U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-334/85-25

Docket No. 50-334

License No. DPR-66 Priority -- Category C

Licensee: Duquesne Light Company
Post Office Box 4
Shippingport, Pennsylvania 15077

Facility Name: Beaver Valley Power Station, Unit 1

Inspection At: Shippingport, Pennsylvania

Inspection Conducted: November 18-22 1985

Inspector: S Pullani 1-9-86
S. Pullani, Fire Protection Engineer date

Also participating and contributing to the report were:

A. Coppola, Mechanical Systems Specialist, BNL
K. Parkinson, Electrical Systems Specialist, BNL
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Approved by: C J Anderson 1/9/86
C. J. Anderson, Chief date
Plant Systems Section, DRS

Inspection on November 18-22, 1984 (Report No-334/85-25).

Areas Inspected: Special, announced team inspection of the licensee's efforts to comply with the requirements of 10 CFR 50, Appendix R, Sections III.G, J. and O, concerning fire protection features to ensure the ability to achieve and maintain safe shutdown in the event of a fire. The inspection involved 160 inspector hours onsite and 27 inspector hours in-office by the team consisting of 4 inspectors.

Results: One violation was identified for failure to provide emergency lighting in safe shutdown access and egress routes as required by Appendix R, Section III J. In addition, four items remained unresolved at the end of inspection. For details, see various sections of this report as listed in Attachment 5.

DETAILS

1.0 Persons Contacted

1.1 Duquesne Light Company (DLC)

*J. Belfiore, Senior QA Specialist
*S. Bose, Engineer
*R. Conley, Engineer, Nuclear Operations
H. Cox, Training Instructor
R. Dambaugh, Design Engineer
T. Dowhy, Engineer
J. Drosjack, Engineer
*R. Druga, Manager, Technical Services
*L Freeland, Operations Coordinator
E. Gabriel, Nuclear Control Operator
*K. Grada, Manager, Nuclear Safety
*T. Jones, General Manager
*H. Kahl, Senior Project Engineer
*M. Kilpatrick, Quality Assurance
J. Kinest, Shift Technical Advisor
L. Knapp, Senior Project Engineer
*F. Lipchick, Senior Licensing Supervisor
*J. Maracek, Senior Licensing Supervisor
*M. Rencheck, Engineer
*D. Schmitt, Acting Director Electrical
J. Sieber, General Manager, Nuclear Services
*H. Siegel, Engineering Manager
*S. Sovick, Senior Licensing Supervisor
*G. Svaranowick, Engineer
D. Topper, Nuclear Control Operator
*J. Turner, Shift Supervisor, Nuclear Operations
R. Woodhouse, Design Engineer

1.2 Hinchliffe and Keener (Penetration Seals Contractor)

R. Hart, Technician
J. Ulizio, Quality Control

1.3 Nuclear Regulatory Commission (NRC)

*A. Asars, Resident Inspector
*P. Tam, Licensing Project Manager
*W. Troskoski, Senior Resident Inspector

*Denotes those present at the exit meeting.

2.0 Purpose

This inspection was to ascertain that the licensee is in conformance with 10 CFR 50, Appendix R, Sections III.G, J, and O, including exemptions approved by the Office of Nuclear Reactor Regulation (NRR).

3.0 Background

10 CFR 50.48 and 10 CFR 50, Appendix R became effective on February 17, 1981. Section III.G of Appendix R requires that fire protection be provided to ensure that one train of equipment necessary to achieve and maintain safe shutdown remains available in the event of a fire at any location within a licensed operating facility. For hot shutdown conditions, one train of the systems necessary must be free of fire damage (III.G.1.a). For cold shutdown conditions, repair is allowed using in place procedures and materials available onsite with the provision that cold shutdown be achievable within 72 hours of the initiating event (III.G.1.b). Section III.G.2 lists specific options as follows to provide adequate protection for redundant trains of equipment located outside of the primary containment:

- Separation by a fire barrier having a three hour rating (III.G.2.a).

- Separation by a horizontal distance of at least 20 feet with no intervening combustibles and with fire detection and automatic fire suppression installed in the fire area (III.G.2.b).

- Enclosure of one train in a fire barrier having a one hour rating in addition to having fire detection and automatic suppression installed in the fire area (III.G.2.c).

For non-inerted primary containment, Section III.G.2 specifies one of the above three protection options, or any of the following:

- Separation by a horizontal distance of at least 20 feet with no intervening combustibles or fire hazards (III.G.2.d).

- Fire detection and automatic fire suppression installed in the fire area (III.G.2.e).

- Separation of redundant trains by a non-combustible radiant energy shield (III.G.2.f).

If the protection required by Section III.G.2 is not provided or the systems of concern are subject to damage from fire suppression activities, Section III.G.3 of the rule requires that an alternate or dedicated shutdown capability be provided which is independent of the area of concern. Any alternate or dedicated system requires NRC review and approval prior to implementation.

For situations in which fire protection does not meet the requirements of Section III.G, however, such protection is deemed to be adequate by the licensee for the specific situation, the rule allows the licensee to request an exemption on a case-by-case basis. Such exemption requests are submitted to the NRC for review and approval and must be justified by the licensee on a technical basis.

4.0 Correspondence

All correspondence between the licensee and the NRC concerning compliance with Sections III.G, J and O was reviewed by the inspection team in preparation for the site visit. Attachment 1 to this report is a listing of the correspondence reviewed.

5.0 Post-Fire Safe Shutdown Capability

5.1 Systems Required for Safe Shutdown

The systems required for post-fire safe shutdown are listed in Section 4.1 of the licensee's fire hazard analysis (see Attachment 2 to this report).

Safe shutdown of the reactor is initially performed by rod insertion from the control room. Insertion can also be accomplished by removing power to the rod drive in the motor-generator set area.

Reactor coolant inventory is maintained by one of the three high pressure charging pumps which injects borated water through the reactor coolant pump seals, taking suction from the refueling water storage tank.

Reactor coolant pressure can be maintained by one set of pressurizer heaters and one of three charging pumps. Overpressure protection is provided by safety/relief valves and code safety valves on the pressurizer.

Decay heat removal can be accomplished by releasing steam from the steam generators via the atmospheric dump valves, the decay heat removal dump valve and/or and the steam safety valves. Makeup water to the steam generators can be provided by one of the auxiliary feedwater pumps which take suction from the condensate storage tank, or, as a backup, from the two demineralized water storage tanks.

Cold shutdown conditions can be achieved and maintained by going to the solid steam generator mode of operation. In this method, the steam generator receives makeup water from the auxiliary feedwater system and drains to the main condenser via steam bypass dump valves. The two-inch bypass valves around the main steam isolation valves (MSIVs) can be throttled in conjunction with auxiliary feedwater to stabilize the flow to the steam generators. The main condenser can

be drained to several locations. A backup river water source is available through safety-related piping for this function to continue indefinitely. The licensee has analyzed the steam lines and existing supports and determined that they are adequate for this method of cold shutdown.

The residual heat removal (RHR) system will be used, when available, for achieving and maintaining cold shutdown conditions. The RHR system will not be available should a fire take place in the control room, process equipment room, cable spreading room, containment and cable vaults. The licensee does not intend to use the RHR system if the control room cannot be reentered and made available following a fire. For this eventuality, the solid steam generator method will be used for the shutdown.

5.2 Areas Where Alternate Safe Shutdown Is Required

The licensee is required to provide alternate shutdown capability independent of cabling and equipment in the control room (CR-1), cable spreading room (CS-1), relay room (CR-3), instrument rack room (CR-4), normal switchgear room (NS-1), pipe tunnel area (PT-1), CO_2 storage/PG pump room (CO_2), containment area (RC-1), cable vaults (CV-1 and CV-2), auxiliary building area (PA-1A), emergency switchgear rooms (ES-1 and ES-2) and control room A/C room (CR-2).

The alternate shutdown will be accomplished by procedural means, with actions performed at local shutdown stations or locally at the equipment. The licensee has provided a summary of the functions for which alternate shutdown methods may be needed, and the manual actions required to accomplish each of the identified functions which have been described. Alternate process monitoring capability is achieved through a backup indication panel in the east cable vault. The required instrumentation for process variables are available at the backup indication panel. The licensee has installed a local steam pressure indicator in the atmospheric dump valve area for manual control of the steam pressure during post-fire shutdown.

Due to the proximity of the three existing auxiliary feedwater pumps in the pipe tunnel area (PT-1), the licensee has installed a new 100-percent capacity auxiliary feedwater pump located in a separate fire area in the turbine building. This new pump is tied to the existing feedwater headers.

Also due to the proximity of motor-operated valves on the river water supply to the diesel generators, in the CO_2 storage/PG pump room, the licensee relocated one of the motor-operated valves to a separate fire area to eliminate the possibility of coincident loss of cooling water to both diesel generators in the event of a fire.

The licensee intends to use portable, gasoline-powered fans as a means of providing essential ventilation in three areas in the event of fire damage to the normal ventilation equipment. These three areas are the primary auxiliary building area (PA-1A) the emergency switchgear rooms (ES-1 and ES-2) and the control room A/C room (CR-2).

The licensee has made modifications to the No. 2 diesel control circuit and wiring since redundant control circuits for the diesel generator were found to run in the same fire area. The modifications were also made in areas of normal switchgear, cable spreading room, instrument rack room, relay room and control room A/C room.

The licensee has modified the circuits of all Category I, safety related motor control centers (480V) by installing encapsulated control power transformers to prevent hot shorts from occurring.

5.3 Remaining Plant Areas

All other safe shutdown areas of the plant are required to comply with Section III.G.2 of Appendix R, unless an exemption request has been approved by the staff.

6.0 Inspection Methodology

The inspection team examined the licensee's capabilities for separating and protecting equipment, cabling and associated circuits necessary to achieve and maintain hot and cold shutdown conditions. This inspection sampled selected fire areas which the licensee had identified in compliance with Section III.G.

The following functional requirements were reviewed for achieving and maintaining hot and cold shutdown:

- Reactivity control
- Pressure control
- Reactor coolant makeup
- Decay heat removal
- Support systems
- Process monitoring

The inspection team examined the licensee's capability to achieve and maintain hot shutdown and the capability to bring the plant to cold shutdown conditions in the event of a fire in various areas of the plant. The examination included a review of several drawings, safe shutdown pro-

cedures and other documents. Drawings were reviewed to verify electrical independence from the fire areas of concern. Procedures were reviewed for general content and feasibility.

Also inspected were fire detection and suppression systems and the degree of physical separation between redundant trains of Safe Shutdown Systems (SSSs). The team review included an evaluation of the susceptibility of the SSSs for damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems.

The inspection team examined the licensee's fire protection features provided to maintain one train of equipment needed for safe shutdown free of fire damage. Included in the scope of this effort were fire area boundaries, including walls, floors and ceilings, and fire protection of openings such as fire doors, fire dampers, and penetration seals.

The inspection team also examined the licensee's compliance with Section III.J, Emergency Lighting, and Section III.O, Oil Collection System for Reactor Coolant Pump.

7.0 Inspection of Protection Provided to Safe Shutdown Systems

7.1. Protection in Various Fire Areas

The fire areas required for the safe shutdown are listed in Section 3.4 of the licensee's fire hazard analysis (see Attachment 3 to this report).

The team reviewed the protection provided to selected safe shutdown system components in the following fire areas for compliance with Appendix R, Section III.G.1, 2, and 3.

- Process Instrument and Rod Position Room (CR-4)
- Cable Spreading Room (CS-1)
- Emergency Switchgear Room No. 1 (ES-1)
- Normal Switchgear Room (NS-1)
- Diesel Generator Room (DG-2)
- Intake Structure Cubicles (IS-1, IS-2, IS-3, and IS-4)
- Pipe Tunnel Area (PT-1)
- Main Steam Valve Area (MS-1)
- Primary Auxiliary Building (PAB-1)

- West Cable Vault (CV-1)
- East Cable Vault (CV-2)
- Cable Tunnel (CV-3)
- Motor Generator Room (MG-1)
- Turbine Building General Area (TB-1)

The safe shutdown systems and components selected for inspections in the above fire areas were based on their relative importance to safety using Probabilistic Risk Assessment (PRA) techniques (see Section 11.0 for details).

The team did not identify any unacceptable conditions.

7.2 Safe Shutdown Procedures

7.2.1 Procedure Review

The team reviewed the following safety shutdown procedure:

- Operating Manual Chapter 56C, Alternate Safe Shutdown from Outside Control Room, Revision 1.

The scope of review was to ascertain that the shutdown could be attained in a safe and orderly manner, to determine the level of difficulty involved in operating equipment, and to verify that there was no dependence on repairs for achieving hot shutdown. For purpose of the review, a repair would include installing electrical or pneumatic jumpers, wires or fuses to perform an action required for hot shutdown.

The team did not identify any unacceptable conditions.

The inclusion of the Shift Technical Adviser (STA) as an active member of the shutdown crew, particularly the use of the STA to establish a charging flow path, was questioned and the training of STA's for this function was reviewed. It was determined that at BVPS, the STA is adequately trained for this function. (i.e., procedure walkthrough at least once a year, fire fighting training, and on the job checkout of operator valve manipulations are part of STA's normal duties).

7.2.2 Procedure Walk-Through

The team walked through selected portions of the procedure to determine that shutdown could be attained in an orderly and timely fashion.

The walk-through demonstrated that auxiliary feed water flow and charging could be established within the time required for this plant (30 minutes), and that stable hot standby conditions could be established within one hour after control room evacuation.

The only communications system used during this demonstration was the dedicated phone system, and this proved adequate for the purpose.

Other aspects of the procedure (cooldown and preparation for cold shutdown) were also walked through and the feasibility of these aspects was demonstrated.

The team did not identify any unacceptable conditions except as follows:

a. Minor Changes Required for Alternate Safe Shutdown Procedure 56C

The Nuclear Shift Supervisor (NSS) was detracted from his main function upon arriving at the Back-up Indicating Panel (BIP) when he began hooking up the source range monitor which is not required at the beginning of the procedure to achieve stable hot standby conditions. It was determined that the procedure be changed to delete this from the NSS portion of the procedure and make it the primary responsibility of the STA when he arrives at the BIP (within one hour).

The licensee has committed to making this change to the procedure by December 31, 1985. This is an unresolved item pending the revision of the procedure and its review by NRC (50-334/85-25-01).

b. Enhancement of the Key Rings Used for Access to Safe Shutdown Areas

The key rings carried by the operators contained many keys, not all of which are required for the procedure under review. Finding the correct keys under poor lighting conditions could be time consuming. It was determined that some kind of coding be instituted that would enhance this action.

The licensee has committed to making improvements to the key rings (key identifying devices), to enhance key selection, by December 31, 1985. This is an unresolved item, pending completion of the licensee action and its review by NRC (50-334/85-25-02).

7.3 Protection for Associated Circuits

Appendix R, Section III.G, requires that protection be provided for associated circuits that could prevent operation or cause maloperation of redundant trains of systems necessary for safe shutdown. The circuits of concern are generally associated with safe shutdown circuits in one of three ways:

- Common bus concern
- Spurious signals concern
- Common enclosure concern

The associated circuits were evaluated by the team for common bus, spurious signals, and common enclosure concerns. Power, control, and instrumentation circuits were examined for potential problems. A sampling basis was used in making the examination, since many circuits were involved and a determination of cable routing took considerable time.

7.3.1 Common Bus Concern

The common bus concern is found in circuits, either safety related or non-safety related where there is a common power source with shutdown equipment and the power source is not electrically protected from the circuit of concern.

The team examined, on a sampling basis, 4160V, 480V, 120V AC and 125V DC bus protective relay co-ordination. The team also examined, on a sampling basis, the protection for specific instrumentation, controls, and power circuits, including the coordination of fuses and circuit breakers. The licensee has been performing relay settings at approximately 48 month intervals in accordance with an established maintenance procedure. No unacceptable conditions were identified.

7.3.2 Spurious Signals Concern

The spurious signals concern is made up of 2 items:

- False motor, control, and instrument indications can occur such as those encountered during 1975 Brown's Ferry fire. These could be caused by fire initiated grounds, short or open circuits.
- Spurious operation of safety related or non-safety related components can occur that would adversely affect shutdown capability (e.g., RHR/RCS isolation valves).

The licensee has performed a spurious signal analysis, which is documented in the Updated Fire Protection Review, Chapter 5, Section 5.2.2. This analysis satisfactorily addresses the spurious signal issue.

The team reviewed the following areas:

- Current transformer secondaries including Emergency Diesel Generator differential relays.
- High/low pressure interface
- General fire instigated spurious signals

No unacceptable conditions were identified.

7.3.3 Common Enclosure Concern

The common enclosure concern is found when redundant circuits are routed together in a raceway or enclosure and they are not electrically protected or when fire can destroy both circuits due to inadequate fire barrier penetrations.

A number of circuits selected for this concern were all found to be electrically protected. In addition, the licensee stated that non-safety related circuits were never routed from one redundant train to another.

The licensee stated that associated circuits for common enclosures are limited to switchgear and load center compartments or panels and boards in which safe shutdown circuits exist. The team verified this by reviewing a number of randomly selected circuits.

No unacceptable conditions were identified.

7.4 General Fire Protection Features

The team examined the general fire protection features in the plant provided to maintain one train of safe shutdown equipment free of fire damage. Included in the scope of this effort were fire area boundaries, including walls, floors and ceilings, and fire protection of openings such as fire doors, fire dampers, and penetration seals.

No unacceptable conditions were identified except as follows:

Combustible Waste Storage in Primary Auxiliary Building

By letter dated June 6, 1979 (A. Schwencer to C.N. Dunn), the Commission issued Amendment 18 to Facility Operating License DPR-66 for the Beaver Valley Power Station Unit 1. The amendment added to the operating license a condition related to facility modifications for fire protection and completion dates for the modifications.

Section 3.0 of tne Fire Protection Safety Evaluation Report (SER) attached to the amendment summarized the modifications and Table 3.1 listed the completion dates for the modifications.

Section 3.12-4 of the SER states that the contaminated waste storage area will be relocated in a new building having sprinkler protection. Table 3.1 of the SER lists October 31, 1980 as the implementation date for this modification.

During the inspection, the team observed a contaminated waste storage area in Elevation 735' 6" (Fire Sub-Area PA-1E) of the Primary Auxiliary Building between the component cooling water pumps and the charging pump cubicle hatch covers. The team also observed that the new waste storage building is not complete. However, the licensee indicated that there was no commitment date for completion of the new waste storage building and that the commitment date of October 31, 1980 was for the implementation of the administrative control of unnecessary combustibles which has been completed as required. The above commitment is documented in the NRC memorandum, Wigginton to Schwencer, dated March 26, 1979 (Summary of meeting held on March 5, 1979 to discuss fire protection for Beaver Valley), Item 3.12.4. The SER, therefore, appears to be in error.

The licensee has initiated actions to resolve this issue with NRR. This is an unresolved item, pending completion of the resolution of this issue with NRR (50-334/85-25-03).

The licensee has an existing one hour roving fire watch in the Primary Auxiliary Building pending resolution of an outstanding exemption request for lack of area wide automatic suppression in the nearby charging pump cubicles located in this building (see licensee's Updated Fire Protection Appendix R Review, Section 11.20, for details of this exemption request). The licensee committed to continue this fire watch pending a satisfactory resolution of the above issue with the office of NRR.

8.0 Emergency Lighting

10 CFR 50, Appendix R, Section III.J, requires that emergency lighting units with at least an 8-hour battery power supply shall be provided in

all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

The team examined the plant emergency lighting system to ascertain the licensee's compliance with the above requirement.

The team identified the following unacceptable conditions:

a. Lack of Emergency Lighting in Safe Shutdown Access and Egress Routes

Emergency lighting units with 8-hour battery power supply are not provided in the following locations serving as safe hot shutdown access and egress routes.

1. Clean Shop (Fire Area SH-1)
2. Stairway vestibule immediately outside the Control Room in the Service Building.
3. The corridor between the aforementioned stairway (item 2) and the Service Building roof.
4. The Service Building roof and the Yard Area between the Service Building and the Diesel Generator Building.

This is a violation of Section III.J of Appendix R to 10 CFR 50 (50-334/85-25-04).

The licensee committed to install an emergency lighting unit with an 8 hour battery power supply in the Clean Shop (item 1).

The licensee stated that the security perimeter lighting powered by the security diesel generator would provide adequate emergency lighting for items 2, 3 and 4 above. Furthermore, the licensee stated that it was their opinion that this security lighting was equivalent to the requirements of Section III.J of Appendix R to 10 CFR 50. The licensee stated that an exemption would be requested from the technical requirements of Section III.J of Appendix R to 10 CFR 50 for these locations.

b. Emergency Lighting Insufficient or Marginal in 4 Areas

The team walked down all of the safe shutdown access and egress routes designated by the licensee. Emergency lighting units are provided in the following areas:

1. Turbine Generator Building - elevation 735' 6' (Fire Area TB-1)

2. Fire brigade equipment room.

3. Safeguards Containment Penetration A Area (Key access to gate)

4. Primary Auxiliary Building to Safeguards Area - elevation 722'.

However, as the licensee could not switch off the normal lighting in these areas while the plant is operating, the team could not determine whether or not the number of units provided or the orientation of the lamps was adequate to allow the operators to accomplish the intended safe shutdown functions. The licensee could not provide an analysis to show the adequacy of the area lighting, and certain areas appeared to be marginally covered.

This is an unresolved item pending a demonstration by the licensee that the lighting in their areas is adequate and its review by NRC (50-334/85-25-05)

9.0 Oil Collection System for Reactor Coolant Pump

10 CFR 50, Appendix R, Section III.O, requires that the reactor coolant pump shall be equipped with an oil collection system if the containment is not inerted during normal operation. The oil collection system shall be so designed, engineered, and installed that failure will not lead to fire during normal or design basis accident conditions and that there is reasonable assurance that the system will withstand the Safe Shutdown Earthquake.

Such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Leakage shall be collected and drained to a vented closed container that can hold the entire lube oil system inventory. A flame arrester is required in the vent if the flash point characteristics of the oil present the hazard of fire flashback. Leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such feature exist on the reactor coolant pumps. The drain line shall be large enough to accommodate the largest potential oil leak.

The team examined the licensee's drawings and design change safety evaluation report for the three reactor coolant pump oil collection systems to ascertain that the above requirements were met. Because of the subatmospheric condition of the containment while the plant is operating, no actual entry was attempted.

No unacceptable conditions were identified.

10.0 Quality Assurance

During the course of the inspection, the team reviewed several drawings, fire hazard analysis, fire protection modification packages, procedures, and other fire protection documents. The scope of review included verification of their technical adequacy, appropriate reviews, design and procurement controls, and other Quality Assurance requirements for the licensee's fire protection program.

Except as noted in the previous sections of this report, the team did not identify any other unacceptable conditions.

11.0 Use of PRA Techniques for the Inspection

The safe shutdown systems (SSSs) and components were selected for inspection of their fire protection features, based on their relative importance to safety using PRA techniques as opposed to random sampling basis (see Section 7.1 of this report). If there exists a plant specific PRA or related studies such as Interim Reliability Evaluation Program (IREP) or Reactor Safety Study Methodology Application Program (RSSMAP), their results could be used in the selection process. In the absence of these types of plant specific studies (such as for Beaver Valley, Unit 1), generic conclusions on the relative importance of PWR and BWR systems based on a study of 15 published PRAs could be used for this purpose, with lesser precision (see NUREG-1050, PRA Reference Document, September 1984, Section B.3.2). The relative importance of PWR systems considering dominant accident sequences from the 15 PRAs is reproduced in Attachment 4 to this report.

Comparing the systems in Attachment 4 to their functionally equivalent SSSs in Attachment 2, the following SSSs were selected for this inspection, based on their relative importance:

- Auxiliary Feedwater System
- Chemical and Volume Control System
- Main Steam System
- River Water System
- Electrical Distribution System

In addition, some of the other SSSs such as Process Monitoring Instrumentations were also inspected because of their importance in the case of a fire scenario.

12.0 Unresolved Items

Unresolved items are matters for which more information is required in order to ascertain whether they are acceptable, violations, or deviations. Unresolved items are discussed in Sections 7.2.2.a, 7.2.2.b, 7.4, and 8.0.b.

13.0 Conclusions

The findings of this inspection are summarized in Attachment 5 and are categorized as follows:

- One violation of Appendix R, Section III.J
- Four unresolved items

The details of the above violation and unresolved items are discussed in various sections of this report as listed in Attachment 5. The licensee actions and commitments, including the actions required to resolve the unresolved items, are also discussed in these sections of the report.

14.0 Exit Interview

The inspection team met with the licensee representatives, denoted in Paragraph 1, at the conclusion of the inspection on November 22, 1985. The team leader summarized the scope and findings of the inspection at that time.

The team leader and the licensee discussed the contents of this inspection report to ascertain that it did not contain any proprietary information. The licensee agreed that the inspection report may be placed in the Public document Room without prior licensee review for proprietary information (10 CFR 2.790).

At no time during this inspection was written material provided to the licensee by the team.

ATTACHMENT 1

Correspondence List

June 6, 1979	NRC forwarded Safety Evaluation on APCSB 9.5-1 (Amendment #18 to Tech. Specs.)
June 30, 1982	DLC submitted report on 10 CFR 50.48 Appendix R
October 22, 1982	DLC submitted additional information for exemption requests for Containment Area and Primary Auxiliary Building
October 28, 1982	DLC provided clarification on Appendix R report, alternate shutdown procedure and 72-hour cold shutdown time limit.
December 10, 1982	DLC submitted summary of November 30, 1982 meeting with the NRC.
December 20, 1982	DLC provided additional information on Control Room and PAB exemptions.
January 5, 1983	NRC issued Safety Evaluation on Sections III.G and L of Appendix R.
March 1, 1983	NRC issued corrections to January 5, 1983 SER
March 14, 1983	NRC grants exemptions from Appendix R requested in DLC submittal of June 30, 1982.
April 18, 1983	DLC provides information on protection of control power transformers and additional emergency lighting.
May 20, 1983	DLC provides additional information on control power transformers.
June 20, 1983	NRC approves method of protecting control power transformers.
October 19, 1983	NRC issues Generic Letter 83-33 on clarification of Appendix R issues.
December 16, 1983	DLC submits additional requests for exemptions based Generic Letter 83-33.

May 30, 1984	DLC provided revised exemption request on structural steel.
August 30, 1984	NRC grants exemptions requested in December 16, 1983 submittal (except structural steel issue)
January 9, 1985	NRC issues Generic Letter 85-01 clarification of Appendix R issues
January 14, 1985	DLC submits additional exemption requests and clarifications of deviations from Appendix R.
June 6, 1985	DLC submits additional information on Communications and Emergency Lighting based on Generic Letter 85-01.
July 10, 1985	DLC submits information on resolving structural steel issue.
August 28, 1985	DLC submits additional information on Emergency Lighting.
October 16, 1985	DLC submits the Updated Fire Protection Review Report, dated September 1985.

ATTACHMENT 2

Systems Required for Post-Fire Safe Shutdown

The determination of what systems should be utilized for safe shutdown was based not only on normal safety-related shutdown systems but also on diverse systems that could duplicate these functions. Those systems selected for post-fire shutdown are as follows:

Auxiliary Feedwater System
Chemical and Volume Control System
River Water System
Electrical Distribution System
Ventilation System
Main Steam System
Process Monitoring Instrumentation

Conspicuously absent from this list are the rod control, component cooling (CCR), and residual heat removal (RHR) systems. While these systems would be used in a normal shutdown process, they are not absolutely essential for achieving safe shutdown.

- The rod control system is a fail-safe system and as such, rod insertion can be assured by deenergizing the system at locations in different fire zones in the plant.

- If the RHR system is not available, cold shutdown could be achieved by continuous steaming of the steam generators, and eventually a feed-and-bleed operation on the steam generators.

- The component cooling system's primary function, in support of shutdown, is reactor coolant pump seal cooling and RHR heat removal. The reactor coolant pumps are not essential for shutdown since natural circulation is available and seal injection is provided by the charging system. Miscellaneous equipment that requires component cooling water during the shutdown can be provided with alternate cooling, or isolated.

ATTACHMENT 3

Fire Areas Required for Post-fire Safe Shutdown

For the purpose of conducting the fire hazard analysis and the safe shutdown evaluation, the plant arrangement is divided into fire areas. In general, fire areas are defined by physically identifiable boundaries. Some fire areas, due to size, nature, or floor areas involved, have been divided into subareas within a certain fire area.

- Reactor Containment Area (RC-1)
- Control Room (CR-1) including Sub-area
  HVAC Equipment Room (CR-2)
- Communication Equipment and Relay Panel Room (CR-3)
- Process Instrument and Rod Position Room (CR-4)
- Cable Spreading Room (CS-1)
- Emergency Switchgear Room No. 1 (ES-1)
- Emergency Switchgear Room No. 2 (ES-2)
- Normal Switchgear Room (NS-1)
- Diesel Generator Room (DG-1)
- Diesel Generator Room (DG-2)
- Intake Structure Cubicles (IS-1, IS-2, IS-3, and IS-4)
- Pipe Tunnel Area PT-1) including subarea
  Auxiliary Feedwater and Quench Spray Pump Room (QP-1)
- Main Steam Valve Area (MS-1)
- Steam Generator Blowdown Room (SGPD-1)
- Fuel Building (FB-1)
- Primary Auxiliary Building (PAB), composed of floor levels:
  - PA-1A(Elev.768)
  - PA-1C(Elev.752)
  - PA-1E(Elev.735)
  - PA-1G(Elev.722)

  including the following sub-areas:
  Charging Pump Cubicles (PA-1f, 1g, 1h)
  Component Cooling Water Pumps Area (located in PA-1E)
  Main Exhaust Filter Banks (MF-1 and MF-2, located in PA-1A)
- West Cable Vault (CV-1)
- East Cable Vault (CV-2)
- Cable Tunnel (CV-3)
- Motor Generator Room (MG-1)
- CO2 Storage/PG Pump Room (CO-2)
- Turbine Building General Area (TB-1)

ATTACHMENT 4

(Reproduced from NUREG-1050, Figure B-5)

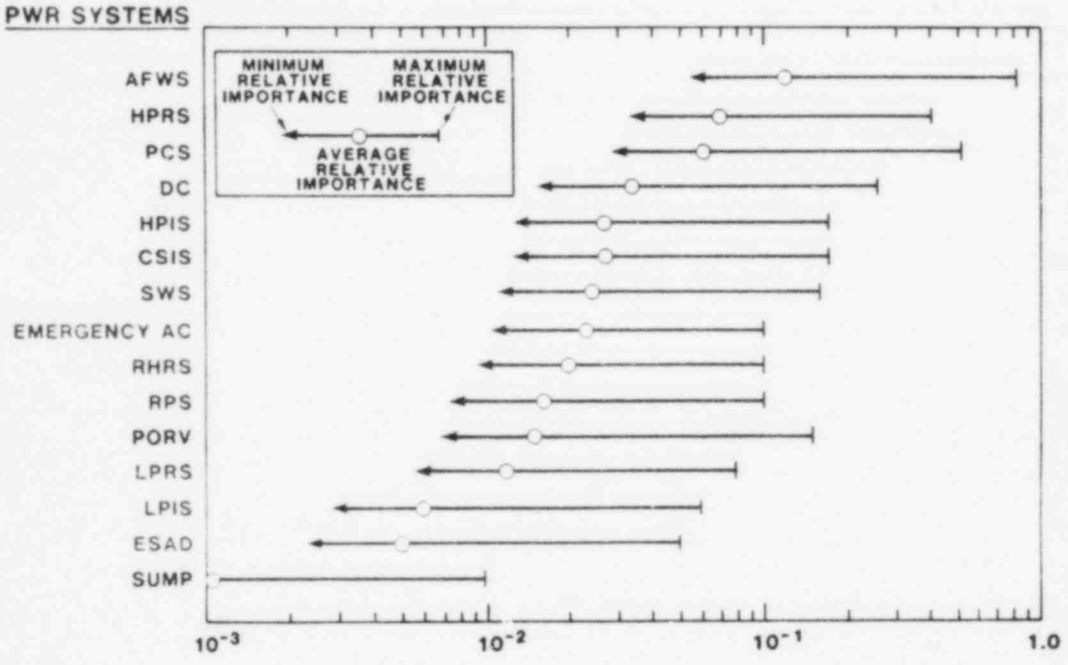

Figure B-5. Relative Importance of PWR Systems Considering Dominant Accident Sequences from 15 PRAs

AFWS	Auxiliary feedwater system
HPRS	High-pressure recirculation system
PCS	Power conversion system
DC	Direct current power
HPIS	High pressure injection system
CSIS	Containment spray injection system
SWS	Service water system
Emergency AC	Emergency ac power
RHRS	Residual heat removal system
RPS	Reactor protection system
PORV	Power operated relief valve
LPRS	Low pressure recirculation system
LPIS	Low-pressure injection system
ESAD	(To be defined)
SUMP	Containment sump
HPCI	High-pressure coolant injection system
LPCI	Low-pressure coolant injection system
S/R VALVE	Safety/relief valve
ADS	Automatic depressurization system
RCIC	Reactor-core isolation cooling system
LPCS	Low-pressure core spray system

ATTACHMENT 5

Summary of Inspection Findings

	Item No.	Description	For details, refer to Section
1.	Violations		
	85-25-04	Lack of Emergency Lighting in Safe Shutdown Access and Egress Routes	8.0. a
2.	Unresolved Items		
	85-25-01	Minor Changes Required for Alternate Safe Shutdown Procedure 56 C	7.2.2. a
	85-25-02	Enhancement of Key Rings Used for Access to Safe Shutdown Areas	7.2.2. b
	85-25-03	Combustible Waste Storage in Primary Auxiliary Building	7.4
	85-25-05	Emergency Lighting Insufficient or Marginal in 4 areas	8.0. b