January 26, 2001

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: QUAD CITIES TRIENNIAL FIRE PROTECTION BASELINE INSPECTION REPORT NO. 50-254/00-16(DRS); 50-265/00-16(DRS)

Dear Mr. Kingsley:

On December 15, 2000, the NRC completed a fire protection triennial baseline inspection at the Quad Cities Nuclear Power Plant. The enclosed report presents the results of that inspection which were discussed on December 15, 2000, with Mr. Dimmette and other members of your staff.

The inspection examined the effectiveness of activities conducted under your license as they related to implementation of your NRC approved Fire Protection Program. The inspection consisted of a selected examination of design drawings, calculations, analyses, procedures, audits, field walkdowns and interviews with personnel. The team determined that, for the fire areas reviewed, Quad Cities' fire protection program, structures, systems, and components were acceptable and capable of performing their intended functions.

Based on the results of this inspection, the team identified two issues of very low risk significance (Green) and an additional example of a previously identified adverse trend in human performance which constituted a cross cutting issue (No Color). These three issues were considered violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny the Non-Cited Violations, you should provide a response with the basis for your denial within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with a copy to the Regional Administrator, Region III, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001 and the NRC Resident Inspector at the Quad Cities facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

\RA\ by Roy Caniano for

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30

cc w/encl: D. Helwig, Senior Vice President, Nuclear Services
C. Crane, Senior Vice President, Nuclear Operations
H. Stanley, Vice President, Nuclear Operations
R. Krich, Vice President, Regulatory Services
DCD - Licensing
J. Dimmette, Jr., Site Vice President
G. Barnes, Quad Cities Station Manager
C. Peterson, Regulatory Affairs Manager
M. Aguilar, Assistant Attorney General
State Liaison Officer, State of Illinois
State Liaison Officer, State of Iowa
Chairman, Illinois Commerce Commission
W. Leech, Manager of Nuclear
MidAmerican Energy Company

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U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Docket Nos:	50-254; 50-265
License Nos:	DPR-29; DPR-30
Report No:	50-254/00-16; 50-265/00-16
Licensee:	Commonwealth Edison Company (ComEd)
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	December 4 - 15, 2000
Lead Inspector:	R. Langstaff, Senior Reactor Inspector Mechanical Engineering Branch
Inspectors:	D. Chyu, Reactor Inspector Electrical Engineering Branch
	G. Hausman, Senior Reactor Inspector Electrical Engineering Branch
	P. Qualls, Fire Protection Engineer Plant Systems Branch Office of Nuclear Reactor Regulation
Accompanying Personnel:	R. Daley, Reactor Inspector Electrical Engineering Branch
	P. Lain, Fire Protection Engineer Plant Systems Branch Office of Nuclear Reactor Regulation
Approved By:	Ronald N. Gardner, Chief Electrical Engineering Branch Division of Reactor Safety

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

SUMMARY OF FINDINGS

IR 05000254-00-16; IR 05000265-00-16, on 12/4-15/2000, Commonwealth Edison, Quad Cities Nuclear Power Plant, Units 1 & 2. Triennial Fire Protection.

The inspection was conducted by a team of four Region III inspectors and two Office of Nuclear Reactor Regulation personnel. The inspection identified three very low safety significant issues (two Green and one No Color), which were Non-Cited Violations. The significance of findings is indicated by their color (Green, White, Yellow, Red) and was determined by the Significance Determination Process using IMC 0609 "Significance Determination Process." Findings for which the significance determination process does not apply are indicated by "No Color" or by the severity level of applicable violation.

Cornerstone: Mitigating Systems

- Green. The team identified that electrical cabinets in the auxiliary electric equipment room were not sealed at the top to protect equipment from water damage. The failure to seal the top of the cabinets was considered a Non-Cited Violation (NCV 50-254/00-16-01; NCV 50-265/00-16-01) of Operating Licenses DPR-29 and DPR-30, Section h.3.F (Section 1R05.2.b.1).

  The failure to seal the cabinets, a fire protection feature, involved very low risk (Green) because a fire protection defense-in-depth element, as described by MC 0609, Appendix F, Fire Protection Significance Determination Process, was not affected.

- Green. The team identified that fire stops were not installed in divisional cable trays for which specified separation had not been maintained. The failure to install fire stops was considered a Non-Cited Violation (NCV 50-254/00-16-02; NCV 50-265/00-16-02) of Operating Licenses DPR-29 and DPR-30, Section H.3.F (Section 1R05.2.b.2).

  The failure to install fire stops, a fire protection feature, involved very low risk (Green) because a fire protection defense-in-depth element, as described by MC 0609, Appendix F, Fire Protection Significance Determination Process, was not affected.

Cross-Cutting Issues: Human Performance

- No Color. The inspectors identified a number of technical errors in safe shutdown procedure QCARP 0050-02. The procedure errors were considered a Non-Cited Violation (NCV 50-254/00-16-03; NCV 50-265/00-16-03) of 10 CFR 50, Appendix R, Section III.L.5 (Section 40A4.1).

  The technical errors were determined to have no appreciable risk significance (No Color) because the errors would not have impacted safe shutdown. However, the errors were another example of a previously identified adverse trend in human performance.

Report Details

Summary of Plant Status: Unit 1 scrammed during the inspection period and was returned to and operated at or near full power for the duration of the inspection period. Unit 2 was operated at or near full power throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection (71111.05)

The purpose of this inspection was to review the Quad Cities Nuclear Power Plant, Units 1 and 2, fire protection program for selected risk-significant fire areas. Emphasis was placed on verifying that the post-fire safe shutdown capability and the fire protection features were maintained free of fire damage to ensure that at least one post-fire safe shutdown success path was available. The inspection was performed in accordance with the new NRC regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The lead inspector and a Region III senior reactor analyst used the Quad Cities Nuclear Power Plant, Units 1 and 2 Individual Plant Examination for External Events to choose several risk-significant areas for detailed inspection and review. The fire areas chosen for review during this inspection were:

SB-I, Service Building

TB-I, Turbine Building Northern Zone Group

Within these fire areas, inspection emphasis was placed on the following fire zones:

6.3 Auxiliary Electrical Equipment Room

8.2.6.E Unit 2 Turbine Building Ground Floor

8.2.7.E Unit 2 Turbine Building Mezzanine

For each of these fire areas, the inspection was focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of license commitments, and changes to the fire protection program.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

10 CFR Part 50, Appendix R, Section III.G.1, required the licensee to provide fire protection features that were capable of limiting fire damage to structures, systems, and components important to safe shutdown. The structures, systems, and components that were necessary to achieve and maintain post-fire safe shutdown were required to be protected by fire protection features that were capable of limiting fire damage to the structures, systems, and components so that:

- One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) was free of fire damage; and
- Systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) could be repaired within 72 hours.

Specific design features for ensuring this capability were specified by 10 CFR Part 50, Appendix R, Section III.G.2.

a. Inspection Scope

The team reviewed the plant systems required to achieve and maintain a post-fire safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire zone selected for review. Specifically, the review was performed to determine the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions. This team review included the fire protection safe shutdown analysis.

The team also reviewed the operators' ability to perform the necessary manual actions for achieving safe shutdown including a review of procedures, accessibility of safe shutdown equipment, and the available time for performing the actions.

The team reviewed the updated final safety analysis report and the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, safety evaluation reports, exemptions, and deviations) to determine the licensing basis.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability

10 CFR Part 50, Appendix R, Sections III.G.2.a and III.G.3.a, required separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a 3-hour rating. If the requirements cannot be met, then alternative of dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, or zone under consideration should be provided.

a. Inspection Scope

For each of the selected fire areas, the team reviewed the licensee's safe shutdown analysis to ensure that at least one post-fire safe shutdown success path was available in the event of a fire. This included a review of manual actions required to achieve and maintain hot shutdown conditions and make the necessary repairs to reach cold shutdown within 72 hours. The team also reviewed procedures to verify that adequate direction was provided to operators to perform these manual actions. Factors, such as

timing, access to the equipment, and the availability of procedures, were considered in the review.

The team also evaluated the adequacy of fire suppression and detection systems, fire area barriers, penetration seals, and fire doors to ensure that at least one train of safe shutdown equipment was free of fire damage. To do this, the team observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the team reviewed license documentation, such as deviations, detector placement drawings, fire hose station drawings, carbon dioxide pre-operational test reports, smoke removal plans, fire hazard analysis reports, safe shutdown analysis, and National Fire Protection Association codes to verify that the fire barrier installations met license commitments.

b. Findings

b.1 Lack of Seals at the Top of Electrical Cabinets in Auxiliary Electric Equipment Room

During the walkdown of the auxiliary electric equipment room, the team noted that not all electrical cabinets were sealed at the top to protect equipment from water damage as a result of fire fighting activities. In addition, the licensee could not provide any evaluation for this change in the fire protection program that would provide a basis for not meeting this requirement. The team observed that the following electrical cabinets were not completely sealed at the top:

901-40 Inboard Main Steam Isolation Valve Relay Panel

901-63A Inverter for Unit 1 Essential Service Bus

902-40 Inboard Main Steam Isolation Valve Relay Panel

902-41 Outboard Main Steam Isolation Valve Relay Panel

902-63A Inverter for Unit 2 Essential Service Bus

There was no automatic fire suppression system in the auxiliary electric equipment room. However, manual fire fighting activities using hose streams could result in water damage to cabinets which were not directly involved with the fire. The licensee's justification for not sealing all of the electrical cabinets was that the Appendix R analysis had demonstrated that safe shutdown capability existed for the auxiliary electric equipment room. Therefore, the damage from fire fighting activities would be no worse than that from a design basis fire. The team disagreed with the licensee's justification because it was not consistent with the concept of minimizing the effect of fires as discussed in 10 CFR 50, Appendix A, Criterion III, and 10 CFR 50, Appendix R.

The licensee had designed the alternate shutdown capabilities for the fire area to encompass a design basis fire (i.e., fire damage to all equipment located in the area). The alternate shutdown capabilities required evacuation of the control room, shutdown of reactor using manual actions, and establishment of a command post in the mezzanine level in the reactor building. The purpose of the seals at the top of electrical cabinets was to minimize water damage during fire fighting activities and reduce the

possibility of evacuating the control room which would require the use of the alternate shutdown capabilities.

Quad Cities Facility Operating Licenses DPR-29 and DPR-30, Section h.3.F, stated that the licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in Updated Final Safety Analysis Report for the facility and as approved in the Safety Evaluation Report dated July 27, 1979, and subsequent Safety Evaluation Report supplements. The section also stated that the licensee may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. Section 5.3, "Auxiliary Electrical Equipment Room," of the July 27, 1979, Safety Evaluation Report stated that the top of electrical cabinets will be protected to prevent water damage from hose streams. Failure to seal the top of the electrical cabinets in the auxiliary electric equipment room was considered a violation of the Quad Cities Facility Operating License.

The team determined that the failure to seal the top of electrical cabinets in the auxiliary electric equipment room had a credible impact upon safety because a fire protection feature was affected. However, the sealing of the top of electrical cabinets was not a fire protection defense-in-depth element as described in NRC Manual Chapter 0609, Appendix F, Fire Protection Significance Determination Process. Consequently, this violation is considered to be of very low safety significance (i.e., Green). Because of the very low safety significance of the item and because the licensee has included this item in their corrective action program (Condition Report Q2000-04344), this issue is being treated as a Non-Cited Violation (NCV 50-254/00-16-01; NCV 50-265/00-16-01), consistent with Section VI.A.1 of the NRC Enforcement Policy.

b.2 Lack of fire stops for divisional cable trays which did not meet the separation requirements

During the walkdown of the selected fire areas, the team noted that the licensee had either not installed or had not maintained flame retardant coatings (fire stops) for divisional cable trays which were closer than three feet horizontally or five feet vertically from each other. Specific examples included the divisional cable trays above Bus 21 (in Fire Zone 8.2.6.E) and Bus 24 (in Fire Zone 8.2.7.E). In addition, the licensee could not provide any evaluation for this change in the fire protection program. The licensee's justification for not maintaining the flame retardant coating (fire stops) was that the Appendix R analysis had demonstrated that safe shutdown capabilities existed for the fire areas of concern. Since these fire protection features were not required to ensure post-fire safe shutdown conditions, the fire stops were no longer warranted. The team disagreed with the licensee's justification because it was not consistent with the concept of minimizing the effect of fires as discussed in 10 CFR 50, Appendix A, Criterion III, and 10 CFR 50, Appendix R.

The licensee had designed the safe shutdown capabilities for the fire zones to encompass a design basis fire (i.e., fire damage to all equipment located in the area). However, this capability consisted of manual operation of equipment which provided less equipment available to the operators, and required local monitoring of reactor level and pressure. The purpose of the fire stops for the divisional cable trays was to minimize fire

propagation and damage to divisional cable trays so that non-fire affected equipment would be available to the operators thereby reducing challenges to the operators during post-fire safe shutdown conditions.

Section 4.9 of the Quad Cities Safety Evaluation Report, dated July 27, 1979, stated that where cables trays of different safety divisions are found to be closer than three feet horizontally or five feet vertically from each other, the cables will be coated with a flame retardant coating for the length of the tray until the three feet/five feet separations are achieved. In addition, the section stated that in some locations a single cable tray changes classification from one safety-related division to another and non-safety related cables are routed to provide a continuity of combustibles between divisions. Fire stops will be installed in all such cable trays to prevent a fire in one division from propagating to the other division. Failure to install or maintain fire stops in divisional cables trays which did not meet the above separation requirements is a violation of the Quad Cities Facility Operating License.

The team determined that the failure to install and maintain fire stops in divisional cable trays had a credible impact upon safety because a fire protection feature was affected. However, the installation and maintenance of fire stops was not a fire protection defense-in-depth element as described in NRC Manual Chapter 0609, Appendix F, Fire Protection Significance Determination Process. Consequently, this violation is considered to be of very low safety significance (i.e., Green). Because of the very low safety significance of the item and because the licensee has included this item in their corrective action program (Condition Report Q2000-04344), this issue is being treated as a Non-Cited Violation (NCV 50-254/00-16-02; 50-265/00-16-02), consistent with Section VI.A.1 of the NRC Enforcement Policy.

.3 Post-fire Safe Shutdown Circuit Analysis

10 CFR Part 50, Appendix R, Section III.G.1., required that structures, systems, and components important to safe shutdown be provided with fire protection features capable of limiting fire damage to ensure that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Options for providing this level of fire protection were delineated in 10 CFR Part 50, Appendix R, Section III.G.2. Where the protection of systems whose function was required for hot shutdown did not satisfy 10 CFR Part 50, Appendix R, Section III.G.2, an alternative or dedicated shutdown capability and its associated circuits, was required to be provided that was independent of the cables, systems and components in the area. For such areas, 10 CFR Part 50, Appendix R, Section III.L.3, specifically required the alternative or dedicated shutdown capability to be physically and electrically independent of the specific fire areas and capable of accommodating post-fire conditions where offsite power was available and where offsite power was not available for 72 hours.

a. Inspection Scope

On a sample basis, the team investigated the adequacy of separation provided for the power and control cabling of redundant trains of shutdown equipment. This investigation focused on the cabling of selected components in systems important for safe shutdown. The team's review also included a sampling of components whose

inadvertent operation due to fire may adversely affect post-fire safe-shutdown capability. The purpose of this review was to determine if a single exposure fire, in one of the fire areas selected for this inspection, could prevent the proper operation of both safe shutdown trains.

b. Findings

No findings of significance were identified.

.4 Alternative Safe Shutdown Capability

10 CFR Part 50, Appendix R, Section III.G.1., required that structures, systems, and components important to safe shutdown be provided with fire protection features capable of limiting fire damage to ensure that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Options for providing this level of fire protection were delineated in 10 CFR Part 50, Appendix R, Section III.G.2. Where the protection of systems whose function was required for hot shutdown did not satisfy 10 CFR Part 50, Appendix R, Section III.G.2, an alternative or dedicated shutdown capability independent of the area under consideration was required to be provided. Additionally, alternative or dedicated shutdown capability must be able to achieve and maintain hot standby conditions and achieve cold shutdown conditions within 72 hours and maintain cold shutdown conditions thereafter. During the post-fire safe shutdown, the reactor coolant process variables must remain within those predicted for a loss of normal ac power, and the fission product boundary integrity must not be affected (i.e., no fuel clad damage, rupture of any primary coolant boundary, or rupture of the containment boundary).

a. Inspection Scope

The team reviewed the licensee's systems required to achieve alternative safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions. The team also focused on the adequacy of the systems to perform reactor pressure control, reactivity control, reactor coolant makeup, decay heat removal, process monitoring, and support system functions.

b. Findings

No findings of significance were identified.

.5 Operational Implementation of Alternative Shutdown Capability

10 CFR Part 50, Appendix R, Section III.L.2.d, required that the process monitoring function should be capable of providing direct readings of the process variables necessary to perform and control the functions necessary to achieve reactivity control, reactor coolant makeup, and decay heat removal.

a. Inspection Scope

The team performed a walkdown of a sample of the actions defined in Procedures QCARP 0050-01 and QCARP 0050-02, which were the procedures for performing a plant alternative shutdown from outside the control room. The team verified that operators could reasonably be expected to perform the procedure actions within the identified applicable plant shutdown time requirements and that equipment labeling was consistent with the procedure.

The team's reviews of the adequacy of communications and emergency lighting associated with these procedures are documented in Sections 1R05.6 and 1R05.7 of this report.

b. Findings

No findings of significance were identified.

.6 Communications

For a fire in an alternative shutdown fire area, control room evacuation is required and a dual unit shutdown is performed from outside the control room. Radio communications are relied upon to coordinate the shutdown of both units and for fire fighting and security operations. 10 CFR Part 50, Appendix R, Section III.H., required that equipment provided for the fire brigade include emergency communications equipment.

a. Inspection Scope

The team reviewed the adequacy of the communication system to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties.

b. Findings

No findings of significance were identified.

.7 Emergency Lighting

10 CFR Part 50, Appendix R, Section III.J., required that emergency lighting units with at least an 8-hour battery power supply be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

a. Inspection Scope

The team performed a walkdown of a sample of the actions defined in Procedures QCARP 0050-01 and QCARP 0050-02. As part of the walkdowns, the team verified that sufficient emergency lighting existed for access and egress to areas and for performing necessary equipment operations. The team verified that testing of emergency lighting for the Unit 2 reactor core isolation cooling room and Bus 29 area of the turbine building ensured a minimum of eight hours of emergency lighting.

b. Findings

No findings of significance were identified.

.8 Cold Shutdown Repairs

10 CFR Part 50, Appendix R, Section III.L.5, required that equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72 hours. Materials for such repairs shall be readily available onsite and procedures shall be in effect to implement such repairs.

a. Inspection Scope

The team reviewed the licensee's procedures to determine if any repairs were required to achieve cold shutdown. The team determined that the licensee did require repair of some equipment to reach cold shutdown based on the safe shutdown methods used.

b. Findings

One finding was identified and is discussed in Section 4OA4.1, Human Performance.

.9 Fire Barriers and Fire Zone/Room Penetration Seals

10 CFR Part 50, Appendix R, Section III.M, required that penetration seal designs be qualified by tests that are comparable to tests used to rate fire barriers.

a. Inspection Scope

The team reviewed the test reports for one hour rated barriers installed in the plant and performed visual inspections of selected barriers to ensure that the barrier installations were consistent with tested configuration.

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features and Equipment

a. Inspection Scope

The team reviewed the material condition, operations lineup, operational effectiveness and design of fire detection systems, fire suppression systems, manual fire fighting equipment, fire brigade capability, and passive fire protection features. The team reviewed deviations, detector placement drawings, fire hose stations drawings, carbon dioxide pre-operational test reports, and fire hazard analysis reports to ensure that selected fire detection systems, carbon dioxide systems, portable fire extinguishers, and

hose stations were installed in accordance with their design, and that their design was adequate given the current equipment layout and plant configuration.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team conducted a review to verify that adequate compensatory measures were put in place by the licensee for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features. The team also verified that short term compensatory measures were adequate to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

No findings of significance were identified.

.12 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed the corrective action program procedures and samples of corrective action documents to verify that the licensee was identifying issues related to fire protection at an appropriate threshold and entering them in the corrective action program. The team reviewed selected samples of condition reports, work orders, design packages and fire protection system nonconformance documents.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA4 Cross-Cutting Issues

.1 Human Performance

Procedure QCARP 0050-02, SB-1-2, Injection with RCIC [Reactor Core Isolation Cooling] and Bringing Unit 2 to Cold Shutdown, Revision 0, contained a technical error in that guidance for restoring operability to a valve had been omitted from the procedure. Specifically, step D.14.e of QCARP 0050-02 directed operators to restore operability to and close motor operated valve MO 2-0202-5B, a recirculation pump discharge valve, per an attachment to the procedure. The referenced attachment did not contain the necessary guidance for restoring operability to the valve nor was the

necessary guidance contained elsewhere within the procedure. The valve was to be closed as part of setting up an injection path through the low pressure coolant injection lines. Section 4.17 of the Safe Shutdown Report specified that realignment of valve MO 2-0202-5B was necessary to achieve cold shutdown. Licensee engineering and operations personnel stated that although realignment of the valve was specified by the Safe Shutdown Report, realignment was not necessary to achieve cold shutdown. The team reviewed system drawings and verified that the valves position would not affect the injection flowpath and would not adversely affect achieving cold shutdown.

The licensee initiated Condition Report Q2000-04318 and re-reviewed the Appendix R safe shutdown procedures. During a walkdown of procedure QCARP 0050-02, the team identified three other technical errors, such as incorrect cubicle designations for steps which directed operators to reposition breakers. The licensee stated that they had also identified the errors during their review performed in response to Condition Report Q2000-04318. The team verified that the errors would not impact safe shutdown. However, the team noted that the errors could have resulted in some initial operator confusion and delay. Initial discussions with the licensee indicated that schedule pressure may have contributed to the errors not being corrected prior to procedure approval. However, because the evaluation for Condition Report Q2000-04318 was not complete at the time of the inspection, the team noted that the licensee had not yet drawn a formal conclusion.

The team determined that the technical errors in procedure QCARP 0050-02 were a violation of 10 CFR 50, Appendix R, Section III.L.5 because Section III.L.5 requires, in part, that procedures be in effect to implement repairs to equipment and systems damaged by fire which are necessary to achieve and maintain cold shutdown. The team determined that this violation was more than minor because the technical errors in the procedure were similar to human performance issues identified during previous NRC inspections and were consistent with a previously identified adverse trend in human performance (see Section 4OA4 of Inspection Report 50-254/00-15; 50-265/00-15). However, because of the very low risk significance of the item (NO COLOR) and because the licensee has included this item in their corrective action program (Condition Report Q2000-04318), this procedure violation is being treated as a Non-Cited Violation (NCV 50-254/00-16-03; 50-265/00-16-03), consistent with Section VI.A.1 of the NRC Enforcement Policy.

4OA5 Other

.1 Violation 050-254/95-05-06; 050-265/95-05-06 (Closed): Many fire impairments existed, many fire brigade drill failures had occurred, and many emergency lights packs had not been repaired. During this inspection, the team reviewed the open fire protection impairments and determined that only two impairments, a relatively low number, were open. The team concluded that licensee corrective action had been effective in reducing the number of open impairments. During this inspection, the team reviewed how the licensee addressed fire brigade drill performance problems and determined that the licensee entered identified problems into the corrective action system by initiating Condition Reports. The team considered use of the corrective action system to ensure that problems are addressed to be acceptable. As discussed in Section 1R05.7,

the team reviewed emergency lighting during this inspection and did not identify any problems. This violation is considered closed.

.2 Violation 050-254/97-23-03; 050-265/97-23-03 (Closed): Inadequate training for personnel assigned as compensatory actions. During this inspection, the team determined that compensatory actions were no longer required for implementation of safe shutdown methodology. This violation is considered closed.

.3 Licensee Event Report 050-254/1997-21-1 (Closed): Discrepancies found between Safe Shutdown procedures. Subsequent to the initiation of this Licensee Event Report, the licensee substantially revised their safe shutdown procedures, safe shutdown analyses, and implemented modifications to the station for achieving safe shutdown in the event of fire. Consequently, the specific issues identified by the Licensee Event Report were no longer applicable. During this inspection, the team verified, for a sample of fire areas, that the safe shutdown methodology and implementing procedures were, in general, acceptable. One issue with respect to technical errors in implementing procedures was identified and is discussed in Section 4OA4.1. The team concluded that the corrective actions in response to this Licensee Event Report were acceptable and this Licensee Event Report is considered closed.

.4 Violation 050-254/98-01012; 050-265/98-01012 (Closed): Failure to provide alternate safe shutdown capability. Subsequent to this violation, the licensee substantially revised their safe shutdown procedures, safe shutdown analyses, and implemented modifications to the station for achieving safe shutdown in the event of fire. The team noted that, as a result of these changes, the licensee did not require alternate safe shutdown capability for many fire areas. Nonetheless, during this inspection, the inspectors verified, on a sample basis, that alternate safe shutdown could be achieved and complied with 10 CFR 50, Appendix R, Section III.G. This violation is considered closed.

.5 Violation 050-254/98-01152; 050-265/98-01152 (Closed): Failure to provide adequate emergency lighting in safe shutdown areas. As discussed in Section 1R05.7, the team reviewed emergency lighting during this inspection and did not identify any problems. This violation is considered closed.

.6 Violation 050-254/98-01162; 050-265/98-01162 (Closed): Untimely and inadequate 10 CFR 50.59 evaluation with NRC approval required but not obtained. This violation concerned the licensee's evaluation, performed in 1997, which incorporated the station blackout diesel generator into the alternative shutdown program in lieu of a station emergency diesel generator to provide electrical power. Specifically, the evaluation failed to considered differences in fuel tank capacity and refueling capability, and the lack of auto start capability. During this inspection, the team reviewed the licensee's safe shutdown analysis which had been substantially revised since 1997. The revised safe shutdown analysis demonstrated that, under postulated post-fire power loads, the fuel tank capacity would be 48 hours, i.e., comparable to the capacity of the emergency diesel generators. The licensee also determined that the time to obtain additional fuel was 8 hours which was similar to that required for the emergency diesel generators. In addition, the team reviewed the licensee's modifications which enhanced operation of the station blackout diesel. The modifications provided controls for the station blackout

diesels in the main control room which allowed the station blackout diesels to be operated remotely, similar to the emergency diesel generators. The team concluded that the licensee's corrective actions were acceptable and this violation is closed.

.7 Unresolved Item 050-254/98-11-01; 050-265/98-11-01 (Closed): Justification for Safe Shutdown assumptions. This unresolved item consisted of five parts as follows:

- loss of 125 Vdc breaker control
- fire induced failure of non-safe shutdown equipment
- automatic closure of main steam isolation valves
- single spurious operation, including effects of automatic depressurizaton failures on the time line for achieving safe shutdown
- adequacy of fire detection and suppression in fire area TB-II

This unresolved item, as a whole, is considered closed. Details pertaining to closure of the specific parts are outlined in the following sections:

.a Loss of 125 Vdc breaker control. During 1998, the NRC identified that the 125 Vdc control power distribution system was not shown to be free of fire damage in fire areas TB-II or TB-III. When 125 Vdc power was not available at the 4160 Vac switchgear, the automatic fault current interrupting capability of circuit breakers associated with the affected switchgear would not operate. To ensure that the analyzed equipment in the protected train was available during a fire, the licensee's safe shutdown methodology at the time dictated that the power supply circuit breakers be manually opened. When the electrical busses were de-energized, the switchgear was to be realigned such that only the protected train was connected and all non-essential loads were de-energized. Consequently, fire-induced faults on load cables of the affected switchgear could have resulted in a station blackout condition in both units for an extended period of time. To restore power, operators would have been required to manually align the electrical distribution system to the desired configuration and isolate, start, and load the station blackout diesel generators. During this inspection, the team determined that, by itself, placing a station in a station blackout condition was not a violation of NRC requirements. In addition, the use of manual actions did not constitute a violation. However, a violation was identified during this inspection because the manual actions could not have been achieved under a postulated fire scenario (see Section 4OA5.7.b). This part of the unresolved item is considered closed.

.b Fire induced failure of non-safe shutdown equipment. During 1998, the NRC identified that the loss of 125 Vdc control power, as discussed above, could result in other problems in accomplishing the safe shutdown. The problems concerned the ability of the fire brigade and the plant operators to fight a fire or to operate the plant equipment required to achieve safe shutdown for a fire in the turbine building. The NRC determined that the emergency diesel generators could continue to run for approximately 40 minutes before the operators took action to manually trip the emergency diesel generator output breakers. Since the 125 Vdc control cables and 4160 Vac power cables were not shown to be free of fire damage, a fault could propagate such that the emergency diesel generator output breaker would not trip. Thus, the emergency diesel generator could continue supplying the damaged 4160 Vac

power cables located in fire area TB-II. This condition had the potential to create secondary fires outside the original fire affected area, as well as impacting the ability of the fire brigade to extinguish the fire and impacting the ability of the operators to implement the alternative shutdown procedures, due to the effect of faulted 4160 Vac cables in unknown locations adjacent to the original fire. Specifically, the licensee's evaluation did not address: (a) the impact that faulted 4160 Vac cables in unknown locations of TB-II may have had on the fire brigade's ability to extinguish the fire; (b) the potential for secondary fires to occur in areas other than the bus duct, switchgear, and cable; and the impact that additional fires may have on the safe shutdown capability; (c) the effect that a corresponding degraded bus voltage condition (i.e., reduced voltage resulting from the faulted condition) would have on the operability of shutdown loads that may have been automatically loaded onto the faulted bus; and (d) the length of time before shutdown procedures directed operators to trip the emergency diesel generator output breaker.

During this inspection, the team reviewed the licensee's subsequent evaluation of the issue. The licensee's evaluation concluded that the emergency diesel generators would be damaged after a time due to damage to the field winding of the generators. Although the team agreed with the licensee's conclusion that the emergency diesel generators would not continue to run on a faulted bus, the team noted that the licensee's evaluation inappropriately relied upon the failure of equipment to prevent further damage and potential secondary fires.

The team also reviewed the potential for the licensee to accomplish safe shutdown for the postulated fire when the turbine building could be full of smoke resulting from the fire. In 1998, the turbine building was divided into three separate fire areas, i.e., fire areas TB-I, TB-II, and TB-III. The fire areas were separated by open hallways and an open turbine deck rather than by enclosed walls and doors. A sprinkler system was provided to prevent fire from spreading between areas. The sprinklers, however, would not prevent the spread of smoke or toxic gases. In 1998, the turbine building fire areas were considered alternative shutdown areas. Hence, redundant trains in the fire areas were not separated by a rated barrier nor distance as provided by Section III.G.2 of Appendix R. Operation of alternative equipment independent of the fire area to achieve safe shutdown was relied upon instead.

The team noted that, in 1998, manual actions to be taken by operators in the event of a fire on one of the turbine building fire areas consisted of opening 14 circuit breaker cabinets which were located on the turbine deck, reaching inside and removing a fuse block for each cabinet, and pushing the trip button for each breaker. A large hydrocarbon fire in one of the turbine building fire areas could generate a large amount of heavy black smoke. Since no barriers existed, the smoke could fill the turbine deck. With little or no visibility, the operators would have been required to locate the different electrical cabinets correctly, and reach inside of potentially energized cabinets to perform the required manual actions. The team also noted that the licensee used the 30 minute rated self-contained breathing apparatus which, although rated for 30 minutes, could only be relied upon to provide about 15 minutes worth of air. During this inspection, the team discussed with the licensee the possibility that the operators would not have been able to perform the required manual actions under these conditions. The licensee acknowledged the NRC observations.

During this inspection, the team verified that modifications had been implemented to ensure that a fire in one of the turbine building fire areas would not result in the loss of 125 Vdc. In addition, the safe shutdown analysis had been substantially revised since 1998. Consequently, the number and complexity of operator manual actions to be taken in response to a turbine building fire were greatly reduced from that of 1998. During this inspection, the inspectors verified, for a sample of fire areas, that operator actions to implement safe shutdown could be implemented. The inspectors determined that the corrective actions necessary to address the issue discussed above have been taken.

10 CFR Part 50, Appendix R, Section III.G.1 required that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage. Section III.G.2 specified physical separation requirements to ensure that this is accomplished. Section III.G.3 allowed alternative shutdown methods for areas where III.G.2 separation requirements could not be met. Section III.L of Appendix R provided requirements to be met by alternative shutdown methods. Section III.L.3 specified that "the alternative shutdown capability shall be independent of the specific fire area(s) and shall accommodate postfire conditions where offsite power is available and where offsite power is not available for 72 hours." The failure to provide alternative shutdown capability that was independent of the other fire areas in the turbine building was considered a violation of 10 CFR Part 50, Appendix R, Section III.L.3, as of May 22, 1998. However, this violation was another example of the 10 CFR Part 50, Appendix R, violations described by Escalated Actions 98-175 and 98-231 (discussed in the September 11, 1998, NRC letter to Mr. Kingsley, Commonwealth Edison) and was identified during the same time period as the other violations. Because this issue was effectively addressed by previous enforcement actions and corrective actions had been taken, this issue was not evaluated using the significance determination process. This part of the unresolved item is considered closed.

.c Automatic closure of main steam isolation valves. In 1998, the NRC was concerned that the licensee was crediting automatic closure of the main steam isolation valves in the hydraulic timeline analysis and was concerned about the possibility of the valves reopening. During this inspection, the team verified that safe shutdown procedures directed operators to close the valves from the main control room prior to evacuation. The procedures also directed operators, after control room evacuation, to verify, from outside the main control room, that the valves had been closed. Given that the control room switches for closing the main steam isolation valves were located on the main operator console, the team determined that closing the valves from the control room could reasonably be accomplished with seconds of scramming the reactor and concluded that the manual actions were reasonable and acceptable. Subsequent to the 1998 inspection, the licensee performed an analysis, GL 86-10 Evaluation Q-ECDS-00-168, which demonstrated that the main steam isolation valves would not reopen due to fire effects. The team reviewed the licensee's analysis and concurred with analysis conclusions. This part of the unresolved item is considered closed.

.d Single spurious operation, including effects of automatic depressurization system failures on the time line for achieving safe shutdown. This issue pertains to associated circuits and is described in Section E1.4 of Inspection Report 50-254/98011; 50-265/98011. Pending completion of the NRC/industry review and resolution of

associated circuit issues affecting safe shutdown, this is considered an unresolved item. This issue will be tracked under a new unresolved item (URI 50-254/00-16-04; 50-265/00-16-04). This part of the unresolved item is considered closed.

.e Adequacy of fire detection and suppression in fire area TB-II. In 1998, the NRC was concerned that two oil filled transformers located in the turbine building had no local suppression system. During this inspection, the team discussed with licensee personnel the need for suppression for the two transformers. Licensee staff stated that no suppression system was needed due to the relative fire hazards in the area, existing fire detection in the area, and the oil in the transformers. The team reviewed the material safety data sheet for the oil in the transformers and confirmed that the oil had a very high ignition temperature. The team evaluated the fire hazards in the area and determined that the localized hazard was not high. The team noted that no specific NRC requirements existed which dictated that a suppression system be provided for transformers. Consequently, this part of the unresolved item is considered closed.

.8 Inspection Follow-Up Item 050-254/98-17-01; 050-265/98-17-01 (Closed): Conflicts between Appendix R and emergency operating procedures. In 1998, the NRC was concerned that there wasn't clear guidance in operations procedures for when to transition from emergency operating procedures to Appendix R safe shutdown procedures. During this inspection, the team discussed the transition from emergency operating procedures to Appendix R safe shutdown procedures. Based on discussion with licensee operations personnel, the determination to make such a transition would be based on reports from the fire brigade on the impact of the fire and ability to control the plant using emergency operating procedures. The licensee agreed to review the wording of their procedures to ensure that operations philosophy with respect to making the determination was appropriately reflected in the procedures. The team noted that procedure QCOA 0010-12, Fire/Explosion, provided operations personnel with information on what the protected and analyzed safe shutdown equipment was and what equipment could be potentially affected by fire for any given fire area. Such equipment was already specified as an option for use by the emergency operating procedures. The team concluded that the licensee's approach was acceptable and, accordingly, this inspection follow-up item is considered closed.

4OA6 Management Meetings

Exit Meeting Summary

The team presented the inspection results to Mr. J. Dimmette, and other members of licensee management at the exit meeting held on December 15, 2000. The licensee acknowledged the findings presented. The inspectors identified the proprietary information reviewed during the inspection and questioned the licensee as to whether proprietary information had been retained. The inspectors also discussed the potential for proprietary information to be included in the inspection report. The licensee confirmed that no proprietary information was retained at the completion of the inspection. The licensee concurred that the proposed inspection report content would not compromise any proprietary information.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Barnes, Plant Manager
G. Boerschig, Engineering Manager
J. Dimmette, Site Vice-President
R. Krich, Licensing Director
C. Peterson, Regulatory Assurance Manager
J. Sipek, Licensing Manager, Dresden and Quad Cities

NRC

R. Gardner, Chief, Electrical Engineering Branch
J. Grobe, Division of Reactor Safety Director, RIII
C. Miller, Senior Resident Inspector

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-254/00-016-04; 50-254/00-016-04	URI	Associated Circuits Issue. Single spurious operation, including effect of automatic depressurization system failures on the time line.

Closed

050-254/95-05-06; 050-265/95-05-06	VIO	Many fire impairments existed, many fire brigade drill failures had occurred, and many emergency lights packs had not been repaired.
050-254/97-23-03; 050-265/97-23-03	VIO	Inadequate training for personnel assigned as compensatory actions.
050-254/1997-21-1	LER	Discrepancies found between Safe Shutdown procedures.
050-254/98-01012; 050-265/98-01012	VIO	Failure to provide alternate safe shutdown capability.
050-254/98-01152; 050-265/98-01152	VIO	Failure to provide adequate emergency lighting in safe shutdown areas.
050-254/98-01162; 050-265/98-01162	VIO	Untimely and inadequate 10 CFR Part 50.59 evaluation with NRC approval required but not obtained.
050-254/98-11-01; 050-265/98-11-01	URI	Justification for Safe Shutdown assumptions.
050-254/98-17-01; 050-265/98-17-01	IFI	Conflicts between Appendix R and emergency operating procedures.
50-254/00-016-01; 50-254/00-016-01	NCV	Failure to seal tops of electrical cabinets.
50-254/00-016-02; 50-254/00-016-02	NCV	Failure to provide fire stops in cable trays.
50-254/00-016-03; 50-254/00-016-03	NCV	Technical errors in Appendix R safe shutdown procedures.

LIST OF DOCUMENTS REVIEWED

The following is a list of licensee documents reviewed during the inspection, including documents prepared by others for the licensee. Inclusion on this list does not imply that NRC inspectors reviewed the documents in their entirety, but, rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort.

Analyses

Fire Hazards Analysis Report, Revision 12

Fire Protection Reports, Volume 3, "Technical Specifications, Technical Requirements, Inspection Reports, and Safety Evaluation Reports"

Safe Shutdown Report, Revision 00-09

Procedures

no number	Pre-Fire Plans, Revision 11
AD-AA-106	Corrective Action Program (CAP) Process Procedure, Revision 3
ER-AA-610	Performance Based Evaluation for Fire Protection, Revision 1
MA-AA-EM-4-00450	Appendix R Emergency Lighting Battery Packs Quarterly Inspection, Revision P
OP-AA-201	Fire Protection Program, Revision 0
OP-AA-201-005	Fire Brigade Qualification, Revision 1
OP-AA-101-102	Roles and Responsibilities of On-shift Personnel, Revision 3
OP-AA-101-103	Roles and Responsibilities of Off-Shift Personnel, Revision 2
OP-AA-201	Fire Protection Program, Revision 0
QAP 0300-03	Operations Shift Staffing, Revision 32
QCAP 1500-01	Administrative Requirements for Fire Protection," Revision 14
QCARP 0010-02	RB-2S Injection with SSMP and Bringing the Unit to Cold Shutdown, Revision 0
QCARP 0030-02	TB-1, Injection with SSMP and Bring the Unit to Cold Shutdown, Revision 0
QCARP 0050-01	SB-1-1, Injection with SSMP and Bringing the Unit to Cold Shutdown, Revision 0
QCARP 0050-01	SB-1-1, Injection with SSMP and Bringing the Unit to Cold Shutdown, Revision 1
QCARP 0050-02	SB-1-2, Injection with RCIC and Bringing the Unit to Cold Shutdown, Revision 0
QCARP 0050-02	SB-1-2, Injection with RCIC and Bringing the Unit to Cold Shutdown, Revision 1

QCMMS 4100-01	Fire Extinguisher and Hose Reel Inspection, Revision 15
QCMMS 4100-33	1/2B-4101 Diesel Driven Fire Pump Annual Capacity Test, Revision 8
QCMMS 4100-41	Annual CO2 Hose Reel Inspection and Functional Test, Revision 2
QCMMS 4100-61	Fire Door Inspection, Revision 5
QCMMS 4100-71	Periodic Hand Held Fire Extinguisher Inspection, Revision 6
QCMMS 4100-72	Annual Wheeled Fire Extinguisher Inspection, Revision 1
QCOA 0010-12	Fire/Explosion, Revision 15
QCOP 2900-02	Safe Shutdown Makeup Pump System Start-Up, Revision 11
QCOP 9000-04	Plant Radio System Operation, Revision 3
QCOS 0010-03	Safe Shutdown Equipment Inspection, Revision 12
QCOS 4100-34	Fire Brigade Equipment Check Surveillance, Revision 3
QCOS 9000-01	Quarterly Hand-Held Radio Check, Revision 2
QCRP 55510-21	Maintenance and Inspection of the MSA Self-Contained Breathing Apparatus (SCBA), Revision 10
QCTS 0850-01	Surveillance of Penetration Fire Stops, Revision 7
QCTS 0850-02	Surveillance of Fire Wraps and Interior Conduit Seals, Revision 4
QCTS 0850-05	Fire System “C” Factor Test, Revision 3
QOP 6500-10	Local Control of 4160 and 480 Volt Motor Operated Circuit Breaker, Revision 7
QGA 100	RPV Control, Revision 4
QGA 200	Primary Containment Control, Revision 6
PI-001	Quad Cities Safe Shutdown Equipment Selection and Logic Diagram Development
PI-002	Quad Cities Safe Shutdown Equipment Circuit Analysis
PI-003	Quad Cities Appendix R Fire Area Compliance Assessment

Modifications

DCP 9900059	Design Change Package for Fire Barrier Upgrade in Unit 1 Cable Tunnel
DCP 9900067	Design Change Package for Alternate Power Supply for FIC ½-2940-07
DCP 9900169	Design Change Package for Re-Route/Protect 125Vdc Pwr Cables 14216 & 14217, Appendix R
DCP 9900271	Design Change Package for Breaker 152-2323 Control Circuit Fuse Additions
DCP 9900381	Design Change Package for New Alternate 125 Vdc Control Power Feed from Unit 1 SBO Battery to 4 kV Bus 13-1 & 14-1

DCP 9900397	Design Change Package for Re-Route of SBO Diesel Power Cables from 71 Bus to the 23-1 4kV Bus

Condition Reports

Q2000-00955	Fire Header OOS, dated February 29, 2000
Q2000-01001	RHR Service Water Vault Detection not Repaired in Timely Manner, dated March 3, 2000
Q2000-01086	Fire Protection Impairments Exceeded 14 day ATR, dated March 10, 2000
Q2000-01101	Fire Hose/Extinguisher Inspections, dated March 11, 2000
Q2000-01110	N.O. Identified Inconsistencies in Operator Logs, dated March 10, 2000
Q2000-01531	Missed Surveillance for Unit 2 Fire Dampers and Fire Wrap, dated April 14, 2000
Q2000-03201	C-factor Test Failure, dated September 6, 2000
Q2000-03058	Minor oil leak on the ½ A fire diesel fuel pump, dated August 25, 2000
Q2000-03385	Surveillance of Fire Seals, dated September 25, 2000
Q2000-04054	Incorrect Design Information in QCTS 0850-05, dated October 29, 2000
Q2000-04296	Fire Drill Failed to meet objectives, dated December 2, 2000
Q2000-04322	QCARP 0050-01, Revision 0 missing steps to strip 250 VDC MCC 1
Q2000-04383	Fire Extinguisher Hydrostatic Retest Dates, dated December 13, 2000
Q2000-04373	Procedural Adherence with ER-AA-610, dated December 13, 2000
Q2000-04354	Expired Fire Extinguisher Hydro, dated December 5, 2000

Condition Reports Initiated as a Result of Inspection

Q2000-04318	QCARP 0050-02 Missed Step for Valve Repairs, dated December 5, 2000
Q2000-04344	Certain Fire Protection Commitments in the 1979 FP SER Not Being Maintained, dated December 8, 2000
Q2000-04376	Evaluation of C Factor Test, dated December 14, 2000
Q2000-04378	C Factor Testing, dated December 14, 2000
Q2000-04379	Calculation QDC-4100-M-0537, dated December 14, 2000

Calculations and Evaluations

7923-36-19-1	Safe Shutdown AC Systems [4kV AC Busses 13, 14, 23, & 24] Coordination for Appendix R, Revision 0
ER 9706022	Verification of 900 MHZ Radios For Unit 1 QCARP Procedures

GE-NE-B1301933-01-03_R1	Appendix R Analyses for Quad Cities Nuclear Power Station [Proprietary], dated December 1998
Q-ECDS-00-168	GL 86-10 Evaluation for Separation of Inboard and Outboard MSIVs Cables in Fire Areas TB-II, TB-III and RB-IN to Assure No Loss of Reactor Inventory Due to Fire Induced Spurious Actuation of the MSIVs, Revision 0
QC-019-E002	4kV Bus 13-1/23-1 & 14-1/24-1 Cross Tie - Coordination Study, Revision 3
QC-98-012	Non 3-hour Fire Barrier Evaluation, TB-I to TB-II, dated April 14, 1998
QC-IET-E-001	Battery Room Minimum Air Flow Requirements, Revision 0
QDC-0000-E-1038	Quad Cities 10 CFR 50 Appendix R Criteria Document, Revision 0
QDC-4100-M-0537	Quad Cities Station Design Basis Hydraulic Calculations, Revision 1, dated April 14, 2000
QDC-4100-M-0691	Combustible Loading, Revision 1
QDC-7100-E-0230	Breaker Settings for Feeders for Unit 2 Safety Related MCC's [480V AC Coordination], Revision 1
QDC-7200-E-0121	Breaker Settings for Feeders for Unit 1 Safety Related MCC's [480V AC Coordination], Revision 1
QDC-8300-E-0482	Evaluation of 125 Volt DC System Coordination for Appendix R, Revision 3
QDC-8300-E-1037	250 VDC Breaker Coordination for Appendix R, Revision 0

Drawings, Diagrams, and Figures

4E-465C	Wiring Diagram Master Sup Pnl 912-8 Pt 4 Safe Shutdown System, Revision F
4E-1049	Cable Routing - Turbine & Reactor Building and Crib House, Revision S
4E-1050	Cable Routing - Turbine & Reactor Bldg Ground Floor
4E-1051	Cable Routine - Turbine & Reactor Building Mezzanine Floor, Revision AP
4E-1052	Cable Routing - Cable Room & Auxiliary Electrical Equipment & Computer Room, Revision AT
4E-1053	Cable Routing - Outdoor Area and Cable Tunnels, Revision AB
4E-1059	Cable Routing - Torus Area, Control Room, and Filter Bldg, Revision S
4E-1060B	Electrical Installation Fire Protection System Turbine Building Plan Elevation 595'-0" NW Area, Revision F
4E-1318B	Overall Key Diagram 125V DC Distribution Centers, Revision J

4E-1320	Key Diagram 120/240V AC Distribution ESS & Reactor Prot Buses, Sheet 1, Revision AC
4E-1328	Single Line Diagram Emergency Power System, Revision F
4E-1430	Schematic Diag Core Spray Systems I & II, Sheet 1, Revision BA
4E-1430	Schematic Diagram Core Spray Systems I & II, Sheet 2, Revision AT
4E-1438C	Schematic Diagram RHR System Relay Logic Div-I, Sheet 3, Revision AJ
4E-1438E	Schematic Diagram RHR System Relay Logic Div-II, Sheet 5, Revision AG
4E-1438G	Schematic Diagram RHR System Process Instrumentation, Sheet 7, Revision AD
4E-1438L	Schematic Diagram RHR System Motor Operated Valves-Div II, Sheet 1, Revision AC
4E-1438L	Schematic Diagram RHR System Motor Operated Valves-Div II, Sheet 2, Revision AG
4E-1438L	Schematic Diagram RHR System Motor Operated Valves-Div II, Sheet 3, Revision AA
4E-1438Q	Schematic Diagram RHR System SH 15 Pumps 1002A,B,C,D 4160V Bkr Control Div I & II, Revision W
4E-1349	Schematic Diagram 480V Trans 18 & 19 and Buses 18 & 19 Main Breakers, Sheet 2, Revision R
4E-1484A	Schematic Diagram RCIC System Part 1, Revision V
4E-1484B	Schematic Diagram Reactor Core Isolation Cooling System Part 2, Revision AN
4E-1484C	Schematic Diagram RCIC System Part 3, Revision AJ
4E-1484D	Schematic Diagram RCIC System Part 4, Sheet 1, Revision AK
4E-1484D	Schematic Diagram Reactor Core Isolation Cooling System Part 4, Sheet 2, Revision AE
4E-1484E	Schematic Diagram RCIC System Valves MO 1-1301-16, 1-1301-22, & 1-1301-48, Sheet 1, Revision AC
4E-1484E	Schematic Diagram RCIC System Valves MO 1-1301-17, & -49, Sheet 2, Revision Z
4E-1484F	Schematic Diagram RCIC System Valves MO 1-1301-25, 53 & 60, Sheet 1, Revision Z
4E-1484F	Schematic Diagram RCIC System Valves MO 1-1301-26, 61 & 62, Sheet 2, Revision AA
4E-1484G	Schematic Diagram RCIC System Part 7, Revision U
4E-1680A	Wiring & Schematic Diagram Reactor Building Essential Service 480V MCC 19-4 Part I, Revision AN

4E-1680B	Wiring & Schematic Diagram Reactor Building Essential Service 480V MCC 19-4 Part 2, Revision AL
4E-1684F	Wiring Diagram Reactor Building 250V DC MCC 1B Part 2, Revision R
4E-1684H	Wiring Diagram Reactor Building 250V DC MCC 1B Part 4, Revision AE
4E-1705	Wiring Diagram Panel 901-4 Part 1, Revision AW
4E-1765C	Wiring Diagram Panel 901-48 Part 1, Revision AC
4E-1765D	Wiring Diagram Panel 901-48 Part 2, Revision AH
4E-1769A	Wiring Diagram Instrument Rack 2201-5, Sect. A Reactor Instrumentation and Protection, Revision U
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QDC-SSD-LOG-106	CCST Inventory Preservation, dated November 14, 2000
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QDC-SSD-LOG-202	Residual Heat Removal Service Water Div II, dated November 14, 2000
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QDC-SSD-LOG-206	RHR, HPCI & RCIC Equipment Room Cooling, dated November 14, 2000
QDC-SSD-LOG-207	Unit 1/2 Emergency DG System, dated November 14, 2000
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QDC-SSD-LOG-209	Unit 2 Emergency DG System, dated November 14, 2000

Work Requests

WR 990175745 06	Group 6 Eight Hour ELP Inspection
WR 990194889 02	Group 2 Eight Hour ELP Inspection
WR 990203283 01	Perform Group 15 and 17 Eight Hour ELP Inspection

Miscellaneous Documents

Fire Test Report on 3-hour fire test/5-minute water hose test on Darmatt KM1 Fire Protection System

Licensed/Non-Licensed Requal Training lesson plan, QRWQCARP: Revisions to QCARPs, Revision 0

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