

Commonwealth Edison Company
Quad Cities Generating Station
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Cordova, IL 61242-9740
Tel 309-654-2241

DCS
PDR



SVP-98-315

October 12, 1998

Mr. James Lieberman, Director
Office of Enforcement
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Quad Cities Nuclear Power Station, Units 1 and 2
Reply to a Notice of Violation
Facility Operating License Numbers DPR-29 and DPR-30
NRC Docket Numbers: 50-254 and 50-265

Reference: (a) J. L. Caldwell (NRC) letter to O. D. Kingsley (ComEd), dated September 11, 1998, "Notice of Violation and Proposed Imposition of Civil Penalty - \$88,000 (NRC Inspection Report Numbers 50-254(265)/97023 (DRS) and 50-254(265)/98011(DRS))"

Dear Mr. Lieberman:

Enclosed is Commonwealth Edison's (ComEd's) reply to the Notice of Violation (NOV) and Proposed Imposition of Civil Penalty transmitted in Reference (a) with payment of the proposed Civil Penalty.

As discussed at the Predecisional Enforcement Conference on June 18, 1998, ComEd recognizes that the Quad Cities Nuclear Power Station: 1) Safe Shutdown Analysis was not in compliance with certain applicable requirements of 10CFR50, Appendix R, and 2) an inadequate safety evaluation was performed for the use of the station blackout diesels which involved an unreviewed safety question. Reference (a) referred to these two areas as violations and classified them in aggregate as a Severity Level II problem.

Additionally, Reference (a) requested that ComEd respond to the following:

Notwithstanding the apparent comprehensiveness of your corrective actions associated with the 10CFR50.59 violation, and in light of the prior similar violations, you should describe why you believe your actions will be effective in preventing additional violations of 10CFR50.59.

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The ComEd response to this request is as follows:

Continued oversight of 10CFR50.59 activities is provided by line management, Plant Operations Review Committee (PORC) and Nuclear Oversight. These overviews provide an additional means to monitor performance and allow for correction of any weaknesses should they occur. The completed actions and additional actions indicated in Attachment A, Part B, relative to this subject provide assurance that the 10CFR50.59 Safety Evaluations prepared at Quad Cities will be performed in conformance with regulatory requirements and the expectations of ComEd Management.

This letter contains the following commitments:

1. After completion of the Fire Protection Improvement Program studies, potential improvement changes will be identified. The studies and the identification of potential improvement changes will be completed by December 15, 1998.
2. Advanced 10CFR50.59 training will be provided to qualified Safety Evaluation preparers and reviewers by December 18, 1998. This training is developed and is taught by the Nuclear Generation Group (NGG) subject matter expert in the 10CFR50.59 process.
3. The Corporate procedure for the 10CFR50.59 process, NSP-CC-3005, has been revised to include the appropriate guidance from Generic Letter 91-18, Rev. 1, and will be implemented by December 8, 1998.

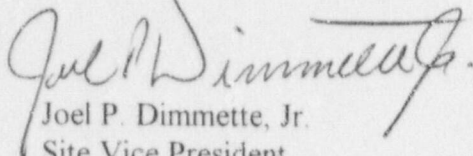
Enclosed is a check for \$88,000 in accordance with the requirements of the Civil Penalty of Reference (a).

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief. In some instances these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contract employees and consultants. Such information has been reviewed in accordance with company practices.

October 12, 1998

If there are any questions or comments concerning this letter, please refer them to Mr. Charles Peterson, Regulatory Assurance Manager, at (309) 654-2241, ext. 3609.

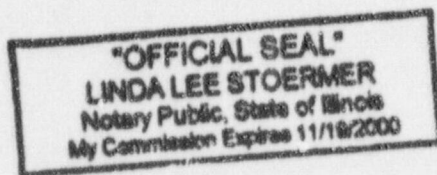
Sincerely,



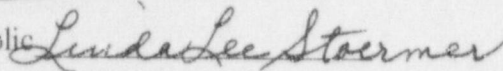
Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Station

Subscribed and Sworn to before me

On this 12 day of October, 1998



Notary Public



Enclosure: Check

Attachment A: "Reply to Notice of Violation"

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - Quad Cities Nuclear Power Station

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REPLY TO A NOTICE OF VIOLATION
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NOTICE OF VIOLATION (50-254(265)/97023(DRS) AND 50-254(265)/98011(DRS)) – PART A

A. 10 CFR 50.48(a), "Fire Protection," requires, in part, that each operating nuclear power plant must have a fire protection plan so that the capability to safely shutdown the plant is ensured.

10 CFR 50.48(b) requires, in part, that all nuclear power plants licensed to operate prior to January 1, 1979, shall satisfy the applicable requirements of Appendix R to this part, including specifically the requirements of Sections III.G and III.J. The Quad Cities facility was licensed before January 1, 1979.

1. 10 CFR 50, Appendix R, Section III.G.3, requires, in part, that alternative or dedicated shutdown capability is provided where the protection of systems whose function is required for hot shutdown does not satisfy requirements of Section III.G.2.

10 CFR 50, Appendix R, Section III.L.1, requires, in part, that alternative or dedicated shutdown capability provided for a specific fire area shall be able to:

- (a) achieve and maintain subcritical reactivity conditions in the reactor;
- (b) maintain reactor coolant inventory; (c) achieve and maintain hot shutdown conditions; (d) achieve cold shutdown conditions within 72 hours; and (e) maintain cold shutdown conditions thereafter.

10 CFR 50, Appendix R, Section III.L.2, requires, in part, those performance goals for accomplishing safe shutdown shall include reactivity control, reactor coolant makeup, decay heat removal, process monitoring, and support functions.

Contrary to the above, as of September 26, 1997, the licensee failed to provide alternate shutdown capability for some fire areas of the Quad Cities facility, containing safe shutdown equipment. A postulated fire in certain fire areas would render safe shutdown equipment inoperable such that safe shutdown would not be ensured in each of the following examples. Each of the following examples is considered a separate violation:

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- a. The fire area for safe shutdown path A consisted of the torus area north of column line 16; the 1A residual heat removal (RHR) pump room; the 1A core spray room; the high pressure coolant injection (HPCI) pump room; the ground floor and all areas above the ground floor in the Unit 1 reactor building; and 4kV Bus 13-1 and 480V Bus 18 and 19 areas in the turbine building. A postulated fire in this fire area would render inoperable the emergency diesel generator (EDG), safe shutdown makeup pump (SSMP), HPCI system, and several main steam line (MSL) drain valves and RHR valves for high/low pressure interface for the reactor coolant makeup function. In addition, the RHR system and the automatic depressurization system (ADS) would be rendered inoperable for the decay heat removal function. There would be no RHR service water (SW) flow indication available to meet the process monitoring function for safe shutdown. In addition, the RHR room coolers would be rendered inoperable for the support function. (01012)
- b. The fire area for safe shutdown path D1 consisted of the 1B RHR pump room (Fire Zone 11.2.2), the 1B core spray pump room (Fire Zone 11.2.1), and Unit 1 torus south of column line 16 (Fire Zone 1.1.1.1.S). A postulated fire in this fire area would render inoperable the EDG, the SSMP, and the HPCI system for the reactor coolant makeup function. In addition, the RHR system and ADS would be rendered inoperable for the decay heat removal function due to the inability to reject water from the torus. (01022)
- c. The fire area for safe shutdown path D2 consisted of Bus 14-1 area (equivalent Fire Area 8.2.8.A) in Unit 1 turbine building. A postulated fire in this fire area would render inoperable the EDG and the SSMP for the reactor coolant makeup function. (01032)
- d. The fire areas for safe shutdown path D3 consisted of the Unit 1 cable tunnel, any portion of the southern turbine building on the basement, ground, and mezzanine floor elevations except the Unit 1 B and C RHR service water (SW) pump room. A postulated fire in this fire area would render inoperable the EDG, SSMP, the HPCI system, and several MSL drain valves for high/low pressure interface of the reactor coolant makeup functions. In addition, the RHR system and ADS would be rendered inoperable for the decay heat removal function. Fire induced damage to the CCST level indication and a lack of RHR

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SW flow indication would not satisfy the process monitoring function for safe shutdown. (01042)

- e. Safe shutdown path D4 consisted of the 1B and 1C RHRSW pump room. A postulated fire in this fire area would render inoperable the EDG and SSMP for the reactor coolant makeup function. No RHRSW flow indication would be available to satisfy the process monitoring function for safe shutdown. (01052)
- f. The fire area for safe shutdown path E2₁ consisted of the central turbine building area on the ground and mezzanine floor elevations (Fire Zones 8.2.6.C and 8.2.7.C). A postulated fire in this fire area would render inoperable the reactor core isolation cooling (RCIC) system and several MSL drain valves for high/low pressure interface for the reactor coolant makeup functions. In addition, the RHR system and ADS would be rendered inoperable for the decay heat removal function. (01062)
- g. The fire area for safe shutdown path E2₂ consisted of the control room, the auxiliary electric room, the cable spreading room, and the computer room. A postulated fire in this fire area would render the RCIC system, and several MSL drain valves for high/low pressure interface inoperable for the reactor coolant makeup functions. In addition, the RHR system and the ADS would be rendered inoperable for the decay heat removal function. (01072)
- h. The fire area for safe shutdown path B consisted of the torus area north of column 10 in the 2A RHR pump room, the 2A core spray pump room, and the ground floor (including all areas above the ground floor in the Unit 2 reactor building). A postulated fire in this fire area would render inoperable the EDG, SSMP, the HPCI system, and several MSL drain and RHR valves for high/low pressure interface for the reactor coolant makeup function. In addition, the RHR system and the ADS would be rendered inoperable for the decay heat removal function. There would be no RHRSW flow indication available to satisfy the process monitoring function for safe shutdown. In addition, the RHR room coolers would be rendered inoperable for the support function. (01082)

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- i. The fire area for safe shutdown path C1 consisted of the cable tunnel or any portion of the northern turbine building on the basement, ground, and the mezzanine floor elevations in the Unit 2 turbine building. A postulated fire in this fire area would render inoperable the EDG, the SSMP, the HPCI system, and several MSL drain valves for high/low pressure interface for the reactor coolant makeup function. In addition, the RHR system and the ADS would be rendered inoperable for the decay heat removal function. There would be no RHRSW flow indication available to satisfy the process monitoring function for safe shutdown. (01092)

- j. The fire area for safe shutdown path C2 consisted of the Buses 24-1, 28, and 19 in the Unit 2 turbine building. A postulated fire in this fire area would render inoperable the EDG and SSMP for the reactor coolant makeup function. There would be no RHRSW flow indication available to satisfy the process monitoring function for safe shutdown. (01102)

- k. The fire area for safe shutdown path H consisted of the central turbine building area on the ground and mezzanine floor elevations. A postulated fire in this fire area would render inoperable the RCIC system for the reactor coolant makeup function. In addition, the RHR system and ADS would be rendered inoperable for the decay heat removal function. (01112)

- l. The fire area for safe shutdown path K1 consisted of the turbine building Bus 23-1 area. A postulated fire in this fire area would render the EDG and the SSMP inoperable for the reactor coolant makeup functions. (01122)

- m. The fire area for safe shutdown path K2 consisted of the control room, auxiliary electric room, cable spreading room, and computer room. A postulated fire in this fire area would render inoperable the EDG, the SSMP, and several MSL drain valves for high/low pressure interface for the reactor coolant makeup function. In addition, the RHR system and the ADS would be rendered inoperable for the decay heat removal function. (01132)

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- n. The fire area for safe shutdown path L consisted of south of column line 10 in the torus area, the 2B RHR pump room, the 2B core spray pump room and the HPCI pump room in the Unit 2 reactor building. A postulated fire in this fire area would render the EDG, the SSMP, the HPCI system inoperable for the reactor coolant makeup functions. In addition, the RHR system and the ADS would be rendered inoperable for the decay heat removal function. (01142).
2. 10 CFR 50, Appendix R, Section III.J, "Emergency Lighting," requires, in part, 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.

Contrary to the above, as of September 26, 1997, the licensee failed to provide adequate emergency lighting units with at least an 8-hour battery power supply in the Unit 1 and 2 HPCI rooms and 1B and 2B RHR pump rooms, areas needed for operation of safe shutdown equipment. (01152)

This is a Severity Level II problem (Supplement 1) Civil Penalty - \$88,000.

ADMISSION OF VIOLATION

ComEd agrees that the violation occurred as stated.

REASON FOR THE VIOLATION

The inadequacies of the safe shutdown procedures and emergency lighting resulted from two fundamental root causes. First there was an inadequate knowledge and ownership of the Fire Protection Program. This resulted in personnel not understanding the Safe Shutdown Analysis well enough to sufficiently develop accurate safe shutdown procedures. In addition, a lack of knowledgeable management oversight resulted in an inappropriate approach to Appendix R compliance prior to 1997. The traditional approach to a Safe Shutdown Program, which considers a variety of equipment or paths, was not thoroughly investigated during the original (pre 1997) program development. The use of only two systems for high pressure injection (Reactor Core Isolation Cooling and Safe Shutdown Make-up Pump) and development of very large fire areas (each Unit reactor building being only two fire areas) resulted in an overly restrictive approach to developing safe shutdown methodologies.

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The second contributing root cause was inadequate management involvement in correcting identified deficiencies in the Safe Shutdown Program. Station Management did not place a priority on support for the Fire Protection Program. ComEd focused on specific deficiencies that were identified over the years, but failed to take broader programmatic actions to correct the Safe Shutdown issues.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

1. An extended shutdown of both units was conducted for approximately one reactor year.
2. The Safe Shutdown Analysis was revised to correct known discrepancies.
3. The Safe Shutdown Procedures (QCARPs) were revised for accuracy; simplified and enhanced. These procedures were formatted in a manner similar to Emergency Operating Procedures (EOPs) which allows for a more structured and timely response.
4. Forty-one modifications were implemented prior to the restart of the units to address many of the discrepancies. These modifications included fire wrapping of cables, installation of emergency lighting, and changes to electrical components to prevent spurious operation. The remaining discrepancies were addressed with compensatory measures. (Refer to ComEd to USNRC letter, SVP-98-149, dated April 20, 1998 and SVP-98-203, dated May 22, 1998).
5. The Fire Protection Group was strengthened to provide accountability for the fire protection program.
6. The corporate oversight of the program was strengthened through the involvement of the corporate organization. The Corporate Fire Protection Engineer is actively engaged as a key resource for solving problems and sharing information with other ComEd stations.
7. This violation was a topic during Engineering Support Personnel Continuing Training session 98-04.

As a result of these actions Quad Cities Nuclear Power Station will be able to achieve and maintain safe shutdown as described in the revised Safe Shutdown Analysis and implemented in the associated revised QCARPs.

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CORRECTIVE ACTIONS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION

1. A Fire Protection Improvement Program was developed and a project team assembled to further strengthen the overall program. A steering committee was established to provide strong corporate leadership and management involvement. As discussed in the response to the NRC Inspection Report 50-254(265)/98-011(DRS), dated 8/31/98 (SVP 98-273), ComEd continues to improve the Fire Protection Program through continuing studies. Potential improvement changes identified by these studies will be assessed using the revised fire risk model and prioritized based on enhanced compliance with regulations, risk significance, and cost benefit. The studies and the identification of potential improvement changes will be completed by December 15, 1998.
(NTS 2541009801103.01, due 12/15/98)
2. Periodic meetings with the NRC to discuss the progress and direction of the plan were established.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Compliance was achieved in May, 1998 prior to the restart of the Units.

Compliance without compensatory measures will be achieved when appropriate remaining plant modifications and procedure changes are completed during Q1R16.

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**NOTICE OF VIOLATION (50-254(265)/97023(DRS) AND
50-254(265)/98011(DRS)) – PART B**

- B. 10 CFR 50.59(a)(1) "Changes, Tests, and Experiments," requires, in part, that the holder of a license authorizing operation of a facility may make changes in the facility as described in the safety analysis report and make changes in the procedures as described in the safety analysis report without prior Commission approval, unless the proposed change involves an unreviewed safety question.

10 CFR 50.59(a)(2) requires, in part, that a proposed change shall be deemed to involve an unreviewed safety question if a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created.

Quad Cities Updated Final Safety Analysis Report (UFSAR), Section 9.5.1, "Fire Protection System," states, in part, that Sections 3.1 and 3.2 of the Safe Shutdown Analysis (Fire Protection Report Volume 2) identified systems and equipment that can be used to bring the plant to hot and cold shutdown in the event of a fire in any fire area or equivalent fire area and loss of offsite power.

Fire Protection Report Volume 2, Section 3.1.1.6.1, "On-Site AC Power," states, in part, that power for the reactor core isolation cooling valves, the safe shutdown makeup pump, and the residual heat removal system was provided by a diesel generator which normally starts automatically upon a loss of offsite power. In addition, the diesel generator was supplied from a 750 gallon day tank which was supplied from a 15,000 gallon fuel oil tank. The Technical Specification required a minimum of 10,000 gallons fuel onsite for each diesel. The fuel supply of 10,000 gallons will supply each diesel generator with a minimum of two days of full load operation.

Contrary to the above, in December 1997, the licensee made a change in the facility as described in the Quad Cities UFSAR which involved an unreviewed safety question without obtaining prior Commission approval. Specifically, on December 2, 1997, the licensee implemented revised Quad Cities Appendix R procedures without performing a written safety evaluation to use a diesel generator that did not start automatically upon loss of offsite power, to provide onsite AC power. In addition, the licensee failed to evaluate that the diesel generator fuel tank capacity was only 22 hours instead of two days of full load operation. The manual action to refuel this diesel generator was an unreviewed safety question because it created a malfunction of a different type than previously evaluated. (01162)

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This is a Severity Level II problem (Supplement I). Civil Penalty - \$88,000.

ADMISSION OF VIOLATION

ComEd agrees that the violation occurred as stated.

REASON FOR THE VIOLATION

The root cause of the untimely and inadequate Safety Evaluation with respect to the substitution of the station blackout (SBO) diesels for the emergency diesel generators (EDG) was a misunderstanding of the application of 10CFR50.59 related to the use and guidance of Generic Letter (GL) 91-18, Rev. 1. Contributing to this was a lack of procedural guidance for performing Safety Evaluations for compensatory measures. ComEd failed to recognize that even if the SBO diesel generator was an interim compensatory measure that a Safety Evaluation is required to compare the change against the plant design basis (i.e., the Safe Shutdown Analysis).

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

1. Unit 1 was shutdown for 6 months.
2. The Safe Shutdown Analysis and Safe Shutdown Procedures (QCARPs) were revised. The five Safety Evaluations prepared for these changes resulted in three Unreviewed Safety Questions (USQs), which have been submitted under separate cover for review.
3. In-line third party review of full safety evaluations by the Engineering Assurance Group (EAG) was in place from September, 1997, until August, 1998. This responsibility was transferred to the department head of the responsible organization in August 1998, to ensure that accountability for the quality and accuracy of the safety evaluations was clearly assigned to line management.
4. The population of individual safety evaluation preparers and reviewers has been limited as a means of maintaining quality through consistency and experience.
5. All currently qualified preparers and reviewers have attended a two-day safety evaluation workshop.
6. Plant Operations Review Committee (PORC) members were trained on the relationship between 10 CFR 50.59 Safety Evaluations and Generic Letter 91-18, Rev 1.
7. Memorandum (CCP-98-002) was issued to all Safety Evaluation preparers, reviewers, and PORC members which provided additional guidance on Generic Letter 91-18, Rev. 1 and compensatory measures.

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8. This violation was a topic during Engineering Support Personnel Continuing Training session 98-04.
9. Corporate procedure NSP-CC-3001, Operability Determinations, was implemented on September 8, 1998. This procedure contains specific guidance from GL 91-18, Rev. 1 on the application of the 10CFR50.59 process to non-conforming conditions and compensatory measures.

CORRECTIVE ACTIONS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION

Continued oversight of 10CFR50.59 issues is provided by line management, Plant Operations Review Committee (PORC) and Nuclear Oversight. The actions below are planned in addition to the above completed actions:

1. Advanced 10CFR50.59 training will be provided to qualified Safety Evaluation preparers and reviewers by December 18, 1998. This training is developed and is taught by the NGG subject matter expert in the 10CFR50.59 process. (NTS 2541009801103.02, due 12/18/98)
2. The Corporate procedure for the 10CFR50.59 process, NSP-CC-3005, has been revised to include the appropriate guidance from GL 91-18, Rev. 1, and will be implemented by December 8, 1998. (NTS 2541009801103.03, due 12/8/98)

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Compliance was achieved when the subject Safety Evaluation was revised and when all qualified reviewers were re-trained by completion of the two-day workshop. These items were completed in May, 1998.