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MFN 06-308
Supplement 7

Docket No. 52-010

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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 51 Related to ESBWR Design Certification Application –
System Classifications – RAI Number 3.2-48 S02**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the Reference 1 letter.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

James C. Kinsey
Project Manager, ESBWR Licensing

D068

References:

1. MFN 06-308, Letter from David Hinds to U.S. Nuclear Regulatory Commission, *Response to NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Numbers 3.2-1 through 3.2-62*, September 8, 2006
2. MFN 06-308, Supplement 1, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Number 3.2-19 S01*, March 22, 2007
3. MFN 06-308, Supplement 2, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – RWCU System – RAI Number 3.2-34 S01*, March 26, 2007
4. MFN 06-308, Supplement 3, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Classification of Structures, Systems and Components – RAI Numbers 3.2-3 S01 and 3.2-7 S01*, March 26, 2007
5. MFN 06-308, Supplement 4, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Turbine Main Steam System – RAI Number 3.2-1 S01*, March 30, 2007
6. MFN 06-308, Supplement 5, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Hydraulic Control Unit/Main Steam Piping – RAI Numbers 3.2-16 S01 and 3.2-21 S01*, April 18, 2007
7. MFN 06-308, Supplement 6, Letter from James C. Kinsey to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – Hydraulic Control Unit/Main Steam Piping – RAI Numbers 3.2-16 S01 and 3.2-21 S01*, May 2, 2007

Enclosure:

1. MFN 06-308, Supplement 7 – Response to Portion of NRC Request for Additional Information Letter No. 51 Related to ESBWR Design Certification Application – System Classifications – RAI Number 3.2-48 S02

cc: AE Cabbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
BE Brown GE/ Wilmington (with enclosures)
eDRF 00063-8276

Enclosure 1

MFN 06-308

Supplement 7

Response to Portion of NRC Request for

Additional Information Letter No. 51

Related to ESBWR Design Certification Application

System Classification

RAI Number 3.2-48 S02

NRC RAI 3.2-48

Table 3.2-1, Component T12: In Section 6.2.1.1.2 of the DCD, there are discussed containment vacuum breakers. Consistent with RGs 1.26 and 1.29 and SRPs 3.2.1 and 3.2.2, these components should be included in the Table as Quality Group B, Quality Assurance B, and Seismic Category I components. Please revise the Table accordingly.

GE Response

Comment accepted.

DCD, Tier 2, Table 3.2-1 will be revised by adding vacuum breakers and its instrumentation and vacuum breaker isolation valves as per the attached markup.

NRC RAI 3.2-48 S01

Email from Jim Gaslevic on 11/20/06

The response to RAI 3.2-48 clarified that DCD table 3.2-1 will be revised to include vacuum breakers. Due to this omission and other recent changes to table 3.2-1, it is not evident that table 3.2-1 has been thoroughly reviewed in comparison to design documents to assure that all components important to safety have been identified. To assure that the scope of items important to safety included in Table 3.2-1 is complete and consistent with the classification criteria contained in Section 3.2, it is requested that the applicant verify that a comprehensive review of P&IDs and other design documents has or will be performed to identify any missing items. It is also requested that the revision of the P&IDs and other design documents used for this review be identified so that the detailed version of the plant design applicable to the design certification is documented. This commitment may be linked to the resolution of item 3.2-7.

GE Response

GE has reviewed and made corrections to DCD Table 3.2-1 to assure that the system classifications are complete, consistent, and up-to-date. All safety-related systems are properly classified. DCD Table 3.2-1 is subject to change as the plant design progresses. The table below contains explanations for the DCD Table 3.2-1 changes.

Explanations for Table 3.2-1 Changes

System	Item(s)	Basis for Change
C62	1	Seismic II added for components that are mounted in close proximity to Seismic Category I components. A note has been added to clarify this item.
C62	2	Changed Seismic Category from NS to II because components are in close proximity to Seismic Category I components.
C72	--	System name changed for consistency with Chapter 7.
E50	5	Quality Group classification changed to "-" because components do not meet RG 1.26 requirements for being assigned a quality group classification (i.e., they do not contain steam or water and they do not retain pressure).
F11	1, 2	Original item was expanded into two separate items to stay consistent with Table 9.1-4.
F15	3	Item deleted. Refueling bellows transferred from F15 to T12. See RAI 16.2-77 for further details.
F21	--	Location changed from FB to RB for consistency with Table 9.1-4.
F32	--	Location changed from RB to FB for consistency with Table 9.1-4.
R10	3, 4, 5	Item names changed to be consistent with Chapter 8.
R51	--	Note added to clarify requirements for equipment mounting in safety-related areas.
T12	7	New item transferred here from System F15. See RAI 16.2-77 for further details.
T62	All	Editorial change. Replaced note with individual table entries.
U31	2	Changed from Seismic Category I to II because the crane is not responsible for any safety-related functions. However, its failure could affect safety-related systems, which qualifies it as Seismic Category II.
U43	5	Changed from Seismic Category II to I to withstand tornado loading and missiles. The fire pump enclosure protects the Seismic Category I diesel-driven fire pump and Seismic Category II motor-driven fire pump.
U43	7	Changed from Seismic Category NS to II because it is in the same enclosure as the Seismic I Category diesel-driven fire pump.

DCD Impact

DCD Tier #2, Revision 4, Table 3.2-1 will be revised as noted in the attached markup.

NRC RAI 3.2-48 S02

Email from Jim Gaslevic on 11/20/06

The response to RAI 3.2-48 clarified that DCD table 3.2-1 will be revised to include vacuum breakers. Due to this omission and other recent changes to table 3.2-1, it is not evident that table 3.2-1 has been thoroughly reviewed in comparison to design documents to assure that all components important to safety have been identified. To assure that the scope of items important to safety included in Table 3.2-1 is complete and consistent with the classification criteria contained in Section 3.2, it is requested that the applicant verify that a comprehensive review of P&IDs and other design documents has or will be performed to identify any missing items. It is also requested that the revision of the P&IDs and other design documents used for this review be identified so that the detailed version of the plant design applicable to the design certification is documented. This commitment may be linked to the resolution of item 3.2-7.

GE Amended Response

GE has reviewed and made corrections to DCD Table 3.2-1 to assure that the system classifications are complete, consistent, and up-to-date. All safety-related systems are properly classified. DCD Table 3.2-1 is subject to change as the plant design progresses. The table below contains explanations for the DCD Table 3.2-1 changes.

Subsequent to the submittal of GE's response to RAI 3.2-48 S01, it was decided in the response to RAI 16.2-77 that T10 (Containment System) was the most appropriate location for the refueling bellows. This supplement was written to amend the response to RAI 3.2-48 S01 to make it consistent with the final response to RAI 16.2-77. The location of the refueling bellows is the only change associated with this amended response.

Explanations for Table 3.2-1 Changes

System	Item(s)	Basis for Change
C62	1	Seismic II added for components that are mounted in close proximity to Seismic Category I components. A note has been added to clarify this item.
C62	2	Changed Seismic Category from NS to II because components are in close proximity to Seismic Category I components.
C72	--	System name changed for consistency with Chapter 7.
E50	5	Quality Group classification changed to "-" because components do not meet RG 1.26 requirements for being assigned a quality group classification (i.e., they do not contain steam or water and they do not retain pressure).
F11	1, 2	Original item was expanded into two separate items to stay consistent with Table 9.1-4.
F15	3	Item deleted. Refueling bellows transferred from F15 to T10. See RAI 16.2-77 for further details.
F21	--	Location changed from FB to RB for consistency with Table 9.1-4.
F32	--	Location changed from RB to FB for consistency with Table 9.1-4.
R10	3, 4, 5	Item names changed to be consistent with Chapter 8.
R51	--	Note added to clarify requirements for equipment mounting in safety-related areas.
T10	7	New item transferred here from System F15. See RAI 16.2-77 for further details.
T62	All	Editorial change. Replaced note with individual table entries.
U31	2	Changed from Seismic Category I to II because the crane is not responsible for any safety-related functions. However, its failure could affect safety-related systems, which qualifies it as Seismic Category II.
U43	5	Changed from Seismic Category II to I to withstand tornado loading and missiles. The fire pump enclosure protects the Seismic Category I diesel-driven fire pump and Seismic Category II motor-driven fire pump.
U43	7	Changed from Seismic Category NS to II because it is in the same enclosure as the Seismic I Category diesel-driven fire pump.

DCD Impact

DCD Tier #2 Table 3.2-1 will be revised as noted in the attached markup.

Table 3.2-1
Classification Summary

Principal Components¹		Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
B NUCLEAR STEAM SUPPLY SYSTEMS							
B11 Reactor Pressure Vessel System							
1.	Reactor pressure vessel	1	CV	A	B	I	
2.	Reactor vessel appurtenances – reactor coolant pressure boundary (RCPB) portions	1	CV	A	B	I	
3.	Control Rod Drive (CRD) housing and in-core housing	1	CV	A	B	I	
4.	Control rods	2	CV	—	B	I	
5.	Standby Liquid Control (SLC) system header and spargers	2	CV	—	B	I	
6.	Reactor vessel support and stabilizer	1	CV	A	B	I	
7.	Other safety-related reactor internals, including core support structures (Subsection 3.9.5)	3	CV	B	B	I	
8.	Reactor internals – Nonsafety-Related components (Subsection 3.9.5)	N	CV	—	E	II	
B21 Nuclear Boiler System (NBS)							
1.	Level instrumentation condensing chambers	1	CV	A	B	I	
2.	Safety relief valves (SRVs) and depressurization valves (DPVs)	1	CV	A	B	I	
3.	Safety relief discharge piping (including supports)	3	CV	C	B	I	
4.	Nitrogen accumulators (for ADS and manual actuation of SRVs)	3	CV	C	B	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
5. Piping and valves (including supports) for main steamlines (MSL) and feedwater (FW) lines up to and including the outermost containment isolation valves	1	CV, RB	A	B	I	
6. Piping (including supports) for MSL from outermost isolation valve to and including seismic interface restraint and FW from outermost isolation valve to and including the shutoff valve	2	RB	B	B	I	Seismic interface restraints are located inside the seismic category I building.
7. Deleted.						
8. Piping and valves (including supports) from FW shutoff valve to the seismic interface restraint	2	RB	B	B	I	
9. Pipe whip restraints	3	CV, RB	—	B	I or II	Pipe Whip Restraints —Pipe Whip Restraints are required on the Main Steam Line (MSL) and Feedwater (FW) piping.
10. Main steam drain piping and valves (including supports) within outermost containment isolation valves	1	CV, RB	A	B	I	(7)
11. RPV head vent piping and valves (including supports) to the main steam line and to the second isolation valve	1	CV	A	B	I	
12. Piping (including supports) for main steam drains beyond outermost MSL isolation valves up to and including second drain isolation valve	N	TB	B	B	II	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
13. Piping and valves (including supports) for main steam drains beyond outermost MSL isolation valves downstream of second drain isolation valve	N	TB	D	E	II	
14. Piping (including supports) for instrumentation up to and including first instrument isolation valve	2	CV, RB	B	B	I	(7)
15. Piping and valves (including supports) for instrumentation downstream of first instrument isolation valve	N	CV, RB	D	E	NS	(7)
16. Other mechanical modules with safety-related function	3	CV, RB, CB	—	B	I	
17. Other electrical modules, cable, and instrumentation with safety-related function	3	CV, RB, CB	—	B	I	
B32 Isolation Condenser System (ICS)						
1. Piping and valves (including supports) inside containment between reactor and the containment penetration	1	CV	A	B	I	
2. Isolation condenser and piping outside containment	2	RB	B	B	I	
3. Vent piping and valves (including supports) to suppression pool	2	CV, RB	B	B	I	
4. Electrical modules and cable with safety-related function	3	CV, RB	—	B	I	
5. Pneumatic accumulators	3	CV, RB	C	B	I	

Table 3.2-1
Classification Summary

Principal Components ¹	Safety Class. ²	Location ³	Quality Group ⁴	QA Req. ⁵	Seismic Category ⁶	Notes
C CONTROL AND INSTRUMENT SYSTEMS						
C11 Rod Control and Information System (RC&IS)	N	RB, CB	—	E	NS	
C12 Control Rod Drive System (CRD)						
1. CRD primary pressure boundary	1	CV	A	B	I	
2. CRD internals	3	CV	—	B	I	
3. Hydraulic control unit	2	RB	—	B	I	(8)
4. Piping including supports – insert line	2	CV, RB	B	B	I	
5. High pressure makeup piping including supports, the check valve, and the injection valve at the connection to RWCU/SDC	2	RB	B	B	I	CRD piping classification is consistent with piping to which it connects.
6. Piping and valves with no safety-related function (pump suction, pump discharge, drive header, and other piping not part of hydraulic control unit)	N	RB	D	E	II	(7)
7. CRD water pumps	N	RB	D	E	II	
8. Fine motion drive motor	N	CV	—	E	II	
9. Electrical modules and cable with safety-related function	3	CV, RB, CB	—	B	I	
10. ATWS equipment associated with the Alternate Rod Insert (ARI) functions	N	RB	—	E	II	Anticipated Transients Without Scram (ATWS) Equipment — A quality assurance program that meets or exceeds the guidance of NRC Generic Letter 85-06 is applied to all Nonsafety-Related ATWS equipment.

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
C21 Leak Detection and Isolation System (LD&IS)						
1. Electrical modules (temperature sensors, pressure transmitters, etc.) and cable with safety-related function	3	CV, RB, CB	—	B	I	
2. Other electrical modules and cable with no safety-related function	N	CV, RB, CB	—	E	NS	
C31 Feedwater Control System (FWCS)						
	N	CV, TB, RB, CB, EB	—	E	NS	
C41 Standby Liquid Control (SLC) System						
1. Standby liquid control accumulator including supports	2	RB	B	B	I	
2. Valves – injection	1	RB	A	B	I	
3. Piping and valves (including supports) between injection valves and reactor vessel	1	CV, RB	A	B	I	(7)
4. Piping and valves (including supports) upstream of injection valves and downstream of automatic N ₂ makeup valve	2	RB	B	B	I	(7)
5. N ₂ gas bottles and associated piping up to automatic N ₂ makeup valve	N	RB	—	E	NS	
6. Electrical modules and cable with safety-related function	3	RB, CB	—	B	I	

**Table 3.2-1
Classification Summary**

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
7. Electrical modules and cable – others	N	RB, CB	—	E	NS	Anticipated Transients Without Scram (ATWS) Equipment — A quality assurance program that meets or exceeds the guidance of NRC Generic Letter 85-06 is applied to all Nonsafety-Related ATWS equipment.
C51 Neutron Monitoring System (NMS)						
1. Detector and tube assembly – primary pressure boundary	2	CV	B	B	I	
2. Detector and tube assembly – internals	3	CV	C	B	I	
3. Electrical modules and cable – SRNM, LPRM, and APRM	3	CV, CB, RB	—	B	I	
C61 Remote Shutdown System (RSS)						
1. Safety-related panels	3	RB	—	B	I	
2. Nonsafety-Related panels	N	RB	—	E	II	
C62 NonSafety-Related DCIS						
1. Electrical modules and cable with no safety-related function	N	ALL	—	E	II/NS	Components located in close proximity to Seismic Category I components (e.g., in main control room) are required to be Seismic Category II. Otherwise the components are non-seismic.
2. Performance Monitoring and Control Subsystem (PMCS) equipment	N	CB	—	E	II	
C63 Safety-Related DCIS						
1. Electrical modules and cables with safety-related function	3	RB, CB	—	B	I	
C71 Reactor Protection System (RPS)						
	3	CB, TB, RB	—	B	I	

**Table 3.2-1
Classification Summary**

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
C72 Diverse Protection System	N	CB, RB	—	E	NS	
C74 Safety System Logic and Control (SSLC)	3	RB, CB	—	B	I	
C82 Plant Automation System	N	CB	—	E	NS	
C85 Steam Bypass and Pressure Control (SB&PC) System	N	CB	—	E	NS	
D RADIATION MONITORING SYSTEMS						
D11 Process Radiation Monitoring System (PRMS)						
1. Radiation monitors, sensors, and other electrical modules and cable with safety-related function	3	CV, RB, CB	—	B	I	
2. Fission product monitoring piping and valves (including supports) forming part of the containment boundary	2	CV, RB	B	B	I	
3. Fission product monitoring system (other portions)	N	CV, RB, CB	—	E	NS	
4. Other electrical modules and cable with no safety-related function	N	ALL	—	E	NS	
D21 Area Radiation Monitoring System (ARMS)	N	ALL, except CV	—	E	NS	
E CORE COOLING SYSTEMS						
E50 Gravity-Driven Cooling System (GDCCS)						
1. Piping and valves (including supports) connected with the reactor vessel, including the squib valves, and up to and including the check valves upstream of the squib valves	1	CV	A	B	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
2. Piping and valves (including supports) from the check valves upstream of the squib valves to the suppression pool and GDCS pools	2	CV	B	B	I	
3. Piping and valves (including supports) from the GDCS pools to the lower drywell	2	CV	B	B	I	
4. Safety-related electrical modules, components and cables	3	CV, RB, CB	—	B	I	
5. GDCS pool splash guard and perforated plate	3	CV	—	B	I	
6. Nonsafety-Related electrical modules, components and cable	N	CV, RB, CB	—	E	II	
F REACTOR SERVICING EQUIPMENT						
F11 Fuel Servicing Equipment						
1. Fuel Preparation Machine	N	FB	—	E	II	
2. All Other Equipment	N	FB, RB	—	E	NS	
F12 Miscellaneous Servicing Equipment						
F13 Reactor Pressure Vessel Servicing Equipment						
1. RPV head holding pedestal	N	RB	—	E	I	
2. All other RPV servicing equipment	N	RB	—	E	NS	
F14 RPV Internal Servicing Equipment						
F15 Refueling Equipment						
1. Fuel Handling Machine	N	FB	—	E	II	
2. Refueling Machine	N	RB	—	E	II	

**Table 3.2-1
Classification Summary**

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
3. (Deleted)						
F16 Fuel Storage Facility						
1. Fuel storage racks - new and spent	N	RB, FB	—	E	I	
F17 Under-RPV Servicing Equipment	N	CV	—	E	NS	
F21 CRD Maintenance Facility	N	RB	—	E	NS	
F32 Fuel Cask Cleaning Facility	N	FB	—	E	NS	
F41 Plant Startup and Test Equipment	N	CV	—	E	NS	
F42 Fuel Transfer System (FTS)						
1. Transfer tube assembly from interface with upper fuel pool, through building to lower spent fuel pool terminus equipment, including drain connection	N	RB, FB	D	E	I	
2. Remaining equipment	N	RB, FB	—	E	NS	
G DECAY HEAT REMOVAL NETWORK						
G21 Fuel and Auxiliary Pools Cooling System (FAPCS)						
1. Piping and valves including supports between containment isolation valves (including valves) for – Suppression pool return line – GDCS pool suction line – GDCS pool return line – Drywell spray discharge line	2	CV, RB	B	B	I	

**Table 3.2-1
Classification Summary**

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
2. Piping between inboard manual valve and second outboard containment isolation valve on suppression pool suction line, as well as the LPCI piping between the RWCU/SDC interface and the second isolation valve.	2	CV, RB	B	B	I	
3. Independent line (including piping, valves, and supports) for safety-related makeup to IC/PCC and spent fuel pools from piping connections at grade level in reactor yard area and to the fire protection system.	3	OO, RB, FB	C	B	I	
4. GDCS pool interconnecting pipes	3	CV	C	B	I	
5. Piping and components outside containment needed for fuel pool cooling, suppression pool cooling, LPCI and drywell spray modes of operation including skimmer lines and all components in the cooling and cleanup trains.	N	RB, FB	B	E	II	
6. Suppression pool suction line inside containment between inboard manual valve and its termination point (including suction strainers)	N	CV	C	E	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
7. Piping and valves inside containment between inboard containment isolation valves and their termination points inside containment for: – Suppression pool return line – Drywell spray discharge line	N	CV	C	E	I	
8. Piping and valves inside containment between inboard containment isolation valves and their termination points inside containment for: – GDCS pool suction line – GDCS pool return line	N	CV	D	E	II	
9. IC/PCC pools active cooling and cleanup subsystem piping, and components.	N	RB	D	E	II	
10. Auxiliary pools skimmer lines, and auxiliary pool return lines between isolation valves and terminus points.	N	RB	D	E	NS	
11. Instrument sensing lines for the following parameters – IC/PCC pool water level – Spent fuel pool level	3	RB	C	B	I	
12. Electrical modules and cables with safety-related function (containment isolation, LPCI isolation)	3	RB, CB, CV, FB	—	B	I	
13. Electrical modules and cables with Nonsafety-Related function	N	RB, CB, FB	—	E	II	

**Table 3.2-1
Classification Summary**

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
14. Control and instrumentation required for spent fuel pool cooling, suppression pool cooling and drywell spray modes of operation	N	RB, FB, CB	—	E	I	
15. All other controls and instrumentation	N	RB, FB, CB	—	E	II	
G31 Reactor Water Cleanup/Shutdown Cooling (RWCU/SDC) System						
1. Piping including supports and valves within and including outermost containment isolation valves on pump suction	1	CV, RB	A	B	I	(7)
2. Piping including supports and valves from feedwater lines to and including shutoff valves	2	RB	B	B	I	(7)
3. Vessels including supports (demineralizer)	N	RB	C	E	I	RWCU/SDC piping classification is consistent with piping to which it connects.
4. Regenerative heat exchangers (including supports) carrying reactor water	N	RB	C	E	I	
5. Cleanup recirculation pump, motors	N	RB	C	E	I	
6. Other piping including supports and valves between containment isolation valves and shutoff valves at feedwater line connections	N	RB	C	E	I	(7)
7. Nonregenerative heat exchanger tube side and piping (including supports and valves) carrying process water	N	RB	C	E	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
8. Nonregenerative heat exchanger shell and piping (including supports and valves) carrying cooling water	N	RB	D	E	I	
9. Sample station	N	RB	D	E	I	
10. Electrical modules and cable with safety-related function	3	RB, CB	—	B	I	
11. Electrical modules and cable with no safety-related function	N	RB, CB	—	E	II	
12. Overboard line piping outside reactor building	N	TB	C	E	II	
H CONTROL PANELS						
H11 Main Control Room Panels						
1. Panels, electrical modules, and cable with safety-related function	3	CB	—	B	I	Control Panels — Panels and associated structures that support or house safety-related mechanical or electrical components are safety-related.
2. Panels, electrical modules, and cable with no safety-related function	N	CB	—	E	II	
H12 MCR Back Room Panels						
1. Panels, electrical modules, and cable with safety-related function	3	CB	—	B	I	Control Panels — Panels and associated structures that support or house safety-related mechanical or electrical components are safety-related.
2. Panels, electrical modules, and cable with no safety-related function	N	CB	—	E	II	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
H14 Radwaste Control Room Panels	N	RW	—	E	NS	Radwaste Management Systems – A quality assurance program meeting the guidance of NRC Regulatory Guide 1.143 is applied to radioactive waste management systems during design and construction.
H21 Local Panels and Racks						
1. Panels, electrical modules, and cable with safety-related function	3	ALL	—	B	I	Control Panels – Panels and associated structures that support or house safety-related mechanical or electrical components are safety-related.
2. Panels, electrical modules, and cable with no safety-related function	N	ALL	—	E	NS	
J NUCLEAR FUEL						
J10 Core and Fuel Services	No physical items to be classified					
J11 Nuclear Fuel	3	CV, RB, FB	—	B	I	Nuclear fuel and channels are designed in accordance with NRC-approved methodology as described in chapters 4, 15 and Reference 15.0-2.
J12 Fuel Channel	3	CV, RB, FB	—	B	I	See note for J11.

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
K RADIOACTIVE WASTE MANAGEMENT SYSTEMS						
K10 Liquid Waste Management System (LWMS)						
1. Mechanical modules (including supports)	N	RB, RW	D (see note)	E	NS	Radwaste Management Systems – A quality assurance program meeting the guidance of Regulatory Guide 1.143, as applied to radioactive waste management systems, is described in Chapter 17. The radioactive Waste Management System components conform to Regulatory Guide 1.143 Table 1. For Radwaste processing systems, Regulatory Guide 1.143 Table 1 modifies Regulatory Guide 1.26 Table 1 Quality Group D. This modification is acceptable per Standard Review Plan 3.2.2 Appendix C Note (9). Applicable portions of Regulatory Guide 1.143 Table 1 are reprinted in Chapter 11 Table 11.2-1.
2. Electrical modules and cabling	N	RB, RW	(see note)	E	NS	Same as above.
K20 Solid Waste Management System (SWMS)						
1. Mechanical modules (including supports)	N	RB, RW	D (see note)	E	NS	See note for K10 item 1.
2. Electrical modules and cabling	N	RB, RW	(see note)	E	NS	See note for K10 item 1.
K30 Offgas System (OGS)						
	N	TB	D (see note)	E	NS	Offgas System – See note for K10 item 1.

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
N POWER CYCLE SYSTEMS						
N11 Turbine Main Steam System (TMSS)						
1. Turbine Main Steam System (TMSS) consists of the piping (including supports) for the MSL from the seismic interface restraint (or seismic guide) to the turbine stop valves, turbine bypass valves and the connecting branch lines up to and including their isolation valves.	N	TB	B	B	II	Main Steam Lines – TMSS lines are designed to ASME Section III Code, Class 2. TMSS piping is not code stamped and does not require ASME authorized inspection. Lines smaller than 63.5 mm (2.5 inches) are NS. Also see Figure 3.2-1.
2. Other mechanical and electrical modules	N	TB	D	E	NS	
N21 Condensate and Feedwater System (C&FS)						Feedwater lines from seismic isolation restraint to last feedwater heater are Quality Group B, Seismic Category II. See Figure 3.2-2.
1. Main feedwater line (FW) beyond seismic interface restraint	N	TB	D	E	NS	
N22 Heater Drain and Vent System (HDVS)	N	TB	—	E	NS	
N25 Condensate Purification System (CPS)	N	TB	D	E	NS	
N31 Main Turbine	N	TB	—	E	NS	
N32 Turbine Generator Control System (TGCS)	N	TB	D	E	NS	(9)
N33 Turbine Gland Seal System (TGSS)	N	TB	D	E	NS	
N34 Turbine Lubricating Oil System (TLOS)	N	TB	—	E	NS	
N35 Moisture Separator Reheater (MSR)	N	TB	—	E	NS	
N36 Extraction System	N	TB	—	E	NS	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
N37 Turbine Bypass System (TBS)	N	TB	D	E	II	TBS lines are designed to ASME Section III Code, Class 2. TBS piping is not code stamped and does not require ASME authorized inspection. Lines smaller than 63.5 mm (2.5 inches) are NS. Also see Figure 3.2-1.
N38 Turbine Hydraulics	N	TB	—	E	NS	
N39 Turbine Auxiliary Steam System (TASS)	N	TB	—	E	NS	
N41 Generator	N	TB	—	E	NS	
N42 Hydrogen Gas Control System (HGCS)	N	TB	—	E	NS	
N43 Stator Cooling Water System (SCWS)	N	TB	—	E	NS	
N44 Generator Lube and Seal Oil System (GLSOS)	N	TB	—	E	NS	
N45 Hydrogen and Carbon Dioxide Bulk Gas Storage System	N	OO	—	E	NS	
N51 Generator Excitation System (GES)	N	TB	—	E	NS	
N61 Main Condenser and Auxiliaries						See Figure 3.2-1.
1. Condenser anchorage	N	TB	—	E	NS	The condenser anchorage is seismically analyzed (see note) for SSE.
2. Condenser air removal system	N	TB	D	E	NS	
3. All other main condenser and auxiliaries components	N	TB	—	E	NS	
N71 Circulating Water System (CIRC)	N	TB, OO	D	E	NS	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
P STATION AUXILIARY SYSTEMS						
P10 Makeup Water System (MWS)						
1. Piping and valves (including supports) forming part of the containment boundary	2	CV, RB	B	B	I	
2. Piping and valves inside containment or inside Reactor Building	N	CV, RB	D	E	II	
3. Other mechanical and electrical modules	N	OO, RW, RB, CB, SF	D	E	NS	
P21 Reactor Component Cooling Water System (RCCWS)						
1. Piping and valves inside Reactor Building	N	RB	D	E	II	
2. Other mechanical and electrical modules	N	TB, RB	D	E	NS	
P22 Turbine Component Cooling Water System (TCCWS)						
	N	TB	D	E	NS	
P25 Chilled Water System (CWS)						
1. Piping and valves (including supports) forming part of the containment boundary	2	CV, RB	B	B	I	
2. Piping and valves inside containment and Reactor Building	N	CV, RB	D	E	II	
3. Other mechanical and electrical modules	N	TB, RB, CB, FB, EB, RW	D	E	NS	

**Table 3.2-1
Classification Summary**

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
P30 Condensate Storage and Transfer System (CS&TS)						
1. Mechanical modules, including piping and valves, in Reactor Building	N	RB	D	E	II	
2. Other mechanical modules, including piping, valves, and condensate storage tank	N	OO, RW, TB	D	E	NS	
3. Electrical modules and cable	N	RB	—	E	NS	
P32 Oxygen Injection System (OIS)						
	N	TB	—	E	NS	
P33 Process Sampling System (PSS)						
	N	RB, OO, TB, RW	D	E	NS	(7)
P41 Plant Service Water System (PSWS)						
1. Mechanical and electrical modules, including piping and valves (including supports)	N	SF, OO, RB	D	E	NS	
P51 Service Air System (SAS)						
1. Piping and valves (including supports) forming part of the containment boundary	2	CV, RB	B	B	I	
2. Other system components	N	ALL	D	E	NS	
P52 Instrument Air System (IAS)						
	N	ALL	D	E	NS	
P54 High Pressure Nitrogen Supply System (HPNSS)						
1. Piping and valves (including supports) forming part of the containment boundary	2	CV, RB	B	B	I	
2. Other Nonsafety-Related mechanical modules	N	RB	D	E	NS	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
3. Other Nonsafety-Related electrical modules	N	RB, CB	—	E	NS	
4. Nitrogen storage bottles	N	RB	—	E	NS	
P62 Auxiliary Boiler System (ABS)	N	OL	—	E	NS	
P63 Hot Water System (HWS)	N	ALL	—	E	NS	
P73 Hydrogen Water Chemistry System (HWCS)	N	TB	—	E	NS	The ESBWR Standard Plant design includes the capability to connect a Hydrogen Water Chemistry (HWC) System, but the system itself is not part of the ESBWR Standard Plant design.
P74 Zinc Injection System	N	TB	D	E	NS	The ESBWR Standard Plant design includes the capability to connect a Zinc Injection System, but the system itself is not part of the ESBWR Standard Plant design.
R STATION ELECTRICAL SYSTEMS						
R10 Electrical Power Distribution System (EPDS)						
1. Main transformers	N	OO	—	E	NS	
2. Main generators	N	TB	—	E	NS	
3. Reserve and unit auxiliary transformers	N	OO	—	E	NS	
4. Isolated phase bus duct	N	OO, TB	—	E	NS	
5. Non-segregated bus duct	N	OO, EB	—	E	NS	
6. Metal clad switchgear	N	RB, EB, TB, OL	—	E	NS	
7. Power centers	N	RB, EB, FB, TB, OL	—	E	NS	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
8. Motor control centers	N	RB, EB, FB, CB, TB, OL	—	E	NS	
9. Cable and supports with safety-related function	3	RB, FB, CB	—	B	I	
10. Other cable and supports with no safety function	N	CV, CB, RB, EB, TB, OL	—	E	NS	
R11 Medium Voltage Distribution System						
1. Medium voltage components required to protect containment from overpressure during a feedwater line break	3	TB	—	B	I	
2. Other medium voltage components	N	EB	—	E	NS	
R12 Low Voltage Distribution System						
	N	ALL	—	E	NS	
R13 Uninterruptible AC Power Supply						
1. Electrical modules and cable with safety-related function	3	CV, CB, RB	—	B	I	
2. Other electrical modules and cable with no safety function	N	CV, RB, CB, EB, TB, OL	—	E	NS	
R14 Instrumentation and Control Power Supply						
1. Electrical modules and cable with no safety function	N	EB, CV, CB, RB, TB	—	E	NS	
R15 Lighting and Servicing Power Supply						
1. Lighting	N	ALL	—	E	NS	
2. Emergency lighting in control room	3	CB	—	B	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
R16 Direct Current Power Supply						
1. Electrical modules and cable with safety-related function	3	RB, CV, CB, TB	—	B	I	
2. Other electrical modules and cable with no safety function	N	EB, CV, CB, RB, TB, OO	—	E	NS	
R21 Standby AC Power Supply						
	N	EB	—	E	NS	
R31 Raceway System						
1. Conduit, cable trays and supports with safety-related function	3	CV, CB, RB, FB, TB	—	B	I	
2. Other electrical modules with no safety function	N	CV, CB, RB, EB, TB, OL	—	E	NS	
3. Electrical penetrations	3	CV, RB	—	B	I	
R41 Plant Grounding System						
	3	OO	—	B	I	
R51 Communication System						
	N	ALL	—	E	NS	System components are mounted to Seismic Category II requirements in safety-related areas.
S POWER TRANSMISSION SYSTEMS						
S21 Switch Yard						
	N	OO	—	E	NS	
T CONTAINMENT AND ENVIRONMENTAL CONTROL SYSTEMS						
T10 Containment System						
1. Upper and lower drywell airlocks and equipment hatches, wetwell access hatch, and safety-related instrumentation	2	CV	B	B	I	
2. Wetwell/drywell vacuum breakers	2	CV	B	B	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
3. Vacuum Breaker "Closed" Proximity Instrumentation	3	CV	—	B	I	
4. Vacuum Breaker "Open" Proximity Instrumentation.	N	CV	—	E	II	
5. Vacuum Breaker Isolation Valves	2	CV	B	B	I	
6. Refueling bellows	N	CV	—	E	I	
T11 Containment Vessel						
1. Drywell head	2	CV	B	B	I	
2. Reinforced Concrete Containment Vessel (RCCV)	2	CV	B	B	I	
3. Reactor pedestal (Part of RCCV)	2	CV	B	B	I	
4. Portion of basemat under pedestal	2	CV	B	B	I	
T12 Containment Internal Structures						
1. Reactor vessel support brackets and stabilizer support	3	CV	—	B	I	
2. Support structures for safety-related piping, including supports and equipment	3	CV	—	B	I	
3. Reactor shield wall	3	CV	—	B	I	
4. Diaphragm floor	3	CV	—	B	I	
5. GDCS pools	3	CV	—	B	I	
6. Vent Wall	3	CV	—	B	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
T15 Passive Containment Cooling System (PCCS)	2	CV, RB	B	B	I	
T31 Containment Inerting System						
1. Piping and valves (including supports) forming part of the containment boundary	2	RB	B	B	I	
2. Electrical modules and cables with safety-related function	3	RB, CB	—	B	I	
3. Other mechanical modules (including nitrogen storage tanks, and vaporizers), piping, valves, and electrical modules and cables with no safety function	N	RB, OO	—	E	NS	
T41 Drywell Cooling System (DCS)	N	CV	—	E	II	
T62 Containment Monitoring System						
1. Mechanical components involved in containment isolation function	2	CV, RB	—	B	I	
2. Other safety-related portions of System	3	CV, RB, CB	—	B	I	
3. Nonsafety-Related portions of system	N	CV, RB, CB	—	E	NS	
T64 Environmental Monitoring System	N	OL	—	E	NS	
U STRUCTURES AND SERVICING SYSTEMS						
U31 Cranes, Hoists, and Elevators						
1. Reactor building cranes, fuel building crane	N	RB, FB	—	E	II	Cranes — The reactor building and fuel building cranes are designed to maintain their position and hold up their loads under conditions of an SSE.

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
2. Upper and lower drywell servicing hoists and cranes	N	CV	—	E	II	
3. Main steam tunnel servicing hoists and cranes	N	OL	—	E	II	
4. Special service rooms hoists and cranes	N	RB, TB, FB, RW	—	E	II or NS	Components must be seismic category II if they can potentially damage safety-related equipment.
5. Elevators	N	RB, TB, FB, CB, RW	—	E	NS	
U36 Electrical Building HVAC	N	EB	—	E	NS	
U37 Service Building HVAC	N	SB	—	E	NS	
U38 Radwaste Building HVAC	N	RW	—	E	NS	
U39 Turbine Building HVAC	N	TB	—	E	NS	
U40 Reactor Building HVAC						
1. Building isolation dampers	3	RB	—	B	I	
2. Controls associated with the isolation dampers	3	RB	—	B	I	
3. Other system components	N	RB	—	E	II	
U41 Other Building HVAC	N	OL	—	E	NS	
U42 Potable Water and Sanitary Waste System	N	CB, SB, EB, RB, OO	—	E	NS	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
U43 Fire Protection System (FPS)						
1. Non-seismic yard piping and valves including supports	N	OO, OL	D	E	NS	Fire Protection System — A quality assurance program meeting the guidance of NRC Branch Technical Position SPLB 9.5-1 (NUREG-0800) is applied to the protection system. Also, special seismic qualification requirements are applied.
2. Seismic category I piping and valves including supports (includes source of makeup water to IC/PCC and fuel pools)	N	OO, RB, CB, FB	D	E	I	Same as above.
3. Primary fire water storage tanks	N	OO	D	E	I	Same as above.
4. Secondary fire water storage	N	OO	D	E	NS	
5. Fire pump enclosure	N	OO	—	E	I	Same as above.
6. Primary nuclear island diesel-driven fire pump	N	OO	D	E	I	Same as above.
7. Primary nuclear island motor-driven fire pump	N	OO	D	E	II	Same as above.
8. Primary diesel fire pump fuel tank	N	OO	—	E	I	Same as above.
9. Other pumps and motors	N	OO	D	E	NS	Same as above.
10. Electrical modules and cables for RB preaction sprinklers	N	RB	—	E	NS	Same as above.
11. All other electrical modules and cables	N	ALL	—	E	NS	Same as above.
12. CO ₂ actuation modules	N	TB	—	E	NS	Same as above.
13. Sprinklers	N	RB, TB, RW, SB, EB, OL	D	E	NS	Same as above.
14. Foam, preaction or deluge	N	EB, TB, OO	—	E	NS	Same as above.

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
U44 Sanitary Waste Discharge System	N	CB, SB, EB, RB, OO	—	E	NS	
U50 Equipment and Floor Drain System						
1. Piping and valves forming part of the containment boundary	2	CV, RB	B	B	I	
2. Drain piping and valves, including supports, in Seismic Category I buildings	N	RB, FB	D	E	II	
3. Drain piping and valves, including supports, in other buildings	N	ALL except RB, FB	D	E	NS	
4. Other mechanical and electrical modules	N	ALL	—	E	NS	
U65 Other Building Structures	N	OO, OL	—	E	NS	
U66 Access Tunnel Structures	N	OL	—	E	II	
U67 Radwaste Tunnel	N	OL	—	E	NS	Structural acceptance and material criteria for the Radwaste tunnel are in accordance with RG 1.143, Safety Classification RW-IIa.
U71 Reactor Building Structure						
1. Main building	3	RB	—	B	I	
2. Stair towers and elevator shafts	N	RB	—	E	II	
U72 Turbine Building Structure	N	TB	—	E	II	
U73 Control Building Structure						
1. Main building	3	CB	—	B	I	
2. Stair towers and elevator shaft	N	CB	—	E	II	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
U74 Radwaste Building Structure	N	RW	—	E	NS	Radwaste Management Systems – A quality assurance program meeting the guidance of NRC Regulatory Guide 1.143, Category RW-IIa is applied to radioactive waste management systems during design and construction.
U75 Service Building Structure	N	SB	—	E	II	
U77 Control Building HVAC						
1. Ducts, valves, and dampers (including supports) supporting safety-related areas	3	CB	—	B	I	
2. Other ducts, valves and dampers (including supports)	N	CB	—	E	NS	
3. Electrical modules and cable with safety-related function	3	CB	—	B	I	
4. Main control room bottled air system	3	CB, OO	—	B	I	
5. Other Nonsafety-Related equipment	N	CB	—	E	NS	
U78 Cold Machine Shop	N	OO		E	NS	
U80 Electrical Building Structure	N	EB	—	E	NS	
U81 Seismic Monitoring System	N	ALL	—	E	NS	
U84 Service Water Building Structure	N	SF	—	E	NS	
U85 Service Water Building HVAC	N	SF	—	E	NS	
U91 Administration Building Structure	N	OL	—	E	NS	
U93 Training Center	N	OL	—	E	NS	
U95 Hot Machine Shop	N	OO	—	E	NS	
U97 Fuel Building Structure						
1. Main building	3	FB	—	B	I	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
2. HVAC penthouse, stair towers and elevator shaft	N	FB	—	E	II	
U98 Fuel Building HVAC						
1. Building isolation dampers	3	FB	—	B	I	
2. Ducting penetrating fuel building boundary	3	FB	—	B	I	
3. Controls associated with the isolation dampers	3	FB	—	B	I	
4. Other system components	N	FB	—	E	II	
U99 Stack	N	OO	—	E	NS	
W INTAKE STRUCTURE AND SERVICING EQUIPMENT						
W12 Intake and Discharge Structures	N	OO	—	E	NS	
W24 Cooling Tower	N	OO	—	E	NS	
W32 Screen Cleaning Facility	N	OO	—	E	NS	
W33 Screens, Racks, and Rakes	N	OO	—	E	NS	
W41 Intake Structure Power Supply	N	OO	—	E	NS	
Y YARD STRUCTURES AND EQUIPMENT						
Y12 Roads and Walkways	N	OO	—	E	NS	
Y21 Tanks and Equipment Pads	N	OO	—	E	NS	Some tanks in the yard area belong to other systems (e.g., fire water storage tank in U43) and have different classifications.
Y41 Station Water System	N	OO	—	E	NS	
Y46 Cathodic Protection System	N	OO	—	E	NS	
Y47 Meteorological Observation System	N	OO	—	E	NS	
Y51 Yard Miscellaneous Drain System	N	OO	—	E	NS	

Table 3.2-1
Classification Summary

Principal Components¹	Safety Class.²	Location³	Quality Group⁴	QA Req.⁵	Seismic Category⁶	Notes
Y52 Oil Storage and Transfer System	N	OO	—	E	NS	
Y53 Chemical Storage and Transfer System	N	OO	—	E	NS	
Y71 Piping Duct	N	OL	—	E	NS	Typical classifications for piping ducts in the yard area. Classification of individual piping ducts shall match the classification of the pipe they carry.
Y72 Cable Duct	N	OL	—	E	NS	Typical classifications for cable ducts in the yard area. Classification of individual cable ducts shall match the classification of the cables they carry.
Y86 Site Security	N	ALL	—	E	NS	

Notes:

- (1) Principal components: A module is an assembly of interconnected components that constitute an identifiable device or piece of equipment. For example, electrical modules include sensors, power supplies, and signal processors; and mechanical modules include turbines, strainers, and orifices.
- (2) Safety Class: 1, 2, 3 or N are designations for safety-related or Nonsafety-Related as discussed in Subsection 3.2.3.
- (3) Location codes:

ALL = All locations	RW = Radwaste Building
CV = Containment Vessel	CP = Circulating Water Pump House
CB = Control Building	SF = Service Water Building
RB = Reactor Building	TB = Turbine Building
OO = Outdoors Onsite	EB = Electrical Building
OL = Any Other Location	SB = Services Building
FB = Fuel Building	

- (4) Quality group classifications: A, B, C, or D are quality groups defined in Regulatory Guide 1.26, as discussed in Subsection 3.2.2. The principal components are classified, designed, and constructed in accordance with the requirements identified in Tables 3.2-2 and 3.2-3. The designation “—” indicates that the quality groups A through D are not applicable to the associated principal component.
- (5) Quality assurance requirements: The designation “B” indicates that the quality assurance requirements of 10 CFR 50, Appendix B, are applied in accordance with the quality assurance program described in Chapter 17. The designation “E” indicates that quality assurance requirements are applied, commensurate with the importance of the item's function.
- (6) Seismic category: The designations “I” or “II” indicate that the design requirements of Seismic Category I or II structures and equipment are applied as described in Subsection 3.2.1 and Section 3.7, Seismic Design. Structures and equipment that are not designated “I” or “II” are designated “NS.”
- (7) Small Piping and Instrument Lines — Lines 25 mm (one inch) and smaller in diameter that are part of the reactor coolant pressure boundary are QGB and meet the requirements of the ASME B&PV Code, Section III, Class 2 and Seismic Category I, with the exceptions noted below:

Instrument lines that are connected to the reactor coolant pressure boundary and are used to actuate or monitor safety-related systems are QGB from the outer isolation valve or the process shutoff valve (root valve) to the sensing instrumentation. Instrument lines that are connected to the reactor coolant pressure boundary and are not used to actuate and monitor safety-related systems are Nonsafety-Related and Quality Group D from the outer isolation valve or the process shutoff valve (root valve) to the sensing instrumentation. Other instrument lines meet the following requirements:

- Through the root valve: the lines are the same classification as the system to which they are attached.
- Beyond the root valve, if used to actuate a safety-related system: the lines are the same classification as the system to which they are attached.
- Beyond the root valve, if not used to actuate a safety-related system: the lines may be Quality Group D.

Sample lines from the outer isolation valve or the process root valve through the remainder of the sampling system may be Quality Group D.

Safety-related instrument lines comply with the guidance of NRC Regulatory Guide 1.151.

- (8) Hydraulic Control Unit for Control Rod Drive System — The hydraulic control unit (HCU) is a factory-assembled, engineered module of valves, tubing, piping, and stored water that controls two control rod drives by the application of pressure and flow to accomplish rapid insertion for reactor scram.

Although the HCU is field installed as a unit and connected to process piping, many of its internal parts differ markedly from process piping and components because of the more complex functions of the HCU. Thus, although the codes and standards invoked by the different quality groups (A, B, C and D) apply to the interfaces between the HCU and its connections to conventional piping components (e.g., pipe

nipples, fittings, hand valves, etc.), they are not considered applicable to the specialty parts (e.g., solenoid valves, pneumatic components, and instruments).

However, the design and construction specifications for the HCU do invoke such codes and standards as can be reasonably applied to individual parts in developing required quality levels. For example: (1) all welds are inspected using liquid penetrant, (2) all socket welds are inspected for gaps between the pipe and socket bottom, (3) all welding is performed by qualified welders, and (4) all work is performed in accordance with written procedures. Quality Group D is generally applicable because the codes and standards invoked by that group permit the use of manufacturer's standards and proven design techniques that are not explicitly defined within the codes for Quality Groups A, B or C. This is supplemented by appropriate quality control (QC) techniques.

- (9) Turbine Control System — The turbine stop valve is designed to withstand the SSE and maintain its pressure-retaining integrity.

All cast pressure-retaining parts of a size and configuration for which volumetric methods are effective are examined by radiographic methods by qualified personnel. Ultrasonic examination to equivalent standards is used as an alternative to radiographic methods. Examination procedures and acceptance standards are at least equivalent to those defined in Paragraph 136.4, Nonboiler External Piping, ASME B31.1.

The following qualifications are met with respect to the certification requirements:

- a. The manufacturer of the turbine stop valves, turbine control valves, turbine bypass valves, and main steam lines from turbine control valve to turbine casing uses quality control procedures at least equivalent to those defined in GE Publication GEZ-4982A, General Electric Large Steam Turbine Generator Quality Control Program.
- b. A certification obtained from the manufacturer of these valves and steam lines demonstrates that the quality control program as defined has been accomplished.

The following requirements are applied in addition to the Quality Group D requirements:

- a. All longitudinal and circumferential butt weld joints are radiographed (or ultrasonically tested to equivalent standards). Where size or configuration does not permit effective volumetric examination, magnetic particle or liquid penetrant examination may be substituted. Examination procedures and acceptance standards are at least equivalent to those specified as supplementary types of examinations, Paragraph 136.4 in ASME B31.1.
- b. All fillet and socket welds, and all structural attachment welds to pressure-retaining materials are examined by either magnetic particle or liquid penetrant methods. Examination procedures and acceptance standards are at least equivalent to those specified as supplementary types of examinations, Paragraph 136.4 in ASME B31.1.
- c. All inspection records are maintained for the life of the plant. These records include data pertaining to qualification of inspection personnel, examination procedures, and examination results.