



Duquesne Light

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U. S. Nuclear Regulatory Commission
Office of Inspection & Enforcement
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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
1984 Report of Facility Changes, Tests and Experiments

Gentlemen:

This letter forwards the 1984 annual Report of Facility Changes, Tests and Experiments, in accordance with 10CFR50.59. The report covers the period January 22, 1984 to January 22, 1985 to coincide with the annual FSAR update. A brief description of each facility and procedure change is provided along with a summary of the safety evaluation for each change.

Very truly yours,

J. J. Carey
J. J. Carey
Vice President, Nuclear

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DUQUESNE LIGHT COMPANY
Beaver Valley Power Station
Docket No. 50-334, License No. DPR-66

Design Change No. 42 - Manual Synchronizing of
4160 V Emergency Busses to Normal Busses

The objectives of this design modification were two fold. First, to provide the ability to manually synchronize the 4160 V emergency busses to the station service (normal) busses without dropping the emergency bus load or emergency diesel generator feed; and secondly, to prevent the possibility of simultaneously connecting more than one potential transformer voltage to an incoming or running synchronizing bus using synchronizing switches.

For operating conditions where there exists a loss of coolant accident or normal power is not available to safety related busses, engineered safety features (ESF) equipment necessary for the safe shutdown of the power plant receives power from the emergency diesels. After a safe shutdown of the power plant and when it is desirable to return the load to the station service (SS) bus, all ESF equipment loads must be shed by opening the individual breakers to the equipment; station service power is then aligned to emergency bus; and individual breakers which supply ESF equipment are then closed to establish station service power. This unloading of the diesels and loading the station service bus(es) requires operator time, increases the chance for operator error, and represents a severe operating condition for the equipment. The modifications set forth in this Design Change Package provides for the ability to parallel the emergency diesel with the station service bus, thus eliminating the presently used lengthy procedure.

The second objective of this design modification, to prevent the possibility of simultaneously connecting more than one potential transformer voltage to an "incoming" or "running" synchronizing bus using synchronizing switches, entails the following:

Syn-switches are provided with a handle that is removable only in the "OFF" position. Regardless of the number of syn-switches supplied, only one (1) handle is provided for the entire synchronizing system. Since two new General Electric SB-1 switches were added to Section C of the main control board, the four remaining Westinghouse type W switches were replaced in order that all switches be operated with the same handle.

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) was not increased. The emergency AC power system is designed to provide the protective function assuming a single failure. The accident analysis presented in the FSAR requires that at least one of the redundant diesel generators accomplish its intended function. The modifications maintain this redundant character and no single failure will prevent the protective function. Additionally, a failure of the syn-switch (off normal position) is annunciated.

The possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report was not created. The modification allows paralleling and transfer of load redundancy and single failure criteria is maintained. Additional operational capability resulting from the proposed change does not affect these design characteristics.

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Design Change No. 42 - (CONTINUED)

The margin of safety as defined in the basis for any Technical Specification was not reduced. BVPS-1 Technical Specification Section 3/4.8, "Electrical Power System", requires in the bases that at least one onsite AC power source be operable during accident conditions coincident with the loss of offsite power and single failure of the other AC source. A single failure of the syn-switch proposed in this modification would not affect the redundant system; therefore, the margin of safety was not reduced.

Design Change No. 129
Permanent Steam Generator Blowdown Demineralizers

This design change installed a new, higher-capacity, blowdown system. It tied-in with the present blowdown system. The new portion of the system will be used for normal operations and the old portion will be used for isolation of blowdown flow from a steam generator that experiences a detected primary-to-secondary side RCS leak. This modification increased the steam generator blowdown flow capacity and permitted continued plant operations at higher levels of leakage. It also provided for better control over the secondary side water chemistry.

The scope of work done in 1984 was limited to the tie-ins to the old portion of the Blowdown System and 60% of new portion piping.

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) was not increased. The design modification only increased the flow capacity of the existing non-safety related portion of the Steam Generator Blowdown System.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The modification did not affect any safety-related systems or components.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The rate of RCS leakage from the primary to the secondary side as limited by the Technical Specifications was not affected by this design change.

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Design Change No. 174
Water Treatment System Modification

The purpose of this design change was to increase the reliability and capacity of the demineralized water system; to supply demineralized water to Unit 2, WT-TK-10 and WT-TK-11; and supply demineralized water from WT-TK-26 to users previously supplied from the surge line between WT-TK-11 and CN-SC-1A.

The scope of the work installed in 1984 consists of the new water tank, 90% of the required piping, and 20% of the electrical work.

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) was not increased. The modification did not adversely affect any of the plant safety related components or equipment nor increase the probability of likelihood of any accident or malfunction of associated equipment as described or evaluated in Section 14, Safety Analysis of the UFSAR.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The modification did not adversely affect the operation of any safety related equipment as described in Sections 9.11 and 10.3.5 of the UFSAR.

The margin of safety as defined in the basis for any Technical Specifications was not reduced. This modification did not adversely affect the margin of safety as described in the basis for Section 3/4.7.1.3 or any other section of the Technical Specifications.

Design Change No. 296
BVPS #1 Emergency Response Facilities Monitoring
Equipment (NUREG 0696)

This change involved the installation of Plant Variable Computer System (PVS) in the Emergency Response Facility Building (ERF) and the Safety Parameter Display System (SPDS) in the control room. Consoles from both computer systems are located in the ERF, control room, and alternate technical support center. A Bypassed and Inoperable Status Indication Panel was installed in the control room which interfaces with PVS Computer.

To date, the PVS Computer System is complete and operational, while the SPDS Computer System is installed but is not yet operational.

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) was not increased. The PVS and SPDS provides 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.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The computer display systems included in this modification are for process monitoring only and do not control any plant process. Failure of the output of an isolation amplifier has no effect on the input circuit.

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

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Design Change No. 311
Upgrade Charging Pumps 1A, 1B, and 1C

This design change was initiated by a proposal from the original equipment supplier, Westinghouse, which recommended modifications to the charging pumps and associated equipment to improve reliability and reduce maintenance. The following modifications were performed on the CH-P-1A charging pump in 1984:

A new seal housing was installed which uses internal pumpage (borated water) to cool and flush the seal cavities, thereby eliminating the need for external cooling water.

In the past, the charging pumps and high-speed gear drive had separate lube oil systems. This design change installed a higher capacity lube oil pump in the gear drive which provides lube oil to both gear drive and the charging pump. The lube oil pump which was shaft driven off of the charging pump was removed. The new combined lube oil system is completely upgraded to higher capacity equipment and has just one oil cooler and one oil filter. Before each of the separate oil systems had its own cooler and filter. The Auxiliary Lube Oil Pump and its AC drive were also replaced with higher capacity components. In addition, a new lube oil temperature controller was installed. The new temperature controller regulates oil flow between the oil cooler and an oil cooler bypass line to maintain a constant outlet oil temperature. The oil temperature controller was designed to fail in the position that allows total oil flow through the oil cooler.

The river water piping to the charging pumps was modified to accommodate the new oil cooler arrangement. The river water piping feeds just one oil cooler instead of the two in the past.

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) was not increased. These modifications improved the reliability of the charging pump and thereby enhanced its ability to perform the required safety related functions as described in the UFSAR, Sections 6.3 and 9.1.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. These modifications did not affect the safety related aspects of the functional operation of the charging pump. These changes only altered the charging pump support systems to make the pump more reliable.

The margin of safety as defined in the bases for any Technical Specification was not reduced. These modifications did not reduce the margin of safety as defined in the bases for Technical Specifications Section 3/4.1.2 since they in no way affected the functional operation of the charging pump.

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Design Change No. 320
Post Accident Sampling System

The Post Accident Sampling System (PASS) was designed to enable sampling and chemical analysis of highly radioactive liquids and gases during severe post-accident conditions. The PASS allows sampling of the reactor coolant system, containment sump, and containment atmosphere within one (1) hour following an accident. The PASS includes a shielded cabinet which is maintained at a slightly negative pressure to control airborne contamination. Most of the manual valves in the system are operated from outside the cabinet using reach rods. New, environmentally qualified containment isolation valves are installed on existing sample line penetrations as part of the PASS modification. Diluted samples can be drawn from outside the cabinet using a diluted sample isolation valve and tubing which penetrates the cabinet.

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) was not increased. Since the PASS is normally isolated until after an accident has occurred, the probability of occurrence of an accident is not increased. Containment isolation capability is enhanced by the installation of environmentally qualified isolation valves in the sample lines. Redundant radiation monitors sample exhaust air from the shielded PASS cabinet, and shut the containment isolation valves for the sampling lines in the event of high airborne activity. Thus consequences of an accident were not increased.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Section 9.6.3 of the UFSAR evaluates the effect of a sample line rupture. Since the PASS is normally isolated, the probability of even this occurrence remains low. Redundant radiation monitors automatically close the sample system containment isolation valves in event of high airborne activity within the PASS sampling box.

The margin of safety as defined in the basis for any Technical Specification was not reduced. Replacement of the containment isolation valves with environmentally qualified valves enhanced valve operability. As long as the design closure time of the new valves do not exceed the time specified in Table 3.6-1, the margin of safety is not reduced. Technical Specification 3/4.3.3.8 is based on recommendations of Regulatory Guide 1.97, Revision 2 and NUREG 0578. Since the PASS is based on the recommendations of these documents, there is no effect on the basis for 3/4.3.3.8. Changes to the Technical Specifications are required to incorporate PASS operability requirements. The basis for Technical Specification 3/4.3.3.8 should be changed to include NUREG 0737 as a reference.

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Design Change No. 333
Reactor Vessel Level Instrumentation System (RVLIS)

The objective of this modification was to provide additional instrumentation for the detection of inadequate core cooling. The modification required connections of the Reactor Vessel Head, Reactor Coolant Hot Leg Piping, and In-Core Instrumentation Conduits. Instrumentation tubing and cabling penetrate the containment to level transmitters located outside the containment. The instrument signals are wired from the transmitters and temperature sensors to microprocessors in the control room. Alarm signals from the microprocessors will be sent to the annunciators on the main control board.

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) was not increased. There was no change to the accident or transient analysis as described in Section 14.3 resulting from the implementation of RVLIS.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The connection of the RVLIS to the reactor coolant pressure boundary satisfies the closed system isolation criteria. Reactor coolant is present in the tubing up to the high volume sensors. The tubing from the high volume sensors, through the containment penetration to the hydraulic isolators does not contain reactor coolant. The hydraulic isolators and high volume sensors serve as an isolation device in the event of failure of the tubing.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The RVLIS is not presently addressed in the Technical Specification, although a change to Technical Specification 3/4.3.3.8 (Accident Monitoring Instrumentation) will need to be revised to include the RVLIS as indicated on NUREG 0737 Section II.F.2. The RVLIS may enhance the margin of safety by supplementing the Core Subcooling Monitor.

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Design Change No. 366
BVPS #1 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 and the Safety Parameter Display System (SPDS). This modification provides the required isolation arrangements to Monitor Category I inputs with the Category III SPDS and Plant Variable Computer.

In 1984, approximately 50% of the inputs which interface with Category I instrumentation were completed.

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) was not 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 possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not increased. 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 1E power sources are not altered. Thus no new possibility for an accident or malfunction was created.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The performance of the various Category I instrumentation and equipment for which isolation was 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. A change in the Technical Specifications is required, since the BVPS Unit 1 Technical Specifications does not specifically address the isolation of monitoring equipment connected to safety related items.

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Design Change No. 368
Charging Pump Spool Pieces

In the past, station personnel had considerable problems concerning the removal of charging pumps CH-P-1A, CH-P-1B, and CH-P-1C for maintenance. This design change fabricated and installed discharge line spool pieces for CH-P-1A (CH-P-1B and CH-P-1C were modified in 1983). A seismic analysis was also performed for this modification. 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 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) was not increased. The new portion was designed with the strictest seismic considerations, as delineated in Appendix B of the UFSAR. Also, if one flow path or charging pump became inoperable due to a faulty flange connection, the remaining 2 would still be more than adequate to perform the CVCS or ECCS functions.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Malfunction probabilities are kept to an absolute minimum due to the design inputs mentioned in sections 6.3.1.1 and 6.3.1.2. Leakage from flanged joints have already been analyzed in the UFSAR, sections 6.3.1.2, 6.3.3.8, and table 6.3-9 and any leakage would be of a gradual nature and would be isolated before it could reach dangerous levels.

The margin of safety as defined in the basis for any Technical Specification was not reduced. This change will not alter availability or capacity of the charging pumps as defined in Section 3/4.5.

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Design Change No. 369
Insert Type River Water System Check Valves

The purpose of this modification was to replace failed Carbon Steel River Water System Insert Type Check Valves (RW-110, 111, 112, 113, 158, and 159) with similar all stainless steel check valves in order to prevent failure of the subject check valves due to corrosion.

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 (UFSAR) was not increased. The replacement of the carbon steel check valves with similar all stainless steel check valves will mitigate the effects of corrosion and increase the integrity of the River Water System as described in the UFSAR, Section 9.9.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. This modification will not alter the safety function of the River Water System as described in the UFSAR, Section 9.9.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The margin of safety defined in the basis for Technical Specification 3/4.7.4 was not affected by the installation of this modification.

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Design Change No. 390
Diesel Generator Fuel Tank Modification

The purpose of this design change was to provide an 8000 gallon diesel oil storage tank and two low flow pumps for storage, sampling, and transfer of makeup oil to the Emergency Diesel Generator Diesel Fuel Oil Storage Tanks. A capped connection was also installed on each of the Fuel Oil Storage Tanks to provide for sampling these tanks in accordance with ASTM 0270. This change tied into the Emergency Diesel Fuel Oil Storage Tank fill lines and manways.

The probability of an occurrence or consequence of an accident or malfunction of equipment important to safety as previously evaluated in the Updated Final Safety Analysis Report (UFSAR) was not increased. This modification involved a connection to an existing system at an existing normally closed valve and installation of sample connections on the existing Emergency Diesel Fuel Oil Storage Tank manways. The installation of this new equipment has not affected any postulated failure of the existing system.

The possibility of an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. This modification provides a new system which ties the new 8000 gallon fuel oil tank to both Emergency Diesel Fuel Oil Tanks. The new 8000 gallon tank provides on-site storage of fuel while analyses of the fuel oil, in accordance with ASTM 75-77, is being completed until such time as the Emergency Diesel Fuel Oil Tanks require filling. Failure (i.e. leakage) of the 8000 gallon tank during this storage period could result in contamination of the tank contents with water and/or solids. Transfer of this contaminated fuel oil to both Emergency Diesel Fuel Oil Tanks could result in the failure of both Emergency Diesels to operate when required. This can be precluded by incorporating, into the system operating procedures, steps that require sampling of the 8000 gallon tank and obtaining satisfactory results for (1) Specific or API Gravity, (2) Water or Sediment, and (3) Viscosity immediately prior to filling the Emergency Diesel Fuel Oil Tanks from the 8000 gallon tank. The need for incorporation of these steps in the filling procedure has been acknowledged by the Operations Department. A memo to file has been generated to ensure that operating procedures include these steps. Failure of operations and/or chemistry personnel to properly reinstall the cap on the new Emergency Diesel Generator Storage Tank sample connection after sampling could result in contamination of the storage tank with water and/or solids. Again, administrative controls are required to ensure the sample connection caps are properly reinstalled. With caps properly installed on both tanks in accordance with the design code (ASME VIII), failure of a sample connection is equivalent to failure of a tank which is evaluated in the UFSAR. A memo to file has been generated by the Chemistry Department to ensure the sample procedures for the Emergency Diesel Generator Fuel Oil Storage Tanks will contain the proper procedure for reinstalling the caps.

The margin of safety as defined in the basis for any Technical Specifications was not reduced. This modification did not reduce the margin of safety as defined in the Technical Specifications, Section 3/4.8 which addresses Emergency Electrical Power Systems.

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Design Change No. 398
BVPS Emergency Response Facility
Substation Common Facilities

The purpose of this modification was to provide a Non-Category I, Non-1E, 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
350 HP Fire Pump
Future Unit 2 ERF and SPDS Items
Future Unit 2 4000 HP Startup Feed Pump

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

Details of this Design Change include:

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 System
Installation of Motor Control Centers (MCC)
Installation of Load Center
Installation of Feeder Lines
Installation of a Diesel Generator

To date, this modification is approximately 97% complete.

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) was not increased. The subject modifications did not involve or interface with any safety related equipment previously evaluated in Section 14 of the UFSAR. 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 were not included in this analysis.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The equipment which was 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 installed cannot degrade existing safety related equipment.

The margin of safety as defined in the basis for any Technical Specification was not 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.

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Design Change No. 432
River Water Radiation Monitor
Sample Line Modification

The purpose of this modification was to provide corrosion resistant sampling lines and valves (replacing carbon with stainless steel) for Radiation Monitors RM-RW-100 and RM-RW-101. The reason for this change was to reduce clogging and corrosion caused by untreated river water. Also, RM-RW-100 was relocated in the Turbine Building due to the piping routing of DCP-129.

To date, the modification performed on RM-RW-100 is complete and RM-RW-101 is 97% complete.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report (UFSAR) was not created. This modification does not adversely affect any of the plant safety-related equipment nor increase the consequence of an accident as previously evaluated in Chapter 14 of the UFSAR.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The modifications do not create the possibility for any new type of accident or malfunction of the plant safety-related equipment. The possibility of a malfunction is reduced by replacing the carbon steel lines with stainless steel. Therefore changes to Chapter 14 of the UFSAR are not required.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The Limiting Condition for Operation as defined in Section 3/4.3.3 of the Technical Specifications states that RM-RW-100 must be OPERABLE. If the monitor is inoperable, effluent may continue via this pathway provided grab samples are analyzed every eight (8) hours. The installation of stainless steel lines enhance the operability of RM-RW-100, therefore the margin of safety is not reduced. RM-RW-101 is not covered in the Technical Specifications.

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

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

This modification was started in 1983 with the final 40% installed in 1984.

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) was not increased. The Bulk Hydrogen Storage Tanks are not safety related and they were 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 possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not 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.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The Technical Specification criteria does not address the Hydrogen Supply System.

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Design Change No. 496
BVPS #1 Radio and Communications Modifications

The purpose of this modification was to install a new 450 MHz radio communication system for use by security personnel; new remote consoles in the control room, remote shutdown panel, and ERF on the 153.47 MHz band; and, two antennae for use by the state of Ohio. The 450 MHz system includes repeater stations, mobile radios, and "Handie-Talkies". New mobile units for Rad Monitoring Personnel on the 153.47 MHz band are also provided.

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) was not increased. This modification provides additional or upgraded non-safety related communications equipment.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created by this modification.

The margin of safety as defined in the basis for any Technical Specifications was not reduced. This modification does not reduce the margin of safety as defined in the basis for the Technical Specification 3/4.9.5 which addresses communication between the refueling area and control room during core alterations.

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Design Change No. 539
Degasifier Recovery Heat Exchanger
Cross-Connect Pipe Modification

The design objective of DCP 539 was to replace the rigid 2" diameter pipes cross-connecting the Degasifier Recovery Heat Exchanger pairs (BR-E-12A1/12A2 & 12B1/12B2) with flexible lines. This was done to alleviate the thermal stresses in the pipe due to the cycling operation of this portion of the Boron Recovery System.

The scope of work completed so far was limited to the BR-E-12B1/12B2 heat exchanger. Work on the BR-E-12A1/12A2 heat exchanger will be completed at a later date.

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) was not increased. The replacement of a rigid 5" long pipe with stainless steel bellows expansion joint will minimize the possibility of weld failure due to thermal gradients. Therefore, the probability of an occurrence of accident as previously evaluated in the UFSAR is not increased.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Thermal gradients contributing to weld failure are compensated for by expansion bellows. Thus a different type of accident cannot occur.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The function and design of the intermittent Degasifier Recovery Heat Exchanger pairs remains as originally intended.

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Design Change No. 556
Diesel Generator Circuit Modifications

The objective of this task was to resolve the items described in Section 6.10 of the Fire Protection Appendix R Review for Beaver Valley Power Station Unit 1 by making the necessary modifications.

Specific problems that were addressed include:

1. Fire induced short circuits and open circuits due to a fire in various plant areas including the Control Room, Cable Spreading Area, Relay Room, Control Room Air Conditioning Room, Process Instrument Room or Normal Switchgear Area that could result in loss of both emergency diesel generator control circuits, or control circuits for one diesel generator and power cables of the other diesel generator.
2. Fire induced short circuits in the Cable Spreading Room that could disable control circuits for all Emergency Diesel Generator Fuel Oil Transfer Pumps.

Specific Modifications made include:

1. The generator differential protection relay 87-VF-109 and associated relays are moved out of the relay room to the switchgear room. But there was the installation of a test switch to isolate relay 87-VF-109XX from the overcurrent relays in the relay room. Emergency procedures are being developed to use this test switch to isolate the relays from the relay room in the event of a fire in that room.
2. Two relays associated with the No. 2 Diesel Generator Fuel Oil Transfer Pumps were moved from the No. 2 Emergency Switchgear room to the Diesel Generator Building. This change removed cables associated with these relays which run through fire areas where the No. 1 diesel generator is assumed lost. This also eliminated all remote cables associated with the No. 2 diesel generator fuel oil transfer pumps.
3. It was found that there are power cables for the No. 2 diesel and control cables for the No. 1 diesel in the process rack room. To prevent a fire in this room disabling both diesels, interposing relays were installed on the control circuits for the No. 1 diesel generator.
4. The d-c power cable associated with the No. 1 diesel generator field flash circuit were rerouted out of the control room air conditioning room, where the No. 2 diesel generator is assumed lost, to another fire area.

To date, this modification is 95% complete. The remaining portion will be completed at a later date.

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) was not increased.

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Design Change No. 556 - (CONTINUED)

This modification will improve the overall safety of the plant by reducing the possibility that a fire in any one fire area will completely disable both diesel generators. The movement of relay 87-VF-109 does not affect the evaluation of any accident. The addition of the test switch into the circuitry for relay 87-VF-109XX will increase overall plant safety by being used to prevent a fire in the relay room from disabling both diesels. This increase in overall safety will negate the small chance of affecting the circuit if the switch fails. The relocation of two No. 2 diesel generator fuel transfer pump relays to the diesel generator building does not increase the probability of an accident occurring. This change will increase the safety of the system by eliminating the remote controls for the fuel oil transfer pumps. The installation of interposing relays on the safety injection start circuits for the No. 1 diesel generator, in the process rack room does not decrease the safety of the plant as described in the UFSAR. This change will increase overall plant safety by preventing a fire in the process rack room from disabling both diesel generators; the No. 1 diesel will be protected by the interposing relays, and the No. 2 diesel will be disabled by its power cables burning. The rerouting of the No. 1 diesel generator field flash circuit d-c power cable will not adversely affect the safety of the plant as described in the UFSAR. This change does not modify any equipment, it just moves the power cable out of a fire area common to both diesel generators.

The possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report was not created. The installation of this Design Change will not create a new accident or malfunction as defined in the UFSAR. The installation of the test switch in the circuitry for relay 8700-VF-109XX will not create a new type of accident. The failure of the test switch would, in the worst case, disable the No. 2 diesel; and the plant has already been analyzed for the loss of one diesel generator. The movement of two relays for the No. 2 diesel generator fuel oil pumps will not create a new type of accident. This change improves the safety of the plant by eliminating all remote cables associated with the No. 2 diesel generator fuel oil transfer pumps controls. The installation of interposing relays on the safety injection automatic start signal for the No. 1 diesel generator, will not create a new type of accident. If the relays fail, only one diesel generator is affected, and the single failure criteria is still valid. The rerouting of the d-c power cable will not create a new type of accident. This change helps to prevent both diesels from being disabled due to a fire in one area.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The modifications to the circuitry for the diesel generator and its auxiliary equipment will not affect the basis for Technical Specification 3/4.8.1. These changes assure that conformance to the Appendix R criteria are maintained.

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Design Change No. 558
Replacements For Crane Globe Valves

This design change will enable Duquesne Light Company to either repair or replace Crane globe valves originally purchased by Stone & Webster Engineering Corporation (P.O. Numbers BV-154 and BV-155). Spare parts and identical replacement valves are no longer available from Crane or their distributors. Therefore, requirements will be specified so repair parts for large globe valves may be fabricated at the Crane Repair Facility in Ambridge, PA, and a model offered by a qualified supplier will be chosen to replace small Crane globe valves.

The valves range in size from 1/2" to 10", are rated from 150 lb. to 1500 lb., and are located in the following systems:

- 1 Chemical and Volume Control
- 2 Boron Recovery
- 3 Safety Injection
- 4 Containment Vacuum
- 5 Containment Depressurization
- 6 Reactor Plant Component Cooling Water
- 7 Liquid Waste Disposal
- 8 Main Steam
- 9 Condensate
- 10 Extraction Steam and Heater Drain
- 11 Steam Generator Feedwater
- 12 Steam Generator Blowdown
- 13 Main Turbine and Condenser
- 14 Auxiliary Steam
- 15 Turbine Plant Component Cooling Water
- 16 Chilled Water
- 17 River Water
- 18 Water Treating
- 19 4 KV Station Service
- 20 Building Service
- 21 Nitrogen Gas

To date, only the following valves have been replaced; BD-10, BD-11, BD-12, BD-13, BD-14, and BD-15.

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) is not increased. For each valve repair or replacement a technical evaluation will ensure that the new valve meets or exceeds the original design requirements.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report is not created since Technical Evaluations will ensure that each repair or replacement meets or exceeds the original design requirements.

The margin of safety as defined in the basis for any Technical Specification is not reduced since the replacement valves will ensure that original design requirements are met or exceeded.

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Design Change No. 561
Ventilation System Modifications
For the Charging Pump Cubicles

The purpose of this modification was to provide a level of fire protection equivalent to the criteria of 10CFR 50 Appendix R, Section III.G.2, as determined by the NRC letter, Docket No. 50-334, Dated 3/14/83. This was achieved in the Charging Pump Cubicles by:

1. Eliminating the common supply air opening on elevation 722'6" for the middle cubicle, CH-P-LB, using a qualified fire sealant.
2. Adding metal plates under the existing hatch cover grating for cubicles CH-P-LA and CH-P-LC at elevation 735'6".
3. Protecting the existing exhaust ductwork from a 90 minute charging pump lube oil fire by:
 - a. Installing fire dampers in the exhaust duct openings for pump cubicles CH-P-LB and CH-P-LC and in the ductwork through the wall between pump cubicles CH-P-LA and CH-P-LB.
 - b. Insulating the ductwork in pump cubicles CH-P-LB and CH-P-LC with a 90 minute fire barrier material.

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) was not increased. The installation of this modification does not increase the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in Section 9.13.2 "Auxiliary Building" Ventilation Systems since the required flow rates for the ventilation system of the pump cubicles to maintain a maximum ambient air temperature of 104°F will still be provided. This modification does not affect Section 6.6 "Supplementary Leak Collection and Release System" of the UFSAR.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Since this Design Change was designed to prevent the spread of fire from one cubicle to the other cubicles, it will prevent the loss or malfunction of all three charging pumps due to fire. Also because, the ductwork was analyzed for strength and seismic qualification, the possibility for an accident or malfunction of a different type than any previously evaluated in the UFSAR was not created.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The ventilation system for the charging pump cubicles is not covered in the Technical Specifications and section 3/4.7.8 "Supplemental Leak Collection and Release System" does not apply for this modification.

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Design Change No. 562
Dedicated Auxiliary Feedwater Pump
Modification

The purpose of this modification was to install a new dedicated Auxiliary Feedwater Pump capable of providing demineralized water to the three steam generators should the existing three Auxiliary feedwater pumps be incapacitated by fire.

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) was not increased. The new dedicated auxiliary feedwater pump is installed to provide a level of protection equivalent to that required by 10CFR50, Appendix R, subsection III.L and to reduce the consequences of an accident involving a loss of normal feedwater, as described in UFSAR Section 14.1.8, a loss of offsite power, as described in UFSAR Section 14.1.11, and a loss of Auxiliary feedwater as a result of a fire that incapacitates the auxiliary feedwater pumps.

The Auxiliary Feedwater System delivers cooling water to the Steam Generators in the event cooling water flow from the normal Feedwater System is lost. If a fire occurs which incapacitates all three Auxiliary Feedwater Pumps it is imperative that cooling water from the new dedicated Auxiliary Feedwater pump reach the Steam Generators. To ensure a long term dedicated shutdown capability following the start up of the dedicated Auxiliary Feedwater Pump, stop/check valves MOV-FW-156A, B and C will be de-energized open and feedwater isolation signals to these valves and the Bypass Feedwater Control valves will be disabled. A Feedwater isolation signal is initiated by:

- 1) A Safety Injection Signal,
- 2) 2/3 Steam Generator Level (High-High) in 1/3 Steam Generators,
OR
- 3) A low Tavg following a Reactor Trip.

The disabling of a feedwater isolation signal to the above mentioned valves will not diminish the safety of the plant since cooling water will be able to reach the dehydrated Steam Generators. Also this feedwater isolation signal disabling should not be a safety concern since the current Auxiliary Feedwater System is not isolated by a feedwater isolation signal.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. A new type of accident will not be caused by the installation of the dedicated Auxiliary Feedwater System.

The margin of safety as defined in the basis for any Technical Specification was not reduced by this installation.

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Design Change No. 563
Backup Indicating Panel (BIP)

The objective of this task was to provide alternate shutdown capability for Appendix R design basis fires in various areas for which redundant instrument and control channels could be lost, including:

Fire Area CR-4, Instrument Room - Potential loss of No. 2 (Purple) diesel generator, the Emergency Shutdown Panel, and the Process Racks and associated Control Room instruments.

Fire Area CS-1, Cable Spreading - Potential loss of No. 1 (Orange) diesel generator and various Control Room instrumentation and controls.

Fire Area ES-1, Orange Switchgear - Potential loss of Vital Bus 1, 3, 4 and all Orange train shutdown equipment.

Fire Area ES-2, Purple Switchgear - potential loss of Vital Bus 1, 2, 3, 4 and all Purple train shutdown equipment.

Fire area NS-1, Normal Switchgear - Potential loss of Vital Bus 2, 3 and all Orange diesel generator.

The following items were provided to support the above main objective:

1. Redundant 120 V ac power supplies to the backup indicating panel (BIP) to operate instrument power supplies and the dc power source for key solenoid valves.
2. The capability of transferring certain plant variable signals to the BIP and to display the transferred signals on direct reading indicators on the BIP, in the event that a fire prevents the normal instrument system from operating.
3. The capability of transferring control of 1 train of the reactor vessel head and pressurizer vent solenoid valves to the BIP and use the BIP as an alternate dc power supply for these valves. This will allow the reactor vessel head vent valves to be used as an alternate letdown path and the pressurizer vent to be used for depressurization.
4. The capability of powering the incore thermocouple reference junction box TB-195 heater from the BIP.
5. The capability of monitoring source range indication at the BIP.
6. The capability of transferring control of the B containment air recirculation cooler solenoid valves to the BIP and use the BIP as an alternate dc power supply for these valves. This will provide a flow path for containment cooling in the event that a fire disables normal valve control. When operation of these valves is transferred to the BIP, the CIB signal to the valves will be bypassed, since fire damage to process racks and associated cables could result in spurious tripping of the valves under the accident conditions which require activation of the BIP.

Design Change No. 563 - (CONTINUED)

7. A dc breaker panel to aid in repair procedures involving the reactor vessel head vent solenoid valves.
8. Category I key lock isolation switches within Category I seismic enclosures which provide a means of isolating certain high-low reactor coolant pressure boundary valves which could be opened inadvertently due to fire induced hot shorts. Potential leakage paths identified are:
 - a. Letdown inlet isolation valves LCV-CH-460A and B could both open inadvertently as a result of hot shorts in certain fire areas.
 - b. Pressurizer PORV's PCV-RC-455C, 455D or 456 could be energized inadvertently, coincident with loss of power or control cables for the associated MOV isolation valve in some fire areas.

These modifications were 90% complete in 1984, the final 10% will be completed at a later date.

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) was not increased. The probability of an occurrence or the consequence of an accident as previously evaluated in the UFSAR was not increased, since, the transfer switches will be keylocked to prevent tampering of plant signal and control switchovers. The probability of a malfunction of equipment important to safety was not increased, since, the interfacing Category I equipment was be bought Category I and meets the requirements of IEEE 323 and 344 for environmental and seismic qualifications, respectively. Also, the BIP and various electrical components had a seismic mounting analysis performed on them to ensure that they do not become missiles during an earthquake.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The BIP, along with local instrumentation and controls provide for an alternate safe shutdown method. Most of the monitoring indicators as referenced in Section 7.4.1.1 of the UFSAR, which are necessary for maintaining a hot shutdown, are provided for through the use of the BIP and local instrumentation. The remaining indicators, i.e., intermediate range flux level, intermediate range start-up rate, and residual heat exchanger temperature, are not included in the alternate safe shutdown method, since, a safe shutdown of the plant could be maintained without their use. It is also stated in Section 7.4.2 of the UFSAR that safety is not adversely affected by an uncontrolled boron dilution, loss of normal feedwater, loss of external electrical load and/or turbine trip, or loss of all A-C power to the station auxiliaries provided that the instrumentation and controls indicated in Section 7.4.1.1 and 7.4.1.2 are available to control and/or monitor shutdown. Therefore, the use of the BIP to maintain a safe shutdown of the plant, does not create an accident or malfunction than any previosly evaluated in the UFSAR, but, in fact eliminates one, by providing backup indication in the event that a fire renders the instrumentation of the control room and emergency shutdown panel inoperable.

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Design Change No. 563 - (CONTINUED)

The margin of safety as defined in the basis for any Technical Specification was not reduced. Bases 3/4.3.3.5, "Remote Shutdown Instrumentation", margin of safety, was not reduced by the installation of the BIP. Moreover, the presence of the BIP should increase the margin of safety by providing an alternate method to achieve a safe shutdown in the event that both the control room and emergency shutdown panel instrumentation is lost due to a fire. In addition, Technical Specification 3/4.6.3 requires changing to show that CIB signal to the containment air recirculation cooler isolation valves will be bypassed when control is transferred to the BIP. The margin of safety as defined in Bases 3/4.6.3 will not be reduced since a CIB signal to isolate containment should not be present for an Appendix R design basis fire.

Design Change No. 565
Hydrogen Recombiner Zero Fire
Modules

The hydrogen recombiner control consoles HY-CCA-1A and 1B were 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 was also removed and permanent jumpers were installed in its place. The timer could be removed without decreasing the recombiner's reliability and/or safety as recommended by the manufacturer's letter dated February 16, 1984.

The scope of work done in 1984 was limited to the Hydrogen Recombiner HY-RT-1A. HY-RT-1B was modified in 1983.

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) was not increased. Section 14.3.4.4, "Post DBA Hydrogen Generation" allows both recombiners to be inoperable. This modification reduces the possibility of both recombiners being inoperable since the control console SCR units meet BV-1 environmental qualification criteria.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Section 13.3.4.4 already addressed both recombiners being inoperable.

The margin of safety as defined in the basis for Technical Specification 3.6.4 was not reduced.

Design Change No. 574
Modify Blank Flanges For
Type C Leak Testing

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 will then be plugged when not in use and can be connected directly to the testing apparatus to conduct the Type C Leak Test. By installing this design change, time will be saved by eliminating the intermediate step of having to remove the previous blank flanges and replacing them with a test flange in order to conduct the Type C Leak Test.

This modification was initially started in 1983 with the final 25% installed in 1984.

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) was not 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 previous blind flanges were 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 possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Since there are 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 is not created.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The margin of safety as defined in the bases of Technical Specification 3/4.6.1.2 "Containment Leakage" was not reduced since the modifications made under this design change do not alter the containment leakage rates defined in Section 3.6.1.2.

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Design Change No. 581
Modifications to Air Ejector Isolation Valves

This modification entailed the replacement of four valves in the lines connecting the condensor with the air ejectors. The valves previously contained bronze internals and have exhibited corrosion due to ammonia which is present in the fluid stream. The valves were replaced with new valves which have iron internals to minimize the corrosion problem.

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) was not increased. The valves that were replaced are not part of a safety system although their failure could potentially release a small amount of radioactivity if a primary to secondary leak was present. Replacement of the valves with valves of a more corrosion resistant design will decrease the probability of a failure of this equipment. Elimination of the bronze also removes a potential copper source which has been associated with steam generator tube failures in some plants.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The replacement of the valves with valves of similar design and different materials will not create the possibility of any new malfunctions or accidents.

The margin of safety as defined in the basis for any Technical Specification was not reduced since there are no Technical Specifications associated with the operation of the air ejectors.

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Design Change No. 591
4KV Bus Under Voltage Loss of Control Voltage Alarm

The alarms, which monitor the transformer fuses on each of the 4160 volt busses, were modified to annunciate on a loss of 125 vdc control power to the undervoltage relays.

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) was not increased. By providing annunciation on a loss of 125 vdc control voltage to the undervoltage relays, the reliability of generating a reactor trip signal due to reactor coolant pump bus undervoltage is enhanced.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created by the implementation of the Design Change.

The margin of safety as defined in the basis for any Technical Specification was not reduced. According to the Technical Specification basis for section 2.2.1, the Undervoltage Reactor Coolant Pump bus trip provides reactor core protection against DNB as a result of loss of voltage to more than one reactor coolant pump. This modification will assure that annunciation will occur on a loss of 125 vdc control power to the sensing relays, thus enhancing the reliability of this protection system.

Design Change No. 597
Unit 1/Unit 2 Electrical Interface Modification Q.A. Category II

This modification provides an electrical control, protection and indication interface between Beaver Valley #1 and #2 Main Generator and Transformer System. This modification also provides an electrical interface between the BV-1 and BV-2 communication system.

The scope of the work completed in 1984 consisted of:

- Station service transformer 1A & 1B primary and backup pilot wire modification.
- Addition of shorting switches to 1C & 1D unit service transformers and #1 main transformer neutral C. T. Circuit.

The rest of the modification will be installed at a later date.

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) was not increased. Section 8.3, "System Connection" addresses the BV-2 Offsite Power System. Section 9.17, "Communication Systems" addresses BV-2 construction communication system and this change just expands this communication system.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. Section 8.3, "System Connection" addresses grid stability due to a loss of a large power station. Expanding the communication network is already mentioned in Section 9.17, "Communication Systems".

The margin of safety as defined in the basis for any Technical Specification was not reduced. The margin of safety of Technical Specification 3/4.8.1 and 3/4.8.2 is not reduced since emergency power is still available, also these Technical Specifications will increase surveillance requirements on the Emergency Power Systems.

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Design Change No. 611
Control Room Emergency Air
System for Units 1 & 2

The design objective of this design change package was to modify the existing Beaver Valley Power Station (BVPS) Unit 1 Control Room Emergency Bottled Air Pressurization System (CREBAPS) to accommodate the BVPS Unit 2 control room area. This modification will provide automatic emergency pressurization of both control room areas during a Unit 1 or a Unit 2 containment isolation Phase B (CIB) or a high chlorine condition and will enable the BV-1 & BV-2 main control room area to be pressurized to 1/8 inch of water gauge for one hour after the DBA. This safety function will be provided despite of a loss of offsite power, a single failure or operating status of BV-1 or BV-2.

The scope of work installed in 1984 amounted to 40% of the total modification. The rest of the modification will be installed at a later date.

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) was not increased. Section 1.7 & 9.13.4 addresses the emergency pressurization of the BV-1 and BV-2 Main Control Area for one hour after a DBA and chlorine detection. The additional bottled air storage will ensure the above criteria will be satisfied.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. This modification will not adversely affect the control room emergency pressurization system as described in Section 1.7 and 9.13.4 since it increases the bottled air supply.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The margin of safety as defined in Technical Specification 3.7.7.1 basis is not reduced since the bottled air supply is being increased by this modification.

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Design Change No. 620
Evaporators Bottoms Sample System

Revisions to 10CFR61, effective 12-26-83, require any licensee who transfers radioactive waste to a land disposal facility must classify the waste according to paragraph 61.55. BVPS intends to have waste samples sent to independent labs for classification purposes. This modification provides a means for conveniently and safely drawing samples of the Spent Resin and Evaporator Bottoms waste being transferred to the mixer-feeder for solidification. This modification added a sample sink in the Solid Waste area and ran tubing from process piping to the sample sink.

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 (UFSAR) was not increased. Liquid leakage or releases from components modified or added by this change will be locally collected and disposed of in the liquid waste disposal system and therefore will not increase the probability or consequences analyzed in UFSAR Section 14.2.2 Accidental Release of Waste Liquid.

The possibility for an accident or malfunction of a different type than any evaluated previously in the Updated Final Safety Analysis Report was not created. There is no possibility of an accident of a different type other than the accidental release of liquid waste previously analyzed in UFSAR Section 14.2.2

The margin of safety as defined in the basis for any Technical Specification was not reduced. This modification does not reduce the margin of safety defined in the basis for either Technical Specification 3/4.11.1 Liquid Effluents or 3/4.11.3 Solid Radioactive Waste.

Design Change No. 667
Fire Wrapping CH-P-LB Power Cable at 735 PAB

The objective of this design change was to modify cable raceways 1TH720P, 1TH721P and power cable 1CHSBPH300 to protect the LB charging pump power cable in the primary auxiliary building, level 735', from an exposure fire. The design change entailed the design and installation of a one hour fire barrier around the perimeter of the raceway and cable. The material used was an approved one hour fire barrier and is supported by the cable raceway.

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) was not increased. The malfunction of a charging pump is evaluated in the single active failure analysis of the ECCS in Section 6 of the UFSAR. This design change does not affect the consequences of a loss of one charging pump. The probability of a malfunction of the LB charging pump is not 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 possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. This change decreases the probability of a loss of redundant charging pumps due to a fire in the 735 ft. level of the PAB. This event was not previously evaluated in the UFSAR, 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-P-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-LC 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 LC cables. The power cable for CH-P-LB exists the cubicle via the south wall traverses elevation 722 then is routed up to the 735 elevation along a column where it exits the PAB via the west wall. Separation of at least 20 feet is maintained between the LB charging pump power cable and the other two, however no automatic fire suppression system is available in this area.

Design Change 580 provided protection of the power cable for CH-P-LB by wrapping the cable on the 722 elevation. This Design Change continued the fire protection to the 735 elevation. 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.

The margin of safety as defined in the basis for any Technical Specification was not reduced. This change does not affect the basis 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. 626
Addition of Local Pressure Gauges
On Main Steam Header

In the event of a loss of use of the Control Room and Emergency Shutdown Panel during a fire, plant control will be accomplished locally. To observe various station functions a backup indicating panel (BIP) is tied into terminals in the east cable vault. One of these functions at the BIP is to monitor the steam generator level. However, to read the actual steam generator level, the indicated level needs to be compensated for the changes in water density as the plant cools down. Since density is a function of pressure, steam pressure will be monitored and used for water density compensation. This modification installed pressure gauges coming off the previously existing pressure transmitter instrument tubing, in the main steam valve room, which will provide the required local pressure indication.

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) was not increased. Since the pressure gauges are located upstream of the main steam isolation valves, they are seismically qualified. The gauges were seismically installed and their effect on the pipe to which they were attached was analyzed to meet the criteria stated in UFSAR section 10.3.1.1. Therefore, the probability of an accident or malfunction as previously evaluated will not be increased.

The possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report was not created. The only type of accident which could occur would be a rupture of the pressure gauge connection. However, UFSAR section 10.3.1.3 analyzes a main steam line break, which would result in a greater loss of fluid than a ruptured pressure gauge connection. Therefore, since the steam line break has been analyzed, no different type of accident than previously evaluated can occur.

The margin of safety as defined in the basis for any Technical Specification was not reduced. In the event of a break of the pressure gauge a loss of main steam will occur. The rate of loss would be very small and easily controllable. If by some chance the affected steam generator is rendered inoperable plant shutdown will be forced by Technical Specification 3/4.4.5. Therefore, the margin of safety will not be reduced.

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Design Change No. 646
Modify SOV Manifold to TV-MS-101A, B & C

During a test (OST 1.21.4) it was found that the Main Steam Trip Valves, TV-MS-101 A, B, & C, did not close in the specified 5 second closure time. The diagnoses to the problem as determined by station personnel was that the SOVs for the Trip Valves were not venting the air cylinders quick enough. The modifications to the SOV Bleed-Off Manifold which increased the venting rate were accomplished by replacing the existing 3/4" ASCO 3 Way Solenoids Model No. 8316-C-47 with a 1" solenoid of equal to or better quality.

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) was not increased. This modification enables TV-MS-101A, B & C to meet UFSAR requirements to close within 5 seconds without flow, since the pistons holding up the flapper are able to bleed-off air pressure faster.

The possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report was not created. Loss of station air from any event is discussed in Section 9.8, a malfunction of the new parallel SOV's would cause the plant to trip and be in a safe position which agrees with Section 9.8.

The margin of safety as defined in the basis for any Technical Specification was not reduced. Technical Specification 3.7.1.5 surveillance limit of full closure within 5 seconds is being maintained.

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Design Change NO. 660
Gaseous Waste BV-1/BV-2 Interconnections

The purpose of this design change is to enable Beaver Valley Power Station Unit No. 1 to use the Gaseous Waste System storage tanks of Unit No. 2 if additional capacity is required. This design change will also permit Unit No. 2 to use the Discharge of the Gaseous Waste decay tanks of Unit No. 1. This modification will be accomplished by connecting line 1/2"-GW-27-N8-Q2 to 2-GWS-500-241-3 and line 2-GWS-500-289-3 to 1/2"-GW-68-N8-Q2. This design change only encompasses work within the Unit No. 1 boundary.

The scope of work completed so far includes:

- Adding line 1/2"-GW-184-N8-Q2 to 1/2"-GW-27-N8-Q2 and capping the end.
- Adding line 1/2"-GW-185-N8-Q2 to 1/2"-GW-68-N8-Q2 and capping the end.

Line 1/2"-GW-184-N8-Q2 will be connected to 2-GWS-500-241-3, and line 1/2"-GW-185-N8-Q2 will be connected to 2-GWS-500-289-3 at a later date.

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) was not increased. The probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in UFSAR Section 14.2.3, Accidental Release of Waste Gases, will not be increased. The addition of the two cross-connect lines, with two manual isolation valves in series, does not increase the probability of any accident described in UFSAR 14.2.3 (i.e. rupture of either the Volume Control Tank or the gas surge tank).

The possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report was not created. The addition of the two cross-connects does not adversely affect the operation of the Gaseous Waste Disposal System as described in UFSAR Section 11.2.3. The change will allow BVPS Unit No. 1 to use the Gaseous Waste System Storage tanks of Unit No. 2 if additional capacity is required or allow Unit No. 2 to use the discharge of the Gaseous Waste Decay Tanks of Unit No. 1.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The margin of safety as defined in the basis for Technical Specification 3/4.11.2.4 - Gaseous Radwaste Treatment will not be reduced. The cross-connects will provide either BVPS Unit 1 or 2 with additional waste gas storage if required.

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Design Change No. 673
Replacement of Station Batteries Numbers 1 and 2

The Unit 1 station batteries numbers 1 and 2 did not pass BVT-1.1-1.39.2, which tests the batteries over the design basis duty cycle. This design change replaced the Unit 1 station batteries with the Unit 2 station batteries.

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) was not increased. The replacement batteries are sized sufficiently to carry the emergency loads for the accidents analyzed in UFSAR Chapter 14. They are equivalent to the previously installed batteries.

The possibility for an accident or malfunction of a different type than previously evaluated in the Updated Final Safety Analysis Report was not created. The replacement batteries perform the same function as the original batteries and are environmentally and seismically qualified.

The margin of safety as defined in the basis for any Technical Specification was not reduced. The margin of safety in the basis for Technical Specifications 3.8.2.3 and 3.8.2.4 was not reduced since the replacement batteries met the design requirements of the original batteries.

Technical Evaluation Report No. 45
Rockwell-Edwards Check Valve Replacement

Rockwell was discontinued production of Model #3674-F316J Piston Check Valve (Westinghouse Designation C-58). The purpose of this modification was to replace valve No. CH-69, a 1" Rockwell lift check valve used to isolate the volume control tank H_2-N_2 gas inlet piping during RCS degassing operation prior to opening the RCS for refueling, with a suitable replacement valve. This suitable replacement valve was a new style Rockwell Model #36174-F316T4 Piston Check Valve (C58-1), which meets the same functional requirements as the original model.

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) was not increased. The replacement of valve CH-69 with the newer version of Rockwell check valve model #36174-F316T4 (C58-1) will not alter the function of safety related equipment, the pressure rating of the replacement valve exceeds the design conditions, and the weight is the same as the existing valve.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The replacement of valve CH-69 will not alter the design or function of the CVCS system.

The margin of safety as defined in the basis for any Technical Specifications was not reduced. The parameters listed in the Technical Specifications are not affected by the modification of the Piston Check Valves. The replacement valve is equal to or better than the original valve.

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Technical Evaluation Report No. 46
New Style Rockwell-Edwards T-58 Valves

Rockwell has discontinued production of the Model #3624 Globe Valve (Westinghouse Designation T-58). The purpose of this modification was to replace valve No. CH-29, a normally closed globe stop valve used to bypass FCV-CH-122, with a new style Rockwell-Edwards Model #36124 globe valve (T58-1). This replacement valve meets the same functional requirements as the original model.

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) was not increased. The replacement of valves CH-29, with the newer style valve will not alter the function of safety related equipment. Also the pressure rating of the replacement valves exceed the design conditions.

The possibility for an accident or malfunction of a different type than any previously evaluated in the Updated Final Safety Analysis Report was not created. The replacement of valve CH-29 will not alter the design or function of the CVCS System.

The margin of safety as defined in the basis for any Technical Specifications was not reduced. This modification does not affect the parameters listed in the Technical Specifications. The replacement valve is equal to or better than the original valve.

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Temporary Operating Procedure (TOP) 84-10,
Return [DG-TK-1] and [DG-TK-2] Effluent to the RCS

The purpose of this procedure was to decrease the amount of water used during plant operation by recovering the effluents of the primary drain transfer tanks [DG-TK-1] and [DG-TK-2] via the degasifier and the volume control tank. The system will be in an alignment already considered by UFSAR Section 9.2.1 and Chemistry shall periodically sample and verify the Reactor Coolant System limits listed in Technical Specification Table 3.4-1 prior to addition to the volume control tank.

Temporary Operating Procedure (TOP) 84-12, Maintaining Steam Generator
Level Using Auxiliary Feed Pumps During a Main Feed Pump Outage

This procedure details valve and equipment line-ups necessary to maintain steam generator levels using motor-driven auxiliary feed pump [1FW-P-3A and/or 3B] and primary plant demineralized water storage tank [WT-TK-10] during a main feed pump outage from 4 to 6 hours into Mode 2 or in Mode 3.

The Safety Evaluation stated that since the motor-driven auxiliary feed pumps could handle the expected heat load, the turbine-driven auxiliary feed pump would be available, if needed, and existing Technical Specifications and FSAR cover the feedwater system boundaries and malfunctions, no unreviewed safety question exists.

Temporary Operating Procedure (TOP) 84-14, Manual Transfer of
Spent Resin from [SW-TK-2] to High Integrity Container (HIC) Liner

The purpose of this TOP was to transfer spent resin from Solid Waste Spent Resin Storage Tank [SW-TK-2] to a High Integrity Container (HIC) liner using a portable positive displacement pump, since the metering pump [SW-P-6] was out of service. The requirements of 10 CFR 20 and 10 CFR 71 were incorporated into this TOP. The intent of this procedure is consistent with those procedures described in BVPS Unit 1 UFSAR 11.2.5.2. The use of all temporary hoses in this procedure was in compliance with BVPS No. 1 Radcon Manual, Chapter 1, Part 3, Procedure F, "Use of Temporary Hoses". Technical Specification 3.11.3.1 was adhered to when performing this procedure. The TOP satisfies the criteria set forth in IE Circular 80-18. No unreviewed safety questions were involved with this procedure.

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Temporary Operating Procedure (TOP) 84-15,
CCR Heat Exchangers Tube Integrity Test

The purpose of this procedure was to verify CCR Heat Exchangers [CC-E-1A, B, C] tube integrity by pressurizing the shell side of the heat exchangers under clearance at CCR System pressure while monitoring tube sheets for possible leakage. Leaking tubes were to be identified, marked and sealed. The BVPS Nuclear Engineering Department indicated their agreement via EM 61,131 that the testing method set forth in this procedure is adequate to verify heat exchanger tube integrity and to return a CCR heat exchanger to service. The procedure was not intended to introduce any abnormal conditions to CCR heat exchangers, therefore, increase probability of tube degradation or damage to good tubes should not have occurred. The CCR System is in Normal System Arrangement during this TOP. No unreviewed safety question was involved with this procedure.

Temporary Operating Procedure (TOP) 84-18,
Sampling Group I Ion Exchangers

This procedure details the necessary steps for removing Ion Exchangers [CH-I-1B] and [CH-I-3A] from service, obtaining resin samples for isotopic analysis and returning the ion exchangers to service.

The Safety Evaluation stated that since the procedure only provides guidance for sampling and does not affect any system operation and the maximum amount of activity that could be released by an accident relative to this procedure is well within amounts previously analyzed by the UFSAR, no unreviewed safety question exists.

Temporary Operating Procedure (TOP) 84-19,
Solidification of Contaminated Oil

This procedure gives detailed instructions for equipment operation; sequence of operation and radiological precautions used with the Chem Nuclear Systems Cement/Oil Solidification Units.

No unreviewed safety questions were found concerning the Safety Evaluation which addressed regulations, codes and standards, equipment arrangement, ALARA compliance and postulated accidents.

Temporary Operating Procedure (TOP) 84-21, Leak Test of
Degasifier Recovery Heat Exchangers Cross-Connect Expansion Joints

This procedure leak tested the Degasifier Recovery Heat Exchangers to determine if leakage occurs at the cross-connect expansion joints installed per DCP 539. Test pressure was achieved by use of a hydro-pump and does not exceed ASME recommended pressure. The test utilized temporary hosing installed in accordance with an approved procedure to

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address radiological safety concerns for handling radioactive fluids.

Temporary Operating Procedure 84-22,
Purging the Degasifier With Nitrogen

The purpose of this procedure was to individually purge the 2A and 2B Degasifiers with nitrogen to return them to a non-flamable environment without the risk of explosion, since oxygen buildup in the degasifiers is eliminated. All temporary hoses used in this procedure were installed in accordance to BVPS Unit 1 Radcon Manual, Chapters 1, Part 3, Procedure F. The procedure contains appropriate RadCon controls to prevent contaminating the PAB during venting operations. The degasifier to be burped was shutdown and isolated per initial conditions prior to performing this procedure. No unreviewed safety question was involved with this procedure.

Temporary Operating Procedure 84-23, Stroking Rockwell Valves

The purpose of this procedure was to determine and document the number of turns required for stroking (full open to close) the 1 1/2" and 2" Unit 1 Rockwell valves. The Licensing and Compliance Department (Duquesne Light) evaluated the results of this TOP and compared these results against data from Rockwell to identify any inconsistencies. This TOP was performed under Mode 5 conditions. It included stroking Rockwell valves in the charging, safety injection, reactor coolant, reactor drains and RHR systems. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety evaluated in FSAR (BVPS No. 1) were not increased due to this procedure. No unreviewed safety question was involved with this procedure.

Temporary Operating Procedure (TOP) 85-01,
Checking Alignment of Rod F-10

This procedure was to verify the alignment of Rod F-10 which was assumed to be misaligned. The procedure was drafted from a recommended Westinghouse generic procedure and utilized a visicorder to monitor Stationary Gripper Coil Voltage while the subject drive line was withdrawn. The Stationary Gripper Coil Voltage was then compared to a Westinghouse graph to verify alignment. Reactor Power was less than 50%. Delta-Q is not limiting below 50% reactor power and penalty minutes accumulated as a result of ΔQ being outside the target band will be maintained. Bank D misalignment will only be two steps and will be replaced to where ΔQ is within the target band so there will be no affect upon core geometry.

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Maintenance Surveillance Procedure (MSP) 2.01, Revision 7
Nuclear Instrument Rate and Comparator Drawer N37/N46 Calibration

This revision to MSP 2.01 raised the alarm setpoint of N-46, "Power Range Comparator Deviation", to eliminate alarms determined to be spurious by Operations thus restoring the bistable to a condition where it is able to perform its design function. The UFSAR Section 7.7.1.3.1 describes the alarm function of N-46, and it is described again in Section 7.7.2.2, "Analysis of Response Consideration of Reactivity". In Section 7.2.2, "Analysis", seven transients and accidents analyzed in Chapter 14 are referenced with reactor trip setpoints given credit for protecting the health and safety of the public.

The N-46 alarm's function as defined by the UFSAR is to alert the operator to a power imbalance caused by a misaligned rod. The setpoint given in the PLS is annotated to explain that the setpoint is expected to be adjusted during startup and subsequent operation such that it is just beyond the range of normal operating variations. No unreviewed safety question was involved with this procedure revision.