



Applicability to the SRP

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Overview

Contents:

- Placement of CANDU specific items in SRP
- Example compliance summary table
- Conclusions



Proposed DCD Sections for CANDU Specific Items Previously Presented

- **Chapter 3**
 - **3.9.4 Control and Shutoff Rod Drive through RCS (not applicable)**
 - **3.9.5 Reactor Internals (very small scope)**
 - **3.9.7 Fuel Handling Systems (added)**
- **Chapter 5**
 - **5.3 Fueling machine pressure boundary (added)**
- **Chapter 6**
 - **Control and shutoff rod mechanisms (added)**
- **Chapter 7**
 - **Fuel Handling controls (added)**
- **Chapter 9**
 - **Fuel Handling and Fuel Transfer Systems (added)**
 - **Calandria and moderator (added)**



Preliminary RCPB Compliance Matrix

(example for discussion)

SRP Section	Specific Requirement	Pressure Tube	End Fitting	Fueling Machine	Feeder Tubes	
5.2.1.1	Compliance with the Codes and Standards Rule, 10 CFR 50.55a					
(a)	Meets the quality group and Code classification requirements of Regulatory Guide 1.26 "Quality Group Classification Standards for Water, Steam and Radioactive-waste-containing Components of Nuclear Power Plants."	X	X	X	X	
(b)	RCPB components meet the requirements of Section III of the ASME Code	5-1	5-1	X	X	



Preliminary RCPB Compliance Matrix

(example for discussion)

5.2.1.2	Applicable Code Cases					
(a)	Meets the requirements of regulatory guide 1.147 "Inservice Inspection Code Case Acceptability, ASME Section XI, Div 1"	5-2	X	X	5-2	



Preliminary RCPB Compliance Matrix

(example for discussion)

5.2.2	Overpressure Protection					
(a)	Meets NUREG 0737 item II.D.1 regarding testing to qualify reactor coolant system relief and safety valves under expected operating conditions for design basis transients and accidents.	X	X	X	X	
(b)	Meets NUREG 0737 item II.D.3 regarding the provision of direct indication of relief and safety valve position.	X	X	X	X	
(c)	Relief valves are designed with sufficient capacity to preclude actuation during normal operational transients.	X	X	X	X	
(d)	Safety valves are designed with sufficient capacity to limit pressure to 110% of design pressure during the most severe abnormal operational transient.	X	X	X	X	
(e)	A Low Temperature Overpressure Protection (LTOP) system is provided in accordance with BTP RSB 5-2.	NA	NA	NA	NA	No Rx Press Vessel



Preliminary RCPB Compliance Matrix

(example for discussion)

5.2.3	Reactor Coolant Pressure Boundary Materials					
(a)	Meets applicable sections of ASME Code and approved Code Cases	5-1	5-1	X	X	
(b)	Satisfies GDC-4 by meeting the requirements of RG 1.44 "Control of the Use of Sensitized Stainless Steel" Including controls to prevent stress corrosion cracking.	5-3	X	5-3	X	The stainless steel components satisfy RG 1.44. See note 5-3 for the other components.
(c)	Carbon steel components that are clad, are designed with conservative corrosion allowances for all exposed surfaces of carbon and low alloy steels as required by ASME Code, Section III NB3121.	NA	NA	NA	NA	No cladding on these components
(d)	Meets the fracture toughness requirements of 10CFR50 Appendix G	NA	NA	X	NA	Only the Fueling Machine is Ferritic material.
(e)	Meets the requirements of RG 1.50 regarding control of preheat temperature for welding of low alloy steel.	NA	NA	X	NA	Only the Fueling Machine is Ferritic material.



Preliminary RCPB Compliance Matrix

(example for discussion)

5.2.3	Reactor Coolant Pressure Boundary Materials					
(f)	Meets the acceptance criteria for electroslag welds as presented in RG 1.34	NA	NA	X	NA	Only the Fueling Machine is Ferritic material.
(g)	Meets the welder qualification guidelines of RG 1.71	NA	NA	X	NA	Only the Fueling Machine is Ferritic material.
(h)	Meets the requirements of RG 1.43 for control of stainless steel weld cladding	NA	NA	NA	NA	No cladding on these components
(i)	Meets the requirements for; water quality, controls for abrasive work, and controls for IGSCC as per RG 1.37	NA	X	NA	X	Only end fittings and feeder tubes are stainless steel.
(j)	Meets the insulation material compatibility requirements of RG 1.36	NA	X	NA	X	Pressure tube and FM are not austenitic.
(k)	Meets acceptance criteria for control of welding of austenitic stainless steel as per RG 1.31.	NA	X	NA	X	Pressure tube and FM are not austenitic.



Preliminary RCPB Compliance Matrix (example for discussion)

5.2.4	Reactor Coolant Pressure Boundary Inservice Inspection and Testing					
(a)	The reactor coolant system pressure boundary subject to inspection is established in accordance with the definition in 10CFR50.2	X	X	X	X	
(b)	The accessibility requirements of IWA-1500 of the ASME Code are met	5-4	5-4	X	5-4	
(c)	Examination methods and categories are in agreement with the criteria of IWB-2000 of the ASME Code	5-5	X	X	X	
(d)	Inspection intervals are defined as each 10 year interval of service. Intervals are also to be in accordance with IWA-2000 of the ASME Code	5-6	5-6	X	5-6	



Preliminary RCPB Compliance Matrix

(example for discussion)

5.2.4	Reactor Coolant Pressure Boundary Inservice Inspection and Testing					
(e)	Examination evaluations for flaws are in agreement with the standards of IWB-3000 of the ASME Code	5-7	X	X	X	
(f)	Proposed program for repair and replacement meets IWB-3000 and IWA-4000 of the ASME Code	5-8	X	X	X	
(g)	Meets standard in RG 1.150 for UT tests of reactor vessels	NA	NA	NA	NA	No Rx Press Vessel
(h)	System leakage and hydrostatic testing meets ASME Section XI IWB-5000	X	X	X	X	



Preliminary RCPB Compliance Matrix (example for discussion)

5.2.5	Reactor Coolant Pressure Boundary Leakage Detection					
(a)	The integrated design of the RCPB Leakage Detection Systems satisfies GDC-2 by meeting the requirements of RG 1.29 for seismic design	X	X	X	X	
(b)	The integrated design of the RCPB Leakage Detection Systems satisfies GDC-30 by meeting the requirements of RG 1.45	X	X	X	X	



Preliminary RCPB Compliance Matrix

(example for discussion)

5.3.1	Reactor Vessel Materials	NA	NA	NA	NA	No Rx Press Vessel. See detailed write-ups for pressure tube materials as it pertains to SRP 5.2.3.
5.3.2	Pressure -Temperature Limits and Pressurized Thermal Shock					
(a)	Meets the requirements of 10CFR50 Appendix G for Ferritic materials	NA	NA	X	NA	Only the FM is of Ferritic materials.
(b)	Meets the requirements of 10CFR50 Appendix H for the material surveillance program related to PWR reactor vessel beltline region materials.	NA	NA	NA	NA	No Rx Press Vessel. See detailed write-ups for pressure tube materials as it pertains to SRP 5.2.3.
5.3.3	Reactor Vessel Integrity	NA	NA	NA	NA	No Rx Press Vessel. See detailed write-ups for pressure tube materials as it pertains to SRP 5.2.3.



Preliminary RCPB Compliance Matrix

(example for discussion)

Note 5-1:

- **Criteria**
 - 10CFR50 Appendix A GDC 1
 - 10CFR50.55a Quality Standards
 - RG 1.26 Quality Groups
- **Pressure tube compliance**
 - Designed to ASME Section III NB-3200
 - Additional fabrication and material properties from CSA N285.6.1
 - Rolled joint designed to ASME Section III Subsection NB



Preliminary RCPB Compliance Matrix

(example for discussion)

Note 5-1 continued:

- **End fitting compliance**
 - **Designed to ASME Section III article NB-3200**
 - **Additional fabrication and material properties from CSA Standard N285.6.8**
- **Use of the CSA Standards along with ASME Codes ensures that the pressure tubes and end fittings are designed, fabricated and erected to the highest available national standards and that the quality standards are commensurate with the importance of the safety function to be performed**



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