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

Report of Facility Changes, Tests and Experiments

The following is a compilation of facility changes, tests and experiments completed during the year 1981 at Beaver Valley Power Station Unit No 1. This report is provided in accordance with the Code of Federal Regulations, Title 10; Paragraph 50.59, "Changes, Tests and Experiments." Several of these changes were previously reported to the NRC as they involved Technical Specification Changes.

Design Change No. 130, Auxiliary Feedwater Recirculation Line Modifications

This Design Change involved the installation of a larger recirculation line for each of the three auxiliary feedwater pumps. Flow in each recirc line is now controlled by a flow control valve. Check valves were installed downstream of the recirc valves to prevent backflow from the other pumps. Check valves were also installed in each of the six auxiliary feedwater lines downstream of the Motor Operated Isolation Valves to the Steam Generators. This will prevent backflow to a broken feedwater line in the event that the associated MOV is inoperable. In addition, a relief valve was installed on the discharge line of the Steam Driven Auxiliary Feed Pump FW-P-2, to protect the pump and piping in the event of a turbine overspeed condition.

The Onsite Safety Committee reviewed the Design Concept for this DCP and agreed that the larger recirc line and associated control valves would help prevent the pumps from overheating and possibly burning up due to lack of sufficient flow through them. It was also noted that these modifications are all reliability improvements in the Auxiliary Feedwater System and as such, do not constitute an unreviewed safety question.

This portion of DCP-130 was completed in 1980. There are more modifications planned under this DCP and they will be reported as they are completed.

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. Other changes were made to make these systems more reliable. The major changes are as follows:

1) Diversion of water from the Quench Spray Pumps to the Inside Recirc Spray Pump inlet (150 gpm each) and to the Outside Recirc Spray Pump inlet (300 gpm each).

2) Modification to the Quench Spray Pump impellers to allow for the additional required flow and shop testing to verify head vs. flow characteristics.

3) The addition of Motor Operated Valves (MOV's) in the Quench Spray Pump discharge lines with orificed bypass lines. This arrangement allows QS flow to be reduced after the containment returns to subatmospheric conditions by shutting the MOV's, thus conserving water in the Refueling Water Storage Tank (RWST).

4) Modification of the caustic (Sodium Hydroxide) chemical injection system requiring the addition of four positive displacement pumps, motor operated discharge valves, pressure relief valves and controls, all in a seismically qualified chemical addition building.

5) Replacement of all six hundred and twenty four (624) Type 1HH30100 containment recirculation spray and quench spray nozzles with four hundred and twelve (412) Type 1713A nozzles to provide more spray efficiency. The remaining two hundred and twelve (212) nozzles were plugged.

6) Addition of loop seals in the Quench Spray lines to the Recirc Spray pump sumps to prevent gravity flow from the RWST under certain conditions.

7) Replacement of several sections of existing safety injection piping with heavier wall pipe (Schedule 10 to Schedule 40) to allow for additional stress requirements.

8) A reduction in the RWST level at which automatic transfer to recirculation is initiated.

9) A change in the concentration of sodium hydroxide (NAOH) in the chemical addition tank.

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 occurence 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.

Most of this DCP was completed in 1980. Some of it was completed in 1981,and the last portion is scheduled for completion in 1982.

Design Change No. 253, Piping and Hanger Reanalysis

The NRC Show Cause Order of March 14, 1979 instructed Duquesne Light to reanalyze all piping and hangers originally designed using algebraic summation in the computer calculation of seismic loads. This DCP was issued to cover all piping hanger modifications made necessary by the reanalysis.

The Onsite Safety Committee (OSC) concurred that these modifications would ensure that the plant is designed and built to withstand a seismic event as delineated in the FSAR. With this added assurance of safety the OSC concluded that no unreviewed safety question existed.

One of the modifications required changes to the Pressurizer Power Operated Relief Valve (PORV) and Code Safety Valve discharge line supports. This was due to the calculated stresses imposed on the supports if the safety valves lift and a surge of water from the loop seal creates a hydraulic shock on the downstream piping. In order to allow time for detailed work instructions to be formulated and parts to be ordered, Duquesne Light requested, and was subsequently granted permission to continue to operate, with the loop seal drain valves open. This was understood to be an interim fix until the permanent modifications to the discharge lines could be made during the second refueling outage.

The safety evaluation for this particular part of DCP 253 stated that, while some steam leakage past the seat is likely, the station had taken adequate measures to detect and quantify this leakage and take appropriate actions to prevent a major leak. The OSC concurred that no unreviewed safety question would exist.

The majority of DCP 253 was completed during 1980, however, the entire package was closed out in 1981, and the work for Pressurizer Code Safety valve discharge line supports was transferred to Design Change 305. (See page 4).

Design Change No. 297, Installation of Reactor Containment Pressure Monitoring System

In compliance with the recommendation of NUREG-578-2.19, Duquesne Light installed two new wide range pressure transmitters for monitoring containment pressure. Two pressure indicators and one recorder were installed in the control room. This new instrumentation was procured to the highest state of qualification as was commercially available.

The safety evaluation for this DCP stated that the probability of an occurence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR would not be increased. In addition, the possibility of an accident or malfunction of a different type than any previously evaluated in the FSAR would not be created. These conclusions were drawn based on the fact that this added containment pressure monitoring equipment, while not having any control function, would enhance plant safety by giving the operators more reliable data on containment pressure, during both normal operation and accident conditions. For the same reason, it was determined that the margin of safety as defined in the basis of any Technical Specification would not be reduced. In conclusion, the OSC concurred that an unreviewed safety question does not exist.

Design Change No. 298, Containment Sump Level Indication Modification

In accordance with the recommendation of NUREG-578-2.19, the station upgraded the reactor containment sump level indication system. The existing level transmitters were replaced with higher integrity units. Two additional transmitters, with a range of 0-12 inches were installed in stilling wells to measure sump level when the water was below the range of the first two. Four new receivers were installed in the service building. Two new indicators were installed in the Control Room, in addition to a two channel sump level recorder.

The safety evaluation for this DCP stated that the probability of an occurence or the consequences of an accident or malfunction of safety related equipment previously evaluated in the FSAR would not be increased. In addition, the possibility of an accident or malfunction of a different type than any previously evaluated in the FSAR was not created. These conclusions were drawn based on the fact that this additional sump level monitoring equipment would enhance plant safety by giving the operators more reliable data on sump levels, and has no affect on other safety related equipment. For the same reasons, it was determined that the margin of safety defined in the basis of any Tech. Spec. would not be reduced. In conclusion, the OSC concurred that an unreviewed safety question does not exist.

Design Change No. 305, Pipe Support Modifications Required by NRC I.E. Bulletin 79-14

I.E. bulletin 79-14 required Duquesne Light to inspect safety related piping systems 2½ inches and larger and compare inspection results with the original pipe support design documents. Any subsequent modifications required were covered by this DCP. Later, this DCP was expanded to include the required changes to the Pressurizer Safety and Power Operated Relief Valve discharge line supports. This problem had originally been identified under DCP 253.

The safety evaluation stated that the probability of an occurrence or the consequences of an accident or malfunction of safety-related equipment as previously evaluated in the FSAR would not be increased because the required modifications would ensure that the affected systems are supported adequately as required in Appendix B of the FSAR. The possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR is not created because these changes do not involve piping or components directly, but rather their supports. The margin of safety as defined in the Tech. Specs. will be assured as a result of this design change. Based on the above it was determined that an unreviewed safety question does not exist.

It should be noted that the majority of this DCP was completed in 1980, and the Pressurizer Safety and PORV discharge line support modifications are expected to be complete by the end of the second refueling (Spring, 1982).

Design Change No. 420, Second Generation Mechanical Seal for 1B Charging Pump

This DCP covered the upgrading of the inboard and outboard mechanical seals for the 1B Charging/High Head Safety Injection Pump. Formerly, the seals were cooled with river water through a heat exchanger. Extensive testing by the Vendor (Pacific Pumps) has revealed that the heat generated in the mechanical seals is not as great as originally anticipated. This gave rise to the second generation seal. Cooling is accomplished by routing process fluid, which has been heated by mechanical seal friction, from the seal housing to special spool pieces in the pump balancing line where it is mixed with lower temperature process fluid. A return line from the spool piece supplies lower temperature fluid back to the seal housing. This eliminates the need for river water cooling.

The safety evaluation stated that the probability of an occurence or the consequences of an accident or malfunction of safety related equipment previously evaluated in the FSAR will not be increased because the pump will not be degraded in any manner. This new design has already proven itself in the 1A Charging Pump. It was further stated that the possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR is not created. This is because the change does not alter the intended function of the seal, and while it will still cool the seal adequately, it will do so with less parts and no interfacing with other systems. This will ensure a more reliable seal. The margin of safety as defined in the Tech. Specs. will not be decreased. This change will reduce down time for these pumps, thereby increasing their availability for service. Based on the above discussions it was determined that no unreviewed safety question exists.

Design Change No. 428, Relocation of PT-RC-403

This design change was necessitated by a cracked weld in the sensing line to Reactor Coolant Pressure Transmitter PT-RC-403. The method of repair consisted of permanently capping the existing sensing line at its penetration into the 14 inch Residual Heat Removal (RHR) suction line. The new sensing line was rerouted and tee'd into the Reactor Coolant local pressure indicator (PI-RC-405) sensing line.

The safety evaluation stated that the probability of an occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR would not be increased. This is because at its new location, the transmitter will still function to prevent RHR from being lined up to the Reactor Coolant System (RCS) when RCS pressure is above 425 psig, and automatically isolate it from the RCS when RCS pressure is above 600 psig. Also, the possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR will not be created because in the event of a transmitter failure, the possible consequence would be overpressurization of the RHR system, and the FSAR presently addresses this accident.

The margin of safety as defined in the basis for the Tech Specs. will not be reduced because the transmitter will still provide the same automatic RHR isolation protection from the RCS as required in Tech Spec. 3.4.7.10 and its basis. For these reasons, the OSC concluded that no unreviewed safety question exists.

Design Change No. 457, Second Generation Seal for 1C Charging Pump

This design change upgraded the inboard and outboard mechanical seals for Charging/High Head Safety Injection Pump 1C. See DCP 420 (Page 5) for details. In addition to that change, a new style shaft sleeve was used. This new style sleeve incorporated the pumping ring (part of the mechanical seal) in a one piece assembly. Formerly the pumping ring was set screwed to the shaft sleeve. This caused problems because the set screws had a tendency to back out causing damage to the rotating seal.

The safety evaluation stated that the probability of an occurrence or the consequences of an accident or malfunction of safety related equipment previously evaluated in the FSAR would not be increased because the cooling water portion of the change had already proven itself on the 1A & 1B pumps. The shaft sleeve change reduces the number of parts in the seal, making it more reliable. This design has been backed up by testing at the pump vendor's factory.

It was also determined that the possibility for an accident or malfunction of a different type than any previously evaluated is not created. This is true because the change doesn't alter the function of the seal.

It will still be cooled adequately without interfacing with the river water system. No new type of accident or malfunction is possible.

The margin of safety as defined in the Tech. Specs. will not be decreased because these changes will make the pump more reliable.

Based on the above discussions, it was determined that no unreviewed safety question exists.

Design Change No. 475, Modification to the Pressurizer Safety Valve Inlet Flanges

This modification resulted from an Electric Power Research Institute (EPRI) report alerting the utilities of a possible problem with blockage of the pilot sensing port of the Pressurizer Safety Valves (RV-RC-551A, B & C). A potential inside diameter mismatch between the inlet pipe flange and the valve flange may have resulted in at least a partial blockage of the pilot sensing tube on our valves. The inlet pipe flange to each valve was subsequently grooved to provide an adequate opening in the sensing port area.

The safety evaluation stated that the probability of an occurrence or the consequences of an accident or malfunction of safety related equipment previously evaluated in the FSAR would not be increased, because enlarging the port area would ensure without a doubt that the pilot assembly was subject to full RCS pressure. This in turn assures that the Safety Valves can be relied on to perform their intended function. Engineering analysis determined that removal of metal at the inlet flange area would not affect the pressure rating of the flange. For the same reasons, the OSC determined that the possibility for an accident or malfunction of a different type was not created. Similarly, it was stated that the margin of safety as defined in the Tech. Specs. was not reduced.

Based on the above, it was concluded that no unreviewed safety question exists.

Special Liquid Waste Temporary Operating Experiment

A temporary operating procedure involving processing of liquid waste with an auxiliary liquid waste demineralizer and associated piping was approved and implemented in 1980. This experiment was continued thru 1981. See the 50.59 report of 1980 for details of the safety evaluation. A design change is being processed to upgrade this arrangement into a permanent system.

Steam Generator Tube Inspection

Technical Specification 4.4.5.5.b requires reporting of any steam generator tube in-service inspections. No such inspections were conducted during 1981.

Challenges to Safety and Power Operated Relief Valves

As per item II.K.3.3. of NUREG 0737 Duquesne Light is required to report any challenges to the Pressurizer Safety and Power Operated Relief Valves (PORV's). During 1981, no challenges to any of the Safety Valves occured. PORV actuations are listed below.

Date	Cause	Actuations
12/25/81	Reactor Trip	1
7/21/81	Testing	3
5/7/81	Testing	1
3/24/81	Testing	1