

September 2, 1982

Docket No. 50-237
LS05-82-09-019

Mr. L. DelGeorge
Director of Nuclear Licensing
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dear Mr. DelGeorge:

SUBJECT: SEP TOPIC III-1, QUALITY GROUP CLASSIFICATION OF COMPONENTS
AND SYSTEMS - DRESDEN NUCLEAR POWER STATION UNIT 2

- References: (1) Letter, P. O'Connor to L. DelGeorge, "SEP Topic III-1, Quality Group Classification of Components and Systems (Dresden Unit 2)," dated March 9, 1982.
- (2) Letter, T. Rausch to P. O'Connor, "Dresden 2, SEP Topic: III-1, Quality Group Classification of Components and Systems," dated July 16, 1982.

Enclosed is the staff's revised safety evaluation of SEP Topic III-1 for the Dresden Unit 2 plant. Our evaluation is based upon the original assessment in Reference 1 and incorporates the additional information provided in Reference 2. The staff has concluded that, based upon a sampling review of the information in Reference 2, all of the open items addressed in Reference 1, except for fracture toughness requirements and radiography, have been resolved. The remaining open items will be resolved in the Integrated Assessment of Dresden Unit 2.

Sincerely,

Original signed by:

Paul W. O'Connor, Project Manager
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Enclosure:
As stated

cc w/enclosure:
See next page

SEQA Add: Gary Stoley
DSU USE EX(10)

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|-----|------------------|------------------|------------------|------------------|-------------------|-------------------|------------------------|
| ICE | SEP B <i>MLB</i> | SEP B <i>MLB</i> | SEP B <i>(G)</i> | SEP B <i>WTR</i> | ORB#5 <i>PWOT</i> | ORB#5 <i>PWOT</i> | AD: SA: DJ <i>Spit</i> |
| ME | MBoyle: b1 | Gowal: na | CGrimes | WRussell | PO'Connor | DCrutchfield | Tippold to |
| ATE | 8/10/82 | 8/10/82 | 8/10/82 | 8/10/82 | 9/1/82 | 9/2/82 | 9/2/82 |

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Mr. L. DelGeorge

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SYSTEMATIC EVALUATION PROGRAM

TOPIC III-1

DRESDEN NUCLEAR POWER STATION UNIT 2

Topic: III-1, Classification of Structures, Components and Systems
(Seismic and Quality)

I. INTRODUCTION

SEP plants were generally designed and constructed during the time span from the late 1950's to late 1960's. They were designed according to codes and criteria in effect at that time; however, since then, the codes and criteria have been revised to incorporate the results of additional research. Thus, earlier plants may have been designed according to criteria and codes no longer accepted by the NRC.

The purpose of Topic III-1 is the review of the classification of structures, systems and components of as-built plants as compared to current appropriate classifications, codes and standards for seismic and quality groups. The review of seismic classification is being addressed in the seismic topics. Accordingly, this topic was limited to an evaluation of the quality group classification of systems and components.

II. REVIEW CRITERIA

The review criteria are presented in the Appendix of Franklin Technical Evaluation Report - C527-430, "Quality Group Classification of Components and Systems - Dresden 2 Plant." (This TER is Enclosure 2 of a March 9, 1982 letter from P. O'Connor to L. DelGeorge, "SEP Topic III-1, Quality Group Classification of Components and Systems (Dresden Unit 2)".)

III. RELATED SAFETY TOPICS AND INTERFACES

The scope of review for this topic was limited to avoid duplication of effort since some aspects of the review were performed under related topics. The related topics and the subject matter are identified below.

- III-6 Seismic Design Considerations
- III-7.B Design Codes, Design Criteria, Load Combinations and
Reactor Cavity Design Criteria
- V-6 Reactor Vessel Integrity
- V-8 Steam Generator Integrity

IV. REVIEW GUIDELINES

The review guidelines are presented in Section 3 of Franklin Report - C-5257-430, "Quality Group Classification of Components and Systems - Dresden 2 Plant." Quality Assurance was not reviewed since it is addressed in Topic XVII, "Operational Quality Assurance (QA) Program" and because QA during design and construction is outside of the scope of SEP.

V. EVALUATION

The basic input for this report is Table 4.1 in Section 4 of the Franklin Report. Table 4.1 is a compilation of all systems and components which are required to be classified by Regulatory Guide 1.25 and the original codes and standards used in the plant design. After comparing the original codes with those currently used for licensing new facilities, the following areas were identified where the requirements have changed:

- 1) Fracture Toughness
- 2) Quality Group Classification
- 3) Code Stress Limits
- 4) Radiography Requirements
- 5) Fatigue Analysis of Piping Systems

An evaluation of each of these areas is presented in Section 5 of the Franklin Report, with a detailed discussion included in the Appendix of that report. We have determined that changes in the following areas have not significantly affected the safety of the systems and components reviewed in this report:

- 1) Quality Group Classification
- 2) Code Stress Limits
- 3) Fatigue Analysis of Piping Systems

As noted earlier, we have decided that the area of quality assurance need not be reviewed for this report.

In the remaining two areas we have concluded the following:

- 1) Fracture Toughness - The ASME Boiler and Pressure Vessel Code, Section III, requires fracture toughness testing of pressure retaining material and material welded thereto. Attached to this evaluation is an updated Table 5.1 of the Franklin Report. The fracture toughness requirements for the Reactor Water Cleanup System, the Reactor Shutdown Cooling System and the Reactor Building Closed Cooling Water System have not been provided for our review. For those components identified in the revised Table 5.1 as requiring fracture toughness testing, the actual requirements imposed on those components and the test results have not been provided. This information is necessary to complete our evaluation, because of the radical change in fracture toughness test requirements that occurred in 1972. The remaining components and systems identified in Table 5.1 meet current fracture toughness requirements.

- 2) Radiography - The ASME Boiler and Pressure Vessel Code requires that radiographic inspections of certain component parts and joints be performed. We have reviewed, on a sample basis, the fabrication and construction inspection program implemented at Dresden Unit 2. We find that the program is generally in agreement with current requirements except that the following items have not been addressed:
- a) Class 2 vessels built to Class C requirements and containing Category C joints, along with the examination technique employed, should be identified.
 - b) The actual examination given to the recirculation system pump casing (this is a Class 1 component built to Class C requirements).

Any other discrepancies that exist between the actual inspection procedures used and those currently required during fabrication and construction are few and their safety significance is small because Dresden Unit 2 has implemented an inservice inspection program that meets the current requirements of 10 CFR Part 50, Section 50.55a(g).

VI. CONCLUSION

We have evaluated the quality group classification of the components and systems in Dresden Unit 2 and, with the exception of the two open items discussed above, we conclude that Dresden Unit 2 meets current requirements. The open items will be resolved in the Integrated Assessment.

Table 5-1

Review of Fracture Toughness Requirements
Dresden Nuclear Power Plant Unit 2

| <u>Structures, Systems, and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|---|---|-----------------------------------|----------------------------------|------------------------------------|----------------|
| <u>RECIRCULATION SYSTEM</u> | | | | | |
| Recirculation System Piping | Class A | Stainless Steel Type 304 | No | 8e | |
| Recirculation System Valves | Class A | Stainless Steel A351, Gr. CF8M | No | 8e | |
| Recirculation System Pumps | Class A | Stainless Steel Type 304, 316 | No | 8e | |
| <u>EMERGENCY SYSTEMS</u> | | | | | |
| <u>Isolation Condenser</u> | | | | | |
| Shell Side | Class C | Carbon Steel S.A. 106 | No | 8a | |
| Tube Side | Class B | Stainless Steel Type 304, 316 | No | 8e | |
| All Stainless Steel Piping, Valves, Fittings | Class B | Type 304 | No | 8e | |
| All Carbon Steel Piping, Valves, Fittings | Class B | A106, Gr. B | No | 8a | |

1. Refer to Tables A4-4 through A4-6 of Appendix A in Franklin Research Center report on Quality group classification of components and Systems for explanation of exemptions.

Table 5-1 (Cont.)

| <u>Structures, Systems, and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|---|---|-------------------------------|----------------------------------|------------------------------------|------------------------------|
| <u>Standby Liquid Control System</u> | | | | | |
| Pump Casing | Class B | Carbon Steel | No | 8d | |
| Tank | Class B | Stainless Steel Type 304 | No | 8e | |
| Piping and Casing | Class B | Stainless Steel Type 304 | No | 8d, e | |
| <u>Core Spray System</u> | | | | | |
| Pump Casing | Class B | Carbon Steel A216, Gr. WCB | Yes | | Thickness up to 13/16 in. |
| All Carbon Steel Piping, Fittings, Valves | Class B | A106, Gr. B | No | 8a | |
| All Stainless Steel Piping, Fittings, Valves | Class B | Type 304 | No | 8a,e | |

Table 5-1 (Cont.)

| <u>Structures, Systems and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|---|---|-------------------------------|----------------------------------|------------------------------------|-------------------------------|
| Spray Spargers and Spray Nozzles | Class B | Stainless Steel Type 304 | No | 8e | |
| <u>Low Pressure Coolant Injection/Containment Coolant Subsystem</u> | | | | | |
| Pump Casing | Class B | Carbon Steel A216, Gr. WCB | Yes | | Thickness up to 13/16 in |
| All Stainless Steel Piping, Fittings, Valves | Class B | Type 304 | No | 8e | |
| All Carbon Steel Piping Fittings, Valves | Class B | A106, Gr. B | No | 8a | |
| Heat Exchangers - Tube Side | Class B | 70/30 CuNi | No | 8f | |
| Shell Side | Class C | Carbon Steel S.A. 212 - B | Yes | | Portions Have 1" thickness |

Table 5-1 (Cont.)

| <u>Structures, Systems, and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|--|---|-----------------------------------|----------------------------------|------------------------------------|--|
| <u>High Pressure Coolant Injection</u> | | | | | |
| Pump Casing | Class B | ASTM A 217, Gr. B | Yes | | Thickness up to 1 1/2" |
| Piping, Fittings, and Valves | Class B | Carbon Steel A106, Gr. B | Yes | | Impact Test on all Piping with Nominal Pipe Diameter Greater Than 6" |
| Spargers (Feedwater Spargers Used) | Class B | Stainless Steel Type 304 | No | 8e | |
| <u>Standby Coolant Supply System (Condenser Hotwell to Service Water Line)</u> | | | | | |
| Pipings, Fittings, and Valves | Not Safety-Related | | | | Deleted |
| <u>STANDBY GAS TREATMENT SYSTEM</u> | | | | | |
| Pipings, Fittings, and Valves | Class B | Carbon Steel A211, A106, Gr. B | No | 8a | |
| <u>PRIMARY CONTAINMENT</u> | | | | | |
| Safety Valves | Class A | Carbon Steel | No | 8d | |
| Relief Valves | Class A | Carbon Steel | No | 8d | |

Table 5-1 (Cont.)

| <u>Structures, Systems, and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|--|---|--|----------------------------------|------------------------------------|----------------|
| <u>CONTAINMENT PENETRATIONS</u> | | | | | |
| Hydraulic Lines to the Control Rod Drives | Class B | Stainless Steel | No | 8d | |
| Valves | Class B | | No | 8d | |
| <u>CONTAINMENT ISOLATION VALVES NOT LISTED WITH MAJOR SYSTEM</u> | Class A | | No | 8d | |
| <u>CONTROL ROD DRIVE HOUSING</u> | Class A | | No | 8d | |
| <u>CONTROL ROD DRIVE SYSTEM</u> | | | | | |
| Velocity Limiter | Class B | Stainless Steel Casting | No | 8d | |
| Guide Tubes | Class B | Stainless Steel Type 304 | No | 8e | |
| <u>SPENT FUEL STORAGE FACILITIES</u> | | | | | |
| Spent Fuel Pool | Class C | Stainless Steel Lining-3/16 inch thick | No | 8a | |

Table 5-1 (Cont.)

| <u>Structures, Systems, and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|--|---|-----------------------------|----------------------------------|------------------------------------|----------------|
| <u>REACTOR VESSEL HEAD COOLING SYSTEM</u> | | | | | |
| Piping, Fittings, and Valves | Class C | Stainless Steel | No | 8d,e | |
| <u>CONDENSATE/FEEDWATER SYSTEM</u> | | | | | |
| Piping from Reactor Vessel to Outermost Containment Isolation Valve | Class A | Carbon Steel A106, Gr. B | Yes | | |

Table 5-1 (Cont.)

| <u>Structures, Systems, and Components</u> | <u>Quality Group Classification</u> | <u>Material</u> | <u>Impact Test Required?</u> | <u>Reason for Exemption(1)</u> | <u>Remarks</u> |
|--|---|-----------------------------|----------------------------------|------------------------------------|----------------|
| <u>MAIN STEAM SYSTEM</u> | | | | | |
| Piping, Valves, Fittings | Class A | Carbon Steel A155 | Yes | | |
| <u>CONDENSATE STORAGE TANK</u> | Class C | Aluminum | No | 8f | |
| <u>COMPRESSED AIR SYSTEM</u> | | | | | |
| Piping, Fittings, and Valves | Class D | | No | 8d | |
| <u>STANDBY DIESEL GENERATOR SYSTEM</u> | | | | | |
| Service Water Piping, Fittings, and Valves | Class C | Carbon Steel A106, Gr. B | No | 8a | |
| Fuel oil Piping, Fittings and Valves | Class C | Carbon Steel A53, Gr. B | No | 8a | |