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July 16, 1982

Paul O'Connor
Project Manager
Operating Reactors Branch No. 5
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden 2
SEP Topic: III-1, Quality Group Classification of Components and Systems

NRC Docket 50-237

Reference: NRC draft SER; P. O'Connor's letter to L. DelGeorge dated March 9, 1982.

Dear Mr. O'Connor:

Per the above referenced letter, additional information is provided to complete the draft safety evaluation report. Two general comments on the Franklin Research Center Report should be pointed out. First of all, the report incorrectly references the 1955 edition of ASA B31.1 on codes for pressure piping. The correct code of construction for Dresden 2 is the 1967 edition. Secondly, the Franklin Research Center Report included a number of pieces of equipment that are not considered to be safety-related according to the Dresden 2 safety classification and the ISI Program submitted to the NRC.

The following are responses to items requesting additional information:

Item 1 - Fracture Toughness - Table 5-1 of the Franklin Report identified those components which need a review of the fracture toughness requirements. The NRC requested missing information on Table 5-1 be provided. Attached is Table 5-1 with all required information completed.

Item 2 - Full Radiography Requirements - The NRC requested information on radiography requirements for various systems. Enclosed is Drawing M-59, Sheets 1 through 26, which document the type of testing which was required to be performed by the contractor.

Item 3 - Valves - As requested by the NRC, we have prepared Table 1, attached, which provides information on a sample basis, regarding the design of valves in order to evaluate if they meet current body shape and pressure-temperature rating requirements.

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Item 4 - Pumps - The reactor building closed cooling water system pumps are non-safety and will not be addressed.

Low Pressure Coolant Injection (LPCI) and Core Spray Pumps

Both pumps were built to the ASME boiler and pressure vessel code, Section 3 - Class C as listed in GE Specification Number 21A5735, dated September 13, 1966 for the LPCI pump and 21A5566, dated December 29, 1965 for the core spray pumps.

The ASME boiler and pressure vessel code, Section 3, 1965 edition classified pressure vessels as A, B, or C. Class A is equivalent to Class 1 of the current code. Class B is concerned with containment vessels, and Class C may currently be classified as Class 2 or Class 3 of the current code. The current systems of classification first appeared in the 1971 edition of Section 3.

The LPCI and core spray pumps for Drsden are Class 2 components, as described in Regulatory Guide 1.26 under Group B quality standards. The code of construction and current classification of the pumps were verified by GE.

Item 5 - Storage Tanks - The NRC requested confirmation that the atmospheric storage tanks meet current compressive stress requirements. These tanks were analyzed based on the methodology outlined in API-650 Code specifications. However, it was required to requalify these tanks per ASME Section III, Subsection ND for compliance. Requalification of these tanks and their components has shown that the critical stress levels are within the maximum allowable valves per ASME Code at the design temperaure of 150°F. The governing seismic, wind, snow, dead weight, and live loads with proper combinations was considered in this analysis.

The Standby Liquid Control Tank was designed and analyzed based on the methodology outlined in API-650 Code specifications. However, it was required to requalify the tank per ASME Section III, Subsection No for compliance. The requalification has indicated that the standby liquid control tank components, such as roof cover, vessel shell, base plate, roof ring, weldment and U-bolts do meet the ASME Code requirement. The analysis has also shown that the actual stresses in these components subjected to specified seismic excitations are well within the ASME Section III Code allowables at design temperature of 150°F.

Item 6 - Piping - The potential problems of temperature loading for a large number of cycles and for a medium range of cycles of piping systems should be assessed. A temperature drop from 100% power to 0% power of 11°F was given to the staff via a telephone call between the NRC and CECo. The ΔT was based on the difference between the saturation temperature at 100% power (1000 psig, normal operating), and the saturation temperature at the setpoint of the first bypass valve (920 psig). However the ΔT for a normal shutdown reduction to 0% power is 0°F as shown on attached General Electric Drawing No. 885D941.

The two examples of change in temperature due to a large number of cycles for the Palisades plant as stated in Franklin Research Center Report, Section 4.2, are inappropriate for Dresden. The concerns as stated in the Franklin Research Center Report are that piping systems designed in accordance with the past codes may be unconservative for services greater than 500 cycles over the life of the plant.

The Dresden reactor vessel was designed for the conditions, and number of cycles which could occur during the 40 year life, listed in FSAR Table 4.2.1:

REACTOR VESSEL DESIGNED CYCLES

Type of Cycle	Number of Cycles
Plant startup at 100°F/hr.	120
Plant shutdown at 100°F/hr.	120
Daily reduction to 75% power	10,000
Weekly reduction to 50% power	2,000
Control rod worth test	50,000
Loss of feedwater heaters	80
Loss of feedwater flow	80
Scram	200
Turbine trips	40
Vessel hydro test to 1560 psig	3
Vessel pressure test to 1250 psig	180
Improper start of shutdown recirculation loop	10

The reactor vessel was designed for a 40 year life. It will not be exposed to more than 10^{19} nvt of neutrons which energies exceeding 1 Mev. The Δt corresponding to the operations with a large number of cycles (reduction to 75% power, reduction to 50% power, and control rod worth test) is 0°F per General Electric drawing #885D941.

Item 7 - Codes and Standards - The design codes used by the NRC for their evaluation of the systems listed in their letter are correct. although ASME Section III refers to pressure vessels, similar procedures contained in this code can be applied directly to other pieces of equipment, such as pumps. These codes were verified by General Electric as those that were used and which apply to the various pieces of equipment listed.

Item 8 - Others - The NRC requested the code of construction be determined for the emergency system isolation condenser, main steam safety valves, standby liquid control tank, and the reactor building closed cooling water system pumps. The emergency system isolation condenser and the main steam safety valves were designed to ASME Section III, 1965, Class A. The standby liquid control tank was designed to API 650. The reactor building closed cooling water system pumps are non-safety related and need not be addressed.

Please addresd any questions you may have concerning this matter to this office.

One (1) signed original and forty (40) copies of this transmittal have been provided for your use.

Very truly yours,

Thomas J. Rausch

Thomas J. Rausch
Nuclear Licensing Administrator
Boiling Water Reactors

SPP/ji
2094D
cc: RIII Resident Inspector, Dresden
Gregg Cwalina, SEP Integrated Assessment Project Manager (w/attach.)

TABLE 1

SAMPLE COMPARISON OF VALVE PRESSURE/TEMP. DESIGN vs. CURRENT REQUIREMENTS

DRESDEN UNIT 2

Valve	Class	Valve No.	Size	Type	ASA Design Std.	Maximum Service		Material	Working Pressure at Max Service Temp. Required Per ANSI B16.34 (psig)
						Press(psig)	Temp(F)		
Reactor Vessel Drain	1	220-40	2"	Globe	900	1250	575	A182 Gr F316	1355
Core Spray Pump Bypass to Torus	2	1402-4	8"	Globe	300	350	350	A216 WCB	635
LPCI Pump Suction	2	1501-5	14"	Gate	150	150	200	A216 WCB	260
LPCI to Reactor	2	1501-26	16"	Gate	900	1250	575	A351 CF8M	1245 (@ 600^{o}F)
Cond. to Iso. Cond.	3	1301-10	4"	Gate	150	150	250	A216 WCB	230

Table 5-1

Review of Fracture Toughness Requirements
Dresden Nuclear Power Plant Unit 2

Structures, Systems, and Components	Quality Group Classification	Material	Impact Test Required?	Reason for Exemption(1)	Remarks
RECIRCULATION SYSTEM					
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	
EMERGENCY SYSTEMS					
Isolation Condenser					
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.)

Structures, Systems, and Components	Quality Group Classification	Material	Impact Test Required?	Reason for Exemption(1)	Remarks
Standby Liquid Control System					
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	
Core Spray System					
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.)

Structures, Systems and Components	Quality Group Classification	Material	Impact Test Required?	Reason for Exemption(1)	Remarks
Spray Spargers and Spray Nozzles	Class B	Stainless Steel Type 304	No	8e	
Low Pressure Coolant Injection/Containment Coolant Subsystem					
Pump Casing	Class B	Carbon Steel A216, Gr. WCB	Yes		Thickness up to 13/16 m
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.)

Structures, Systems, and Components	Quality Group Classification	Material	Impact Test Required?	Reason for Exemption(1)	Remarks
High Pressure Coolant Injection					
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	
Standby Coolant Supply System (Condenser Hotwell to Service Water Line)					
Pipings, Fittings, and Valves	Not Safety-Related				Deleted
STANDBY GAS TREATMENT SYSTEM					
Pipings, Fittings, and Valves	Class B	Carbon Steel A211, A106, Gr. B	No	8a	
PRIMARY CONTAINMENT					
Safety Valves	Class A	Carbon Steel	No	8d	
Relief Valves	Class A	Carbon Steel	No	8d	

Table 5-1 (Cont.)

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

Table 5-1 (Cont.)

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

Table 5-1 (Cont.)

Structures, Systems, and Components	Quality Group Classification	Material	Impact Test Required?	Reason for Exemption(1)	Remarks
MAIN STEAM SYSTEM					
Piping, Valves, Fittings	Class A	Carbon Steel A155	Yes		
CONDENSATE STORAGE TANK	Class C	Aluminum	No	8f	
COMPRESSED AIR SYSTEM					
Piping, Fittings, and Valves	Class D		No	8d	
STANDBY DIESEL GENERATOR SYSTEM					
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	