipment are required to be monitored by DCP-296 as inputs to the Plant Variable Computer (PVC) and the Safety Standard Parameter Display System (SPDS). This modification provides the required isolation arrangements to monitor Category I inputs with the Category III SPDS and PVC.

To date, approximately 30% of the inputs which interface with Category I instrumentation are complete.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. This design change installed qualified isolation equipment between QA Category I instrumentation and equipment and QA Category III Monitoring equipment. With proper isolation the Category I instrumentation and equipment will not be degraded by any failure of the installed monitoring equipment beyond the isolator. Therefore the probability of failure of any safety related instrumentation or equipment has not been increased.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be created. Proper isolation is provided for all Category I instrumentation and equipment monitored by DCP-296. Therefore all design criteria (such as single failure, separation of control and protection circuits, channel independence, etc.) of the Reactor Trip System, Engineered Safety Features Actuation System, Accident Monitoring Instrumentation and equipment connected to IE power sources are not altered. Thus no new possibility for an accident or malfunction is created.

In addition, it was determined that the margin of safety as defined in the basis for any technical specification would not be reduced. The performance of the various Category I instrumentation and equipment for which isolation is provided is not degraded by this design change. Therefore the margin of safety for the applicable Technical Specifications for the various instrumentation and equipment is not reduced.

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Design Change No. 368 - Charging Pump  
Discharge Spool Pieces

This design change installed flanged spool pieces on the discharge lines of charging pumps CH-P-1B and 1C. The installation of spool pieces in the Charging Pump discharge lines will help in two ways. It will aid in removal/installation of the pumps for maintenance, reducing both radiation exposure and chances for damaging adjacent equipment. It will also lessen pipe stress that can result from misalignment of the pump to pipe discharge flange.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased. The new portion was seismically designed as delineated in Appendix B of the FSAR. Also, if one flow path or charging pump became inoperable due to a faulty flange connection, the remaining two would still be more than adequate to perform the CVCS or ECCS functions. In addition, any leakage would be of a gradual nature and could be isolated.

The safety evaluation also stated that the possibility of an accident or malfunction of a different type than previously evaluated in the FSAR would not be created. Leakage from flanged joints has already been analyzed in FSAR Sections 6.3.1.2, 6.3.3.8, and Table 6.3-9.

In addition, it was determined that the margin of safety as defined in the basis to any Technical Specification would not be reduced. This change does not alter the availability or capacity of the charging pump.

Design Change No. 378 - Liquid Waste Evaporator  
Bottoms Cooler (LW-E-4) Replacement

The following modifications were performed under this design change:

- (1) Replacement of Liquid Waste Evaporator Bottoms Cooler (LW-E-4)
- (2) Addition of a recirculation line to bypass LW-E-4
- (3) Installation of heat trace on new recirculation line
- (4) Replacement of heat trace circuits ET-54 and ET-55 on lines 1" -LW-84-152 and 1"-LW-85-152.

The safety evaluation stated that the probability of an occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased because:

- Evaporator Bottoms Cooler LW-E-4 was replaced with a unit which was similar in all respects to the old cooler with the exception of the tube side material. The new tube side material, Incoloy 825, provides excellent corrosion resistance to concentrated acids within the temperature range normally found in the Liquid Waste Disposal System.



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- The new recirc. line which bypasses LW-E-4 for recirc. flow, will help to reduce plugging and fouling problems, and thus will add to the increased efficient operation of the Bottoms Cooler. The new recirc. line does not perform any safety related function nor tie into any safety related lines.
- The new recirc. line is heat traced to maintain the temperature of the fluids at 170°F for prevention of boron solidification. Chemelex heat trace cable was used and ties into existing heat trace circuit ET-54 on line 1"-LW-84-152.
- Heat trace circuit ET-55 on line 1" LW-85-152 was Nelson heat trace and was damaged as a result of work being performed to install the new recirc. line (i.e., removal of insulation and heat trace on line 1"-LW-85-152). Therefore, the old Nelson heat trace was replaced with Chemelex heat trace cable. The old Nelson controllers and thermostats were not replaced. Since the Chemelex cable meet or exceeded the design requirements, and can be used with the existing controllers and thermostats, there was no reduction of safety as described in the FSAR. Heat trace circuit ET-54 on line 1"-LW-84-152, was Chemelex heat trace and was replaced with the same heat trace cable as is presently installed. Therefore, there was no reduction in safety for heat trace circuit ET-54.

The safety evaluation also stated that the possibility of an accident or of a malfunction of safety related equipment different than any already evaluated in the FSAR will not be created because as mentioned in all of the cases, the components will be replaced with equipment of similar or better design.

In addition, it was determined that the margin of safety as defined in the bases to any Technical Specifications would not be reduced.

Design Change No. 389 - Re-Location of  
Gaseous Nitrogen Supply System

This design change relocated the Nitrogen Supply System to an interim location at the south wall of the boric acid tank BR-TK-7 cubicle. The interim location will be utilized for approximately two or three years until the cryogenic system is installed.

The old location of the Nitrogen Supply System is needed to accomodate the new Solid Waste Building.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. The Nitrogen vessels are not located adjacent to any equipment essential for maintaining a safe reactor shutdown. In addition, the vessels have overpressure relief protection which precludes missile generation caused by overpressure bursting of the vessels.

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The safety evaluation also stated that the possibility of an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis (FSAR) would not be created. The same supply system is being utilized and is just being relocated. The interim location is still external to any building or structure containing safety related equipment. Therefore, the response to FSAR Question 9.23 is unchanged.

This modification does not involve a change to the technical specification but does involve a change to the UFSAR.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The Accumulators, the passive components of the ECCS, are pressurized with the nitrogen gas at 605-661 psig. The Limiting Condition for Operation requires the inoperable Accumulator to be restored to Operate status within one hour. The moving of the present Nitrogen Supply System to an interim location does not affect the system capability, since the general system design is not altered.

Design Change No. 397 - Upgrade Peak Shock  
Recorder (XR-ER-101)

This design change replaced the Triaxial Response Spectrum Recorder (XR-ER-101) located in the Reactor Containment. The Reactor Containment units are the only units that contain reed switches that did not hold its setpoints. The other units (Control Room XR-ER-100 and Auxiliary Building XR-ER-102) were not replaced. The containment peak shock recorders, Engdahl Model PSR 1200, were replaced with new Engdahl Model RSR 1600-H/V-A recorders. The modification replaced the three recorders with new recorders for a triaxial installation. Three right angle type connectors attached the existing cables to the new recorders. A maximum of 24 indicators, engraved with the appropriate frequencies, were installed on the existing annunciator. Additionally, a raised concrete pedestal (39" x 39" x 18" high) was required to support the three recorders. The pedestal makes it easier to insert and remove record plates and is high enough to avoid occasional flooding and periodic washdown.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. The FSAR section 14 does not address seismic instrumentation. However, Appendix B part B.3.6 makes reference to seismic instrumentation in 5.2.8.1. This section has a thorough description of the instrumentation but no change is necessary due to this design change.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR would not be created. The installation of an instrument from which reliable and accurate data will be available after or during a seismic event will enable the proper evaluation of the seismic event to be made. This will determine if the station is to be shutdown or if it is safe to start up.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety as outlined in the Technical Specifications 3.3.3.3 and Tables 3.3-7 and 4.3-4 is not reduced because this design change only replaced a non-reliable seismic instrument with a more reliable one.

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Design Change No. 398 - Beaver Valley Power Station  
Emergency Response Facility Substation-Common Facilities

The purpose of this modification is to provide a Non-Category I, Non-1-E, Diesel Generator backed offsite power source for the Emergency Response Facility (ERF) and other Non-Category I items. The following will be powered from the Substation:

- Emergency Response Facility (ERF)
- Equipment Associated with the ERF
- Safety Parameter Display System (SPDS) Items
- Administration Building
- Backup Auxiliary Feed Pump
- Future Unit 2 ERF and SPDS Items
- Future Unit 2 4000 HP Startup Feed Pump

Additional Non-1-E items (QA Category II, III, or F) to be identified in other DCP's will be powered from the subject Substation.

The following work will be performed under this design change:

Construction of a Substation Building  
Relocation of the Existing #2-23 Shippingport Substation  
Installation of Service Transformers and Related Protection, Control  
Duct, Cable, Ground, Ground Resistor, and Deluge Fire Protection Systems  
Installation of Motor Control Centers (MCC)  
Installation of Load Center  
Installation of Feeder Lines  
Installation of a Diesel Generator

The scope of work completed so far includes the installation of:  
The Service Transformers and associated equipment, E.R.F. Substation Battery and associated breakers, safety switches, and battery charger, a portion of the Motor Control Centers, the 480V Substation and associated busses, a portion of the 4 KV Switchgear, a portion of the D.C. circuits, and a A. C. Panel. Also, the existing #2-23 Shippingport Substation was relocated.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. The subject modifications do not involve or interface with any safety related equipment previously evaluated in Section 14 of the FSAR. NOTE: Equipment to be installed under separate DCP's which will be powered from the Substation will interface with existing Category I equipment. Those changes are not included in this Analysis.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report (FSAR) would not be created. The equipment to be installed does not perform any safety related functions and does not interface with any safety related equipment. Therefore, an accident or malfunction of the equipment to be installed cannot degrade existing safety related equipment.

A change to the technical specifications is not required since the subject change is not safety related. Changes to the FSAR were recommended.



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In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety is not affected since the equipment and its functions are not safety related and the basis of the Technical Specifications are not affected.

Design Change No. 446 - Charging Pump Discharge  
Isolation Valve Torque Increasers

This design change installed bearings in some of the charging pump discharge isolation valve operators to obtain more valve disc seating force by reducing the amount of closing torque lost to friction in the valve operator. A reduction in torque lost to friction increases the amount available to close the valve. The manufacturer has indicated in their letter of 5/29/81 to DLC that the closing torque required after the change will be approximately 90 - 100 ft - lb. This change was also implemented to prevent a recurrence of the situation where the suction piping of the LC charging pump was over pressurized. A malfunction of the discharge block valve with leakage past the discharge check valve allowed a high differential pressure to exist across the block valve (CH-27) which prevented its complete closure by one station operator.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the FSAR would not be increased. FSAR section 6.3.1.2, 6.3.2.1 and chapter 14 have considered various leaks from different components but have not considered the overpressurization of suction piping as the result of leaking check and block valves and the resultant leakage from flange gaskets. This change enables better valve closure and should prevent a recurrence of the problem.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR would not be created. The FSAR has considered the malfunction of a single component of the ECCS by designing to the single failure criteria. However, the FSAR has not specifically covered the inability to close a valve tightly due to a high differential pressure existing across the valve seat. This design change modified the valve operators in a manner that would allow for easier opening and closing of the valve by reducing discharge valve closing torque. Therefore, the possibility of an accident not previously evaluated is decreased.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. Technical Specification bases sections 3/4.5.2 and 3/4.5.3 have not specifically addressed the charging pumps discharge block valves. However, the margin of safety shall not be reduced because the basis require operability to be maintained by or through the surveillance requirements. In addition, the change will reduce friction which will enable more torque to be used in seating the valve and less will be lost to friction.

Design Change No. 466 - Relocation of Gaseous Hydrogen  
Supply System to Accomodate the New Solid Waste Building

This design change relocated the Bulk Hydrogen Manifold and associated tanks to an area north of the clarifier settling tank and west of the Chlorination Building. The past location of the Bulk Hydrogen Storage is needed to accomodate construction of the North Office Shop Building. The Bulk Hydrogen Manifold was modified to designate two high pressure bottles for the primary plant supply.

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These bottles are separated from the six generator supply bottles by double isolation valves which are administratively closed. Connection to the generator supply is maintained for charging and emergency purposes only.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. The Bulk Hydrogen Storage Tanks are not safety related and are not located adjacent to any safety related equipment. In addition, the vessels have overpressure relief protection which precludes missile generation caused by overpressure bursting of the vessels.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be created. The Bulk Hydrogen Storage Manifold was modified, as previously discussed. The new location is still remote from any building or structure containing safety related equipment.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The Technical Specification criteria does not address the Hydrogen Supply System.

This modification does involve a change to the UFSAR but does not involve a change to the technical specifications.

Design Change No. 480 - Wall Modification For  
LW-E-4 Replacement

This modification removed the masonry blockwall (ABL-31) on the 722' - 6" elevation of the Primary Auxiliary Building in the cubicle that houses Liquid Waste Evaporator Bottoms Cooler (LW-E-4) in order to remove and replace the cooler. The wall provides adequate radiation shielding, is removable and seismically designed. In addition, distribution panels (ANN-LW-01 and AC-PNL-LW-01), which were originally mounted on the masonry blockwall were relocated and seismically mounted on an adjacent, permanent wall. Seismic mounting was required to ensure that the panels would not damage adjoining safety related equipment during a seismic event.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. This modification was merely the removal and replacement of a shielding wall which provides adequate radiation shielding and is seismically designed.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. With proper radiation shielding and seismic design, the removable wall will not create the possibility for an accident or malfunction of a different type than any previously evaluated in FSAR Section 11.3.2 and 14.

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In addition, it was determined that the margin of safety as defined in the basis for Technical Specification would not be reduced. The Technical Specifications do not address the construction of walls. However, Section 5.7 (Seismic Classification) on design features does indicate that structures identified in Appendix B of the FSAR shall be maintained i.e., as seismic Category I. Therefore, the margin of safety, even though undefined, will not be reduced.

Design Change No. 513 - Rockwell Edwards  
T-58 Valve Replacement

The purpose of this design change was to evaluate the feasibility of using the new style Rockwell-Edwards Model # 36124 Globe Valve as a suitable replacement for the discontinued Rockwell-Edwards Model # 3624 Globe Valve. Replacement parts for the old model are only available for 2 or 3 more years. Engineering evaluated the feasibility of using the newer style valve to meet the same functional requirements when replacement is made by Power Stations on an "as needed" basis. To date, valves CH-294, 295 and SI-107, 109, 118, 299, and 384 have been replaced with the new style valve. Also, the new valves were supplied according to the original specification which required the valves to be seismically qualified. A seismic review was performed and determined that the new valves had no effect on the applicable lines.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. Replacement of the T-58 valves do not alter the function of safety related equipment evaluated in the FSAR.

The safety evaluation also stated that the possibility of an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report (FSAR) would not be created. This modification will not alter the design or function of the systems as described in the FSAR.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specifications would not be reduced. This modification will not affect the parameters listed in the Technical Specifications.

This modification does not involve a change to the technical specifications or the UFSAR.

Design Change No. 520 - Auxiliary Building Column  
Modifications at Elevation 752'-6"

This design change added an additional steel column on level 722' 6" and 735' 6" in the Auxiliary Building to correct a deficiency in the original building design.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. The accident of concern in this case is that due to the external environmental causes (FSAR 14.1.14), primarily earthquake. This modification does not increase the probability of occurrence of this accident. Because it serves to strengthen the structure, it will not increase the consequences of the accident nor will it increase the probability of malfunction of equipment important to safety.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report (FSAR) would not be created. As this is part of the Auxiliary Building structure, and the scope only involves the addition of two steel beams, there is no increase in possibility for an accident or malfunction of a different type than those previously analyzed in FSAR 14.1.14.



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In addition it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. (Section 5.7) This design change will eliminate the administrative controls placed on the auxiliary building by LER 81-82/OIT.

Design Change No. 524 - Hydrogen Recombiner Heater  
Lead Wire Replacement

The purpose of this modification is to replace the hydrogen recombiner heater leadwires and install heater cover standoff. The new leadwires insulation is rated at 302°F as compared to the original wires rating of 194°F. The heater cover standoffs raise the heater cover 1-5/8 inches above the inner cylinder of the heater and improve cooling of the leadwires environment. The modification increases the design life of the leadwires and therefore lengthens the operable lifetime of the hydrogen recombiners. The scope of work completed so far was limited to hydrogen recombiner HY-RT-1A. HY-RT-1B will be done at a later date.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. This modification did not alter the hydrogen recombiner system components or operation as evaluated in UFSAR Section 14.3.4.4.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the UFSAR would not be created. Since the system operation was not altered, an accident or malfunction other than those previously evaluated in the UFSAR would not be created.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. Neither the operability requirements of the recombiner system (Technical Specification 3.6.4.2), nor the surveillance requirements (Technical Specification 4.6.4.2) are affected by this design modification.

Design Change No. 540 - Unit Station Service  
Transformer Replacement

The purpose of this modification was to replace Unit 1 Station Service Transformers 1C and 1D with more reliable transformers, including design features capable of withstanding the load conditions (which caused insulation deterioration due to overheating).

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Final Safety Analysis Report (FSAR) would not be increased. FSAR Section 8.4 "Station Service Systems" description and criteria is not altered by this design improvement for reliability and maintainability as the basic function of this non-safety related equipment is not affected.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report (FSAR) would not be created. The modification is for increased reliability and maintainability of non-nuclear safety equipment. No new safety related function is created by this change.

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In addition, it was determined that the margin of safety as defined in the basis of any Technical Specification would not be reduced. Technical Specification Section 3/4.8.1, "AC Sources" is not applicable to power sources from the LC and LD transformers.

Design Change No. 551 - Softner Pumps WT-P-11A, 11B  
Continuous Operation

This design change installed two (2) jumpers across the relay contacts of 11 & 12 on SD and 1 & 2 on SDX which will result in the pumps WT-P-11A & B to run during Brine Regeneration. This design change supercedes the E & D PS-3074 issued in 1976 which shut off the pumps during Brine Regeneration.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The BVPS-1 Updated FSAR Section 9.11 "Water Supply and Treatment Systems" states that operation of these systems are not necessary for safety and are not required for safe shutdown of the reactor.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. This is a non-safety related system and jumping across the relay contacts of the softener pumps would not create any possibilities of different accidents or malfunctions as previously evaluated in the UFSAR.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The softner pumps are not safety related.

Design Change No. 553 - Halon System  
For Cable Tunnel (CV-3)

The purpose of this design change was to provide a fire detection and a total flooding Halon fire suppression system to protect the cable tunnel area (CV-3). This design change reduces the probability of a fire disabling several vital pieces of equipment required to maintain safe shutdown conditions by protecting the electrical trains located in the cable tunnel, including the safety related diesel generators and river water pumps.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The installation of a total flooding Halon system in the cable tunnel will mitigate the effects of a fire in this area thus reducing the probability of the fire causing malfunction of equipment important to safety.

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The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. The proposed installation does not create the possibility of an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report for the same above mentioned reasons.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The installation of the proposed system will not adversely affect the margin of safety of any system.

Design Change No. 559 - Page Party Modifications

This design change included the installation of handsets, speakers, conduit, cable and seismic supports to various plant areas in which the present page-party system is not audible. This design change will act to improve the onsite page-party communication system by permitting communication to and from the various plant area in which the equipment is installed.

The safety evaluation stated that the probability of an occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report would not be increased. The equipment installed is for communications purposes only and does not adversely affect any of the plant safety related equipment nor increase the consequences of an accident or malfunction of associated equipment.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report would not be increased. The equipment installation does not create the possibility of any new type of accident or malfunction of plant safety related equipment.

In addition, it was stated that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The installation of the new communication equipment to the various plant areas would not adversely affect the margin of safety of any of the systems.

Design Change No. 560 - Relocation of MOV-RW-113D,  
Supply to Diesel Generator Heat Exchanger EE-E-1B

This design change installed an inlet motor-operated valve (MOV-RW-113D1) on the 4"-WR-94-151-Q3 River Water Line Located inside the Diesel Generator Building DG-2 and locked open the existing inlet motor-operated valve (MOV-RW-113D). These changes were made for fire protection purposes to eliminate the possibility of coincident loss of river water cooling water to both emergency diesel generators in the event of a fire in the CO<sub>2</sub> storage/PG pump area.



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The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The installation of this design change will not increase the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the BVPS-1 UFSAR Section 9.9 "River Water System" (specifically Sections 9.9.1.2, 9.9.2, 9.9.3, and 9.9.4) and Section 8.5.2 "A-C Emergency Power Systems" (specifically Sections 8.5.2.3, 8.5.2.4, 8.5.2.5, and 8.5.2.6). Moreover, this design change will decrease the probability of losing cooling water to the diesel generators in the event of a fire in the CO<sub>2</sub> storage/PG pump area.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. Since the equipment installed under this modification is Seismic Category I, there is no possibility for an accident or malfunction of a different type than any previously evaluated in the UFSAR Section 8.5.2.4 and 9.9.1.2.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety as defined in the bases of the Technical Specifications 3/4.7.4 "River Water Systems" and 3/4.8.1 "A.C. Sources" will not be reduced since the modifications made were during the refueling mode and redundant River Water Cooling Systems were maintained.

The seismic requirements were met by seismic calculations and a seismic certificate of compliance from Walworth Valve Co. and a seismic review and verification letter from Stone & Webster Engineering Corp.

Design Change No. 564 - MCC Control Power  
Transformer Modification

This modification replaced the presently installed control power transformers in the safety related MCC's with new transformers. This was done because in the Fire Protection Appendix R Review for BVPS-Unit 1, the transformers were identified as a potential ignition site if there was a short circuit on the secondary side of the transformers. The new transformers will not have an ignition potential if there is a secondary side short circuit.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The new transformers put in will not increase the probability of an accident as defined in UFSAR Section 8.4.3 or Chapter 14. This is because the new transformers will be environmentally qualified and seismically designed.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. The new transformers are similar to the ones previously installed except that the new ones will not have an ignition potential if there is a secondary side short circuit.

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In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The MCC's and their Power Control Transformers are not discussed in the Technical Specifications Section 3/4.8.1 and 3/4.8.2.

Design Change No. 565 - Hydrogen Recombiner  
Zero Fire Modules

The hydrogen recombiner control consoles HY-CCA-1A and 1B will be backfitted with new solid state SCR control units. This backfit is to ensure the long term reliability and spare parts availability of the Hydrogen Recombiners. The timer relay from the control circuit will also be removed and permanent jumpers will be installed in its place. The timer can be removed without decreasing the recombiner's reliability and/or safety as recommended by the manufacturer.

The scope of work completed so far was limited to hydrogen recombiner HY-RT-1B. HY-RT-1A will be done at a later date.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. Section 14.3.4.4, "Post DBA Hydrogen Generation" already allows both recombiners to be inoperable. This modification reduces the possibility of both recombiners being inoperable since the control console SCR units will meet BV-1 environmental qualification criteria.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. Section 14.3.4.4 already addresses both recombiners inoperable.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. Technical Specification basis 3.6.4 is not reduced.

Design Change No. 570 - Third Refueling Bergen-  
Patterson Snubber Modifications

This modification changed all existing Bergen Patterson snubbers and reservoir seals to ethylene propylene due to the shortened life of unadulterated polyurethane seal material. Work also performed included:

1. Gland and ram modification on 20 Bergen-Patterson snubbers.
2. Repair of any "as found" gouged rams.
3. Functionally testing all 36 Bergen-Patterson Snubbers at the design load for lock up and bleed rate.
4. The 3" Reactor Coolant Pump "B" Oil Drain line was cut and flanged in two places so that the interferring piping can be easily removed and reinstalled. Snubber removal would be very difficult, if not impossible without the temporary removal of this line.

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The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The Updated FSAR Section 9.10.2 specified that the RCP oil collection system will collect any leaking Reactor Coolant Pump oil to a sealed container. This modification does not reduce the system's ability to perform its intended function. Also, in UFSAR Section 5.2.2.3, these snubbers are required as supports for thermal expansion and to prevent quick movement of the Reactor Coolant Pumps and the Steam Generators. The changing of materials will not affect the snubbers performance during an earthquake or accident situation.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. This modification of the oil drain line does not create a new type of accident or malfunction to the oil drain system. Also, in this modification the function of the snubbers as shown in UFSAR Section 5.2.2.3 is not changing.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. Technical Specification B 3/4.4.1 is not affected by this modification to the Reactor Coolant Pump oil drain line. Technical specification 3/4.7.12 does not specify the material to be used in the snubbers.

Design Change No. 572 - Page Party Installation,  
Administration Building

The purpose of this modification was to install a page party unit in the Administration Building which will make for better communications in the EOF during an emergency.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The installation of this design change will not increase the consequence of an accident or malfunction of equipment important to safety as evaluated in the BVPS-1 Updated FSAR Section 9.17.6 "Station Page Party Telephone System."

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. This design change should enhance communications between the EOF and the plant during an emergency and will not create the possibility of any different type of accident or malfunction than previously evaluated in the UFSAR.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety as defined in the Bases of Technical Specification 3/4.9.5 "Communications" during refueling operations will not be reduced.



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Design Change No. 573 - Turbine Oil  
Bearing Lift Pumps

This design change involved the installation of two new turbine oil bearing lift pumps to individually supply lift oil to bearings No. 5 and 6 of the low pressure turbine (LP element No. 2). The existing lift pump is being used to supply bearings No. 3 and 4. The new pumps are powered from MCC1-3 and controls and indication are installed in the control room. The purpose of this modification is to prevent damage to the bearing and journal surface areas of the low pressure turbine which can occur at startup and low speed operation. In addition, the control circuit for LO-M-8 was modified by removal of a time delay relay.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The addition of the two oil lift pumps does not affect any piece of equipment which is safety-related. The turbine is not required for a safe shutdown of the reactor. Modification of the control circuit of LO-M-8 by removal of the ten second time delay relay does not increase the probability of a malfunction of this equipment. The purpose of the time delay relay was to start the lift pump automatically ten seconds after the turbine started turning if it was not already running and to stop the pump ten seconds after the turbine stopped spinning. Removal of the relay will not affect the starting of the pump when the turbine speed reaches 600 rpm.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. The modification of the existing equipment and the addition of the new pumps and controls does not affect any equipment important to safety so as to create any new accidents or malfunctions. The pumps and the motor control center are protected by over-current trips. Removal of the time delay relay does not affect the circuit as to create any new malfunctions. The Seismic analysis for the benchboard was reviewed to assure that the additional switches and indicators did not create an unacceptable condition.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The turbine and associated lube oil pumps are not safety related and therefore are not a part of the bases for any Technical Specification. Removal of the time delay relay from the control circuit of LO-M-8 does not affect the load on the diesel generator.

Design Change No. 574 - Modify Blank Flanges for  
Type C Leak Test

The purpose of this design modification was to modify the blank flanges on Type C Leak Test Valves by replacing the blank flanges with replacement flanges and fabricated test fittings. This new test flange would then be plugged when not

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in use and could be connected directly to the testing apparatus to conduct the Type C Leak Test. By installing this design change, time would be saved by eliminating the intermediate step of having to remove the existing blank flanges and replacing them with a test flange in order to conduct the Type C Leak Test. Radiation exposure to plant personnel would also be reduced.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The BVPS-1 UFSAR does not go into great enough detail to cover test flanges for Type C Leak Test. However, since the replacement flanges and their test fittings were made from the same material which the corresponding existing blind flanges are made of, the probability of an occurrence or consequence of an accident or malfunction of equipment important to safety as previously evaluated in the UFSAR was not increased.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. Since there will be normally closed isolation valves upstream of the test flanges and the test fittings will be plugged with a screw on cap when not in use, the possibility for an accident or malfunction of a different type than any previously evaluated in the UFSAR was not created.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety as defined in the Bases of Technical Specification 3/4.6.1.2 "Containment Leakage" will not be reduced since the modifications made under this design change will not alter the containment leakage rates defined in Section 3.6.1.2.

Design Change No. 575 - Chemical Addition  
Pump Vent Valve

The purpose of this modification was to install valves on the casing of the chemical injection pumps. These valves are used to vent off any air which could become trapped in the pump.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The vent valve was put on an existing plugged hole in the casing and the valve was Category I and seismically analyzed. Because of this valve replacing the plug, there is no change in the probability of an accident occurring.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. An existing penetration of the pump casing was used therefore, no new type of accident is created.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The basis for Technical Specification 3/4.6.2.3 is not affected by the addition of a vent valve to the pump casing.

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Design Change No. 579 - PORV Vent Port  
Restriction Modification

This modification entailed the removal of the restricting orifices from the exhaust ports of SOV-RC-455C-1, C-2, D-1 and D-2 and the installation of flow control valves on the cylinder air tubing lines between SOV-RC-455C-2 and PCV-RC-455C, and SOV-RC-455D-2 and PCV-RC-455D.

The restricting orifices were removed from the vent ports of the internally piloted solenoid operated valves since it has been demonstrated that when the vent port is sufficiently restricted, the PORV could fail to close.

The original PORV exhaust system utilized two solenoid operated valves aligned in such a way that if one SOV failed the PORV could still vent through the other SOV. To maintain the PORV exhaust redundancy two flow control valves were installed in a parallel configuration in each of the two PORV cylinder air lines. With this configuration, one flow control valve failure would not inhibit the PORV from closing as air can still pass through the other valve.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. The removal of the restricting orifices from the vent ports of the solenoid operated valves reduce the probability of an SOV failure thus improving the reliability of the PORVs to close after relieving reactor coolant system overpressure. Two flow control valves were installed in a parallel configuration in each of the two PORV cylinder air lines, so that, in the event one flow control valve fails each PORV still is able to vent air out through the other flow control valve. Although each flow control valve allows 50% of the total flow rate needed to meet the ten minute operator response criteria and the failure of one valve will reduce this flow rate as noted, it is much better to allow for reduced flow than to totally inhibit PORV operation as was shown possible with the present configuration of this system. This modification does not affect any accident evaluation concerning operation of the PORVs as addressed in UFSAR sections 14.1.2, 14.1.3, 14.1.7, 14.1.8, 14.1.9, 14.1.10, 14.1.11, 14.1.15, 14.1.16, 14.2.5, or 14.2.7 or any other section of the Safety Analysis of the UFSAR. No section of Chapter 14; Safety Analysis of the UFSAR, considers the malfunction or failure of the PORVs in any accident situation and generally does not take credit for PORV operation, specifically in sections 14.1.7, 14.1.8, 14.2.5, and 14.2.7. The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. Although the failure of one of the new flow control valves is possible, the installation of two flow control valves in a parallel configuration precludes total PORV failure. This modification does not affect the operation of the PORVs as described in UFSAR section 4.2.2.7 - Power Relief Valves, or Section 4.3.4 - Pressure Relief, and does not create a new type of accident than any previously evaluated in the UFSAR.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety as defined in the basis of section 2.1.2 - Reactor Coolant System Pressure; Section 2.2.1 - Reactor Trip Set Points, as it applies to Pressurizer pressure; 3/4.3.1 - Reactor Coolant Loops, as it applies to limits of Appendix G to 10CFR Part 50; Section 3/4.4.2 and 3/4.4.3 - Safety Valves; and 3/4.4.11 - Relief Valves is not adversely affected.



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Design Change No. 580 - Fire Wrap CH-P-1B  
Power Cable

The objective of this design change was to modify the power cable 1CHSBPH300 to protect the 1B charging pump power cable in the primary auxiliary building, level 722'-6" from an exposure fire. This modification was initiated as a result of circuit analysis performed for the DLC Appendix R response, which identified that the cable separation for the charging pumps in the primary auxiliary building did not meet the requirements of 10CFR 50 Appendix R. The design change entailed the design and installation of a one hour fire barrier around the perimeter of the cable. The material used is ANI/MAERP approved one hour fire barrier and is supported by the cable raceways.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The malfunction of a charging pump is evaluated in the single active failure analysis of the ECCS in Section 6 of the Updated FSAR. This design change does not affect the consequences of a loss of one charging pump. The probability of a malfunction of the 1B charging pump will not be increased by this change. The power cable ampacity and the cable tray support were reviewed to assure that the effects of the fire barrier are acceptable.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. This change will decrease the probability of a loss of redundant charging pumps due to a fire in the 722 ft. level of the PAB. This event was not previously evaluated in the Updated FSAR, but was identified as a result of the 10CFR50 Appendix R plant review. The 1A charging pump power cable exits the pump cubicle via the top and traverses the 735 ft. level of the PAB to the LW-TK-2B cubicle. From there it drops to the LW-P-2B cubicle and exits the PAB on the north wall. The power cable for CH-P-1C exits the pump cubicle on the north side and leaves the PAB via the north wall of the LW-P-2A cubicle. Separation and/or fire barriers exist between the 1A and 1C cables. The power cable for CH-P-1B exits the cubicle via the south wall. Separation of at least 20 feet is maintained between the 1B charging pump power cable and the other two, however no automatic fire suppression system is available in this area.

The NRC has evaluated this proposed modification and determined that the protection provided is equivalent to that required by 10CFR50 Appendix R, Section III, G. On this basis an exemption was granted from the requirements of providing an automatic fire suppression system for this area. The evaluation considered all safety related equipment located in this area which included all three charging pumps. Given the spacing and layout of the area and the cubicles acting as heat shields, a fire induced failure of both trains is not considered feasible.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. This change does not affect the bases for Technical Specification 3/4.1.2 since the probability of a malfunction of the charging pump is not increased and the safety analysis assumes only one charging pump is operable.

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Design Change No. 588 - Feedwater  
Control Valve Modification

The purpose of this modification was to modify the current design of the main feedwater control valves to eliminate the effects of flow induced vibration which results in stem breakage.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. The modifications made to the Main Feedwater Control Valves under this design change still keep the valve stroke times within their specified limits. This was verified by performing a stroke test on the valves. Therefore, the probability of an accident or malfunction of equipment important to safety as previously evaluated in Section 10.3.5.1.1 of the UFSAR would not increase.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report would not be created. A loss of normal feedwater has been evaluated in Section 14.1.8 and "Excessive Heat Removal Due to Feedwater System Malfunctions", Section 14.1.9 was also evaluated. The possibility of a different type of accident or malfunction will not be created as a result of the modifications made to the valve under this design change.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specifications would not be reduced. Section 3.6.3.1 "Containment Isolation Valves" states that containment isolation valves specified in Table 3.6-1 shall be operable with the isolation times shown in the table. Since these modifications made to the valves will not exceed the maximum stroke times of 10 seconds as specified in Table 3.6-1, the margin of safety as defined in bases 3/4.6.3 would not be reduced.

Design Change No. 596 - Replacement of Cooling  
Tower Fill Material

This modification involves replacement of the Abestos Cement Board (ACB) fill and eliminators with polyvinyl chloride alpha bars (fill) and eliminators. Also, five stainless steel fire barrier walls will be installed in the cooling tower expansion joints to satisfy ANI requirements. The purpose of this modification is to provide BVPS Unit 1 with a more reliable cooling tower with less maintenance. As of the end of 1983, a total of 41 of the towers 80 fill bays have had new PVC fill installed. The present schedule calls for the remaining 39 bays of ACB fill to be replaced during the next scheduled refueling outage. All of the recommended firewalls have been installed.

The probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (FSAR) would not be increased. Modification of the cooling tower does not affect any safety related equipment or any accident previously analyzed in the Updated FSAR. The cooling tower is not needed for a safe shutdown of the reactor or to mitigate the consequences of an accident.

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The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. Changing the fill material in the cooling tower will not create any new accidents or malfunctions of equipment important to safety. Increased reliability of the fill material as provided by this change should improve the performance of the cooling tower and the plant as a whole.

In addition it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The Circulating Water System is not safety related and is not required to be operable in the basis for any Technical Specifications.

Design Change No. 603 - Tube Lane Blocking  
Devices for Steam Generators

This modification entailed the replacement of the formerly installed welded type S/G tube lane blocking devices with a Westinghouse design bolted type blocking device.

The purpose of this modification was to provide a method for removal and reinstallation of the tube lane blocking devices that requires no grinding or welding. This allows greater ease in the removal of these devices to perform refueling maintenance activities such as inspections, testing, chemistry control, or sludge lancing; and reduces radiation exposure to the workers performing the removal of these devices.

The safety evaluation stated that the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. The replacement of the currently installed welded type S/G tube lane blocking devices with a bolted type device would not increase the probability of an occurrence or the consequence of an accident such as a Steam Generator Tube Rupture as described in UFSAR Section 14.2.4, because the bolted type devices are seismically designed and installed to ensure that they maintain their structural integrity during normal operation and also during a seismic event.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Final Safety Analysis Report would not be created. The proposed modification does not adversely affect the operation of the steam generators as described in UFSAR Section 4.2.2.4 nor does it create a new type of accident or malfunction than any previously evaluated in the UFSAR.

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced. The margin of safety as defined in the basis of Technical Specification Section 3/4.4.5 - Steam Generators and Section 3/4.7.2 - Steam Generator Pressure/Temperature Limitation is not adversely affected.



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Design Change No. 606 - NUREG 0737 Pressurizer Safety  
and Relief Valve Piping Modifications

As a result of TMI, the NRC requires nuclear plant operators to provide added assurance of the structural integrity of the pressurizer safety and relief valve installation. Full scale testing was performed by EPRI and resulting data was used by Westinghouse (W) to adjust and verify adequacy of their analytical methods. These methods were used to determine the structural response of BVPS Unit No. 1 pressurizer and safety valve piping system to expected transients. The modifications required by this evaluation were as follows:

1. Provide a means to maintain safety valve loop seal water temperature between 300°F - 400°F, thus allowing flashing of the loop seal water downstream of the safety valves which will reduce the structural response of the piping system to the pressurizer relief tank. This was accomplished by enclosing each of the seal loops with an insulated box which receives heat from the pressurizer through a window cut in the pressurizer insulation.
2. Tensioning of some anchor bolts on ISO 6.24-349 and 350 to allow the use of higher allowables which are needed to qualify the supports for structural strength.
3. Reposition the clamp of snubber H-127 on ISO 6.24 - 349 to keep the snubber within the vendors required space envelope.

The safety evaluation stated that the probability of occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be increased. The system design and operation as discussed in Section 4.2 and 4.3.4 of the UFSAR remains unchanged. Operation of the safety valves as discussed in Section 4.2.2.7 remains the same. The insulated box installed around the loop seal maintains the seal water at a temperature such that in the event the valve lifts, the water will flash to steam as it is discharged to the pressurizer relief tank. This would minimize the possibility of a water slug traveling through the discharge lines.

The safety evaluation also stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report (UFSAR) would not be created. The described modification does not alter the function of safety related equipment as evaluated in the UFSAR. This modification is intended to reduce the structural response of the piping system in the event of overpressure protection of the Reactor Coolant System by means of the safety valve(s).

In addition, it was determined that the margin of safety as defined in the basis for any Technical Specification would not be reduced.

The parameters listed in Section 3/4.4, Reactor Coolant System, are not affected by this modification. NOTE: The safety valve setpoints were verified to be in accordance with the Technical Specification limitations.

This modification does not affect the operability of the Reactor Coolant System as required by technical specification 3/4.4, therefore a change to the technical specifications is not required.

Also, a revision to Section B.2.1.8 of Appendix B of the UFSAR was recommended.

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Temporary Operating Procedure (TOP) 83-21 (22),  
Pressurization and Leak Tests of B (C) Steam Generator

This procedure detailed the valve and equipment line-ups needed to fill the B (C) steam generator secondary side and pressurize to  $790 + 50$  psig to locate a leaking tube, and to subsequently leak test the repair (plugged tube).

The safety evaluation stated that since the limits of UFSAR 10.3.1.1 Design Basis are not exceeded, the primary system is isolated from the steam generator, the limits of technical specification 3.7.2.1 are not exceeded, and other methods of decay heat removal are available, that no unreviewed safety question existed.

Temporary Operating Procedure (TOP) 83-23, Filling and Venting Drained  
Reactor Coolant Loops with Reactor Defueled

This procedure describes the steps necessary to fill and vent reactor coolant loops with the reactor vessel defueled. The existing operating manual procedure "Filling and Venting a Drained Coolant Loop" was revised to install and remove jumpers on the cold leg loop isolation valve opening interlocks, since with the reactor defueled, there is no need to ensure against an accidental start-up of an unborated and/or cold isolated loop. The initial condition on boron concentration was changed to specify boron at  $2050 + 50$  PPM, as required by Tech. Specs. for refueling operations, instead of a boron concentration equal to that of the reactor coolant system.

The safety evaluation stated that since the reactor vessel is defueled and the loops will be filled with coolant at a boron concentration of  $2050 + 50$  PPM, as required by Tech. Spec. for refueling operations, this did not increase the risk of any accident or malfunction of safety systems, and no new accident or malfunction would be created. It was also determined that the margin of safety would not be reduced. The OSC also commented that with the RCS in a defueled condition, a reactivity excursion is not possible, therefore the loop isolation valve interlocks are not required.

Temporary Operating Procedure (TOP) 83-25, Filling the SI  
Accumulators from SI Hydro Test Pump Thru Nitrogen Fill Header

This procedure provided detailed steps to add makeup water to the SI accumulators from the SI hydro test pump through the accumulator nitrogen fill line via a temporary hose, in order to meet BVPS Unit 1 technical specification 3.5.1 requirements. This alternate fill path was used since the normal flow path was out of service. The probability of an occurrence or consequences of an accident or safety related equipment evaluated in the FSAR is not increased. The same water for filling the accumulator is used in this procedure. The procedure satisfies temporary hose requirements of BVPS Unit 1 Radcon Manual, Chapter 1, Part 3, Procedure F - "Use of Temporary Hoses".

The possibility of an accident or malfunction different from that evaluated in the FSAR is not increased. The unused portions of the nitrogen fill header are "double-valve isolated". The nitrogen fill header is also monitored for radioactivity leakage to prevent discharge into the atmosphere. A permanent relief valve at the SI hydro test pump discharge is set below the nitrogen fill line design pressure to prevent overpressurization. The nitrogen fill system was returned to normal operating status when filling the accumulators was completed. No unreviewed safety question existed.

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Temporary Operating Procedure (TOP) 83-28, Purging Oxygen  
From the Degasifier With Nitrogen

This procedure described the necessary steps, valve and equipment lineups to individually purge the 2A and 2B Degasifiers with nitrogen, to return them to a non-flammable environment. Although the Degasifier is non-nuclear safety related, the probability of damaging safety related equipment in close proximity is decreased by purging the Degasifier with nitrogen. Once the oxygen buildup in the Degasifier is eliminated, the possibility of explosion is significantly decreased.

All temporary hoses used in the procedure were installed in accordance to BVP Unit 1 Radcon Manual Chapter 1, Part 3, Procedure F, "Use of Temporary Hoses". That procedure contains appropriate Radcon controls to prevent contaminating the Primary Auxiliary Building during venting operations. Therefore, no unreviewed safety question existed.

Temporary Operating Procedure (TOP) 83-29, Verifying Operability and  
Position of Hydrogen Analyzer Containment Isolation Valve |SOV-HY-104B\

This procedure details the steps necessary to verify operability and determine position of Hydrogen Analyzer Containment Isolation Valve |SOV-HY-104B|. Since dual valve position was indicated, it was necessary to apply nitrogen pressure (3-5 psig) on the isolation valve and by cycling the valve and observing pressure changes, valve operability and position were verified.

The equipment installed under this TOP maintains containment integrity and was pressure rated at greater than DBA conditions. The affects of discharging a full N<sub>2</sub> bottle to containment were negligible and would not effect peak containment pressure under any accident conditions described in Section 14 of UFSAR. Temporary hosing was installed in accordance to RCM Chapter 1 and meets all Circular 80-18 concerns. For the above reasons the UCC concluded that there was no unreviewed safety question.





**Duquesne Light**

Nuclear Division  
P.O. Box 4  
Shippingport, PA 15077-0004

Telephone (412) 456-6000

June 1, 1984

U. S. Nuclear Regulatory Commission  
Office of Inspection & Enforcement  
Attn: Dr. T. E. Murley, Regional Administrator  
Region 1  
631 Park Avenue  
King of Prussia, PA 19406

Reference: Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66  
1983 Report of Facility Changes, Tests and Experiments

Gentlemen:

This letter forwards the 1983 annual Report of Facility Changes, Tests and Experiments for Beaver Valley Power Station Unit No. 1, in accordance with 10CFR50.59. The report covers the period January 22, 1983 to January 22, 1984 to coincide with the annual FSAR update. A brief description of the changes, tests and experiments are provided along with a summary of the safety evaluation for each.

Very truly yours,

J. J. Carey  
Vice President, Nuclear

cc: Director of Nuclear Reactor Regulation (39)  
U. S. Nuclear Regulatory Commission  
Attn: Mr. R. C. DeYoung, Director  
Office of Inspection and Enforcement  
Washington, DC 20555

Mr. W. M. Troskoski, Resident Inspector  
U. S. Nuclear Regulatory Commission  
Beaver Valley Power Station  
Shippingport, PA 15077

U. S. Nuclear Regulatory Commission  
c/o Document Management Branch  
Washington, DC 20555

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