

6.6 Preservice and Inservice Inspection and Testing of Class 2 and 3 Components and Piping

This subsection describes the preservice and inservice inspection and system pressure test programs for Quality Groups B and C (i.e., ASME Code Class 2 and 3 items^{*}, respectively). It describes those programs implementing the requirements of ASME B&PV Code Section XI, Subsections IWC and IWD. The requirements for subsequent inservice inspection intervals are addressed in Subsection 6.6.4.

The development of the preservice and inservice inspection program plans will be the responsibility of the COL applicant and will be based on ASME Code Section XI, Edition and Addenda specified in accordance with 10CFR50, Section 50.55a. Designing components for preservice and inservice inspection is the responsibility of the COL applicant. The COL applicant will be responsible for specifying the Edition of ASME Code Section XI to be used, based on the procurement date of the component per 10CFR50, Section 50.55a. The ASME Code requirements discussed in this section are provided for information and are based on the 1989 Edition of the ASME Section XI. See Subsection 6.6.9.1 for COL license information requirements.

6.6.1 Class 2 and 3 System Boundaries

The Class 2 and 3 system boundaries for both preservice and inservice inspection programs and the system pressure test program include applicable items within Boundary 3 and Boundary 4 on the piping and instrumentation drawings (P&IDs). Those system boundaries include all or part of the following:

- (1) Main steam System
- (2) Feedwater System
- (3) Reactor Core Isolation Cooling System
- (4) High Pressure Core Flooder System
- (5) Standby Liquid Control System
- (6) Residual Heat Removal System
- (7) Reactor Water Cleanup System
- (8) Control Rod Drive System
- (9) Not Used

* Items as used in this Section are products constructed under a Certificate of Authorization (NCA-3120) and material (NCA-1220). See Section III, NCA-1000, footnote 2.

- (10) Purified makeup water system
- (11) Atmospheric Control System
- (12) Not Used
- (13) HVAC normal cooling water system
- (14) Not Used
- (15) Not Used
- (16) Not Used
- (17) Reactor Building Cooling Water System
- (18) Not Used
- (19) Fuel Pool Cooling and cleanup System
- (20) Reactor Service Water System

6.6.1.1 Class 2 System Boundary Description

Those portions of the systems listed in Subsection 6.6.1 within the Class 2 boundary, based on Regulatory Guide 1.26, for Quality Group B, are as follows:

- (1) Portions of the reactor coolant pressure boundary (RCPB) as defined in Subsection 5.2.4.1.1, but which are excluded from the Class 1 boundary pursuant to Subsection 5.2.4.1.2.
- (2) Systems or portions of systems important to safety that are designed for reactor shutdown or residual heat removal.
- (3) Portions of the steam systems extending from the outermost containment isolation valve up to but not including the turbine stop and bypass valves and connected piping up to and including the first valve that is either normally closed or capable of automatic closure during all modes of normal reactor operation.
- (4) Systems or portions of systems that are connected to the RCPB and are not capable of being isolated from the boundary during all modes of normal reactor operation by two valves, each of which is normally closed or capable of automatic closure.
- (5) Systems or portions of systems important to safety that are designed for (1) emergency core cooling, (2) post-accident containment heat removal, or (3) post-accident fission product removal.

Items (1) through (5) above describe the Class 2 boundary only and are not related to exemptions from inservice examinations under ASME Code Section XI rules. The Class 2 components exempt from inservice examinations are described in ASME Code Section XI, Subsection IWC-1220.

6.6.1.2 Class 3 System Boundary Description

Those portions of the systems listed in Subsection 6.6.1 within the Class 3 boundary, based on Regulatory Guide 1.26, for Quality Group C, are not part of the RCPB but are as follows:

- (1) Cooling water systems or portions of cooling water systems important to safety that are designed for emergency core cooling, post-accident containment heat removal, post-accident containment atmosphere cleanup, or residual heat removal from the reactor and from the spent fuel storage pool (including primary and secondary cooling systems). Portions of these systems that are required for their safety functions and that do not operate during any mode of normal operation and cannot be tested adequately, however, are included in Class 2.
- (2) Cooling water and seal water systems or portions of these systems important to safety that are designed for functioning of components and systems important to safety.
- (3) Systems or portions of systems that are connected to the RCPB and are capable of being isolated from that boundary during all modes of normal reactor operation by two valves, each of which is normally closed or capable of automatic closure.
- (4) Systems other than radioactive waste management systems, not covered by items (1), (2) and (3) above, that contain or may contain radioactive material and whose postulated failure would result in conservatively calculated potential offsite doses (Regulatory Guides 1.3 and 1.4), that exceed 0.5 rem to the whole body or its equivalent to any part of the body.

Items (1) through (4) above describe the Class 3 boundary only and are not exemptions from inservice examinations under ASME Code Section XI rules. The Class 3 components exempt from inservice examinations are described in ASME Code Section XI, IWD-1220.

6.6.2 Accessibility

All items within the Class 2 and 3 boundaries are designed to provide access for the examinations required by IWC-2500 and IWD-2500. Responsibility for designing components for accessibility for preservice and inservice inspection is the responsibility of the COL applicant. See Subsection 6.6.9.2 for COL license information requirements.

6.6.2.1 Class 2 RHR Heat Exchangers

The physical arrangement of the residual heat removal (RHR) heat exchangers shall be conducive to the performance of the required ultrasonic and surface examinations. The

inservice inspection program for the RHR heat exchanger is the responsibility of the COL applicant, and any inservice inspection program relief request will be reviewed by the NRC staff based on the Code Edition and Addenda in effect and inservice inspection techniques available at the time of COL application. Removable thermal insulation is provided for those welds and nozzles selected for frequent examination during the inservice inspection. Platforms and ladders are provided as necessary to facilitate examination.

6.6.2.2 Class 2 Piping, Pumps Valves and Supports

Physical arrangement of piping pumps and valves provide personnel access to each weld location for performance of ultrasonic and surface (magnetic particle or liquid penetrant) examinations and sufficient access to supports for performance of visual, VT-3, examination. Working platforms are provided in some areas to facilitate servicing of pumps and valves. Removable thermal insulation is provided on welds and components which require frequent access for examination or are located in high radiation areas. Welds are located to permit ultrasonic examination from at least one side, but where component geometries permit, access from both sides is provided.

Restrictions: For piping systems and portions of piping systems subject to volumetric examination, the following piping designs are generally not used:

- (1) Valve to valve
- (2) Valve to reducer
- (3) Valve to tee
- (4) Elbow to elbow
- (5) Elbow to tee
- (6) Nozzle to elbow
- (7) Reducer to elbow
- (8) Tee to tee
- (9) Pump to valve

Straight sections of pipe and spool pieces shall be added between fittings. The minimum length of the spool piece has been determined by using the formula $L = 2T + 15.24$ cm, where L equals the length of the spool piece (not including weld preparation) and T equals the pipe wall thickness (cm). Where less than the minimum straight length is used, an evaluation is performed to demonstrate that sufficient access exists to perform the required examinations.

6.6.3 Examination Categories and Methods

6.6.3.1 Examination Categories

The examination category of each item is listed in Table 6.6-1, which is provided as an example for the preparation of preservice and inservice program plans. The items are listed by system and line number, where applicable. Table 6.6-1 also states the method of examination for each item.

For preservice examination, all of the items selected for inservice examination shall be performed once in accordance with ASME Section XI, IWC-2200 and IWD-2200, with the exception of the examinations specifically excluded by ASME Section XI from preservice requirements, such as the visual VT-2 examinations for Category C-H, D-A, D-B and D-C.

6.6.3.2 Examination Methods

6.6.3.2.1 Visual Examination

Visual examination methods (VT-2 and VT-3), shall be conducted in accordance with ASME Section XI, IWA-2210. In addition, VT-2 examinations shall also meet the requirements of IWA-5240.

At locations where leakages are normally expected and leakage collection systems are located (e.g., valve stems and pump seals), the visual (VT-2) examination shall verify that the leakage collection system is operative.

Piping runs shall be clearly identified and laid out such that insulation damage, leaks and structural distress will be evident to a trained visual examiner.

6.6.3.2.2 Surface Examination

Magnetic Particle and Liquid Penetrant examination techniques shall be performed in accordance with ASME Section XI, IWA-2221 and IWA-2222, respectively. For direct examination access for magnetic particle (MT) and penetrant (PT) examination, a clearance (of at least 60.96 cm of clear space) is provided, where feasible, for the head and shoulders of a man within a working arm's length (50.8 cm) of the surface to be examined. In addition, access shall be provided as necessary to enable physical contact with the item as necessary to perform the examination. Remote MT and PT generally are not appropriate as a standard examination process; however, borescopes and mirrors can be used at close range to improve the angle of vision. As a minimum, insulation removal shall expose the area of each weld plus at least 15.24 cm from the toe of the weld on each side. Insulation will generally be removed 40.64 cm on each side of the weld.

6.6.3.2.3 Volumetric Ultrasonic Examination

Volumetric ultrasonic examination shall be performed in accordance with ASME Section XI, IWA-2232. In order to perform the examination, visual access to place the head and shoulder

within 50.8 cm of the area of interest shall be provided where feasible. A distance of 22.86 cm between adjacent pipes is sufficient spacing if there is free access on each side of the pipes. The transducer dimension has been considered: a 3.81 cm diameter cylinder, 7.62 cm long, placed with the access at a right angle to the surface to be examined. The ultrasonic examination instrument has been considered as a rectangular box 30.48 x 30.48 x 50.8 cm located within 12.2 m from the transducer. Space for a second examiner to monitor the instrument shall be provided, if necessary.

Insulation removal for inspection is to allow sufficient room for the ultrasonic transducer to scan the examination area. A distance of $2T$ plus 15.24 cm, where T is the pipe thickness, is the minimum required on each side of the examination area. The insulation design generally leaves 40.64 cm on each side of the weld, which exceeds minimum requirements.

6.6.3.2.4 Alternative Examination Techniques

As provided by ASME Section XI, IWA-2240, alternative examination methods, a combination of methods, or newly developed techniques may be substituted for the methods specified for a given item in this section, provided that they are demonstrated to be equivalent or superior to the specified method. This provision allows for the use of newly developed examination methods, techniques, etc., which may result in improvements in examination reliability and reductions in personnel exposure.

6.6.3.2.5 Data Recording

Manual data recording will be performed where manual ultrasonic examinations are performed. If automated systems are used, electronic data recording and comparison analyses are to be employed with automated ultrasonic examination equipment. Signals from each ultrasonic transducer would be fed into a data acquisition system in which the key parameters of any reflectors will be recorded. The data to be recorded for manual and automated methods are:

- (1) Location
- (2) Position
- (3) Depth below the scanning surface
- (4) Length of the reflector
- (5) Transducer data including angle and frequency
- (6) Calibration data

The data so recorded shall be compared with the results of subsequent examinations to determine the behavior of the reflector.

6.6.3.2.6 Qualification of Personnel and Examination Systems for Ultrasonic Examination

Personnel performing examinations shall be qualified in accordance with ASME Section XI, Appendix VII. Ultrasonic examination systems shall be qualified in accordance with an industry accepted program for implementation of ASME Section XI, Appendix VIII.

6.6.4 Inspection Intervals

6.6.4.1 Class 2 Systems

The inservice inspection intervals for Class 2 systems will conform to Inspection Program B as described in ASME Code Section XI, IWC-2412. Except where deferral is permitted by Table IWC-2500-1, the percentages of examinations completed within each period of the interval shall correspond to Table IWC-2412-1. An example of the selection of Code Class 2 items and examinations to be conducted within the 10-year intervals are described in Table 6.6-1.

6.6.4.2 Class 3 Systems

The inservice inspection intervals for Class 3 systems will conform to Inspection Program B, as described in ASME Code Section XI, IWD-2412. Except where deferral is permitted by Table IWD-2500-1, the percentages of examinations completed within each period of the interval shall correspond to Table IWD-2412-1. An example of the selection of Code Class 3 items and examinations to be conducted within the 10-year intervals are described in Table 6.6-1.

6.6.5 Evaluation of Examination Results

Examination results will be evaluated in accordance with ASME Code Section XI, IWC-3000 for Class 2 components, with repairs based on the requirements of IWA-4000 and IWC-4000. Examination results will be evaluated in accordance with ASME Code Section XI, IWD-3000 for Class 3 components, with repairs based on the requirements of IWA-4000 and IWD-4000.

6.6.6 System Pressure Tests

6.6.6.1 System Inservice Test

As required by ASME Code Section XI, IWC-2500 for Category C-H and by IWD-2500 for Categories D-A, D-B and D-C, a system inservice test shall be performed in accordance with IWC-5221 on Class 2 systems, and IWD-5221 on Class 3 systems, which are required to operate during normal operation. The system inservice test shall include all Class 2 or 3 components and piping within the pressure retaining boundary and shall be performed once during each inspection period as defined in Tables IWC-2412-1 and IWD-2412-1 for Program B. For the purposes of the system inservice test of Class 2 systems, the pressure-retaining boundary is defined in Table IWC-2500-1, Category C-H, Note 7. For the purposes of the system inservice test for Class 3 systems, the system boundary is defined in Note 1 of Table IWD-2500-1, for Categories D-A, D-B and D-C. The system inservice test shall include a VT-2 examination in accordance with IWA-5240, except that, where portions of a system are

subject to system pressure tests associated with two different functions, the VT-2 examination shall only be performed during the test conducted at the higher of the test pressures. The system inservice test will be conducted at approximately the maximum operating pressure and temperature indicated in the applicable process flow diagram for the system as indicated in Table 1.7-1. The system hydrostatic test (Subsection 5.2.4.6.2), when performed, is acceptable in lieu of the system inservice test.

6.6.6.2 System Functional Test

As required by Section XI, IWC-2500 for Category C-H and by IWD-2500 for Categories D-A, D-B and D-C, a system functional test shall be performed in accordance with IWC-5221 on Class 2 systems, and IWD-5221 on Class 3 systems, which are not required to operate during normal operation but for which a periodic system functional test is performed. The system functional test shall include all Class 2 or 3 components and piping within the pressure-retaining boundary and shall be performed once during each inspection period as defined in Tables IWC-2412-1 and IWD-2412-1 for Program B. For the purposes of the system functional test of Class 2 systems, the pressure-retaining boundary is defined in Table IWC-2500-1, Category C-H, Note 7. For the purposes of the system functional test for Class 3 systems, the system boundary is defined in Note 1 of Table IWD-2500-1, Categories D-A, D-B and D-C. The system inservice test shall include a VT-2 examination in accordance with IWA-5240, except that, where portions of a system are subject to system pressure tests associated with two different functions, the VT-2 examination shall only be performed during the test conducted at the higher of the test pressures. The system functional test will be conducted at the nominal operating pressure and temperature indicated in the applicable process flow diagram for the functional test for each system as indicated in Table 1.7-1. The system hydrostatic test (Subsection 5.2.4.6.2), when performed, is acceptable in lieu of the system inservice test.

6.6.6.3 Hydrostatic Pressure Tests

As required by Section XI, IWC-2500 for Category B-P, the hydrostatic pressure test shall be performed in accordance with ASME Section IWC-5222 on all Class 2 components and piping within the pressure retaining boundary once during each 10-year inspection interval. For purposes of the hydrostatic pressure test, the pressure-retaining boundary is defined in Tables IWC-2500-1, Category C-H and IWD-2500-1 Categories D-A, D-B, and D-C. The system hydrostatic test shall include a VT-2 examination in accordance with IWA-5240.

6.6.7 Augmented Inservice Inspection

6.6.7.1 High-Energy Piping

All high-energy piping between the containment isolation valves are subject to the following additional inspection requirements:

All circumferential welds shall be 100% volumetrically examined each inspection interval as defined in Subsection 6.6.3.2.3. Further, accessibility, examination requirements and

procedures shall be as discussed in Subsections 6.6.2, 6.6.3 and 6.6.5, respectively. Piping in these areas shall be seamless, thereby eliminating all longitudinal welds.

6.6.7.2 Erosion-Corrosion

Piping systems determined to be susceptible to erosion-corrosion shall be subject to a program of nondestructive examinations to verify the system structural integrity. The examination schedule and examination methods shall be determined in accordance with Generic Letter 89-08, EPRI NSAC-202L (Reference 6.6-1), and the applicable rules of Section XI of the ASME Boiler and Pressure Vessel Code.

6.6.8 Code Exemptions

As provided in ASME Section XI, IWC-1220 and IWD-1220, certain portions of Class 2 and 3 systems are exempt from the volumetric and surface and visual examination requirements of IWC-2500 and IWD-2500. These portions of systems are specifically identified in Table 6.6-1.

6.6.9 COL License Information

6.6.9.1 PSI and ISI Program Plans

The COL applicant will develop PSI and ISI program plans as outlined in Section 6.6

6.6.9.2 Access Requirement

The COL applicant will incorporate plans for NDE during design and construction in order to meet all access requirements of the regulations (Subsection 6.6.2).

6.6.10 References

- 6.6-1 "Recommendations for an Effective Flow-Accelerated Corrosion Program", EPRI NSAC-202L, Revision 3, Electric Power Research Institute.

Table 6.6-1 Examination Categories and Methods

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method	
B	B21	Nuclear Boiler	Piping from outboard MSIVs F009A,B,C & D up to turbine bypass and turbine isolation valves	Figure 5.1-3 sh. 3				
			700A-NB-024 Piping		C-F-2	Welds (Note 1)	UT, MT	
			50A-NB-119 Piping					
			50A-NB-111 Piping					
			80A-NB-110 Piping					
			50A-NB-112 Piping					
			50A-NB-113 Piping					
			50A-NB-114 Piping					
			Valve body welds (MSIVs)		C-G	Welds (Note 2)	MT	
Integral attachments		C-C	Welds (Note 3)	MT				
		Piping from outboard MSIVs F009A,B,C & D up to turbine bypass and turbine isolation valves	Figure 5.1-3 sh. 3					
		Bolting		C-D	Bolts, Studs (Note 4)	UT		
		All pressure retaining components and piping		C-H	External Surfaces (Note 5)	VT-2		

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	B21	Nuclear Boiler (Cont.)	Piping and component supports		F-A	Supports (Note 6)	VT-3
			Feedwater lines A & B from outermost isolation valves F003A & B up to and including valves F001A & B	Figure 5.1-3 sh. 4			
			550A-NB-002 Piping		C-F-2	Welds (Note 1)	UT, MT
			550A-NB-008 Piping				
			250A-NB-013 Piping				
			150A-NB-017 Piping				
			150A-NB-016 Piping				
			150A-NB-015 Piping				
			150A-NB-020 Piping				
			550A-NB-001 Piping				
550A-NB-007 Piping							
		Integral attachments		C-C	Welds (Note 3)	MT	
		Valve body welds		C-G	Welds (Note 2)	MT	
		Bolting		C-D	Bolts, Studs (Note 4)	UT	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	B21	Nuclear Boiler (Cont.)	All pressure retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			Piping from feedwater thermal sleeves D001A & B up to and including check valves F006A & B	Figure 5.1-3 sh. 4			
			250A-NB-013 Piping		C-F-2	Welds (Note 1)	UT, MT
			150A-NB-017 Piping				
			150A-NB-016 Piping				
			150A-NB-020 Piping				
			150A-NB-019 Piping				
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External Surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			All drain lines, equalizer lines, leakoff lines test connections, instrument lines 20A, 25A, 50A and 80A in diameter	Figure 5.1-3 sh. 2-8		Exempted per IWC-1222 (a),(c)	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	B21	Nuclear Boiler (Cont.)	All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
B	C41	SLC	All Class B piping 20A, 25A, 40A, 50A, 80A and 100A in diameter	Figure 9.3-1	Exempted per IWC-1222 (a),(b)		
			All pressure retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			SLC storage tank		Exempted per IWC-1222 (c)		
B	C12	CRD	Charging water line, drain lines 32A and smaller	Figure 4.6-8 sh. 3	Exempted per IWC-1222 (a),(b)		
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR	S/P suction lines from suction strainers through RHR pumps A,B & C through RHR HX's A,B & C up to and including injection valves F005A,B & C	Figure 5.4-10 sh. 2-7			
			450A-RHR-201 Piping		C-F-2	Welds	UT-MT
			450A-RHR-001 Piping				
			450A-RHR-101 Piping				
			450A-RHR-002 Piping				
			300A-RHR-003 Piping				
			300A-RHR-004 Piping				
			300A-RHR-005 Piping				
			450A-RHR-102 Piping				
			300A-RHR-102 Piping				
			300A-RHR-104 Piping				
			300A-RHR-105 Piping				
			450A-RHR-202 Piping				
			300A-RHR-203 Piping				
			300A-RHR-204 Piping				
		RHR heat exchangers		C-A	Welds	UT	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont)	RHR heat exchanger nozzles		C-B	Welds Inner radius	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			S/P suction lines from suction strainers through RHR pumps A,B & C through RHR HX's A,B & C up to and including injection valves F005A, B & C (Cont.)		C-H F-A		
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			Shutdown cooling suction lines from outermost isolation valves F011A,B & C up to and including connection to S/P suction lines	Figure 5.4-10 sh. 2, 3, 4, 6			
			350A-RHR-111 Piping 350A-RHR-011 Piping 350A-RHR-212 Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont.)					
			All pressure-retaining surfaces		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			RHR HX's A,B & C bypass lines including valves F013A,B & C	Figure 5.4-10 sh. 3, 4, 6			
			300A-RHR-213 Piping 300A-RHR-112 Piping 300A-RHR-012 Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			Test return lines from injection line connection through valves F008A, B & C up to the S/P	Figure 5.4-10 sh. 3, 4, 6			

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method		
B	E11	RHR (Cont.)	250-RHR-208 Piping			Welds (Note 1)	UT, MT		
			250A-RHR-209 Piping						
			250-RHR-108 Piping						
			250-RHR-109 Piping						
			250-RHR-007 Piping						
			250-RHR-008 Piping						
			Integral attachments		C-C			Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H			External surfaces (Note 5)	VT-2
			Piping and component supports		F-A			Supports (Note 6)	VT-3
			Piping connected downstream of RHR HXs A,B,C through valves F029A,B,C F030A,B,C up to and including header line to SPH		Figure 5.4-10 sh. 3, 4, 6				
150A-RHR-128 Piping			C-F-2	Welds (Note 1)	UT, MT				
150A-RHR-230 Piping									
150A-RHR-023 Piping									
150A-RHR-129 Piping									
150A-RHR-229 Piping									

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont.)	150A-RHR-022 Piping				
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			Fuel pool suction lines to RHR from valves F016B & C up to and including connection to the shutdown cooling suction lines of RHR B & C	Figure 5.4-10 sh. 2			
			300A-RHR-215 Piping 300A-RHR-114 Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont.)	RHR Loop A injection line from injection valve F005A up to and including feedwater line A thermal sleeve	Figure 5.4-10 sh. 3			
			250A-RHR-006 Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure retaining		C-H	External surfaces (Note 5)	VT-2
			Component supports	F-A	Supports (Note 6)	VT-3	
			RHR B & C drywell spray lines from discharge line connection up to and including drywell spray sparger	Figure 5.4-10 sh. 5, 7			
			300A-RHR-113 Piping		C-F-2	Welds (Note 1)	UT, MT
			250A-RHR-115 Piping				
			250A-RHR-116 Piping				
			300A-RHR-214 Piping				
300A-RHR-216 Piping							
300A-RHR-218 Piping							
300A-RHR-219 Piping							

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont.)	300A-RHR-217 Piping				
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			Fuel pool suction lines to RHR from valves F016A, B & C up to and including connection to the shutdown cooling suction lines of RHR A,B & C	Figure 5.4-10 sh. 2			
			300A-RHR-215 Piping 300A-RHR-114 Piping 300A-RHR-099 Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont.)	Fuel pool return lines from drywell spray line header up to and including valves F015A,B & C	Figure 5.4-10 sh. 3,5, 7	C-F-2	Welds (Note 1)	UT-MT
			300A-RHR-214 Piping				
			300A-RHR-113 Piping				
			300A-RHR-099 Piping	C-C	Welds (Note 3)	MT	
			Integral attachments				
			All pressure-retaining components and piping	C-H	External surfaces (Note 5)	VT-2	
			Piping and component supports	F-A	Supports (Note 6)	VT-3	
All class B piping 20A, 25A, 40A, 50A and 100A in diameter, i.e.: <ul style="list-style-type: none"> - drain lines - vent lines - makeup lines for water leg seal including fill pump - minimum flow bypass lines - instrument lines - sampling lines - wetwell spray lines - SRV discharge lines - equalizing lines - and etc. 	Figure 5.4-10 sh. 2-6	Exempted per IWC-1221 (a),(c)					

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E11	RHR (Cont.)	All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
B	E22	HPCF	Pump injection lines from injection valves F003B & C up to and including HPCF pumps B & C	Figure 6.3-7 sh. 1, 2 Figure 5.4-8 sh. 1			
			250A-HPCF-007 piping		C-F-1	Welds (Note 1)	UT-PT
			Integral attachments		C-C	Welds (Note 3)	PT
			Pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			Pump test return lines from the injection line connection including valves F008B & C and F009B & C , reducer "80A X 200A" and piping up to the RHR test return line taps.	Figure 6.3-7 sh. 2			
			200A-HPCF-012 piping		C-F-1	Welds (Note 1)	UT, PT
			Integral attachments		C-C	Welds (Notes 3)	PT

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method	
B	E22	HPCF (Cont.)	All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2	
			Piping and component supports		F-A	Supports (Note 6)	VT-3	
			S/P suction lines from suction strainers up to and including isolation valves F006B & C	Figure 5.3-7 sh. 2				
			400A-HPCF-009 Piping 200A-HPCF-011 Piping		C-F-1	Welds (Note 1)	UT, PT	
			Integral attachments		C-C	Welds (Note 3)	PT	
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2	
			Component supports		F-A	Supports (Note 6)	VT-3	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method	
B	E22	HPCF (Cont.)	Piping and equipment subject to pressure and temperature less than 275 psi and 200°F	Figure 6.3-7 sh. 2 Figure 5.4-8 sh. 1 Figure 9.5-1	Exempted per IWC-1222 (c)			
			<ul style="list-style-type: none"> - condensate storage pool - suction lines from condensate storage tank to RCIC, SPCU and HPCF-B, -C - HPCF pumps B and C suction lines from S/P valves F006B & C and from Condensate Storage Pool up to pump inlet 					
			All pressure retaining components and piping		C-H	External surfaces (Note 5)	VT-2	
			All Class B piping 20A, 25A, 50A and 80A in diameter, i.e.:	Figure 6.3-7 sh. 1, 2	Exempted per IWC-1221 (a),(c)			
			<ul style="list-style-type: none"> - test connections - vent lines - instrument lines - minimum flow bypass lines - makeup lines for water leg seal - SRV discharge lines - drain lines - and etc. 					
			All pressure retaining components and piping		C-H	External surfaces (Note 5)	VT-2	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E51	RCIC	Steam supply line from outermost isolation valve F036 (includes drain pot) up to and including "100A X 150A" reducer	Figure 5.4-8 sh. 2			
			150A-RCIC-034 Piping		C-F-2	Welds (Note 1)	UT, MT
			150A-RCIC-035 Piping				
			150A-RCIC-036 Piping				
			Drain pot connections to: 150A-RCIC-34 150A-RCIC-35		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
Piping and component supports		F-A	Supports (Note 6)	VT-3			
			Turbine exhaust line from the turbine up to and including exhaust sparger in the suppression pool	Figure 5.4-8 sh. 1, 3			

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method	
B	E51	RCIC (Cont.)	250A-RCIC-037 Piping		C-F-2	Welds (Note 1)	UT, MT	
			350A-RCIC-038 Piping					
			350A-RCIC-039 Piping					
				Integral attachments		C-C	Welds (Note 3)	MT
				All pressure-retaining components and piping		C-H	External Surfaces (Note 5)	VT-2
				Piping and component supports		F-A	Supports (Note 6)	VT-3
				Turbine exhaust vent line including rupture discs	Figure 5.4-8 sh. 3			
				250A-RCIC-504 piping		C-F-2	Welds (Note 1)	UT, MT
				Integral attachments		C-C	Welds (Note 3)	MT
		All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2		
		Piping and component supports		F-A	Supports (Note 6)	VT-3		

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E51	RCIC (Cont.)	Pump discharge line from feedwater line B thermal sleeve up to and including RCIC pump C001	Figure 5.4-8 sh. 1			
			150A-RCIC-003 piping		C-F-2	Welds (Note 1)	UT, MT
			Pump casing welds		C-G	Welds (Note 2)	MT
			Bolting		C-D	Bolts, Studs (Note 4)	UT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Component supports		F-A	Supports (Note 6)	VT-3
			Suppression pool suction line from suction strainer up to and including isolation valve F006	Figure 5.4-8 sh. 1			
			200A-RCIC-004 piping		C-F-2	Welds (Note 1)	UT, MT
Integral attachments		C-C	Welds (Note 3)	MT			

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	E51	RCIC (Cont.)	All pressure retaining piping and components		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			All Class B piping 15A, 20A, 25A, 50A and 100A in diameter, i.e.: <ul style="list-style-type: none"> - minimum flow bypass - test return line - leakoff lines - test connections - makeup line for water leg seal - SRV discharge line - vacuum breaker line - and etc. 	Figure 5.4-8 sh. 1-3	Exempted per IWC-1221 (a),(c)		
			All pressure retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping and equipment subject to pressure and temperature less than 1.89 MPa and 93.3°C, i.e.: <ul style="list-style-type: none"> - RCIC pump suction lines from S/P valve F006 and from CSP up to pump inlet. 	Figure 5.4-8 sh. 1	Exempted per IWC-1222 (c)		
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	G31	CUW	Return line to RPV from Feedwater line B thermal sleeve up to and including valve F015	Figure 5.4-12 sh. 1 Figure 5.1-3 sh. 4			
			50A-NB-021 Piping 200A-NB-014 Piping 200A-NB-015 Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachment		C-C	Welds (Note 3)	MT
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Component supports		F-A	Supports (Note 6)	VT-3
			50A equipment drain sump line from RPV head	Figure 5.4-12 sh. 1	Exempted per IWC-1222 (a),(b)		
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	P11	Purified Makeup Water	50A piping penetrating primary containment from outermost valve F141 up to and including inboard check valve F142.	Figure 5.2-5 sh. 2	Exempted per IWC-1222 (a), (b)		
			All pressure-retaining components and piping		C-H	External Surfaces (Note 5)	VT-2
B	P21	Reactor Building Cooling Water	Piping penetrating primary containment from valves F075A & B up to and including valves F076A & B; and from valves F080A & B up to and including valves F081A & B	Figure 9.2-1 sh. 3, 6			
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			20A drain lines from valves F075A & B and valves F081A & B taps up to and including normally closed valves F251A & B and F252A & B	Figure 9.2-1 sh. 1, 6	Exempted per IWC-1222 (a), (b)		

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	P21	Reactor Building Cooling Water (Cont.)	All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
B	P24	HVAC Normal Cooling Water	Piping penetrating primary containment from valve F142 up to and including valve F141; and from valve F053 up to and including valve F054	Figure 9.2-2	Exempted per IWC-1222 (a), (b)		
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
B	T31	Atmospheric Control	Drywell/ wetwell purge exhaust lines from primary containment penetrations through valves F004 and F006 up to and including valves F008 and F009	Figure 6.2-39 sh. 1			
			Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components and surfaces		C-H	External Surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
B	T31	Atmospheric Control (Cont.)	All Class B piping 20A, 50A in diameter, i.e.: <ul style="list-style-type: none"> - test connections - equalizing lines - small process lines - air lines - instrument lines - and etc. 	Figure 6.2-39 sh. 1, 2	Exempted per IWC-1222 (a), (b)		
			All pressure-retaining components and piping		C-H	External surfaces (Note 5)	VT-2
			Drywell / wetwell purge supply lines from primary containment penetrations through valves F002 and F003, through Flow Elements FE001 and FE003	Figure 6.2-39 sh. 1			
			Piping		C-F-2	Welds (Note 1)	UT, MT
			Integral attachments		C-C	Welds (Note 3)	MT
			All pressure-retaining components		C-H	External surfaces (Note 5)	VT-2
			Piping and component supports		F-A	Supports (Note 6)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	B21	Nuclear Boiler	Main Steam SRV discharge lines	Figure 5.1-3 sh. 2			
			All pressure-retaining components and piping		D-A	External Surfaces (Note 7)	VT-2
			Integral Attachments		D-A	Welds (Note 8)	VT-3
			Piping and component supports		F-A	Supports (Note 6)	VT-3
C	G31	CUW	From outermost isolation valve F003 and through the following:	Figure 5.4-12 sh. 1, 2			
			<ul style="list-style-type: none"> - 1 Regenerative HX (3 shells per unit) - 2 Non-regenerative HX's (2 shells per unit) - Filter Demineralizer subsystem - return line to the RPV through regenerative HX and bypass line up to and including valves F015 and F016 - blowdown line to the S/P and radwaste up to and including valves F023 and F025 - and all other branch lines > 100A 				
			All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	G31	CUW (Cont.)	Integral attachments		D-B	Welds (Note 8)	
			Piping and Component Supports		F-A	Supports (Note 6)	
			All Class C piping 100A and smaller, i.e.: - drain lines - test connections - instrument lines - vent lines - CUW pump seal purge lines - sampling lines - small process lines - and etc.	Figure 5.4-12 sh. 1, 2	Exempted per IWD-1220		
C	G41	Fuel Pool Cooling and Clean-up	All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	VT-2
			From skimmer surge tanks; Dryer-separator, and reactor well drains through FPC pumps, filter/demineralizer subsystem, FPC HXs and into the reactor well and fuel storage	Figure 9.1-1 sh. 1-3			
			All pressure-retaining components and piping		D-C	External Surfaces (Note 7)	VT-2
			Integral attachments		D-C	Welds (Note 8)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	G41	Fuel Pool Cooling and Clean-up (Cont.)	Piping and Component Supports		F-A	Supports (Note 6)	VT-3
			From skimmer surge tank through Fuel Pool Cooling pumps C001A & B up to and including valve F005B (exclude Filter Demineralizer subsystem).	Figure 9.1-1 sh. 1-3			
			All pressure-retaining components		D-C	External Surfaces (Note 7)	VT-2
			Integral attachments		D-C	Welds (Note 8)	VT-3
			Piping and component supports		F-A	Supports (Note 6)	VT-3
			250A Filter/Demineralizer Bypass Line	Figure 9.1-1 sh. 2			
			All pressure-retaining components		D-C	External Surfaces (Note 7)	VT-2
			Integral Attachments		D-C	Welds (Note 8)	VT-3
		Piping and Component Supports		F-A	Supports (Note 6)	VT-3	

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	G41	Fuel Pool Cooling and Clean-up (Cont.)	Piping from valve F012 through HXs B001A & B and into the reactor well and spent fuel storage	Figure 9.1-1 sh. 2			
			All pressure-retaining components and piping		D-C	External Surfaces (Note 7)	
			Integral Attachments		D-C	Welds (Note 8)	
			Piping and Component Supports		F-A	Supports (Note 6)	VT-3
			All Class C piping 100A and smaller, i.e.: - drain lines - test connections - vent lines - instrument lines - sample lines - and etc.	Figure 9.1-1 sh. 2	Exempted per IWD-1220		
All pressure-retaining components and piping		D-C	External Surfaces (Note 7)				
C	G51	SPCU	Suction lines from valves F002 and F009 through SPCU pump C001 up to and including valves F004, F005, G41-F041, and into the S/P return line up to valve F006 inlet	Figure 9.5-1			

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	G51	SPCU (Cont.)	All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	VT-2
			Integral attachments		D-B	Welds (Note 8)	VT-3
			Piping and Component Supports		F-A	Supports (Note 6)	VT-3
			All Class C piping 20A, 25A, 50A, and 80A in diameter, i.e.: <ul style="list-style-type: none"> - drain lines - test connections - instrument lines - overpressure relief line including SRV - equalizer lines - vent lines - branch lines to RCW, FPC - makeup water line up to valve F015 - and etc. 	Figure 9.5-1	Exempted per IWD-1220		
			All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	VT-2

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	P21	Reactor Building Cooling Water	From and including valves F074A,B & C and F082A,B & C through RCW pumps C001A D,B,E,C & F and through the following:	Figure 9.2-1 sh. 1, 2, 4, 5, 7, 8			
			- RCW HXs A,D,B,E,C,F				
			- Emergency Diesel generator cooling equipment A, B, C				
			- RHR HXs A,B,C				
			- HECW Chillers A, B,C,D				
			- FPC HXs A,B				
			- RCW surge tanks A,B				
			- and all Class C branch lines > 100A				
			All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	VT-2
			Integral attachments		D-B	Welds (Note 8)	VT-3
			Piping and Component Supports		F-A	Supports (Note 6)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method			
C	P21	Reactor Building Cooling Water (Cont.)	All Class C branch lines 100A and smaller, i.e.:	Figure 9.2-1 sh. 1, 2, 4, 5, 7, 8	Exempted per IWD-1220					
			<ul style="list-style-type: none"> - lines to and from RHR/HPCF pumps seals, motor bearing coolers - lines to and from RCIC pump room cooler - instrument lines - lines to and from FPC and SGTS room coolers - lines to and from CAM System coolers - drain lines - test connections - and etc. 							
			All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	VT-2			
C	P41	Reactor Service Water	From suction strainers through RSW pumps C001A, D, B, E, C, F, and through RCW HXs and into but not including the discharge canal to the ultimate heat sink.	Figure 9.2-7						
			All pressure-retaining components and piping					D-B	External Surfaces (Note 7)	VT-2
			Integral attachments					D-B	Welds (Note 8)	VT-3
			Piping and Component Supports					F-A	Supports (Note 6)	VT-3

Table 6.6-1 Examination Categories and Methods (Continued)

Quality Group	System Number	System Title	System Description	P&ID Diagram	Sec. XI Exam Cat.	Items Examined	Exam Method
C	P41	Reactor Service Water (Cont.)	All Class C piping 100A and smaller, i.e.: - test connections - bypass lines - instrument lines - ferrous ion injection lines - drainlines - and etc.,	Figure 9.2-7	Exempted per IWD-1220		
			All pressure-retaining components and piping		D-B	External Surfaces	VT-2
C	P54	HPIN	From nitrogen bottles up to and including valve F012A & B and valves F007A & B inlets (includes all Class C branch lines)	Figure 6.7-1	Exempted per IWD-1220		
			All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	VT-2
			From valves F008A & B through the ADS valves accumulators and into the ADS SRVs		Exempted per IWD-1220		
			All pressure-retaining components and piping		D-B	External Surfaces (Note 7)	

Table 6.6-1
Examination Categories and Methods (Continued)

Notes:

- (1) **Category C-F-2:** At least 7.5% of the circumferential Carbon steel and low alloy steel piping welds (including branch connection welds) shall be selected for inservice inspection in accordance with the rules of Table IWC-2500-1 for examination category C-F-2. Welds NPS 4 and larger, with nominal wall thickness 9.5 mm and greater, are examined by both ultrasonic (UT) and either magnetic particle (MT) or liquid penetrant (PT) examination methods. Welds in piping NPS 2 and greater but less than NPS 4, and which have nominal wall thicknesses greater than 5.1 mm, are examined by the UT and either MT or PT methods. Branch connection welds of branch piping NPS 2 and greater require MT or PT examination only. The examinations include a length of the longitudinal weld intersecting the circumferential weld of at least $2.5t$, where t = the nominal pipe wall thickness.
- (2) **Category C-G:** Pump and valve body welds selected for inservice inspection are limited to at least one valve within each group of valves of the same size and type and performing a similar function in accordance with the rules of Table IWC-2500-1 for examination Category C-G.
- (3) **Category CC:** Examination of integral attachments for inservice inspection is limited to those attachments which are external, associated with an NF type component support and which have a base material thickness greater than 19.1 mm, as specified by Table IWB-2500-1 for examination Category C-C. For attachments to pumps and valves, only those associated with pumps and valves selected for inservice inspection require inservice examination.
- (4) **Category C-D:** Bolting, greater than 50.8 mm in diameter, on pumps and valves selected for inservice inspection may be limited to at least one pump and valves within each group of pumps or valves of the same size and type and performing a similar function in accordance with the rules of Table IWC-2500-1 for examination Category C-G. Flange bolting in piping systems selected for inservice inspection may be limited to the flange connections in piping runs selected for examinations under Category C-F.
- (5) **Category C-H:** Visual examination of the external surfaces of pressure retaining components and piping for inservice inspection is performed in conjunction with the system inservice, system functional and system hydrostatic tests in accordance with the rules of Table IWC-2500-1 for examination Category C-H.

Table 6.6-1
Examination Categories and Methods (Continued)

- (6) **Category F-A:** Supports selected for inservice examination, as described in IWF-2510, shall include 15% of Class 2 piping supports and 10% of Class 3 piping supports. The total percentage sample shall be comprised of supports from each system where the individual sample sizes are proportional to the total number of non-exempt supports of each type and function within the system. All supports of non-exempt components (i.e., vessels, pumps and valves, shall be subject to inservice examination).
- (7) **Category D-A, D-B and D-C:** Visual examination of the external surfaces of pressure-retaining components and piping for inservice inspection is performed in conjunction with the system inservice, system functional and system hydrostatic tests in accordance with the rules of Table IWD-2500-1 for examination Categories D-A, D-B and D-C.
- (8) In the case of multiple components within a system of similar design, function and service, the integral attachment of only one of those components shall be selected for inservice examination.

General: The preservice examination includes all of the items selected for inservice examination in all examination categories with the exception of Category C-H, in accordance with IWC-2200, and the VT-2 examination of pressure retaining surfaces in Categories D-A, D-B and D-C, in accordance with IWD-2200. Preservice examination of supports shall be performed following the initiation of hot functional or power ascension tests.