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Nuclear Assurance and Regulation

September 10, 1984

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Attention: Mr. Albert Schwencer, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

HOPE CREEK GENERATING STATION
DOCKET NO. 50-354
FSAR CHANGES RESULTING FROM NRC QUALITY ASSURANCE
BRANCH OPEN ITEMS

Attached is a copy of the complete set of modifications to FSAR Sections 1.8, Table 1.11-1, 3.2, Table 3.2.1, 9.1, 9.2, 9.3, 11.2, 17.2, Table 17.2-1, 260 series question responses and SRAI Appendix-Item (1). These items were discussed at the NRC/PSE&G Quality Assurance Branch meeting of July 18, 1984, and via telecon between D. Wagner, NRC, J. Spraul, NRC, and B. Preston, PSE&G on August 17, 1984. Please note that portions of this material were previously submitted, via letter from R. L. Mittl, PSE&G, to A. Schwencer, NRC, dated August 3, 1984.

This information will be included in Amendment 8 to the HCGS FSAR. Should you have any questions in this regard, please contact us.

Very truly yours,

R L Mittl / R P Douglas

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Attachment

C D. H. Wagner (w/attach.)
USNRC Licensing Project Manager

W. H. Bateman (w/attach.)
USNRC Senior Resident Inspector

J. Spraul (w/attach.)
USNRC Quality Assurance Branch

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ATTACHMENT

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1.8.1.23 Conformance to Regulatory Guide 1.23 (Safety Guide 8), Revision 0, February 17, 1972: Onsite Meteorological Programs

HCGS complies with Regulatory Guide 1.23.

1.8.1.24 Conformance to Regulatory Guide 1.24 (Safety Guide 24), Revision 0, March 23, 1972: Assumptions Used for Evaluating the Potential Radiological Consequences of a Pressurized Water Reactor Radioactive Gas Storage Tank Failure

Regulatory Guide 1.24 is not applicable to HCGS.

1.8.1.25 Conformance to Regulatory Guide 1.25 (Safety Guide 25), Revision 0, March 23, 1972: Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors

HCGS complies with Regulatory Guide 1.25.

1.8.1.26 Conformance to Regulatory Guide 1.26, Revision 3, February 1976: Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants

HCGS complies with Regulatory Guide 1.26, with the clarifications outlined below.

PSE&G's position is that equipment that is important to safety is safety-related and therefore does not distinguish between these terms. PSE&G does recognize the need for the assurance of the specified operation of certain non-safety-related structures, systems and components, such as fire protection systems, radioactive waste treatment, handling and storage systems, and Seismic Category II/I items. Such assurance is documented through the specification of limited quality assurance programs (described in Table 3.2-1, footnotes (22), (50) and (52). In addition, items designated "~~D~~" "R" in Table 3.2-1 will be included in the QA program during operations, to the extent required by Regulatory Guide 1.143.

The exception to Position C.2.b is that since the reactor recirculation pumps do not perform any safety function and since failure of the reactor coolant pumps due to seal or cooling water failure does not have serious safety implications, the control rod drive (CRD) seal purge supply and reactor auxiliaries cooling

1.8.1.63 Conformance to Regulatory Guide 1.63, Revision 2, July 1978: Electric Penetration Assemblies in Containment Structures for Light-Water-Cooled Nuclear Power Plants

Although Regulatory Guide 1.63 is not applicable to HCGS, per its implementation section, HCGS complies with the design, qualification, construction, installation, and testing requirements of IEEE 317-1976, as modified by Regulatory Guide 1.63, subject to the clarification in Section 8.1.4.12.

1.8.1.64 Conformance to Regulatory Guide 1.64, Revision 2, June 1976: Quality Assurance Requirements for the Design of Nuclear Power Plants

~~Although Regulatory Guide 1.64 does not apply to HCGS, per its implementation section, HCGS complies with it~~
HCGS complies with Regulatory Guide 1.64

~~The architect-engineer indicates that their design verification procedures conform to ANSI 45.2.11-1974 and also that compliance with this standard is as modified and interpreted by Revision 1 of Regulatory Guide 1.64. However, the architect-engineer did not comply with Revision 2 in that it allowed checking of the design output documents by the originator's supervisor.~~

See Section 17.2 for further discussion of quality assurance procedures and Section 1.8.2 for the NSSS assessment of this Regulatory Guide.

1.8.1.65 Conformance to Regulatory Guide 1.65, Revision 0, October 1973: Materials and Inspections for Reactor Vessel Closure Studs

Regulatory Guide 1.65 is not applicable.

See Section 1.8.2 for the NSSS assessment of this Regulatory Guide.

1.8.1.87 Conformance to Regulatory Guide 1.87, Revision 1, June 1975: Guidance for Construction of Class 1 Components in Elevated-Temperature Reactors (Supplement to ASME Section III Code Cases 1592, 1593, 1594, 1595, and 1596)

Regulatory Guide 1.87 is not applicable to HCGS.

1.8.1.88 Conformance to Regulatory Guide 1.88, Revision 2, October 1976: Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records

During the operations phase, HCGS complies with ANSI N45.2.9-1974, as modified and interpreted by Regulatory Guide 1.88 and NUREG 0800 (Standard Review Plan), Revision 2, ~~Section 17.4~~ Section II.17.4. During the construction and startup phases compliance is subject to the changes listed below.

The architect-engineer indicates that the original HCGS project commitment, via the Bechtel nuclear quality assurance manual (NQAM), was to ANSI N45.2.9 (Draft 11, Revision 0, January 17, 1973) rather than to ANSI N45.2.9-1974. The NQAM was revised to reference the 1974 document, as modified and interpreted by the guide, subject to the following specific changes:

a. ANSI Section 2.1, Quality Assurance Record System - Add the following sentence at the end of this section: "The procedures shall include control of records required during completion of the work activity."

b. ANSI Section 2.2.2, Nonpermanent Quality Assurance Records - Revise this section to read: "Nonpermanent records are those required to show evidence that an activity was performed in accordance with the applicable requirement but need not be retained for the life of the item and do not meet the criteria listed in Section 2.2.1."

c. ANSI Section 3.2.2, Index - Revise this section to read: "The quality assurance records shall be listed in an index. The index shall include, as a minimum, record retention times and the location of the records within the record system. The index system used by organizations for the retention of quality assurance

1.8.1.122 Conformance to Regulatory Guide 1.122, Revision 1, February 1978: Development of Floor Design Response Spectra for Seismic Design of Floor-Supported Equipment or Components

Although Regulatory Guide 1.122 is not applicable to HCGS, per its implementation section, HCGS complies with it.

For further discussion of seismic design, see Sections 3.7 and 3.10.

1.8.1.123 Conformance of Regulatory Guide 1.123, Revision 1, July 1977: Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants

HCGS complies with Regulatory Guide 1.123, during construction and startup phases, subject to clarifications stated below. During the operations phase, item a clarification applies ~~only~~ with the exception that applicable requirements of Regulatory Guide 1.38 will be applied to code procurements where necessary to assure safe shipment.

The architect-engineer indicates that the original HCGS project commitment was to ANSI N45.2.13 (Draft October 1973) rather than to ANSI N45.2.13-1976. The architect-engineer NQAM has been revised to reference the 1976 document, as modified by the Regulatory Guide, subject to the following specific changes:

a. Regulatory Guide Section C.2 - This section requires the application of elements of the ASME B&PV Code, Section III, Divisions 1 and 2, and Section XI; and ANSI N45.2.13-1976; specifically, those elements not covered by the ASME B&PV Code for procurement of ASME B&PV Code items and services. The architect-engineer takes exception to the requirement, and has the following alternate position:

   The application of the ASME B&PV Code requirements above to the procurement of ASME B&PV Code items and services is adequate, based on the fact that ASME B&PV Code represents the composite knowledge and experience of a large segment of the nuclear industry, that the ASME B&PV Code is constantly being reevaluted for adequacy, that addenda are issued frequently, and that, to our knowledge, historical data do not exist that would indicate that the ASME B&PV Code quality

Positions C.1.1.2, C.2.1.2, C.3.1.2, and Table 1 of Regulatory Guide 1.143 require that all material specifications for pressure-retaining components within the radioactive process boundary conform to ASME B&PV Code, Section II. In addition, they require that piping materials conform to both the ASME and the identical ASTM specification, and they permit substitution of manufacturers' standards, instead of the ASME specification, in the case of pump materials. Although Regulatory Guide 1.143 does not explicitly address in-line process components, sight flow glasses, Y-strainers, and steam traps procured by the architect-engineer, and the orifice plates and conductivity elements in the NSSS scope of supply do not have certificates of compliance for the materials specified. Also, the records of shop inspection, required by Table 1, for the Y-strainers and the steam traps are not available from the supplier.

Nevertheless, the quality assurance measures taken provide the reasonable assurance needed to protect the health and safety of the public and that of plant operating personnel.

Position C.1.2.1 requires that the designated high-liquid-level conditions should actuate alarms both locally and in the control room. For all tanks, a high-liquid-level condition actuates an alarm in the radwaste control room only. There are no local alarms since the tank rooms are controlled areas and normally unmanned.

Position C.4.3 requires that process lines should not be less than 3/4 inch (nominal). The crystallizer concentrates and slurry waste transfer lines to the extruder/evaporators are 1/2 inch nominal, in order to maintain acceptable flow velocities to prevent settling in the lines. The fluid flowrates are on the order of one (1) GPM as shown in Table 11.4-7 and on Figure 11.4-9.

1.8.1.144 <u>Conformance to Regulatory Guide 1.144, Revision 1, September 1980: Auditing of Quality Assurance Programs for Nuclear Power Plants</u>

HCGS complies with Regulatory Guide 1.144, during the operations phase. During the design and construction phase, the following clarifications apply:

The architect-engineer's quality program for safety-related items during the design and construction phases meets the requirements of ANSI N45.2.12-1977 as modified and interpreted by Regulatory

TABLE 1.11-1 (cont)

SRP Section	Specific SRP Acceptance Criteria	Summary Description of Differences	FSAR Section(s) Where Discussed
17.1 (Rev 2)	II-2A1 QA program to include commitment that the development, control and use of computer code programs be conducted in accordance with the QA program and a description of how the QA program will be applied.	QA program presently does not include commitment that the development, control, and use of computer code programs be conducted in accordance with the QA program.	17.2.6
	II-3E4 Procedures be established to assure that verified computer codes be certified for use and that their use be specified.	No procedures have currently been established to assure that verified computer codes be certified for use and that their use be specified.	17.2.6
	II-12.6 Calibration of this equipment should be against standards that have an accuracy of at least four times the required accuracy of the equipment being calibrated or, when this is not possible, have an accuracy that assures the equipment being calibrated will be within required tolerance and that the basis of acceptance is documented and authorized by responsible management.	Primary standards used to perform calibrations are at least greater than the accuracy of the devices being calibrated.	17.2.12

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b. Permit shutdown of the reactor and maintain it in the safe shutdown condition

c. Contain radioactive material.

A tabulation of quality group classification for each component is shown in Table 3.2-1. Interfaces between components and piping of different classifications are indicated on the system piping and instrumentation diagrams (P&IDs), which are found in pertinent sections of the FSAR. For information on instrument and electrical equipment classification, see Section 3.10. A cross reference of system to FSAR figure number is provided in Table 1.7-2. The code requirements applicable to each quality group classification are identified in Tables 3.2-2 and 3.2-3. Quality group classifications have been maintained during design and construction and are actively maintained during plant operations and system modifications commensurate with the safety functions performed by the safety-related components, except where later requirements allow alternative quality group classifications. Table 3.2-2 is intended to indicate design-basis minimum code requirements for general categories of NSSS components. Code requirement information for specific components is provided in Table 3.2-1.

The plant design complies with Regulatory Guide 1.26, with clarifications as discussed in Section 1.8.

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~~Certain portions of the radwaste system meet the additional requirements of quality group D (augmented) as defined in Regulatory Guide 1.143. Portions of the radwaste system meeting the requirements of quality group D (augmented) may be determined from notes on the appropriate figures in Chapter 11.~~

3.2.2.1 SRP Rule Review

In SRP Section 3.2.2, Subsection II, reference is made to Regulatory Guide 1.26 for determining quality group classifications of components that are important to safety. Section A and B of this guide imply that all components under the quality groups shown are safety-related, including those listed under Quality Group D.

On HCGS, the Quality Group D items are not considered to be "safety-related" or "important to safety" in the same sense that these terms are used in other guides and regulations. All

INSERT FOR PAGE 3.2-3

PORTIONS OF THE RADIOACTIVE WASTE MANAGEMENT SYSTEM WHICH ARE WITHIN THE BOUNDARIES DELINEATED BY THE DIRECTION OF THE "R" FLAGS SHOWN IN THE FIGURES OF CHAPTERS 9 AND 11, INCLUDING PIPING, VALVES, VESSELS, TANKS, AND EQUIPMENT, ARE CLASSIFIED AS QUALITY GROUP R. QUALITY assurance controls for GROUP R items ~~STANDARDS ARE THOSE PROVIDED~~ comply with applicable requirements ~~IN~~ of REGULATORY GUIDE 1.143. THE PLANT DESIGN COMPLIES WITH REGULATORY GUIDE 1.143, WITH CLARIFICATIONS AS DISCUSSED IN SECTION 1.8.1.143.

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HCGS CLASSIFICATION OF STRUCTURES, SYSTEMS, AND COMPONENTS

Principal Components (57)	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
I. <u>Reactor System</u>	4.1							
a. Reactor vessel and head		GE	A	A	III-A(9)	I	Y	(9)
b. Reactor vessel support skirt		GE	A	NA	III-A(9)	I	Y	(9)
c. Reactor vessel appurtenances, pressure retaining portions		GE	A	A	III-A(9)	I	Y	
d. CRD housing supports		GE	A	NA	III-NF	I	Y	
e. Reactor internal structures, engineered safety features		GE	A	NA	None	I	Y	(13)
f. Reactor internal structures, other		GE	A	NA	None	NA	N	(13) (55)
g. Control rods		GE	A	NA	None	I	Y	
h. Control rod drives		GE	A	NA	III-A(9)	I	Y	
i. Core support structure		GE	A	NA	None	I	Y	
j. Power range detector hardware		GE	A	B	III-2	I	Y	(10)
k. Fuel assemblies		GE	A	NA	None	I	Y	
l. Reactor vessel stabilizer		GE	A	NA	III-NF	I	Y	
II. <u>Nuclear Boiler System</u>	5.1							
a. Vessels, level instrumentation condensing chambers		GE	A	A	III-1	I	Y	
b. Vessels, air accumulators		P	A,C	C	III-3	I	Y	
c. Air supply check valves and piping downstream of air supply check valves		P	A,C	C	III-3	I	Y	
d. Piping, safety relief valve discharge		P	A	C	III-3	I	Y	
e. Piping, main steam, within outboard isolation valves		GE/P	A,C	A	III-1	I	Y	
f. Piping, feedwater, within outboard isolation valves		P	A,C	A	III-1	I	Y	
g. Piping, main steam, between outboard and outermost isolation valves		P	C	B	III-2	I	Y	(12)
h. Piping, feedwater, between outboard and outermost isolation valves		P	C	B	III-2	I	Y	(12)

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
IV. <u>CRD Hydraulic System</u>	4.6.1							
a. Piping and valves, reactor building penetration		P	C	D ~~B~~	B31.1.0 ~~III-3~~	II/I ~~I~~,	~~X~~	(50)
b. Valves, scram discharge volume lines		P/GE	C	B	III-2	I	Y	(10)
c. Valves, insert and withdraw lines		P/GE	A,C	B	III-2	I	Y	(8)(48)
d. Valves, other		P/GE	C	D	B31.1.0	NA	N	
e. Pipe cap, water return line		GE	A	A	III-1	I	Y	
f. Piping, scram discharge volume lines		P	C	B	III-2	I	Y	
g. Piping, insert and withdraw lines		P	A,C	B	III-2	I	Y	
h. Piping, other		P	C	D	B31.1.0	NA	N	(13)
i. Hydraulic control unit including scram accumulator		GE	C	Special	(44)	I	Y	(12)
j. Electrical modules with safety function (27)		GE	C	NA	IEEE-279/323	I	Y	
k. Cable with safety function		P	C	NA	IEEE-279/323	NA	Y	(18)
l. Pumps		GE	C	D	None	NA	N	
m. Pump motors		GE	C	NA	None	NA	N	
V. <u>Engineered Safety Features</u>								
a. RHR syst:	6.3/5.4.7							
1. Heat exchangers, primary side (shutdown cooling, suppression pool cooling, steam condensing)		GE	C	B	III-C & TEMA C(9)	I	Y	
2. Heat exchangers, secondary side		GE	C	C	VIII-1 TEMA C(9)	I	Y	
3. Piping, within outermost containment isolation valves (LPCI, shutdown cooling, head spray)		P	C,A	A	III-1	I	Y	(10)

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
4. Piping, beyond outermost containment isolation valves (LPCI, shutdown cooling, suppression pool cooling, head spary, containment spray, steam condensing)		P	C	B	III-2	I	Y	(10)
5. Piping and spray nozzles, containment spray lines within outermost isolation valves		P	A	B	III-2	I	Y	
6. Deleted								
7. Pumps (LPCI, shutdown cooling, suppression pool cooling, head spray, containment spray)		GE	C	B	P&V-II(9)	I	Y	
8. Pump motors		GE	C	NA	NEMA MG-1	I	Y	
9. Valves, inboard isolation, LPCI line & shutdown return line		GE	A	A	III-1	I	Y	(48)
10. Valves, isolation and within (shutdown suction, head spray)		P	C,A	A	III-1	I	Y	(10)(48)
11. Valves, beyond isolation valves (LPCI, shutdown cooling, suppression pool cooling, head spray, containment spray, steam condensing)		P	C	B	III-2	I	Y	(10)(48)
12. Mechanical modules with safety function (27)		GE	C	NA	None	I	Y	
13. Electrical modules with safety function (27)		GE	C	NA	IEEE-279/323	I	Y	
14. Cable with safety function		P	C	NA	IEEE-279/323	NA	Y	(18)
15. ECCS jockey pumps		P	C	B	III-2	I	Y	
16. Piping and valves, reactor building penetration and isolation		P	C	~~Y~~ D	~~III-2~~ B31.1.0	~~I~~ II/I	~~Y~~	(50)
17. ECCS jockey pump motors		P	C	NA	IEEE-323/344	I	Y	
b. Core spray system:	6.3							
1. Piping, within outermost isolation valves		P	A,C	A	III-1	I	Y	(10)
2. Piping, beyond outermost		P	C	B	III-2	I	Y	(10)

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
isolation valves								
3. Pumps		GE	C	B	P&V-II(9)	I	Y	
4. Pump motors		GE	C	NA	NEMA MG-1(9)	I	Y	(40)
5. Valves, inboard isolation		GE	A	A	III-1	I	Y	(40)
6. Valves, outboard isolation and within		P	C	A	III-1	I	Y	(40)
7. Valves, beyond outermost containment isolation valves		P	C	B	III-2	I	Y	(10)
8. Electrical modules with safety function (27)		GE	A,C	NA	IEEE-279/323	I	Y	
9. Cable with safety function		P	A	NA	IEEE-279/323	NA	Y	(10)
10. ECCS jockey pump		P	C	B	III-2	I	Y	
11. ECCS jockey pump motors		P	C	NA	IEEE-323/344	I	Y	
c. High pressure coolant injection (HPCI) system:	6.3							
1. Piping, within outermost containment isolation valves		P	A,C	A	III-1	I	Y	(10)
2. Piping, test return line to condensate storage tank up to second isolation valve		P	C	B	III-2	I	Y	
3. Pumps (main and booster)		GE	C	B	P&V-II(9)	I	Y	
4. HPCI turbine		GE	C	NA	VIII-1	I	Y	(11)(59)
5. HPCI barometric condenser		GE	C	NA	VIII-1(9)	NA	N	
6. HPCI vacuum pump & condensate pump		GE	C	NA	None	NA	N	
7. Vacuum pump & condensate pump motors		GE	C	NA	None	NA	N	
8. Piping, valve leakoff and cooling lines to barometric condenser		P	C	B	III-2	I	Y	
9. Piping, other		P	C	B	III-2	I	Y	(10)(40)
10. Valves, containment isolation and within		P	A,C	A	III-1	I	Y	(10)(40)
11. Valves, other		P	C	B	III-2	I	Y	(10)(40)
12. Electrical modules with safety function (27)		GE	C	NA	IEEE-279/323	I	Y	
13. Electrical auxiliary equipment		GE	C	NA	None	I	Y	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
14. Cable with safety function		P	A,C,O	NA	IEEE-279/323	NA	Y	(15)
15. ECCS jockey pump		P	C	B	III-2	I	Y	
16. ECCS jockey pump motor		P	C	NA	IEEE-323/344	I	Y	
d. Containment atmosphere control system:	6.2.5							
1. Piping and valves, containment penetration and isolation		P	A,C	B	III-2	I	Y	(48)
2. Containment/drywell monitoring (H_2/O_2 analyzer)		P	C,O	B	III-2	I	Y	(10)
3. Piping and valves, reactor building penetrations and isolation		P	C	B	III-2	I	Y	(48)
4. Nitrogen system (containment inerting):								
a. Vessels		P	O	D	VIII-1	NA	N	
b. Piping & valves, reactor building penetration & isolation		P	C,R	~~B~~ D	~~III-2~~ B31.1.0	~~I~~ II/I	~~Y~~	~~[illegible]~~ (50)
c. Piping & valves, other		P	O,C	D	B31.1.0	NA	N	
d. Heat exchangers		P	R	D	VIII-1	NA	N	
5. Containment hydrogen recombiner system:								
a. Motors		P	C	NA	NEMA MG-1	I	Y	
b. Blowers		P	C	NA	None	I	Y	
c. Reaction chambers and spray cooler		P	C	B	III-2	I	Y	
d. Hydrogen recombiner heaters		P	C	NA	NEMA/IEEE-279/323	I	Y	
e. Deleted								
f. Deleted								
g. Piping, containment penetration		P	A	B	III-2	I	Y	
h. Valves, containment isolation		P	C	B	III-2	I	Y	(48)
i. Piping and valves, other		P	C	B	III-2	I	Y	(48)

	Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (4)	Seismic Category (6)	QA Requirements (7)	Comments	
e.	Primary containment leakage rate testing system:	6.2.6								
	1. Piping and valves, containment penetration & isolation		P	C	B	III-2	I	Y	(48)	
f.	MSIV sealing system:	6.7								
	1. Valves, outermost isolation		P	C	A	III-1	I	Y	(48)	
	2. Valves, other, and piping		P	C	B	III-2	I	Y	(48)	
	3. Electrical modules with safety function[27]		P	C	NA	IEEE-279/323	I	Y		|
VI.	<u>Reactor core isolation cooling (RCIC) system:</u>	5.4.6								
	1. Piping, within outermost containment isolation valves		P	A,C	A	III-1	I	Y	(10)	
	2. Piping, beyond outermost containment isolation valves		P	C	B	III-2	I	Y	(10)	
	3. Piping, test return to condensate storage tank up to second isolation valve		P	C	B	III-2	I	Y		
	4. Piping, valve leakoff & cooling lines to barometric condenser		P	C	B	III-2	I	Y		
	5. RCIC pump		GE	C	B	P&V-II[9]	I	Y		
	6. RCIC barometric condenser		GE	C	NA	VIII-1[9]	NA	N		
	7. RCIC condensate pump and vacuum pump		GE	C	NA	None	NA	N		
	8. Condensate and vacuum pump motors		GE	C	NA	None	NA	N		
	9. Valves, containment isolation and within		P	A	A	III-1	I	Y	(10)(48)	
	10. Valves, other		P	C	B	III-2	I	Y	(10)(48)	
	11. RCIC turbine		GE	C	NA	VIII-1	I	Y	(11) (59)	|
	12. Electrical modules with safety function[27]		GE	C	NA	IEEE-279/323	I	Y		
	13. Cable with safety function		P	C	NA	IEEE-279/323	NA	Y	(18)	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
14. ECCS Jockey pump		P	C	B	III-2	I	Y	
15. ECCS jockey pump motor		P	C	NA	IEEE-323/344	I	Y	
VII. <u>Reactor water cleanup system (RWCU)</u>	5.4.8							
1. Vessels, filter/demineralizer		GE	C	C	III-3	NA	N	
2. Heat exchangers, nonregenerative, reactor water side		GE	C	C	III-C/TEMA R[9]	II/I		(30)
3. Heat exchangers, nonregenerative, cooling water side		GE	C	D	VIII-1/TEMA R[9]	II/I		(30)
4. Heat exchanger, regenerative		GE	C	C	III-C/TEMA R[9]	II/I		(30)
5. Piping, within outermost isolation valves		P/GE	A,C	A	III-1	I	Y	(10)
6. Piping, between outermost feedwater isolation valve and flow element		P	C	C	III-3	I	Y	(10)
7. Piping, beyond outermost isolation valves or beyond flow element		P/GE	C	C	III-3	II/I		(10)(30)
8. Pumps		GE	C	C	P&V-III[9]	II/I		(30)
9. Pumps, filter/demineralizer		GE	C	C	P&V-III[9]	NA	N	
10. Valves, isolation and within		P	A,C	A	III-1	I	Y	(10)(40)
11. Valves, beyond isolation valves		P/GE	C	C	III-3/P&V-III[9]	II/I		(30)
12. Valves, filter/demineralizer		P/GE	C	C	III-3/P&V-III[9]	NA	N	
13. Mechanical modules [27]		GE	C	NA	None	II/I		(30)
14. Piping, reactor building penetration		P	C,R	~~C~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	~~Y~~	(50)
15. Valves, reactor building isolation		P	C	~~C~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	~~Y~~	~~[illegible]~~ (50)
16. Cable with safety function		P	C	NA	IEEE-279/323	NA	Y	(16)
17. Tank, precoat, filter/demineralizer		GE	C	C	API-650	NA	N	
18. Electrical modules with safety function[27]		GE	C	NA	IEEE-279/323	I	Y	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (4)	Seismic Category (6)	QA Requirements (7)	Comments
IX. <u>Fuel Pool Cooling and Cleanup System and Torus Water Cleanup System:</u>	9.1.3							
a. Vessels, filter/demineralizer		P	R	D	VIII-1	NA	N	
b. Precoat tank		P	R	D	API-650	NA	N	
c. Heat exchangers		P	C	C	III-3	I	Y	
d. Fuel pool cooling pumps		P	C	C	III-3	I	Y	
e. Valves and piping, cooling loop [redacted]		P	C	C	III-3	I	Y	(48)
f. Valves, other		P	C,R	D	B31.1.0	NA	N	
g. Piping, makeup		P	C	C	III-3	I	Y	
h. Skimmer surge tanks		P	C	D ~~C~~	API-650	NA ~~I~~	N ~~Y~~	(46)
i. Piping, other		P	C	D	B31.1.0	NA	N	
j. Torus water cleanup pump, holding pumps		P	R	D	VIII-1	NA	N	
k. Piping and valves, torus water cleanup containment penetration and isolation		P	C	B	III-2	I	Y	
l. RHR connection (emergency cooling)		P	C	B	III-2	I	Y	
m. Fuel pool cooling pump motors		P	C	NA	IEEE-323/344	I	Y	
n. Valves and piping, reactor building isolation and penetration		P	C	D	B31.1.0	II/I		(50)
X. <u>Radioactive Waste Systems</u>								
a. Liquid radwaste system:	11.2							
1. Spent resin storage tank		P	R	~~D~~ R	API-620	NA	N	(22)
2. Tanks, atmospheric		P	R	~~D~~ R	API-~~620~~ 650	NA	N	(22)
3. Heat exchangers		P	R	~~D~~ R	VIII-1/TEMA C	NA	N	(22)
4. Piping		P	C,R	~~D~~ R	B31.1.0	NA	N	(10)(22)
5. Pumps		P	R	~~D~~ R	B31.1.0/ Hyd.I	NA	N	(22)(24)
6. Valves		P	C,R	~~D~~ R	B31.1.0	NA	N	(10)(22)
7. Vessels		P	R	~~D~~ R	VIII-1	NA	N	(22)
8. Waste evaporator		GE	R	~~D~~ R	VIII-1	NA	N	(22)
9. Mechanical modules		P/GE	R	~~D/D~~ R	B31.1.0	NA	N	(22)
10. Instrument and control boards		GE	R	NA	NEMA 12	NA	N	(22)
11. Decontamination solution evaporator		GE	R	~~D~~ R	VIII-1	NA	N	(22)

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
12. Valves, flow control and filter system		P/GE	R	~~D/B~~ R	B31.1.0	NA	N	(22)
13. Piping and valves, reactor building penetration and isolation		P	C	[redacted] D	[redacted] B31.1.0	[redacted] II/I	[redacted]	[redacted] (50)
b. Gaseous radwaste system:	11.3							
1. Tank, atmospheric		P	R	~~D~~ R	API-~~620~~ 650	NA	N	(22)
2. Heat exchangers		P	R	~~D~~ R	VIII-1/ TEMA C	NA	N	(22)
3. Piping		P	R	~~D~~ R	B31.1.0	NA	N	(30) (22)
4. Valves, flow control		P	R	~~D~~ R	B31.1.0	NA	N	(22)
5. Valves, other		P	R	~~D~~ R	B31.1.0	NA	N	(30)
6. HEPA filters		P	R	~~D~~ R	VIII-1	NA	N	(22)
7. Adsorber units		P	R	~~D~~ R	VIII-1	NA	N	(22)
8. Charcoal guard bed		P	R	~~D~~ R	VIII-1	NA	N	(22)
c. Solid radwaste system:	11.4							
1. Piping		P	R	~~D~~ R	B31.1.0	NA	N	(22)
2. Valves		P	R	~~D~~ R	B31.1.0	NA	N	(22)
3. Pumps		P	R	~~D~~ R	B31.1.0/ Hyd.I/(44)	NA	N	(22)(20)
4. Tanks, atmospheric		P	R	~~D~~ R	API-650/D100/ VIII-1	NA	N	(22)
5. Vessels		P	R	~~D~~ R	VIII-1	NA	N	(22)
6. Compressors		P	R	~~D~~ R	(44)	NA	N	(22)
7. Blowers		P	R	~~D~~	(44)	NA	N	(22)
8. Piping and valves, reactor building penetration and isolation		P	C	[redacted] D	[redacted] B31.1.0	II/I	[redacted]	[redacted] (50)
d. Process and effluent radiological monitoring and sampling system:	11.5							
1. Main steam line RMS		GE/P	C	NA	IEEE-323/344	I	Y	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (4)	Seismic Category (6)	QA Requirements (7)	Comments
3. Expansion tanks		P	C	C	III-3	I	Y	
4. Heat exchangers		P	C	C	III-3/TEMA R	I	Y	
5. Pumps		P	C	C	III-3	I	Y	
6. Pump motors		P	C	C	NEMA MG-1	I	Y	
7. Hydropneumatic accumulators		P	G	C	III-3	I	Y	
8. Electrical modules with safety function		P	C	NA	IEEE-279/323	I	Y	
c. Reactor auxiliaries cooling system (RACS):	9.2.8							
1. Piping and valves forming part of containment boundary		P	A,C	B	III-2	I	Y	(48)
2. Piping and valves, reactor building penetration and isolation		P	C	~~B~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	~~Y~~	~~[illegible]~~ (50)
3. Piping and valves, other		P	A,C,R	D	B31.1.0	NA	N	(18)
4. Heat exchangers		P	C	D	VIII-1/ TEMA C	NA	N	
5. Pumps		P	C	D	B31.1.0/ Hyd.I	NA	N	(24)
6. Expansion tank		P	C	D	API-620	NA	N	
d. Turbine auxiliaries cooling system (TACS):	9.2.2							
1. Piping and valves		P	T	D	B31.1.0	NA	N	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
e. Condensate and refueling water storage and transfer system:	9.2.6							
1. Tank, condensate storage		P	O	D	D100	NA	N	
2. Piping and valves, reactor building penetration and isolation		P	C	~~C~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	~~Y~~	~~(40)~~ (50)
3. Pumps		P	T	D	Hyd.I	NA	N	(24)
4. Piping and valves, HPCI, RCIC, and core spray pump suction		P	C	B	III-2	I	Y	(40)
5. Piping and valves, HPCI, RCIC, and CRD return line		P	O,C	C	III-3	I	Y	(40)
6. Piping and valves, level instrumentation		P	O,C	C	III-3	I	Y	(40)
7. Piping and valves, dike penetrations		P	O	C	III-3	I	Y	(40)
8. Piping and valves, other		P	O,T,R	D	B31.1.0	NA	N	
f. Turbine building chilled water system:	9.2.7.1							
1. Tanks		P	T	D	VIII-1	NA	N	
2. Chillers		P	T	D	VIII-1	NA	N	
3. Pumps		P	T	D	VIII-1/Hyd.I	NA	N	(24)
4. Piping & valves, containment penetration & isolation		P	A,C	B	III-2	I	Y	(40)
5. Piping & valves, reactor building penetration & isolation		P	C	~~C~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	~~Y~~	~~(40)~~ (50)
6. Piping, other		P	T,A,C,R	D	B31.1.0	NA	N	
7. Valves, other		P	T,A,C,R	D	B31.1.0	NA	N	
8. Cooling coils		P	T,A,C	NA	ARI-410	NA	N	
9. Motors		P	T	NA	NEMA MG-1	NA	N	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
g. Auxiliary building control area chilled water system:	9.2.7.2							
1. Chillers		P	B,G	C	III-3	I	Y	
2. Cooling coils		P	B,C,G	C	III-3/ARI-410	I	Y	
3. Pumps		P	B,G	C	III-3	I	Y	
4. Motors		P	B,G	NA	IEEE-323/344	I	Y	
5. Piping and valves		P	B,G,C	C	III-3	I	Y	(14)(46)
6. Tank, head		P	G	C	VIII-1	I	Y	
h. Potable & sanitary water system:	9.2.4							
1. Pumps		P	O,G,B,R	D	B31.1.0/ Hyd.I	NA	N	(24)
2. Motors		P	O,G,B,R	NA	NEMA MG-1	NA	N	
3. Piping and valves		P	O,G,B,R	D	B31.1.0/NSPC	NA	N	
i. Demineralized water makeup storage & transfer system:	9.2.3							
1. Tanks		P	T	D	API-620	NA	N	
2. Pumps		P	T	D	Hyd.I	NA	N	(24)
3. Motors		P	T	NA	NEMA MG-1	NA	N	
4. Piping and valves, reactor building penetration & isolation		P	C	~~C~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	Y	~~(40)~~ (50)
5. Piping and valves, other		P	All	D	B31.1.0	NA	N	
XII. <u>Standby Diesel Generator and Auxiliary Systems</u>								
a. Fuel oil storage and transfer system:	9.5.4							
1. Storage tanks		P	G	C	III-3, N195	I	Y	
2. Day tanks		P	G	C	III-3, N195	I	Y	
3. Piping and valves, fuel oil system		P	G	C	III-3, N195	I	Y	(48)
4. Pumps, motor-driven fuel oil transfer		P	G	C	III-3, N195	I	Y	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (4)	Seismic Category (6)	QA Requirements (7)	Comments
6. Containment atmosphere control system		P	A,B,C	NA	IEEE-279	I	Y	
7. Main steam isolation valve sealing system		P	C	NA	IEEE-279	I	Y	
8. Filtration, recirculation, and ventilation system		P	B,C	NA	IEEE-279	I	Y	
9. Reactor building ventilation isolation system		P	C	NA	IEEE-279	I	Y	
10. Main control room habitability and isolation system		P	B	NA	IEEE-279	I	Y	
11. Essential auxiliary supporting systems for engineered safety features control		P	All	NA	IEEE-279	I	Y	
c. Controls and instrumentation associated with safe shutdown systems:	7.4							
1. Reactor core isolation cooling system (RCIC)		GE	C	NA	IEEE-279	I	Y	
2. Standby liquid control (SLC) system		GE	C	NA	IEEE-279	I	Y	
3. RHR, reactor shutdown cooling mode		GE	C	NA	IEEE-279	I	Y	
4. Remote shutdown systems		P	R	NA	IEEE-279	I	Y	
5. Essential auxiliary supporting systems for the safe shutdown systems		GE/P	All	NA	IEEE-279	I	Y	
d. Safety-related display instrumentation	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~NA~~	~~IEEE-279~~	~~I~~	~~Y~~	~~[illegible]~~

ATTACHMENT A

ATTACHMENT A

	FSAR Section	Source of Supply	Location	Quality Group	Codes and Standards	Seismic Class	Quality Assurance	Comments
I Safety-Related Display Instrumentation								
1 Control Rod Position Indication System (CRPIS) (Non Safety Related)	7.5	GE	B	NA		I	N	
2 Bypass and Inoperable Status Indication System (BISIS) (Safety Related)	7.5	P	B	NA	IEEE 279	I	Y	(49)
Isolation Device	7.5	P	B	NA	IEEE 279	I	Y	(49)
CRIDS Computer	7.5	P	B	NA		NA	N	
3 Plant Computer System (PCS)								
A NSSS (Non Safety Related)	7.6	G.E	B	NA		NA	N	
B CRIDS (Non Safety Related)	7.5	P	B	NA		NA	N	(51)
C RMS (Non Safety Related) NOTE: Safety Related portion of the RMS System is found in Section XVe of this table	7.5	P	B	NA		NA	N	
E ERFDAS (Safety Related) Isolation Device	7.6	P	B	NA	IEEE 279	I	Y	(49)
Data Concentrator Portion	7.5	P	B					(51)
4 Start Up Transient Monitoring System (STMS) (Non Safety Related)	7.5	P	B	NA		I	N	
5 Safety Relief Valve Position Indication System (SRVPIS) (Non Safety Related)	7.5	P	B	NA		I	N	
6 Loose Parts Monitoring System (LPMS) (Non Safety Related)	7.5	P	B	NA		I	N	
7 Post Accident Monitoring Instrumentation (PAMI) (Safety Related)	7.5	P	B	NA	IEEE 279	I	Y	(49)
Isolation Device	7.5	P	B	NA	IEEE 279	I	Y	(49)
CRIDS Computer	7.5	P	B	N/A		NA	N	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
8. Deleted								
9. Area radiation monitoring systems		P	All	NA	None	NA	N	(61)
10. Deleted								
11. Reactor water cleanup system		GE	C	NA	None	NA	N	
12. Radwaste systems		P	R	NA	None	NA	N	
13. Fuel pool cooling ~~and cleanup system~~		P	C	NA	None	NA	~~N~~ Y	(51)
14. Fuel pool cleanup system		P	C	NA	None	NA	N	
g. Control complex panels								
1. Electrical modules with safety function[27]		GE/P	B	NA	IEEE-279/323	I	Y	
2. Cable with safety function		P	B	NA	IEEE-279/323	NA	Y	(18)
h. Local panels and racks								
1. Electrical modules with safety function		GE/P	All	NA	IEEE-279/323	I	Y	
2. Cable with safety function		P	All	NA	IEEE-279/323	NA	Y	(18)
XVI. <u>Electric System</u>								
a. Engineered safety features (Class 1E) ac equipment:	8.3							
1. 4.16-kV switchgear		P	G	NA	IEEE-308/323/344	I	Y	
2. 480-V unit substations		P	G	NA	IEEE-308/323/344	I	Y	
3. 480-V motor control centers		P	B,C,G,W	NA	IEEE-308/323/344	I	Y	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
XVII. <u>Auxiliary Systems</u>								
a. Compressed air (service and instrument) systems:	9.3.1							
1. Compressors		P	T	NA	None	NA	N	
2. Pressure vessels, not for safety-related equipment		P	All	D	VIII-1	NA	N	
3. Piping and valves, containment penetration and isolation		P	C,A	B	III-2	I	Y	(48)
4. Piping and valves, reactor building penetration and isolation		P	C	~~C~~ D	~~III-3~~ B31.1.0	~~I~~ II/I	~~Y~~	~~(48)~~ (50)
5. Piping and valves, other		P	All	D	B31.1.0	NA	N	
b. Primary containment instrument gas system:	9.3.6							
1. Compressors		P	C	B	III-2	I	Y	(48)
2. Filter housings, dryers, & coolers (air side)		P	C	B	III-2	I	Y	
3. Coolers (water side)		P	C	C	III-3	I	Y	
4. Receiver tanks		P	C	B	III-2	I	Y	
5. Piping and valves, air with safety function		P	C	B	III-2	I	Y	(48)
6. Piping and valves, cooling water		P	C	C	III-3	I	Y	(48)
7. Piping and valves, air with safety function (inside drywell)		P	A	C	III-3	I	Y	(48)
8. Piping and valves, containment penetration and isolation		P	A,C	B	III-2	I	Y	(48)
9. Piping and valves, air, other		P	A,C	D	B31.1.0	N	N	
10. Motors, compressors		P	C	N/A	IEEE-323/344	I	Y	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (4)	Seismic Category (6)	QA Requirements (7)	Comments
f. Auxiliary boiler system:	9.5.9							
1. Tanks, blowdown, chemical feed, fuel oil storage and fuel oil day		P	O	D	VIII-1	NA	N	
2. Boilers		P	O	D	VIII-1	NA	N	
3. Deaerator		P	O	D	VIII-1	NA	N	
4. Pumps		P	O	D	VIII-1	NA	N	
5. Piping and valves, reactor building penetration and isolation		P	C	C	III-3	I	Y	(40)
6. Piping & valves, other		P	All	D	B31.1.0	NA	N	
g. Equipment and floor drainage system:	9.3.3							
1. Piping, radioactive		P	C,A,T,R	~~D~~ R/D	B31.1.0	NA	N	~~(40)~~
2. Piping, nonradioactive		P	All	D	B31.1.0	NA	N	
3. Piping and valves, primary containment isolation boundary		P	A,C	B	III-2	I	Y	(40)
4. Piping and valves, reactor building penetration and isolation		P	C	[redacted] D	[redacted] B31.1.0	II/I	[redacted]	[redacted] (50)
h. Post-accident liquid and gas sample system (PASS):	9.3.2							
1. Piping and valves, primary containment isolation and reactor coolant pressure boundary		P	A,C	B	III-2	I	Y	(40)
2. Tubing, reactor building penetration and isolation		P	C,R	D	B31.1.0	NA	N	
3. Piping and valves, other		P	C,R	D	B31.1.0	NA	N	
4. Piping station		GE	R	D	B31.1.0	NA	N	
5. Post-accident sampler		GE	R	D	B31.1.0	NA	N	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
i. Breathing air:	9.5.10							
1. Piping and valves, reactor building penetration & isolation		P	C	~~B~~ D	~~III-5~~ B31.1.0	II/~~I~~ I	~~Y~~	(50)
2. Piping and valves, containment penetration and isolation		P	A,C	B	III-2	I,	Y	(48)
j. Lighting systems:	9.5.3							
1. Components located in safety-related areas		P	All	NA	None	II/I		(50)
XVIII. Buildings	3.8							
a. Primary containment:	3.8.2							
1. Access hatches/locks/doors		P	C	B	III-MC	I	Y	
2. Vessel and head		P	C	B	III-MC	I	Y	
3. Penetration assemblies-pipes		P	C	B	III-2 MC	I	Y	
4. Vent piping		P	C	B	III-MC	I	Y	
5. Vacuum relief valves	6.2.1	P	A,C	B	III-2	I	Y	(48)
6. Monorail supports		P	C	NA	AISC	I	Y	
7. Biological shield		P	A	NA	AISC/ACI-318	I	Y	
8. Coating		P	A,C	NA	None	NA	Y	(29)
9. ECCS suction strainers		P	A	B	None	I	Y	
b. Auxiliary building - diesel area		P	G	NA	AISC/ACI-318	I	Y	
c. Auxiliary building - control area		P	B	NA	AISC/ACI-318	I	Y	
d. Auxiliary building - radwaste area		P	R	NA	AISC/ACI-318	I	Y	(22)
e. Turbine building		P	T	NA	AISC/ACI-318	II/I		(21)(50)
f. Administration facility		P	O	NA	AISC/ACI-318	II/I		(50)
g. Circulating water pumphouse		P	O	NA	AISC/ACI-318	NA	N	

Principal Components	FSAR Section	Source of Supply (1)	Location (2)	Quality Group Classification (3)	Principal Construction Codes and Standards (5)	Seismic Category (6)	QA Requirements (7)	Comments
h. Reactor building/including pressure-retaining doors		P	C	NA	AISC/ACI-318	I	Y	
i. Plant cancelled area		P	All	NA	AISC/ACI-318	I	Y	
j. Shore protection at intake structure (including sheetpile retaining wall and quarrystone revetments)		P	O,W	NA	None	II/I		([illegible])
XIX. **Structures** (58)	3.8							(20)
a. Station service water intake structure		P	O,W	NA	AISC/ACI-318	I	Y	
b. Deleted								
c. Diesel generator fuel tank room		P	G	NA	None	I	Y	
d. Station battery rooms		P	B	NA	None	I	Y	
e. Spent fuel pool, reactor well, new fuel vault, dryer separator pool, and cask pit	9.1.1, 9.1.2	P	C	NA	None	I	Y	
f. Deleted								
g. Unit vent stack, North & South		P	O	NA	ACI-307	I	[redacted] Y	
h. Condensate storage tank dike		P	O	NA	ACI-318	I	Y	
i. Spent fuel pool liner	9.1.2	P	C	NA	None	NA	N	(56)
j. Skimmer surge tanks (concrete structure)	9.1.1	P	C	NA	[redacted] ACI-318	I [redacted]	Y [redacted]	([illegible])
k. Missile/jet barriers		P	A,B,C,G, R,W	NA	AISC/ACI-318	I	Y	
l. Structural backfill		P	O	NA	None	I	Y	
m. Post accident shielding		P	A,B,C,G, R,T	NA	ACI-318	I	Y	
n. Seismic Category I electrical duct bank manholes		P	O	NA	ACI-318	I	Y	

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(1) GE = General Electric
P = Public Service Electric and Gas Company/Bechtel Power Corporation

(2) A = drywell
B = auxiliary building: control area
C = reactor building
G = auxiliary building: standby diesel generator area
L = offsite locale
O = outdoors onsite
R = auxiliary building: radwaste area
T = turbine building
W = station service water intake structure.

(3) A, B, C, D - NRC quality group classification as defined in Regulatory Guide 1.26.
R ~~D+~~ - Quality Group D ~~(augmented) as defined in Regulatory Guide 1.143 for certain portions of radwaste systems. During the operations phase, these items will be covered by the QA Program.~~ is comprised of the requirements provided in Regulatory Guide 1.143.

NA - quality group classification not applicable to this equipment.

(4) Deleted

(5) Notations for principal construction codes:

III-	A, B, C - ASME Boiler and Pressure Vessel Code, Section III, Class A, B, or C
III-	1, 2, 3, MC, NG, NF - ASME Boiler and Pressure Vessel Code, Section III, Class 1, 2, 3, or MC or Subsections NG or NF.
P&V-	I, II, & III - ASME Pump and Valve for Nuclear Power, Class I, II, & III
VIII-1	ASME Boiler and Pressure Vessel Code, Section VIII, Division 1
XI	ASME Boiler and Pressure Vessel Code, Section XI
API-650	American Petroleum Institute, Welded Steel Tanks for Oil Storage
API-620	American Petroleum Institute, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks
C504	American Water Works Association, AWWA 504-70; Section 2 through 19
D100	American Water Works Association, AWWA-D100, Standard for Steel Tanks, Standpipes, Reservoirs and Elevated Tanks for Water Storage
B.31.7	ANSI B31.7, Nulcear Power Piping
B31.1.0	ANSI B31.1.0, Code for Pressure Piping
N195	ANSI N195, Fuel Oil Systems for Standby Diesel Generators
SMACNA	Sheet Metal & Air Conditioning Contractors National Association, Inc
HEI	Heat Exchange Institute
TEMA C&R	Tubular Exchanger Manufacturers Assoc, Class C & R
HYD.I	Hydraulic Institute
AISC	American Institute of Steel Construction, Specification for Design Fabrication, and Erection of Structural Steel for Buildings
AISI	American Iron and Steel Institute, Specification for the Design of Cold-Formed Steel Structural Members; Design of Light-Gauge Cold-Formed Stainless Steel Structural

(15) The conduit, trays, and supports for safety-related cables are Seismic Category I and Q-listed.

(16) FRVS safety classification is at variance with ANSI N212, which has upgraded this system to Quality Group B.

(17) AMCA Publication 211A, AMCA Certified Ratings Program for Air Performance, or AMCA Standard 210, Test Code for Air Moving Devices, can be used for blower design purposes.

(18) This section of steam piping is seismically analyzed to ensure that it does not fail under loadings normally associated with Seismic Category I.

(19) Impact testing of carbon or low-alloy steels is in accordance with ASME B&PV Code, Section VIII, Division 1, Paragraph UCS 66. Low temperature criteria for carbon or low alloy steels is defined as -20°F or below.

(20) Build to ANSI B30.2 and New Jersey Administrative Code for Overhead and Gantry Cranes, Title 12.

(21) The power conversion system structures are constructed in accordance with applicable codes for steam power plants.

(22) The portions of the ~~oxygen and~~ radwaste systems ~~within the pressure boundary~~ are built to Quality Group D ~~requirements, as noted~~ STANDARDS, WHICH ARE THOSE SPECIFIED in the NRC Regulatory Guide 1.143. The equipment, piping, and components are fabricated with a mandatory pressure test and welded construction wherever possible. Regulatory Guide 1.143 reduces the seismic design requirements from Seismic Category I to a simplified seismic analysis. For further information, refer to NRC Regulatory Guide 1.143.

Note: For this project, the radwaste area shares a building that includes control and diesel generator areas, and therefore is required to be Seismic Category I.

(23) These components and associated supporting structures must be designed to retain structural support and/or pressure integrity during and after a Seismic Category I event, but do not have to retain operability for protection of public safety. The basic requirement is prevention of structural collapse and damage to equipment and structures that are Seismic Category I.

(24) There is no established standard for commercial pumps. ASME Section VIII, Division 1 and ANSI B31.1.0, Power Piping, represent related, available standards that, while intended for other applications, are used for guidance and recommendations in determining Quality Group D ~~pump~~ AND R PUMP allowable stresses, steel casting quality factors, wall thicknesses, materials compatibility and specifications, temperature-pressure environment restrictions, fittings, flanges, gaskets, and bolting, installation procedures, etc.

(25) Regulatory Guide 1.54 applies.

(26) These devices are supported and analyzed to remain functional up to an SSE.

(27) A module is an assembly of interconnected components that constitute and identifiable device or piece of equipment. For example, electrical modules include sensors, power supplies, and signal processors; mechanical modules include turbines, strainers, and orifices.

(47) Duct work is of non-Seismic Category I design, but is installed and supported as Seismic Category I.

(48) Valve operators on safety related valves that must function are Q-listed and Seismic Category I

(49) Equipment is classified in accordance with the conformance statements made in Sections 7.2, 7.3, 7.4, 7.5 and 7.6 in reference to IEEE 279 paragraph 4.4 and IEEE-323.

(50) The QA Program controls applicable to equipment classified as Seismic II/I are in accordance with Regulatory Guide 1.29 commitments contained in FSAR Section 1.8

(51) No QA Program controls applied during Design and Construction Phase. QA Programs controls during operation are applied to an extent consistent with the items importance to safety.

(52) QA Program controls for the fire protection program, including emergency lighting and communications, are applied to the extent of the ten quality assurance criteria of Appendix A to Branch Technical Position 9.5-1 and to an extent consistent with the item's/activity's importance to safety.

(53) The recirculation system piping was built to both ASME Section III and B31.7 codes as required by the GE design specification. The ASME Section III NPP-1 report requires signatures by a qualified inspector and also indicates that the pipe was built to the requirements of B31.7.

(54) Except north radwaste area of auxiliary building, since there are no Seismic Category I components in this area.

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(55) The reactor pressure vessel internal structures which are accessible are included in the ISI program, which is covered by the operational QA program.

(56) Any modifications or repair work to the liner will be conducted under the operational QA program.

(57) Containment isolation valves that are required per GDC 54-56 and are not part of the principal components shown, are subject to the pertinent provisions of 10 CFR 50 Appendix

(58) Modifications to roof parapet and openings of Q structures will be conducted under the operation QA program.

(59) The governor valves for HPCI and RCIC turbines are part of the operational QA program.

requirements. ~~The torus water cleanup system piping to and from the FPCC system filter-demineralizer is designed to Seismic Category I requirements at the reactor building penetrations.~~

The design of the FPCC and torus water cleanup systems, with respect to the following areas, is discussed in the sections listed below:

a. Seismic Category I requirements - Section 3.2

b. Protection from wind and tornado effects - Section 3.3

c. Flood design - Section 3.4

d. Missile protection - Section 3.5

e. Protection against dynamic effects associated with postulated rupture of piping - Section 3.6

f. Environmental design - Section 3.11.

Class 1E power is provided for the safety-related equipment of the FPCC system. All annunciators are provided with non-Class 1E uninterruptible power. Class 1E power is provided for the containment isolation valves in the suction and discharge lines for the torus water cleanup system.

The radiological evaluation of the FPCC system is provided in Section 12.2. Radiation monitors mounted on the reactor building walls indicate and actuate audible alarms locally and in the MCR.

A failure mode and effects analysis of the FPCC and torus water cleanup systems is provided in Table 9.1-3.

The fuel pool evaporation rate, the time for the pool water to reach 212°F, and the time required to initiate the makeup water, in the event of loss of the FPCCS, are discussed in Table 9.1-18.

9.1.3.4 Inspection and Testing Requirements

The FPCC and torus water cleanup systems are preoperationally tested in accordance with the requirements of Chapter 14. The safety-related systems that provide makeup water are periodically tested in accordance with the requirements of Chapter 16.

suppression pool in the event of a low condensate storage tank level. Redundant low-low level switches have been provided to allow for automatic switchover of the RCIC pump suction to the suppression pool in the event of a low condensate storage tank level. These level switches and transmitters are seismically supported on a standpipe located inside the reactor building and are electrically separated (powered from different Class 1E power sources) as shown on Figure 9.2-13. The piping between the CST and the reactor building penetration is heat traced to prevent freezing in cold weather. The heat tracing is powered from a highly reliable battery backed non-1E power source. The heat tracing is provided with an alarm monitoring circuit powered from a non-1E battery-backed power supply separate from the heat tracing power supply. This circuit monitors the heat tracing power supply and thermostat and alarms on loss of either. Heat tracing is not required for that portion of piping inside the reactor building. See Sections 7.3.1.1.1.1 (HPCI) and 7.4.1.1.2 (RCIC) for discussions of the automatic switchover functions.

9.2.7 PLANT CHILLED WATER SYSTEMS

9.2.7.1 Turbine Building Chilled Water System

The turbine building chilled water system (CWS) provides chilled water for cooling the drywell, reactor building, turbine building, radwaste area, and service area. In addition, the CWS provides chilled water to the reactor recirculation pump motor air coolers, drywell equipment drain sump cooling coil, sample coolers, and mechanical vacuum pump seal coolers.

9.2.7.1.1 Design Bases

The design bases for the CWS are as follows:

a. The CWS is not safety-related, except for the drywell ~~and reactor building enclosure~~ chilled water penetrations and isolation valves. These are designed to meet Seismic Category I requirements and are discussed in Section 6.2.4.

operate during normal plant conditions. The standby chiller is started manually if an operating chiller fails. The standby pump is started manually if an operating pump fails.

The closed-loop refrigerant system in each water chiller extracts heat from the circulated water in the evaporator, and rejects the heat to TACS water in the condenser. A temperature sensor in the chilled water outlet regulates the refrigerant flow in the chiller to maintain a constant outlet water temperature.

Two redundant piping loops connected to two sets of cooling coils are provided inside the drywell. Changeover from one loop to the other is accomplished from the main control room by changing the position of loop isolation valves. A primary containment isolation signal automatically closes both sets of isolation valves. The valves can be reopened from the main control room, if desired, to resume cooling water flow.

The CWS is automatically shut down in the event of LOP. RACS water is available for the drywell by automatically opened motor-operated diversion valves at the CWS/RACS interconnection. These valves can be operated from the main control room. Chilled water can be restarted manually when normal power is restored.

Chilled water flow through various cooling coils and unit coolers is automatically controlled by local temperature-actuated valves, as shown on Figure 9.2-14. Some air cooling coils have uninterrupted water flow, and drywell cooling coil valves are controlled from the main control room.

During a refueling operation, chilled water is supplied to the third (standby) reactor building ventilation system (RBVS) cooling unit to increase the ventilation rate. Cooling water for the drywell may be provided manually to both loops of the cooling coils in the drywell air coolers if extra space cooling is required.

9.2.7.1.4 Safety Evaluation

The CWS has no safety-related function, except for the isolation valves at penetrations through the drywell. ~~and the reactor building.~~ These valves are described in Section 6.2.4.

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~~2. Reactor/auxiliary building penetrations and the reactor building isolation valves, which are designed both to Seismic Category I requirements and ASME B&PV Code, Section III, Class 3.~~

b. Remove the maximum anticipated heat loads developed by the components served by the system over the full range of the normal plant operating conditions and ambient temperature conditions

c. Permit the use of corrosion inhibitors to prevent long-term corrosion and organic fouling of the system's piping

d. Serve as a barrier between potentially radioactive systems and the SSWS.

9.2.8.2 System Description

The RACS consists of two 50%-capacity cooling water pumps with two 50%-capacity heat exchangers, one expansion tank, one chemical addition tank, two 100%-capacity booster pumps, and associated valves, piping, and controls, as shown on Figures 9.2-16 and 9.2-17. Major equipment design parameters are summarized in Table 9.2-9.

The RACS system provides demineralized cooling water to nonessential equipment, located in the reactor building enclosure, the radwaste area, and the turbine building, that can carry radioactive fluids or that require a clean water supply to minimize long-term corrosion. The system is monitored continuously to detect any radioactive inleakage from the equipment being cooled. The service water in the RACS heat exchanger tube side is maintained at a higher pressure than the closed loop system in the heat exchanger shell side. In the event of tube failure, the service water leaks into the closed loop system to preclude the possibility of radioactive release to the environment in the unlikely condition that the RACS cooling loop becomes radioactive.

The expansion tank is connected to the suction side of the pumps and placed at the highest point in the system to accommodate thermal expansion and contraction of the cooling water due to temperature variation, and provides ample net positive suction head (NPSH) to the RACS pumps. The expansion tank has a capacity of 640 gallons. It also provides necessary makeup water as required.

The RACS supply and makeup water are furnished from the demineralized water system. Sodium nitrite is periodically added to the system for corrosion prevention, from the 93-gallon chemical addition tank.

The RACS pumps, heat exchangers, chemical addition tank, and expansion tank are located in the reactor building.

Valves and piping for the RACS are designed to ANSI Power Piping Code B31.1, except for the primary containment ~~and reactor/auxiliary building~~ penetrations and isolation valves.

Containment penetrations and isolation valves are designed to Seismic Category I requirements and ASME B&PV Code, Section III, Class 2. ~~Reactor/auxiliary building penetrations, and isolation valves are designed to Seismic Category I requirements and ASME B&PV Code, Section III, Class 3.~~

Pumps, heat exchangers, and pressure vessels are designed to ASME B&PV Code, Section VIII, Division 1. The RACS heat exchangers are designed to TEMA Standard Class R and Heat Exchange Institute (HEI) standards.

The expansion tank is designed to the standards of ASME B&PV Code, Section VIII.

9.2.8.3 Safety Evaluation

The RACS has no safety-related function and is not required to be operable following a LOCA. Upon a LOCA signal, the RACS heat exchangers are automatically isolated from the balance of the SSWS, and the RACS pumps are tripped. Each supply and return header in the drywell has two containment isolation valves that close automatically upon a LOCA signal.

Provisions are made to alternate the lead and standby compressor in order to equalize wear. The lead compressor is in continuous operation and is automatically loaded or unloaded in response to the compressed air system demand. The second service air compressor serves as a standby. The standby compressor starts automatically at a predetermined low air pressure whether caused by failure of the lead compressor or an extra demand on the system. Cooling water for the intercooler and aftercooler is provided by the turbine auxiliaries cooling system (TACS).

One of the two drying towers of each instrument air dryer package removes moisture from the air stream while the other drying tower of the instrument air dryer package is regenerated with dry air. Moisture is adsorbed, and the regenerated air is expelled to the atmosphere. The towers are alternated on a timed cycle.

The emergency instrument air compressor and corresponding air dryer package, which are connected to the Class 1E bus system and maintained in automatic operation mode, will start operating if the instrument air pressure drops below 85 psig or both the service air compressors malfunction. In the event of an LOP, power will be manually restored from the SDG by the operator in the main control room. Loading and unloading sequence is regulated by the pressure at the emergency instrument air receiver.

Low pressure in the instrument air header shuts a valve in the service air supply header in order to divert all air supplies to the instrument air system.

All of the above compressed air system supply equipment is located in the turbine building.

9.3.1.3 Safety Evaluation

The instrument and service air systems have no safety-related function other than the integrity of the piping through the containment penetration. Failure of the systems will not compromise any safety-related system or component or prevent a safe shutdown of the plant. The service and instrument air lines penetrating to the reactor building have a motor-operated valve with a handswitch located in the main control room for containment isolation. Refer to Section 6.2.4 for details of containment isolation design features. ~~The service air reactor building penetration and isolation valves are designed to Seismic~~

~~Category I and ASME B&PV Code, Section III, Class 2, requirements as defined in Sections 3.7 and 6.2.~~

9.3.1.4 Tests and Inspections

The containment penetration portions of the compressed air systems are preoperationally tested in accordance wth the requirements of Chapter 14. The instrument air system is tested in accordance with Regulatory Guide 1.68.3, Preoperational Testing of Instrument Air Systems. Compressors and dryers shall be tested in accordance with ASME and manufacturers' test procedures.

9.3.1.5 Instrumentation Application

Instrumentation is provided for each instrument air and service air compressor train to monitor and automatically control each compressor's operation.

The compressors are tripped on the following signals: low oil pressure, high oil temperature, high cooling water discharge temperature, high air pressure in the receiver, high outlet air temperature, and high vibration. Most of these signals are annunciated in the main control room by common trouble alarms. High air temperature in the aftercooler and moisture separators, low pressure in the air receivers, and high intake filter differential pressure are also alarmed on a local control panel and the main control room by a common trouble alarm. Instrumentation is also provided locally for each instrument air dryer package train to monitor the packages operation.

Service air compressor and emergency instrument air compressor trouble are individually annunciated and alarmed on the local common service air compressor control panel. These alarms also indicate on the main control room computer, along with the air dryer trouble alarms.

9.3.2 PROCESS AND POST-ACCIDENT SAMPLING SYSTEMS

The process sampling system (PSS) is designed to monitor and provide grab samples of both radioactive and nonradioactive fluids used in the normal operation of Hope Creek Generating Station (HCGS).

corresponding noble gas release rate of 500,000 μCi/s after 30 minutes decay (design basis).

The concentration of radioactivity at the point of discharge shall not exceed concentration limits specified in 10 CFR 20, on an annual average basis.

g. All piping and equipment in the LWMS are non-~~Seismic~~ Category I with the exception of the primary containment, ~~reactor building isolation valves, and the associated piping between the isolation valves.~~

The seismic category, quality group classification, and corresponding codes and standards that apply to the design of the LWMS are discussed in Section 3.2.

h. Design features that reduce maintenance, equipment downtime, liquid leakage, or gaseous releases of radioactive materials to the building atmosphere, to facilitate cleaning or otherwise improve radwaste operations, are discussed in Section 12.3.

i. All atmospheric liquid radwaste tanks are provided with an overflow connection at least the size of the largest inlet connection. The overflow is connected below the tank vent and above the high level alarm setpoint. It is routed to the nearest drainage system compatible with its purity and chemical content. Each liquid radwaste tank room is designed to contain the maximum liquid inventory in case the tank ruptures.

j. Processed wastes are collected in sample tanks prior to their reuse as condensate quality water or discharged in a controlled manner into the cooling tower blowdown line for dilution before entering the Delaware River.

k. The expected and maximum radionuclide activity inventories for LWMS components containing significant amounts of radioactive liquids are shown in Tables 11.2-8 and 11.2-9. They are based upon the assumptions given in Table 11.2-1 and upon the following:

17.2 QUALITY ASSURANCE DURING THE OPERATIONS PHASE

Public Service Electric and Gas Company (PSE&G) is responsible for assuring that the operation, maintenance, refueling and modification of Hope Creek Generating Station (HCGS) is accomplished in a manner that protects public health and safety and that is in compliance with applicable regulatory requirements. To carry out this responsibility, PSE&G has developed and implemented a comprehensive quality assurance program that is applicable to the design, construction, and testing phases. The description of the quality assurance program provided herein parallels the operational quality assurance program currently being implemented at the Salem Generating Station.

This operational quality assurance program is documented in the nuclear department manual. This description is maintained by nuclear operations quality assurance (NQA). The program provides measures to assure the control of activities affecting the safety-related function of structures, systems, and components. The quality assurance program encompasses fire protection of safety-related areas and other activities enumerated in Regulatory Guide 1.33. A planned monitoring and audit program assures that specified requirements of the operational quality assurance program are met. The program provides coordinated and centralized quality assurance direction, control, and documentation, as required by the NRC criteria set forth in 10 CFR 50, Appendix B. Applicable NRC Regulatory Guides, codes, and standards, as well as the policy statements contained in the nuclear department ~~PSE&G quality assurance~~ manual, are used by PSE&G organizations performing activities affecting safety to prepare appropriate implementing procedures. To assess the effectiveness of the PSE&G quality assurance program, independent auditors from outside the company periodically audit the program for compliance with 10 CFR 50, Appendix B, and other regulatory commitments. Independent audits shall be conducted at least every two years. Reports of such audits are made directly to upper management.

QA policy statements are issued by key management representatives including the Company Board Chairman/President, by the Senior Vice President - Energy Supply and Engineering and by the Vice President - Nuclear and, as such, are mandatory throughout the Company.

The PSE&G policies and organization structure assure that the manager - quality quality assurance nuclear operations has sufficient organizational freedom and independence to carry out his responsibilities.

17.2.1.1.4.1 Nuclear Operations Quality Assurance Personnel Qualifications

and must be obtained within the quality assurance organization

The manager - NQA and engineers reporting directly to him must each have a combination of 6 years of experience in the field of quality assurance and operations. At least 1 of these 6 years of experience must be in the overall implementation of a nuclear power plant quality assurance program. A minimum of 1 year and a maximum of 4 of the 6 years of experience may be fulfilled by related technical or academic training. Personnel performing inspections, examinations, and test activities are certified as Level I, Level II, Level III as appropriate to their responsibilities, also in accordance with Regulatory Guide 1.58, as noted.

(i.e., to verify conformance)

The manager - nuclear operations quality assurance fulfills the above qualifications with the addition of the following:

a. Knowledge and experience in quality assurance,

b. High level of leadership with the ability to command the respect and cooperation of company personnel, vendors, and construction forces

c. Initiative and judgment to establish related policies to attain high achievements and economy of operations.

17.2.1.1.5 Independent Review Groups

Three advisory groups are responsible for reviewing and evaluating items related to nuclear safety. The overall responsibilities of these groups are included in the following sections. More detailed descriptions are contained in Section 13.4.

The SORC is an in station advisory group. Composed of key station personnel, its responsibilities include review of plant

and Maintenance Department personnel who perform visual inspection as part of the Inservice Inspection program.

Personnel requiring certification are evaluated to establish their qualifications for their respective level and discipline. Recertification is based upon demonstrated continued proficiency or requalification, if necessary. Personnel requiring certification in accordance with Regulatory Guide 1.58 are limited to NQA personnel who perform inspection and test activities, ~~and~~ members of the Operational Test Group (OTG) who perform post-design modification testing. ~~NQA and OTG and~~ These ~~calibration~~ personnel receive a periodic training needs assessment to identify additional supportive training needs as well as to evaluate individual post-training performance. The assessment period is three years or less. Inspection and test activities not requiring personnel certification per Regulatory Guide 1.58 include Technical Specification surveillances and periodic inspection and test of fire protection equipment. These personnel are qualified and retrained in accordance with applicable requirements of Regulatory Guide 1.8.

Training programs of supporting organizations are described in their manuals, which are required to comply with the quality assurance program.

The Nuclear Training Center is responsible for the licensed operator training and retraining, in addition to other technical and supervisory training programs, including General Employee Indoctrination, which is required for all personnel having access to the station.

17.2.3 DESIGN CONTROL

The design control program includes activities such as field design engineering, associated computer programs, compatibility of materials, and accessibility for inservice inspection, maintenance, and repair.

During the operations phase, issuance of new drawings and revisions to existing drawings require the implementation of a design change.

The nuclear support division procedures, approved by the manager - nuclear operations QA, provide implementation guidance for the intent of Regulatory Guide 1.64 "Quality Assurance Requirements for the Design of Nuclear Power Plants." Within that division, the nuclear engineering section has the following responsibilities:

(The scope of the design control program includes design activities associated with the preparation and review of design documents, including the correct translation of applicable regulatory requirements into design modification, procurement and procedural documents.

The designation of those activities requiring detailed procedures is made by cognizant department heads and as a minimum, complies with applicable requirements of Regulatory Guide 1.33.

c. Provide right of access for source surveillance and audit by NQA or its agents

d. Provide for required supplier documentation to be submitted to PSE&G or maintained by the supplier, as appropriate

e. Provide for PSE&G review and approval of critical procedures prior to fabrication, as appropriate.

Procurement documents require suppliers and contractors of other than commercial grade items to provide services or components in accordance with a quality assurance program that complies with applicable parts of 10 CFR 50, Appendix B. The requirement for notifying PSE&G of procurement requirements that have not been met is conveyed to the supplier through the standard warranty provision contained in each Purchase Order. In addition, where 10 CFR 21 is imposed, suppliers are required to comply with applicable reporting requirements.

17.2.5 INSTRUCTIONS, PROCEDURES, AND DRAWINGS

Organizations engaged in Q- and F-designated activities are required to perform these activities in accordance with written and approved procedures, instructions, or drawings, as appropriate.

Simple routine activities that can be performed by qualified personnel with normal skills do not require a detailed written procedure. Complex activities require detailed instructions. ~~An activity is defined as complex upon the designation of the responsible department manager~~.

Procedures include, as appropriate, scope, statement of applicability, references, prerequisites, precautions, limitations, and checkoff lists of inspection requirements, in addition to the detailed steps required to accomplish the activity. Instructions, procedures, and drawings also contain acceptance criteria where appropriate.

The general manager - Hope Creek operations is responsible for assuring that station procedures are prepared, approved, and implemented in compliance with the station administrative procedures. Documents affecting nuclear safety are reviewed by

the station operations review committee (SORC) for technical content, by NQA for quality assurance requirements, and are approved by the responsible station department manager or his designee.

The general manager - nuclear support is responsible for issuing specifications, drawings, blueprints, and instruction and technical manuals associated with Q- and F-designated structures, systems, and components. Approved and implemented modifications and design changes are incorporated to these reference documents for the life of the station. Master lists of current editions or revisions of these documents are periodically issued by the general manager - nuclear support to the general manager - Hope Creek operations to periodically assure that only current and approved referenced documents are used at the station.

NQA reviews and approves station inspection plans and procedures that implement the quality assurance program, including testing, calibration, maintenance, modification, rework, and repair. Changes to these documents are also reviewed and approved. In addition, NQA is responsible for review and approval of PSE&G specifications, test procedures, and results of testing.

17.2.6 DOCUMENT CONTROL

Instructions, procedures, drawings, and changes thereto are reviewed for inclusion of appropriate quality assurance requirements and are approved by appropriate levels of management of the PSE&G organizations producing such documents, and distributed on a timely basis to using locations. Measures are provided for the timely removal of obsoleted or superseded documents from the using location. Supplier documents are controlled according to contractual agreements with suppliers.

The following is a generic minimum listing of key documents for the operational phase, showing organization responsibility for review ~~and~~ and/or approval, including changes thereto:

a. Design specification - Nuclear Support, NQA

b. Design, modifications ~~manufacturing, construction, and installation drawings~~ - Nuclear S~~upport~~ support, nuclear services Hope Creek operations, NQA

c. Procurement documents - initiating Nuclear ~~Services,~~ department organization, Purchasing Department, nuclear services, NQA

d. ~~Quality assurance manual - NQA~~ Revise per Insert 17.2-21A

e. ~~Station administrative procedures - General Manager - Hope Creek Operations, NQA~~ Revise per Insert 17.2-21B

f. Maintenance, modification, and calibration procedures for Q- and F-designated station work activities - ~~Nuclear Services, General Manager~~ - Hope Creek Operations, NQA

g. Operating procedures - ~~General Manager~~ - Hope Creek Operations, SORC

h. FSAR - ~~Nuclear Support, NQA~~ Revise per Insert 17.2-21C

i. Maintenance, inspection, and testing instructions - ~~Nuclear Services, NQA~~ nuclear department implementing organizations, NQA

Post modification test procedures - nuclear services, NQA

j. ~~Q-listed test procedures - Nuclear Services, NQA~~

k. ~~Design change requests - Nuclear Support, NQA.~~

In addition, NQA involvement in the work activity includes a review of nonsafety-related work orders for proper classification prior to conducting the activity and a review of completed safety-related work orders.

The establishment and maintenance of a document control system for all instructions, procedures, specifications, and drawings received from the nuclear department, or prepared at the station for use in operating, maintaining, refueling, or modifying items and services covered by the quality assurance program, is the responsibility of the general manager - Hope Creek operations. The administrative procedures manual describes the control of specific documents. Control of station practices is included in the administrative procedures and in department directives authorized by the responsible station department managers. Measures are established to assure that the administrative procedures and department directives are up-to-date, are properly

Insert 17.2-21A

d. Nuclear Department Manual - nuclear department organizations responsible for implementation, NQA

Insert 17.2-21B

e. Nuclear department second-tier manuals, including station administrative procedures - cognizant department head, NQA

Insert 17.2-21C

h. FSAR - nuclear services and other nuclear department organizations responsible for implementing applicable sections. In addition, NQA reviews all FSAR sections and subsequent changes for compliance with applicable QA Program requirements

In addition, station administrative procedures provide for the use of temporary changes which are controlled in accordance with Technical Specifications. Detail instruction for implementation of temporary changes are provided.

e. Critical test sequence

f. Acceptance criteria.

Test results, including verification of above items, ~~as applicable~~ are documented and reviewed for acceptability by the qualified department representative. System tests performed following modifications to Q- and F-designated systems require review of test procedures and test results by the SORC.

NQA ~~maintains~~ monitor~~ing over~~s the conduct of ~~the design change acceptance~~ post modification tests to assure compliance with the test procedure. Test results are reviewed for the following:

a. Presentation of proper documentation

b. Assurance that tests meet objectives

c. Identification and reporting of unacceptable results and initiation of corrective measures.

17.2.12 CONTROL OF MEASURING AND TEST EQUIPMENT

Test equipment, instrumentation, and controls used to monitor and measure activities affecting quality and personnel safety are identified, controlled, and calibrated at specific intervals by cognizant nuclear department personnel. Written procedures for meeting these requirements include provisions for:

a. Specifying calibration frequency

b. Recording and maintaining calibration records

c. Controlling and calibrating primary and secondary standards

d. Determining methods of calibration

e. Tracing use on safety-related items.

repair or "use-as-is" are required to be approved by the responsible engineering representative. Rework or repair of nonconforming material, parts, or components is inspected and/or retested in accordance with specified test and inspection requirements established by the cognizant engineer, based on applicable ~~code~~ requirements.

NQA and the nuclear department review nonconformance reports for quality problems, including adverse quality trends, and initiate reports to higher management, identifying significant quality problems with recommendations for appropriate action.

17.2.16 CORRECTIVE ACTION

Organizations involved in activities covered by the quality assurance program are required to maintain corrective action programs commensurate with their scope of activity. Noncompliances with the quality assurance program identified by NQA are documented and controlled by issuing an action request. NQA reviews responses to action requests for adequacy and monitors these action requests through periodic summary and status reports to management.

Responses to action requests are based on the four elements of corrective action, which are:

a. Identification of cause of deficiency

b. Action to correct deficiency and results achieved to date

c. Action taken or to be taken to prevent recurrence

d. Date when full compliance was or will be achieved.

For significant conditions adverse to quality not identified by NQA, such as LERs, NRC/INPO/CMAP findings, NQA is involved in the review of such conditions and provides oversight to assure timely follow-up and close out through monitoring, auditing, and commitment verification.

Items 3 and 4 are optional for noncompliances that do not have a significant effect on the quality assurance program.

d. Indoctrination and training

e. Implementation of operating and test procedures

f. Calibration of measuring and test equipment

g. Fire protection

h. Other applicable activities delineated in Table 17.2-2.

The audit data is analyzed and a written report of the results of each audit is distributed to appropriate management representatives of the organization(s) audited, as well as to other affected management personnel. Included in the report is a statement of QA program effectiveness. ~~Periodically,~~ NQA is audited by independent auditors at least every two years to verify implementation of the corporate quality assurance program. Reports of these audits are directed to appropriate PSE&G management personnel.

(e) Area radiation monitoring system operation
(f) Process radiation monitoring system operation
(g) Meteorological monitoring and data collection program
(h) Packaging and transport of radioactive material per 10 CFR 71
(i) Decontamination.

7. Technical Specification surveillance

8. Performing maintenance

9. Chemical and radiochemical control.

B. Additional NRC requirements

1. Technical Specification administrative controls

(a) Station operations review committee (SORC)
(b) Nuclear review board (NRB)
(c) Reportable occurrences.

2. Inservice inspection plan

3. Reporting of defects and noncompliance.

4. Modifications to site grading

QUESTION 260.15

The fourth paragraph of FSAR Section 17.2.2 refers to Section 1.8 for commitments to Regulatory Guides. Section 1.8 primarily addresses Regulatory Guide commitments during design and construction, and the staff review of the FSAR is concerned with Regulatory Guide commitments during the operations phase. With any proposed clarifications or exceptions, provide a commitment in the FSAR to the effect that: "During the operations phase of HCGS, PSE&G commits to comply with the regulatory position in ..." the appropriate issue of the Regulatory Guide listed on pages 17.1-26 and 17.1-27 (with RG 1.33 replacing RG 1.28) or NUREG-0800 (Rev. 2 - July 1981). For systems, components, and structures covered by the ASME Boiler and Pressure Vessel Code Section III (Classes 1, 2 and 3), the code QA requirements should be supplemented by the specific guidance addressed in the regulatory positions of the applicable Regulatory Guides. (2B3)

RESPONSE

Section 17.2.2 lists regulatory guidance applicable to the QA program. This list has been revised to include Regulatory Guides 1.116, 1.123, and 1.144. PSE&G will revise section 1.8 to reflect compliance with listed Regulatory Guides which are applicable during the operations phase, along with any clarification, modifications, etc. by June 1984.

The code QA requirements are used for the procurement of systems, components and structures covered by the ASME Boiler and Pressure Vessel Code Section III (classes 1, 2, and 3). The standard QA program controls apply to Q-Listed code items following receipt at the station. In addition, applicable requirements of Regulatory Guide 1.38 will be applied to ASME Code procurements when necessary to assure safe shipment.

QUESTION 260.50 (SECTION 17.2)

Describe the provisions which assure that when inspections associated with normal operations of the plant (such as routine maintenance, surveillance, and tests) are performed by individuals other than those who performed or directly supervised the work, but are within the same group, the following controls are met: (SRP Section 17.2.10, item 2)

a. The quality of the work can be demonstrated through a functional test when the activity involves breaching a pressure retaining item.

b. The qualification criteria for inspection personnel are reviewed and found acceptable by QANO prior to initiating the inspection.

RESPONSE

See response to Questions 260.7 and 260.19.

Section 17.2.10 ~~(Page 17.2-25)~~ has been revised to provide additional information requested.

QUESTION 260.60 (SECTION 17.2)

Describe those provisions which assure that procedures are established to control altering the sequence of required tests, inspections, and other safety-related operations. Such actions should be subject to the same controls as the original review and approval. (14.3)

RESPONSE

Section 17.2.11 states in part:

Test procedures prescribe, as applicable:

(d) Critical test sequence

.....Test results are documented and reviewed for acceptability by the qualified department representative.

In addition, station administrative procedures provide for the use of temporary changes. Detail instructions for implementation of temporary changes are provided.

which are controlled in accordance with Technical Specifications

a.6 The diesel generator combustion air intake and exhaust system is Q-listed (Item VIII.h of Table 3.2-1).

a.7 & a.8 Process radiation monitoring associated with systems required for safety are Q-listed (Item XV.e of Table 3.2-1). QA program controls were not applied during design and construction phase for area radiation monitoring and for process radiation monitoring associated with systems not required for safety (Item XV.f of Table 3.2-1). QA program controls shall be applied during the operations phase to an extent consistent with the item's importance to safety.

a.9, a.10 & a.11 Activities covered by the QA program are delineated in Table 17.2-1, and included radioactivity sampling, radioactive contamination measurement and analysis, and personnel monitoring internal under "control of radioactivity".

a.12 Activities covered by the QA program are delineated in Table 17.2-1 and include instrument storage, calibration and maintenance.

a.13 Decontamination equipment and facilities are not safety-related. Decontamination piping and valves are part of the "Liquid Radwaste System" described in Table 3.2-1. Activities covered by the QA program are delineated in Table 17.2-1 and include personnel decontamination under "control of Radioactivity."

a.14 & a.15 Activities covered by the QA program are delineated in Table 17.2-1 and include respiratory protection and contamination control under "control of Radioactivity."

a.16 Activities covered by the QA program are delineated in Table 17.2-1 and include accident-related meterological data collection equipment under "Meterological Monitoring and Data Collection Program."

a.17 Not applicable to HCGS.

a.18 Structural backfill is Q-listed (Item XIX.1 of revised Table 3.2-1).

a.19 The Seismic Category I electrical duct bank manholes are Q-listed (Item XIX.n of revised Table 3.2-1).

a.20 ~~Site grading is not Q-listed and is not a "structure, system, or component" that should be included in Table 3.2-1. Site grading cannot adversely impact safety-related equipment, because of flood protection measures discussed in Section 3.4.1.1.~~ Modifications to site grading during the operations phase will be covered by the operational QA Program (See Table 17.2-1).

for HCGS, an appropriate safety classification will be determined.

c.1 The HCGS position on TMI Item I.D.2 is given in Section 1.10. The safety parameter display system is part of the Control Room Integrated Display System (Item XV.d of revised Table 3.2-1).

c.2 The HCGS position on TMI Item II.B.1 is given in Section 1.10. The HPCI, RCIC, ADS, and containment instrument gas systems are Q-listed, as shown in Items V.c, VI, XV.b.1, and XVII.b of Table 3.2-1. The RPV head vent is Q-listed but not Class IE (Item I.c of Table 3.2-1).

c.3 The HCGS position on TMI Item II.B.2 is given in Section 1.10. The post-accident shielding is Q-listed (Item XIX.m of revised Table 3.2-1).

c.4 The HCGS position on TMI Item II.B.3 is given in Section 1.10. The post accident sampling system (PASS) is not Q-listed with the exception of the primary containment isolation and reactor coolant pressure boundary piping and valves.

c.5 The HCGS position on TMI Item II.D.3 is given in Section 1.10. The SRV position indication system is Q-listed (Item XV.d of revised Table 3.2-1).

c.6 The HCGS position on TMI Item II.E.4.1 is given in Section 1.10. The dedicated hydrogen control penetrations are Q-listed (Item V.d.4.g and h of Table 3.2-1).

c.7 The HCGS position on TMI Item II.E.4.2 is given in Section 1.10. Containment isolation valves are Q-listed (See Table 3.2-1 under applicable system).

c.8 The HCGS position on TMI Item II.F.1 is given in Section 1.10. Accident monitoring instrumentation will be designed in accordance with the guidance provided in Regulatory Guide 1.97, Rev 2. This instrumentation will be reviewed for classification as Q-listed, and Table 3.2-1 will be modified as necessary.

c.9 The HCGS position on TMI Item II.F.2 is given in Section 1.10. No additional instrumentation was identified as a result of this required study, and therefore no changes to Table 3.2-1 are necessary at this time.

c.10 The HCGS position on TMI Item II.K.3.13 is given in Section 1.10. No change was made to the HPCI and RCIC initiation levels and, therefore no change to Table 3.2-1 are necessary.

c.11 The HCGS position on TMI Item II.k.3.15 is given in Section 1.10. The HPCI and RCIC leak detection systems are Q-listed (Item XV.e.2 of Table 3.2-1).

c.12 The HCGS position on TMI Item II.k.3.16 is given in Section 1.10. HCGS is reviewing the modifications proposed by the BWROG to meet the requirements. This review will be completed by December, 1983. Table 3.2-1 will be modified as appropriate.

c.13 The HCGS position on TMI Item II.k.3.18 is given in Section 1.10. BWROG response to this TMI study is still under evaluation by NRC. HCGS design will be modified to comply with the NRC's acceptable position. Table 3.2-1 will be modified as appropriate.

c.14 The HCGS position on TMI Item II.k.3.21 is given in Section 1.10. No change was made to the core spray and LPCI logic and therefore no change to Table 3.2-1 is necessary.

c.15 The HCGS position on TMI Item II.k.3.22 is given in Section 1.10. The RCIC suction transfer is Q-listed (Item XV.c.1 of Table 3.2-1).

c.16 The HCGS position on TMI Item II.k.3.24 is given in Section 1.10. The HPCI and RCIC room unit coolers are Q-listed (Item XIII.c.2 of revised Table 3.2-1).

c.17 The HCGS position on TMI Item II.k.3.25 is given in Section 1.10. The recirculation pump sealing cooling water supply system (RAC and CRD) are not Q-listed (Item XI.c and IV of Table 3.2-1).

c.18 The HCGS position on TMI Item II.k.3.27 is given in Section 1.10. See Table 3.2 for listing of existing level instrumentation.

c.19 The HCGS position on TMI Item II.k.3.28 is given in Section 1.10. The ADS valves, accumulators and associated equipment and instrumentation are Q-listed (Item II.1, II.b, II.c XV.b.1 & 11 and XVII.b of Table 3.2-1).

c.20 The HCGS position on TMI Items III.a.1.1/III.a.2 is given in Section 1.10. Activities covered by the QA program are delineated in Table 17.2-1 and include emergency plans under, "combating emergencies and other significant events."

c.21 The HCGS position on TMI Item III.a.1.2 is given in Section 1.10. The Emergency Response Facilities Data Acquisition System (ERFDAS) is shown in Item XV.d of revised Table 3.2-1.

c.22 Activities covered by the QA program are delineated in Table 17.2-1 and include inplant I_2 radiation monitoring under "Control of Radioactivity."

c.23 The HCGS position on TMI Item II.d.3.4 is given in Section 1.10. This item is not a "structure, system or component" requiring entry in Table 3.2-1. Control of this activity is provided by appropriate procedures. Chapter 17 describes the Quality Assurance Program coverage of procedural controls.

The following information is provided for additional clarification:

a) The nonsafety-related, non-ESF internal cpmponents include the steam dryer, the shroud head and steam separator assembly, the in-core guide tubes and stabilizers, the differential-pressure and liquid-control lines inside the RPV, the fuel orifices, and the feedwater spargers. In all BWR 4, 5, and 6 designs, these components are not Q-listed because they are neither required for safe shutdown of the plant, nor would their failure jeopardize the safety functions of other safety-related internal components.

During the operating phase of the HCGS, the same high-quality design, procurement, and installation control practices, as were applied during the design and construction phase, will be applied to any changes to these components. As Section 3.2.1 and notes (13) and (50) for Table 3.2-1 indicate, the quality assurance controls for non-ESF RPV internal components and for seismic Class II/I equipment are described in Section 1.8.1.29.

In addition, the reactor pressure vessel internal structures which are accessible are included in the ISI program, which is covered by the operational QA program.

b) Reactor building penetrations are not required to be Q-listed unless the piping system is Q-listed. A non-Q piping system penetrating the reactor building is not required to have a Q-listed penetration. ~~However, most of the reactor building penetrations are Q listed as shown in revised Table 3.2-1.~~

c) The spent fuel pool liner does not perform a safety function and therefore is not Q-listed. However, the spent fuel pool does meet the quality assurance requirements of 10 CFR 50, Appendix B, and has been noted as such in Table 3.2-1, Item XIX.e.

d) Shore protection of the intake structure does not have a safety function and therefore is not Q-listed (Item XVIII.j

of revised Table 3.2-1). However, it is designed to accommodate design flood and seismic event.

e) The roof drainage system and modifications to the roof drainage system are [redacted] not Q-listed and [redacted] are not a "structure system or component" that should be included in Table 3.2-1. Roof drainage cannot adversely impact safety-related equipment because of flood protection measures discussed in Section 3.4.1.1.

¶ Modifications of roof parapet and openings is Q-listed as part of the Q structure

~~Site grading should not be included in Table 3.2-1 as discussed in the response to item a 20 of SRAI(1).~~

f) The purge (containment inerting) system is described under the containment atmosphere control system (Item V.d.3), not the reactor building ventilation system (Item VIII.c).

g) Containment isolation valves used at HCGS meet the requirements outlined in GDCs 54-56 of 10 CFR 50 Appendix A as outlined in Table 6.2-16.

h) Table 3.2-1, Item V.a has been revised to clearly identify piping, valves and other equipment used for suppression pool cooling, steam condensing and suction lines for the shutdown cooling modes of the RHR system.

i) There are no nuclear codes and standards applicable to the design and manufacture of the HPCI and RCIC turbines. Approximately 50 to 75 components of the turbines' lubricating oil systems contribute to the electrohydraulic control of the governing valves. Footnotes (11) [redacted] (48) and (59) provide the applicable quality assurance, documentation, maintenance, and material fabrication information.

j) Process and effluent radiation monitoring systems are listed in Item X.d of Table 3.2-1. See Sections 7.6 and 11.5 for the differences between the process radiation monitoring systems and the process and effluent radiation monitoring systems.

k) Table 3.2-1 will be revised to incorporate the Emergency Response Facilities Data Acquisition System (ERFDAS). This system is non-Q, non-class 1E and non-seismic, except for the Class 1E isolation devices supplied with the ERFDAS.

l) The MSIV sealing system consists of valves, valve operators, and piping only; the sealing system is supplied by the instrument gas system (see Item XVIII.b).

m) The unit vent stacks are Q-listed as shown in revised Table 3.2-1, Item XIX.g.