

MEB-CQ-201505 3.2.2 Responses

Issue #4

Chapter 3 of DCD Tier 2, Revision 0, discusses a seismic, quality group, and safety classification system. When comparing the systems, the applicant compares each to the safety classification system. For example, "All components in Safety Classes 1, 2, and 3 are seismic Category I." This convention complicates staff review, as NRC staff guidance in SRP 3.2.2 is based on the Quality Group classification system discussed in RG 1.26. This requires the staff to relate discussion involving safety classes to statements comparing safety classes and Quality Groups, which could lead to misinterpretation. For clarity, the applicant should compare classification systems to the Quality Group classification system rather than a non-NRC-endorsed methodology such as safety class.

Response

Table 3.2-1 provides the correlation of Safety Class to Quality Group for the APR1400 systems and components. KHNP will clarify the use of Quality Group E and G in the table with respect to seismic and safety classification to preclude potential misinterpretation of the classification of systems. Changes to Table 3.2-1 will be provided in an RAI response.

Issue #5

The definitions of Quality Groups A, B, C, and D do not appear consistent with the guidance of RG 1.26. For instance, Quality Group D is defined as non-safety-related systems that are not covered under Quality Group A, B, or C and that are designed to ASME B31.1. This definition does not take into account the other components listed in Table 1 of RG 1.26 such as pressure vessels designed to ASME Section VIII. Furthermore, the definition of Quality Group A does not clearly comply with the language in 10 CFR 50.55a, which states, in part, that components that are part of the reactor coolant pressure boundary must be Quality Group A unless failure of the component during normal reactor operation would not prevent the reactor to be shut down and cooled down in an orderly manner, assuming makeup is provided by the reactor coolant makeup system. The applicant discusses the "loss of enough reactor coolant to prevent orderly shutdown and cooldown," but this does not capture the full scope of the regulation. The applicant has stated that the quality groups are assigned in accordance with RG 1.26, but the text does not appear consistent. Please observe and incorporate the guidance into the definitions of quality groups, or justify why exception is taken to the RG.

Response

Construction codes and standards of the Quality Group D comply with Table 1 of RG 1.26. DCD 3.2.2, pages 3.2-8 and 3.2-9, states that "Quality Group D applies to non-safety related systems and components that are not covered under Quality Group A, B, or C and that are designed to ASME B31.1 Code criteria or other codes and standards listed in Table 1 of NRC RG 1.26."

KHNP will modify the definition of Quality Group in Subsection 3.2.2 to be consistent with RG 1.26, and markups will be provided via an RAI response.

Issue #6

During review of Quality Group G classifications in DCD Tier 2, Section 3.2.2, the staff noted that although Quality Group G was defined as “designed to codes other than ASME Section III,” ASME Section III CC-2001 with 2003 Addenda is listed as a Code and Standard for a Quality Group G SSCs in DCD Table 3.2-1. This does not appear consistent with the definition of Quality Group G indicated by the applicant in DCD Tier 2, Section 3.2.2. Please clarify the use of ASME Section III CC-2001 with 2003 Addenda as a Quality Group G Code. Additionally, please verify that this code for concrete containments is the correct code to apply to all referenced SSCs, such as the trisodium phosphate baskets (which are described in DCD Tier 2, Sections 6.1.1.2.1, 6.8.2.1.3, and 6.8.2.2.1 as stainless steel baskets).

Response

This issue will be reviewed along with Issue #5 and necessary changes will be provided in an RAI response.

Issue # 7

SRP Section 3.2.2, Table A-1 provides guidance for the classification of several systems. The applicant’s classification differs from several of these classifications. Please provide justification for these differences. Examples include:

- a. SRP Section 3.2.2 indicates that Combustible Gas Control Systems should be Quality Group B, but DCD Table 3.2-1 lists the containment hydrogen control system as Quality Group E (passive autocatalytic recombiners) and N/A (hydrogen ignitors).

Response

The combustible gas control system is Quality Group B in accordance with SRP Section 3.2.2. However, the passive autocatalytic recombiners (PARs) are not included in the components that are water- and steam-containing pressure vessels, heat exchangers (other than turbines and condensers), storage tanks, piping, pumps, and valves for combustible gas control defined in Quality Group B of RG 1.26 and the PARs are non-safety related fluid components which functions for beyond-design-basis combustible gas control in RG 1.7 Rev. 3. Therefore, the PARs are Quality Group E. The definition of Quality Group E is described in DCD Section 3.2.2.

Even though the hydrogen ignitors also perform the function of combustible gas control, they are not Quality Group B in accordance with RG 1.26 and they are not the fluid components. Therefore, the hydrogen ignitors are N/A.

- b. SRP Section 3.2.2 indicates that Emergency Diesel Systems should be Quality Group C, but DCD Tier 2, page 3.2-39 lists the starting air compressors, air dryer package, lube oil separator, lube oil/preheating water heat exchanger, HT water electric heater, preheating HT water pump, prelube oil pump and other non-safety-related equipment as Quality Group D.

Response

The diesel generator unit and related components to perform the safety-related function are Quality Group C. The related components which are not required to perform a safety related function are Quality Group D.

The starting air compressors, air dryer package, lube oil separator, lube oil/preheating water heat exchanger, HT water electric heater, preheating HT water pump, and prelube oil pump are not required for the EDGs to perform their safety related function.

The starting air compressors and air dryer package supply the dry compressed air to the starting air receiver which has the sufficient size to crank the engine five times without recharging the receiver. Therefore, the starting air compressors and air dryer package are not required to perform a safety related function.

MEB-CQ-201505 3.2.2 Responses

The lube oil separator separates the oil and oil vapor from oil vapor which is removed from engine. Therefore, the lube oil separator is not required to perform a safety related function.

In the standby mode, the prelube oil pump draws oil from the engine sump tank and delivers it through lube oil/preheating water heat exchanger. During engine operation, the prelube oil pump is shutdown. The lube oil/preheating water heat exchanger keeps the lubricating oil warm. Prelubrication of the engine with warm lubricating oil provides reasonable assurance of rapid, reliable starting and load capability. Therefore, lube oil/preheating water heat exchanger, HT water electric heater, preheating HT water pump, and prelube oil pump are not required to perform a safety related function.

- c. SRP Section 3.2.2 indicates that plant ventilation systems for areas such as the control room and ESF rooms should be Quality Group C, but DCD Tier 2, Table 3.2-1 cites Quality Groups G/E for control room HVAC (ASME AG-1-2009)

Response

DCD Section 3.2.2 describes that Quality Group C applies to ASME Section III components that are not in Quality Group A or B, and Quality Group G pertains to safety-related fluid systems and components that are designed to codes other than ASME Section III. This section also describes that Quality Group E pertains to non-safety related fluid systems and components that are designed to codes other than ASME B31.1 code criteria and codes and standards listed in NRC RG 1.26.

As stated in Table 3.2-1, the control room HVAC system AHU cooling coils are safety class 3 and ASME Section III components. According to the definition of system Quality Group, the AHU cooling coils are classified as Quality Group C.

Other control room HVAC system components (except the AHU cooling coils) are safety class 3 components that are designed to codes other than ASME Section III or non-safety related components that are designed to codes other ASME B31.1 code criteria and codes and standards listed in NRC RG 1.26. According to the definition of system Quality Group, the safety class 3 components that are designed to codes other than ASME Section III are classified to Quality Group G and the non-safety-related components that are designed to codes other ASME B31.1 code criteria and codes and standards listed in NRC RG 1.26 are classified to Quality Group E.

Issue #8

The classification of the turbine stop and bypass valves is unclear (may be addressed by the “main steam valve house” item in DCD Tier 2, Table 3.2-1). Per RG 1.26, they should be treated as Quality Group B.

Response

There is no classification for turbine stop and bypass valves in Table 3.2-1. The MSIVs and MSIV bypass valves are Quality Group B and the Turbine stop valves are located in TGB and are Quality Group D. Please clarify the need to include the turbine stop and bypass valves in the table.

Issue #9

The following list summarizes some inconsistencies or errors found in the review of DCD Tier 2, Section 14.3.3 and associated sections. These should be addressed, and the document should be checked for additional related issues.

- a. Reactor Coolant Gas Vent Valves V412, 413, 416, and 417 are identified as both Quality Group A and B on DCD Tier 2, page 3.2-71. These valves are also inconsistent with Tier 1 material (412 and 413 are listed instead of 410-413, and 416 and 417 are listed instead of 414-417).

Response

Vent isolation valves V412, 413, 416, and 417 are Quality Group A. DCD Table 3.2-1 will be updated to correct this error as shown in the attached MEB-CQ-201505 3.2.2 #9-a markup.

- b. DCD Tier 2, page 6.3-63 shows that SI-653 is Quality Group B, while page 3.2-74 shows it as Quality Group A.

Response

SI-653 is Quality Group A. DCD Figure 6.3.2-1 will be updated to correct this error as shown in the attached MEB-CQ-201505 3.2.2 #9-b markup.

- c. DCD Tier 2, page 3.2-23 indicates "(v) through vii) below" but has nothing below it.

Response

The notation "(v) through vii)" should be "(5) through 7)." DCD Table 3.2-1 will be updated as shown in the attached MEB-CQ-201505 3.2.2 #9-c markup.

APR1400 DCD TIER 2

Table 3.2-1 (56 of 86)

Item No. / Principal SSCs	Location ⁽²⁾	Safety Class	Quality Group	Codes and Standards	10 CFR 50, App. B ⁽³⁾	Seismic Category	Remarks
j. Core support structures	RCB	SC-3	C	ASME III- NG -2007 with 2008 addenda	Yes	I	(N-2)
k. Valves							
1) Pressurizer spray control valves	RCB	SC-1	A	ASME Sec. III NB-2007 with 2008 addenda	Yes	I	
2) Pressurizer spray isolation valves	RCB	SC-1	A	ASME Sec. III NB-2007 with 2008 addenda	Yes	I	
3) Downstream of flow restricting devices	RCB	SC-2	B	ASME Sec. III NC-2007 with 2008 addenda	Yes	I	
l. Discharge piping vacuum breaker	RCB	SC-3	C	ASME Sec. III ND-2007 with 2008 addenda	Yes	I	
m. RCP lube oil collection tank	RCB	NNS	D	ASME Sec. VIII-2007 with 2008 addenda	N/A	II	
80. RG – Reactor Coolant Gas Vent							
a. Pressurizer gas vent piping upstream of and including the vent isolation valves V410 through 413	RCB	SC-1	A	ASME Sec. III NB-2007 with 2008 addenda	Yes	I	
b. Reactor vessel upper head gas vent piping upstream of and including the vent isolation valves V414 through 417	RCB	SC-1	A	ASME Sec. III NB-2007 with 2008 addenda	Yes	I	
c. RCGVS gas vent piping to and including the vent isolation valves V412, 413, 416, 417 from downstream of the vent isolation valves V418, 419, 420	RCB	SC-2	B	ASME Sec. III NC-2007 with 2008 addenda	Yes	I	

from downstream of the vent isolation valves V412,413,416, and 417 to and including the vent isolation valves V418,419, and 420

APR1400 DCD TIER 2

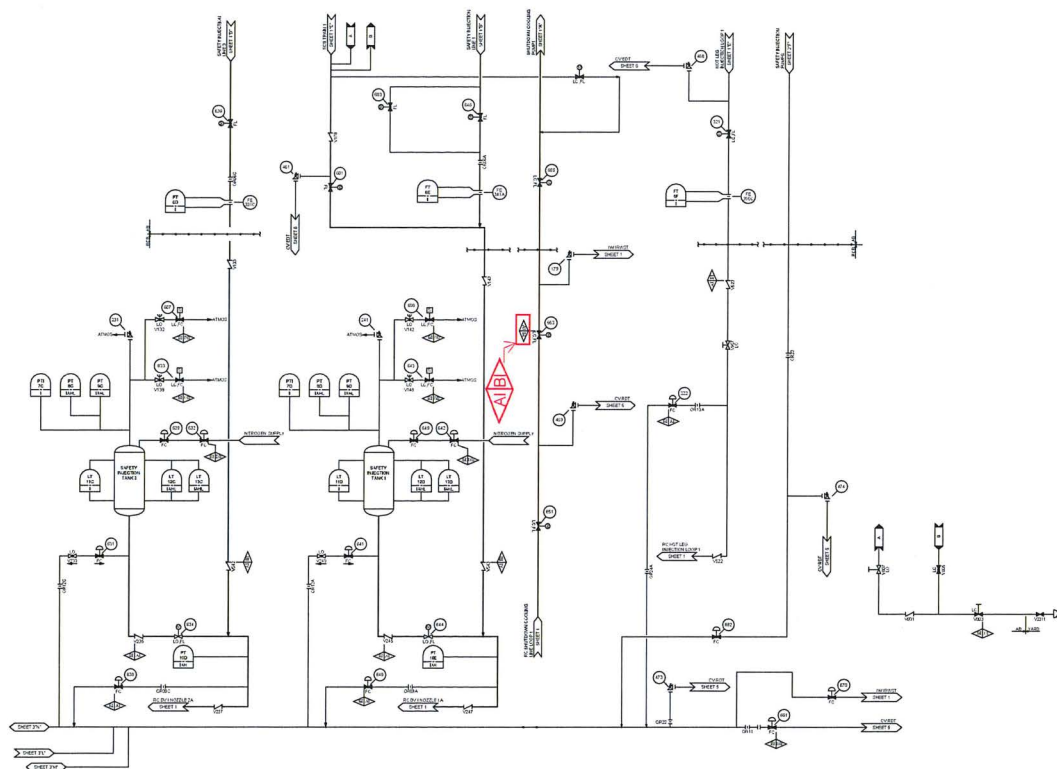


Figure 6.3.2-1 Safety Injection / Shutdown Cooling System Flow Diagram (4 of 4)

APR1400 DCD TIER 2

Table 3.2-1 (8 of 86)

Item No. / Principal SSCs	Location ⁽²⁾	Safety Class	Quality Group	Codes and Standards	10 CFR 50, App. B ⁽³⁾	Seismic Category	Remarks
4) Non-essential supply and return piping between the valve CC-145 and CC-147 in the division I excluding the following v) through vii) below:	AB	NNS	D	ASME B31.1-2010	A	II	(3)(d)
5) Containment penetration piping of letdown heat exchanger supply line between and including the valves CC-296, CC-297, and CC-1685 in the division I	RCB	SC-2	B	ASME Sec. III NC-2007 with 2008 addenda	Yes	I	
6) Containment penetration piping of letdown heat exchanger return line between and including the valve CC-301, CC-302, and CC-1686 in the division I	RCB	SC-2	B	ASME Sec. III NC-2007 with 2008 addenda	Yes	I	
7) Letdown heat exchanger supply and return piping between the valves, CC-297, CC-301, CC-1685, and CC-1686 in the division I	RCB	NNS	D	ASME B31.1-2010	A	II	(3)(d)
8) Non-essential supply and return piping between the valve CC-146 and CC-148 in the auxiliary building of the division II	AB	NNS	D	ASME B31.1-2010	A	II	(3)(d)

5) through 7)