# UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of Commonwealth Edison Company Dresden Station, Unit 3

8905080154

Docket No. 50-249 License No. DPR-25 EA 87-81

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# ORDER IMPOSING CIVIL MONETARY PENALTY

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Commonwealth Edison Company (licensee) is the holder of Operating License No. DPR-25 issued by the Nuclear Regulatory Commission (NRC/Commission) on March 2, 1971. The license authorizes the licensee to operate the Dresden Station, Unit 3, in accordance with the conditions specified therein.

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A special safety inspection of the licensee's activities was conducted during the period May 19 through 23, 1986. The results of this inspection indicated that the licensee had not conducted its activities in full compliance with NRC requirements. A written Notice of Violation and Proposed Imposition of Civil Penalty (Notice) was served upon the licensee by letter dated April 29, 1988. The Notice stated the nature of the violation, the provisions of the NRC's requirements that the licensee had violated, and the amount of the civil penalty proposed for the violation. The licensee responded to the Notice by letters dated June 28 and July 1, 1988. In its response, the licensee made a qualified admission to the violation but believes that the imposition of a civil penalty in this case is not consistent with the NRC's Modified Enforcement Policy. The licensee also requested that, if the NRC concluded that the violation occurred, the NRC staff reconsider its analysis of the mitigation/escalation factors, as set forth in the Modified Enforcement Policy (Generic Letter 88-07). After consideration of the licensee's response and the statements of fact, explanation, and argument for mitigation contained therein, the Deputy Executive Director for Nuclear Materials Safety, Safeguards, and Operations Support has determined, as set forth in the Appendix to this Order, that (1) the violation occurred as stated, (2) the Modified Enforcement Policy has been properly applied, and (3) the penalty proposed for the violation designated in the Notice of Violation and Proposed Imposition of Civil Penalty should be imposed.

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In view of the foregoing and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205, IT IS HEREBY ORDERED THAT:

The licensee pay a civil monetary penalty in the amount of One Hundred Fifty Thousand Dollars (\$150,000) within 30 days of the date of this Order, by check draft, or money order, payable to the Treasurer of the United States and mailed to the Director of Enforcement, U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555.

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-2-

The licensee may request a hearing within 30 days of the date of this Order. A request for a hearing should be clearly marked as a "Request for an Enforcement Hearing" and should be addressed to the Director of Enforcement, U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, with copies to the Assistant General Counsel for Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Regional Administrator, Region III, 799 Roosevelt Road, Glen Ellyn, Illinois, 60137, and the NRC Resident Inspector, Dresden Station.

If a hearing is requested, the Commission will issue an Order designating the time and place of the hearing. If the licensee fails to request a hearing within 30 days of the date of this Order, the provisions of this Order shall be effective without further proceedings. If payment has not been made at that time, the matter may be referred to the Attorney General for collection.

In the event the licensee requests a hearing as provided above, the issue to be considered at such hearing shall be:

(a) Whether the licensee was in violation of the Commission's requirements as set forth in the Notice of Violation and Proposed Imposition of Civil Penalty referenced in Section II above, and

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- 3 -

(b) whether, on the basis of the violation, this Order should be sustain  $( \ )$ 

FOR THE NUCLEAR REGULATORY COMMISSION

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Hugh L. Thompson, Nr. Deputy Executive Director for Nuclear Materials Safety, Safeguards, and Operations Support

Dated at Rockville, Maryland this 3<sup>cd</sup> day of May 1989

#### APPENDIX

#### EVALUATION AND CONCLUSION

On April 29, 1988, a Notice of Violation and Proposed Imposition of Civil Penalty (Notice) was issued for Dresden Unit 3 for a violation identified during an NRC inspection. Commonwealth Edison Company (CECo/licensee) responded to the Notice on June 28 and July 1, 1988. In its response, CECo admitted it was unable to demonstrate that the AMP splices were environmentally qualified based on the results of testing conducted at CECo's initiative in December 1986. However, the licensee does not agree that documentation in its files as of December 6, 1986 was inadequate to demonstrate that the AMP splices were properly qualified in accordance with the DOR Guidelines by type testing and analysis. In addition, the licensee requests reduction of the civil penalty based on the consideration of the factors of identification and reporting and corrective actions. The violation is restated below, followed by a summary of the licensee's response, the NRC evaluation, and the conclusion.

#### 1. Restatement of Violation

10 CFR 50.49(f) requires each item of electric equipment important to safety be qualified by testing and/or analysis.

10 CFR 50.49(k) specifies that requalification of electrical equipment important to safety is not required if the Commission has previously required qualification in accordance with "Guidelines for Evaluation of Environmental Qualification of Class IE Electrical Equipment in Operating Reactors," November 1979 (DOR Guidelines).

DOR Guidelines, Section 5.2.2, states that type tests should only be considered valid for equipment identical in design and material construction to the test specimen and any deviations should be evaluated as part of the qualification documentation.

Contrary to the above, as of December 6, 1986, AMP nylon-insulated butt splices, used in numerous items of electrical equipment important to safety, were not properly environmentally qualified in accordance with DOR Guidelines by type testing. While a type test was done, the tested splices were not demonstrated to be identical to the installed AMP splices and this deviation was not evaluated as part of the documentation in the qualification file.

### 2. Summary of Licensee's Response

CECo admits it was unable to demonstrate that the AMP splices were environmentally qualified based on the results of testing conducted in December 1986, but does not agree that documentation in its files as of December 6, 1986 was inadequate to demonstrate qualification. CECo also contends that the imposition of the proposed civil penalty in this case is not consistent with the NRC's "Modified Enforcement Policy Relating to 10 CFR 50.49" (Modified Enforcement Policy) principally because the NRC staff's finding that Commonwealth Edison Company clearly should have known that the AMP splices were not qualified is in error and is largely based on "impermissible hindsight." The licensee also argues that the amount of any civil penalty imposed should be reduced. This is because the analysis in the NRC staff's April 29, 1988 letter of some of the mitigation/ escalation factors set forth in the Modified Enforcement Policy is flawed by the improper use of hindsight, by a factual error relating to the length of time Dresden Unit 3 operated with the AMP splices, and by failure to give any credit to Commonwealth Edison Company for taking the initiative in testing the AMP splices. The licensee also questions the fairness of the NRC's Modified Enforcement Policy in not considering operability arguments when assessing the safety significance of EQ violations.

#### 3. NRC Evaluation of Licensee's Response

a. Hindsight

In regard to hindsight, the licensee asks:

# (1) <u>Did the NRC Staff Expect the AMP Splices to Fail the</u> December 1986 Tests?

The NRC staff does not believe it relevant to consider whether it expected failures to occur during testing in establishing whether the licensee clearly should have known of the AMP splice deficiency. The NRC staff concludes that the facts of the AMP splice issue, as detailed below, establish that CECo clearly should have known of the splice qualification deficiencies.

As documented in the Region III March 24-25, 1986 inspection report (50-237/86006 and 50-249/86009), eighteen of three hundred Dresden Unit 2 splices were replaced in 1983 due to insulation embrittlement. In January 1985, further splice insulation degradation was observed in Unit 2 and in October 1985 all splices in Unit 2 were replaced because the embrittled insulation was cracking and "falling off" when the splices were moved. This inspection report stated that the NRC was concerned that the AMP splices may have a shorter qualified life than calculated by the licensee and that future failures in Unit 3 could occur during plant operation.

The intent of the March 24-25, 1986 limited inspection was to review the licensee's immediate corrective action in regard to the degraded AMP nylon splices in Unit 2. The inspectors identified EQ concerns and informed the licensee that a more detailed inspection would be performed during the upcoming NRC EQ team inspection in May 1986. The inspectors did not have any immediate safety concerns because (1) similar degradation had not yet been identified in Unit 3 and (2) the licensee insisted that the installed splices were in fact identical in material and construction to tested splices that had properly passed qualification tests, and that they could demonstrate through additional documentation that the AMP splices were qualified.

During the subsequent NRC team inspection in May 1986, the NRC staff concluded that similarity between the tested and installed butt splices was not established by the information in the licensee's qualification files. CECo maintained the splices were qualified by the GE FO1 (R.M. Schuster, April 30, 1971) penetration qualification test. This test documentation indicated insulated splices were used in the penetration test performed under the DOR Guidelines and that the circuits functioned throughout the test. However, the GE F01 qualification test did not describe the splices. The NRC staff's concern was that there was no documentation linking the splice tested by GE with those supplied with the FO1 penetrations and in use in Dresden Unit 3. CECo has indicated that information was obtained from GE indicating that nylon insulated butt splices were used in the test but this information was not included in the licensee's environmental qualification file. The documentation reviewed during the May 1986 NRC inspection did not support qualification of the AMP splices in that similarity could not be established. The violation which is the subject of the Notice was identified at this time and was unaffected by subsequent developments.

Unit 3 was not operating at the time and the licensee committed to corrective action prior to startup. In a letter dated June 12, 1986, CECo stated that additional information would be added to the EQ file to show qualification of these splices. The NRC letter dated September 8, 1986 transmitted the NRC inspection report and acknowledged the commitment made by CECo in the June 12, 1986 letter. The NRC letter also stated that the additional information would be reviewed during a future inspection. The licensee's additional information was subsequently reviewed during an NRC inspection at Quad Cities Station in June 1987 where identical splices existed and the information was found to be inadequate. Had the NRC staff reviewed these analyses prior to the December 1986 tests, the NRC staff would have required the licensee to follow the requirements of Generic Letter 86-15.

In conclusion, a documented test and/or analysis was needed to determine if the AMP splices would perform as intended during an accident. Based on the inadequate documentation in the licensee's files at the time of the NRC EQ site inspections, an environmental qualification violation occurred and the licensee's corrective actions were inadequate.

## (2) If the AMP Splices Had Passed the Tests, Would the NRC Staff Now be Proposing a \$150,000 Civil Penalty?

If the AMP splices had passed the tests, the enforcement action proposed in the Notice would remain unchanged. The NRC's policy in the EQ area has been presented in Generic Letters (GL) 85-15 and 88-07. Both Generic Letters state that unqualified equipment means equipment for which there is not adequate documentation to establish that this equipment will perform its intended functions in the relevant environment. While in certain cases, the ability to quickly obtain documentation may result in a violation of reduced severity level, this provision does not apply to testing. The NRC's position provided in Generic Letter 88-07 is that the results of testing done after deficiencies are identified would not be considered. The NRC staff's position is that 10 CFR 50.49 required licensees to assure that electrical equipment important to safety is qualified for its application prior to the November 30, 1985 deadline. Sufficient documentation to assure qualification was required to be contained in the EQ files prior to the deadline. As such, testing conducted after the the identification of deficiencies after the deadline has no bearing on whether a violation occurred.

For the case at Dresden Unit 3, the NRC staff contends that the AMP splices were not demonstrated to be qualified due to inadequate documentation in the EQ files. The NRC staff identified environmental qualification concerns in March 1986 and again in May 1986. Regardless of whether the AMP splices had passed the December 1986 tests, the licensee had not demonstrated the splices to be qualified prior to the November 30, 1985 EQ deadline or during or shortly thereafter the NRC inspections of March and May 1986. Any subsequent testing by the licensee, whether favorable or unfavorable, has no bearing on the application of the Modified Enforcement Policy. The NRC staff considers it appropriate to propose a civil penalty in this case based on the failure by the licensee to have adequate EQ documentation for AMP splices, a deficiency which the licensee clearly should have known existed as of November 30, 1985.

# b. Application of the Clearly Should Have Known Test

The licensee argues that it was not reasonable for the NRC staff to conclude that it clearly should have known that its EQ documentation was inadequate prior to December 1986. The following considerations support the staff's findings.

(1) In January 1985, the licensee identified degraded nylon AMP splices in Dresden Unit 2. In September 1985, severe degradation was identified in the remaining Dresden Unit 2 nylon AMP splices and the splices were replaced with Raychem Heat Shrink Tubing (HST). The licensee clearly should have known these splices were unqualified since they had degraded significantly before reaching their qualified life. The cause of the degradation of the splices in Unit 2 was attributed to a high temperature event in 1970 which consisted of a peak temperature, claimed by the licensee to be 320 degrees F, for less than one hour. Because the splices in Unit 3 had not been exposed to an event of this type, the licensee did not consider the degradation of Unit 2 splices as applicable to the Unit 3 splices. The event in Unit 2 alone should not have been considered by the licensee as an adequate basis for differentiating between the conditions in Unit 2 and 3. It was not a particularly severe event relative to the service conditions for which



the splices were to be qualified. The licensee did not present analyses to determine if the event was in fact severe enough to have caused the observed difference in degradation and cause possible accelerated aging of these splices in Dresden Unit 2. Thus, the licensee did not present sufficient evidence to conclude that similar degradation would not occur under accident conditions in Unit 3.

The licensee's inspection of the Unit 3 splices did not reveal similar degradation. Dresden Unit 3 splices were not replaced prior to November 30, 1985. Instead, a surveillance (monitoring) program was established. However, it was inappropriate to rely on a monitoring program to provide assurance that, during an accident in which a harsh environment would exist including high temperature, radiation, and steam, these splices would function as intended. Monitoring for degradation would not likely have alerted licensee personnel to potential splice failures in that these failures would likely only occur during accident conditions and not during normal operations. The position stated in DOR Guidelines was intended to provide that surveillance and maintenance records be reviewed to identify and correct equipment exhibiting age related degradation, as an early indicator of a problem. This position was also based on the assumption that the equipment was properly qualified by tests or test and analysis. Therefore, the use of a surveillance program is irrelevant to the issue of whether the licensee "clearly should have known" of the deficiency. The degradation of these splices in Unit 2 served as prior notice that qualification deficiencies existed for these splices.

(2) Appendix C of the DOR Guidelines identifies nylon as being susceptible to radiation damage at a threshold dose as low as 10E5 rads. Nylon is further identified as a material that has a potential for significant aging within ten years under normal operating conditions. Therefore, it should have been concluded that the nylon splices could degrade under plant service and accident conditions. Notwithstanding the above, the NRC staff agrees with the licensee contention that the use of nylon is not prohibited. However, because the licensee sought to qualify the Dresden Station equipment in accordance with the DOR Guidelines, there was clear evidence that these splices using nylon material were potentially degradable and needed special attention to establish and maintain qualification. However, the qualification file was inadequate to demonstrate qualification.

The GE F01 penetration test report (R. M. Schuster, April 30, 1971) relied on by CECo to qualify the AMP nylon splices indicated that the splices were not exposed to radiation and did not test splices made by AMP. This matter was discussed in GE letter G-EBO-8-121 dated April 28, 1978. Therefore, the licensee, in accordance with the DOR Guidelines, had to provide separate radiation qualification for these splices. However, AMP test report (No. 110-11004, February 1982), relied on by the licensee to qualify the splices for radiation, did not document testing of AMP nylon splices. The report was in fact for Kynar, a dissimilar material. Thus, the licensee clearly did not have valid EQ documentation to qualify these splices and did not perform adequate reviews to resolve the inadequacy of these documents. In summary, the GE FO1 Penetration test report and subsequent correspondence between GE and CECo indicated that GE had tested some kind of nylon splice for harsh temperature and pressure conditions and that it did pass the test. However, this test did not adequately qualify the nylon splice for an environment where radiation and steam would be present at the same time. The licensee clearly should have known through prior EQ reviews that this test did not identify the formulation of the nylon tested and that the tests did not simulate the plant accident conditions of the Dresden Station. Clearly, the licensee did not have vendor supplied documentation in its EQ file that demonstrated that AMP splices were qualified.

In sum, a knowledgeable engineer familiar with EQ requirements and information available to the licensee clearly should have known prior to the November 30, 1985 deadline that the qualification file for the AMP splices was deficient.

(3) The licensee argues it had other information on-site which established similarity. A GE Series 100 penetration test report, as described in GE letter G-EBO-2-031 dated February 9, 1982, was subsequently submitted by the licensee during the enforcement conference on June 5, 1987 and during the Region III Quad Cities Station EQ inspection of June 8-12, 1987 to substitute for the inadequate AMP (No. 110-11004) and GE (R. M. Schuster, April 1971) test reports. Documentation submitted by the licensee indicated that this report was in the licensee's files before November 30, 1985. The licensee's intent of using the GE Series 100 report was to address the qualification of the AMP splices for radiation. The NRC staff raised questions at that time regarding various references in this report. One such reference was a GE letter (GE-EBO-2-192, dated 9/7/82) that forwarded to the licensee an electrical penetration environmental information study, dated 8/27/82, conducted by GE for the Dresden and Quad Cities Stations. The list of components in this study identified shrinkable tubing and, under Note 2 listed as applicable to this item, indicated that the tubing was used as a "cover for insulated splice." The nylon splice vendors listed included AMP.

The additional information provided by the licensee failed to establish which kind of splice used in production was actually tested and it appeared that whichever splice had been tested had been protected from the harsh environment by the tubing (apparently intended to be installed on production penetration assembly splices as well). This information was confirmed in discussions with GE personnel in December 1986. Thus, the tested splices were not only protected from some environmental degradation during testing, but also were prevented from causing electrical faults under accident conditions by moisture intrusion or gross failure of their insulation. The splices installed in the FO1 penetrations in Dresden Unit 3; however, were unprotected. This report was therefore not valid to demonstrate qualification of the splices for the postulated accident radiation exposure.

(4) The licensee argues that a previous NRC inspection in 1978 is additional information which supports its conclusion that it should not have clearly known of the splice qualification deficiencies. The licensee asserts that the 1978 inspection accepted the qualification of the AMP splices. The NRC staff agrees that the inspector in 1978 reached that conclusion. However, the qualification of the splices was accepted based on statements made in a GE letter dated April 28, 1978 and the fact that the test configuration was in accordance with the guidance of IE Circular 78-08. The test conditions did not include exposure to radiation and steam simultaneously, which was subsequently required by the DOR Guidelines (issued as an attachment to IE Bulletin 79-01B) to be either included during testing or a separate analysis performed (testing combined with analysis). Therefore, after issuance of the DOR Guidelines the licensee clearly should have known that the inspector's basis for acceptance of qualification was no longer necessarily valid.

Based on the above, the NRC staff concludes that the licensee clearly should have known the AMP splices were not qualified.

## 4. Licensee's Request for Consideration of Mitigation/Escalation Factors

The licensee asks the NRC staff to reconsider its analysis of the first and third mitigation/escalation factors which are addressed in the Modified Enforcement Policy. These factors were addressed in the NRC's April 29, 1988 letter to CECo. The first mitigation/escalation factor is for identification and prompt reporting. The licensee agrees that the NRC staff first identified the AMP splice issue and, in retrospect, admits it might have taken advantage of the identification of degrading splices in Dresden Unit 2 to repair or replace identical splices in Dresden Unit 3; however, the licensee does not believe these facts merit escalation of the base civil penalty because NRC and the licensee considered the deficiency to be a minor documentation problem until the test failure. The licensee contends that the NRC did not give credit for its testing efforts and prompt reporting of the test failures.

With regard to the third mitigation/escalation factor, corrective actions, the licensee contends it did not operate with unqualified splices for a period of six months as indicated in the NRC's April 29, 1988 letter and that the licensee took the corrective actions called for by the NRC staff (supplying additional documentation and analyses in accordance with the established schedule).

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#### 5. NRC Evaluation of Licensee's Response

In regard to the first factor, the NRC staff notes that CECo agrees that the AMP splice issue was identified by the NRC. In addition, CECo had numerous opportunities to identify and correct this problem since it was aware that splices in Dresden Unit 2 were seriously degraded and identical splices were installed in Dresden Unit 3. In view of the above arguments, the NRC staff concludes that there is no adequate basis for changing the NRC staff's position regarding the first factor and concludes 50 percent escalation of the base civil penalty based on this factor is appropriate. The licensee's arguments regarding the NRC staff's categorization of the AMP splice qualification deficiencies as a minor documentation problem and credit for the testing performed by the licensee are more appropriately considered under the factor of corrective actions.

- 8 -

In regard to the third factor of corrective actions, the NRC staff does not agree that the AMP splice qualification deficiencies were considered to be minor. Once the splice deficiencies were identified, rather than requiring an immediate shutdown, the NRC staff allowed the licensee some time to pursue the identification and collection of additional information which could prove qualification of the splices. Continued discussions with the NRC staff failed to demonstrate to the NRC staff that qualification had been shown. The NRC staff agrees that Dresden Unit 3 did not operate for six months with unqualified splices; however, it did operate for more than 100 days (August 24, 1986 to December 6, 1986) and the violation existed from November 30, 1985 (EQ deadline) until December 6, 1986, a period of more than a year. In addition, the NRC staff has concluded that the time expended in making an operability or qualification determination, the quality of the supporting analysis (prior to December 4-5, 1986), and the nature and extent of the licensee's efforts to come into compliance were deficient and do not provide a basis for mitigation of the civil penalty. A careful review of the file should have revealed the deficient nature of the qualification file. The NRC staff considers it inappropriate to either mitigate or escalate the base civil penalty in regard to this factor recognizing the licensee did shutdown operating units upon learning of the test failures, but also recognizing the extended period of time during which the plant operated with splices for which qualification was not demonstrated.

#### 6. Licensee's Request for Consideration of Safety Significance

The licensee expressed its concern as to the fairness of the NRC's enforcement policy not to consider operability arguments in assessing the safety significance of an EQ violation.

### 7. NRC Evaluation of Licensee's Response

The Modified Enforcement Policy is based on the requirement that licensees were to establish a master list of equipment which identified all electrical equipment important to safety. Equipment on this list is required to be environmentally qualified. If a component is on this list, or should have been on the list, the component has safety significance (importance to safety). Consequently, the failure to demonstrate qualification for such a component has safety significance. The NRC staff believes that to further explore and assess the safety significance of the failure or potential degradation of components for which a significant qualification deficiency was found would not be productive and diverts attention away from the root cause of the EQ violation.

## 8. Conclusion

The NRC staff concludes the violation occurred as stated and no adequate basis has been provided for withdrawing the violation or reducing the amount of the proposed civil penalty. Therefore, the NRC concludes that a \$150,000 civil penalty should be imposed.

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# Commonwealth Edison Company

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