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SUBJECT: Forwards FSAR changes,including deviation from Rev 1 to Reg Guide 1.52 & rev to 10CFR50.73 re nonroutine reportability requirements.Changes will be included in next FSAR update.

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Director of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Chief
Licensing Branch 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

August 30, 1985
ANPP-33312-EEVB/JKO

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 2 and 3
Changes to PVNGS FSAR on Various Subjects
Docket Nos. STN-50-529/530
File: 85-056-026; G.1.01.10

Dear Mr. Knighton:

Attached for your review on PVNGS Units 2 and 3 are FSAR changes to various sections. These changes are editorial in nature. They are being submitted for your review. Listed below are the subjects addressed by the FSAR changes:

(1) Deviation from R.G. 1.52 Rev. 1 to be consistent with Tech Specs.
(2) Reg. Guide 1.16 has been superceded by a revision to 10CFR 50.73 with regard to non-routine reportability requirements.
(3) Conform with as-built system configuration for seismic monitors.
(4) Correctly identify plant vent radiation monitors as tag numbers XJ-SQN-RU-143 and XJ-SQN-RU-144.
(5) Revise Figure 3.6-4 to correctly cross reference break number 2206 to Figure 3.6-2.
(6) Amend FSAR references to Chapter 16 to redirect reviewer to the Tech Specs.

For PVNGS Unit 1, safety reviews and evaluations have been completed for implementation of these changes in accordance with the requirements of 10CFR 50.59. The safety reviews and evaluations have determined that there are no unreviewed safety questions involved with the changes. These changes will be included in the next FSAR update.

B001
1/1

If you have any questions concerning these changes, please contact William Quinn of my staff.

Very truly yours,

E. E. Van Brunt, Jr.
Executive Vice President
Project Director

EEVB/JKO/slh
Attachment

cc: E. A. Licitra
M. Ley
R. P. Zimmerman
A. C. Gehr

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Executive Vice President, Arizona Nuclear Power Project, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Edwin E. Van Brunt

Edwin E. Van Brunt, Jr.

Sworn to before me this 30 day of August, 1985.

Nora E. Meador
Notary Public

My Commission Expires:
My Commission Expires April 6, 1987

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S. Shapiro
C. F. Ferguson
SARCNs: 2005, 2007, 2015, 2022, 2038, 2040

I. Position C.3.o

Air straightening devices are installed only if tests indicate that uniform air flow distribution is not achieved.

J. Position C.4.b

Vacuum breakers would be of minimal assistance in opening doors to units during fan operation. The use of vacuum breakers creates potential leakage paths. Units which operate at higher pressure than external pressures; i.e., push-through units, do not require vacuum breakers.

K. Position C.4.c

Accessibility for ease of maintenance is provided by removing opposing filters in opposite directions. The standard suggested distance of 3 feet plus length of component for removal of filters is met.

L. Position C.4.d

Piping associated with manifolding could result in plate-out of components of the sampled gas stream, leading to erroneous test results. The test probes are located in readily accessible locations with a minimum of piping, but are not manifolded.

INSERT A

M. Position C.5.d

The activated carbon adsorber section will be leak
12 tested in accordance with position C.5.d of R.G. 1.52 rev 2 March 1978 and using ANSI N510-1980 in place of ANSI N510-1975.

Insert A to FSAR Page 1.8 - 36B

M. Position C.4.e

Each atmosphere cleanup train will be operated for 15 minutes per month. There is not expected to be any moisture buildup on the absorbers and HEPA filters due to the low humidity at PVNGS. This is in agreement with the Palo Verde Unit 1 Technical Specifications which require the systems to be operated for at least 15 minutes every 31 days.

REGULATORY GUIDE 1.13: Fuel Storage Facility Design Bases (Revision 0, March 10, 1971)

RESPONSE

The position of Regulatory Guide 1.13 is accepted. Compliance is described in sections: 9.1.2, Spent Fuel Storage; 9.1.3, Spent Fuel Pool Cooling and Cleanup System; 3.5, Missile Protection; 3.8.4, Other Seismic Category I Structures; and 9.4, Air Conditioning, Heating, Cooling, and Ventilation Systems.

REGULATORY GUIDE 1.14: Reactor Coolant Pump Flywheel Integrity (Revision 0, October 27, 1971)

RESPONSE

Refer to CESSAR Section 1.8.

REGULATORY GUIDE 1.15: Testing of Reinforcing Bars for Category I Concrete Structures (Revision 1, December 28, 1972)

RESPONSE

The position of Regulatory Guide 1.15 is accepted (refer to section 3.8).

REGULATORY GUIDE 1.16: Reporting of Operating Information (Revision 1, October 1973)

RESPONSE

The position of Regulatory Guide 1.16 is accepted, except ~~as noted below, to the extent described in the PVNGS Technical Specifications.~~ FOR SECTION C.2, NONROUTINE REPORTS, WHICH IS SUPERCEDED BY 10CFR 50.72 AND 50.73 FOR NONROUTINE REPORTS. 12

~~A. Position C.2.a is modified to require the written followup report in 14 days, to be consistent with PVNGS Technical Specification 6.9.1.8.~~

Two seismic triggers are provided to start the SMA recording system. One is located adjacent to the SMA in the containment tendon gallery and the other on the containment operating floor at elevation 140 feet. Both triggers are sensitive to vertical and horizontal motions.

A magnetic tape recording and playback unit is provided for multiple channel recording and playback of the signals from the strong motion accelerometers. The data recordings include an additional recording channel which contains a timing signal. Internal to the tape recorder are triggers which continuously monitor the accelerometer outputs and activate the recording system if the remote seismic trigger(s) should fail.

replace wit below INSERT A

The recording and playback system is housed in a panel furnished for these instruments and devices necessary for system testing, annunciating, calibration, and control. This panel is located in the control room.

3.7.4.2.2 Peak Recording Accelerograph

The sensor unit contains three accelerographs mounted in a mutually orthogonal array. The PRA is mounted directly on
6 | Class 1 pipe in the auxiliary building at elevation 78 feet and has one axis coincident with the principle pipe axis. It is a self-powered unit.

The PRA is located as necessary to verify the continued availability of Seismic Category I systems and equipment. Data from the PRA must be manually retrieved following an earthquake and are used in the detailed investigations for particular structures, systems, and equipment.

INSERT A: Internal to the tape recorder is a trigger switch which continuously monitors the output level of a single accelerometer. This will activate the recording system if the remote seismic trigger(s) should fail.

b) Samples are available by placing the tank in a recirculation lineup and drawing a sample of the pump discharge. This is described in section 11.2.2.2.4.1. Descrete sample capabilities are listed in table 9.3-3 (sheet 10 of 12).

c) The concentrate monitor tanks are kept in a continuous recirculation mode while they contain radioactive concentrate. Samples are taken from an analysis point off the pump discharge. Sample capabilities are listed in table 9.3-3 (sheet 10 of 12).

d) The fuel storage area currently is designed to be grab sampled for iodine using a movable airborne monitor (refer to table 11.5-1). Continuous iodine collection using a charcoal cartridge will be provided for the fuel building. 4

replace with Insert A

The radwaste area and evaporator vent are designed to be grab sampled from the grab sample connection on radiation monitor XJ-SQN-RU-14. Prior to release, the plant vent radiation monitors (XJ-SQN-RU-13) continuously and isokinetically collects an iodine sample using a charcoal cartridge. Additionally, areas in the radwaste building may be grab sampled for iodine using a movable airborne monitor.

QUESTION 9A.38 (NRC Question 460.6) (9.4 and 11.3)

Provide a table comparing the design features and radioactivity removal capability of each normal ventilation filter system to each position detailed in Regulatory Guide 1.140, Rev. 1 (October 1979), "Design, Testing and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power

INSERT A (XJ-SQN-RU-143 AND XJ-SQN-RU-144)

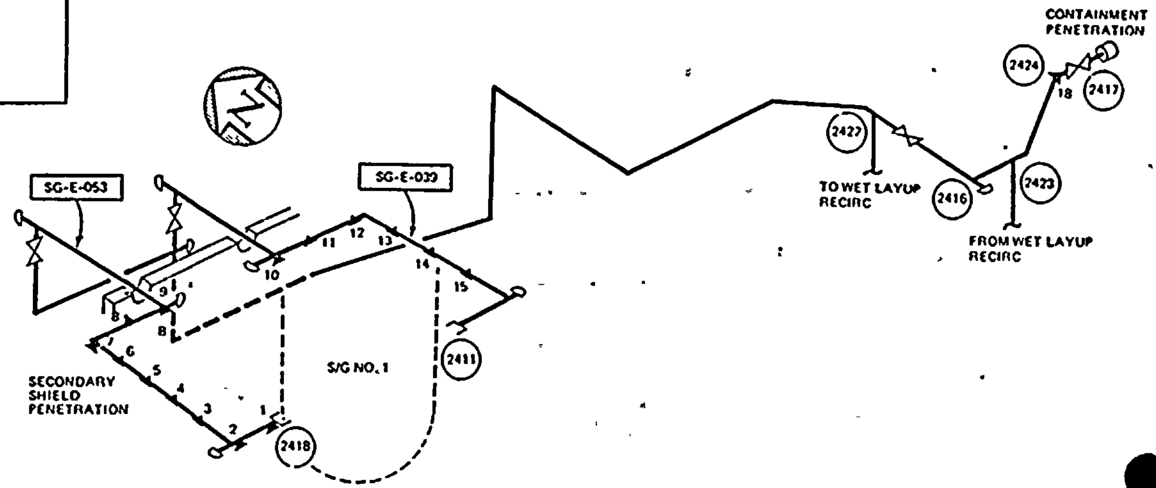
BLOWDOWN LINES TO SG NO. 1 (SG-E-039 AND 053)

PIPE BREAK LOCATION	BREAK NUMBER	WHIP RESTRAINT	TARGET
@ TERMINAL ENDS	2417	NONE	NONE
	2411	NONE	NONE
	2418	NONE	NONE
	2423	NONE	NONE
	2422	NONE	NONE
@ MAX STRESS LOCATIONS	2416	NONE	NONE
	2424	NONE	NONE

JET IMPINGEMENT ON BLOWDOWN LINES (SG-E-039 AND 053)

ORIGIN OF JET	BREAK NUMBER	TARGET
RCS	1109 (FIGURE 3.6-10)	3,4,5,6
RCS	1111 (FIGURE 3.6-10)	12,13
RCS	1112 (FIGURE 3.6-10)	3,4,5,6,8,9,10,11,
RCS	1113 (FIGURE 3.6-10)	8,9,10,11,13,14,15
RCS	1114 (FIGURE 3.6-10)	7
RCS	1117 (FIGURE 3.6-10)	12,13,14,15,16
SURGE	1502 (FIGURE 3.6-12)	2,3,4,5,6,7
MFW	2206 (FIGURE 3.6-3)	18

3.6-2



LEGEND:

◯ PIPE BREAK LOCATION

⬡ PIPE WHIP RESTRAINT

▲ JET IMPINGEMENT TARGET

CHANGE

Palo Verde Nuclear Generating Station
FSAR

S/G NO. 1 BLOWDOWN LINES (SG-E-039 AND 053) LOCATION OF POSTULATED BREAKPOINTS, JET IMPINGEMENT TARGETS AND PIPE WHIP RESTRAINTS

Figure 3.6-4

emergency procedure is implemented. This ensures proper operator response independent of event diagnosis. This approach is consistent with CEN-152, CE Emergency Procedure Guidelines.

Actions identified as subsequent operator action are
addressed as a recovery procedure, implemented after
event diagnosis. This approach is consistent with 1
CEN-152, CE Emergency Procedure Guidelines.

The specific procedure format and content has been identified in the Emergency Procedure Generation Package and submitted to the NRC for review. This is consistent with NUREG 0899.

The implementation of the positions of this Regulatory Guide are described in chapters 13, ~~16,~~ and 17, and the Technical Specifications.

REGULATORY GUIDES

<u>REGULATORY GUIDE 1.34</u>: Control of Electroslag Weld Properties (Revision 0, December 28, 1972)

<u>RESPONSE</u>.

Refer to CESSAR Section 1.8.

<u>REGULATORY GUIDE 1.35</u>: Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containment Structures (Revision 1, June 1974)

<u>RESPONSE</u>

Inservice surveillance requirements are discussed in sections 3.8.1.7.2, and ~~16.3/4.~~ Section 3/4.6.1 of the Technical Specifications. The inservice tendon surveillance program complies with Regulatory Guide 1.35, Revision 1, except for the following:

A. Position C.5.b

Position C.5.b is replaced with Position C.4 of Regulatory Guide 1.35, Draft Revision 3. In addition, as the elongations at installation and during inspection may vary more than 5% due to creep, shrinkage, thermal effects, and friction, a recording of the elongation throughout the history of the inspection program will be maintained so that trends can be identified. This data will be used in evaluating any unusual differences in elongation during installation and inspection.

B. Position C.5.c

Position C.5.c is replaced with Position C.2 of Regulatory Guide 1.35, Draft Revision 3.

(R.G. 1.108, cont.)

governor oil cooler. This system is not part of the diesel generator unit.

B. Position C.2.e.7

Tests to verify correction of a problem will be conducted after the affected diesel is declared "ready for service." The diesel and associated systems may be operated as necessary to perform troubleshooting and verify correction of specific problems, prior to such declaration, without these operations counting as a test, for the purposes of complying with this Regulatory Guide.

Refer to section~~s~~ 14.2.7, and ~~16.3/4.~~ Section 3/4.8.1 of the Technical Specifications.

REGULATORY GUIDE 1.111: Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors (Revision 1, July 1977)

RESPONSE

Information contained in Regulatory Guide 1.111 is utilized as discussed in section 2.3

REGULATORY GUIDE 1.112: Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-Water-Cooled Power Reactors (Revision 0-R, May 1977)

RESPONSE

Information contained in Regulatory Guide 1.112 is utilized as discussed in section 11.3.

this item will be satisfied provided that such work is performed only with approved procedures and that the activities and the results are documented. Evidence of design change approval shall be required prior to placing the affected item in service.

D. Section 5:

For the purposes of functional tests addressed by this standard, APS defines completed systems as any system, or portion or component thereof, on which construction 4
is sufficiently complete to allow the required testing, and on which further or adjacent construction will not render the results of such testing invalid or indeterminate.

E. Item 5.1.g:

Traceability as used in this item is considered to be the same as discussed in section 5.2.13.3 of ANSI N18.7.

REGULATORY GUIDE 1.117: Tornado Design Classification (Revision 1, April 1978)

RESPONSE

The position of Regulatory Guide 1.117 is accepted to the extent described in sections 3.3, 3.5 and 9.2.5.4.

REGULATORY GUIDE 1.118: Periodic Testing of Electric Power and Protection Systems (Revision 1, November 1977)

RESPONSE

The position of Regulatory Guide 1.118 is accepted as described in sections 7.1~~, 8.3 and 16.3/4.~~ and 8.3, and Section 3/4.8 of the Technical Specifications.

2. The system or portion of a system sustaining the leakage crack operates during normal plant operational ~~operating~~ modes 1, 2, and 3 defined in table ~~16.1-1.2~~ 1.2 of the Technical Specifications.

3. The failed line is greater than 1-inch in diameter.

B. Where a postulated leakage crack occurs in one train of a Seismic Category I, dual-purpose, moderate-energy piping system, single active component failures are not assumed in the other train (Refer to Branch Technical Position APCSB 3-1, B.3.b.3). The postulated leakage crack must not adversely affect active components of both trains.

C. Through-wall leakage cracks are not postulated in portions of ASME Code, Section III, Class 2 moderate energy fluid system piping passing through the containment penetrations and extending to the first outside isolation valves if they meet the requirements of NE-1120 of ASME Code Section III and the combined stresses, as calculated by Equations (9) and (10), Paragraph NC-3652 of the ASME Code, Section III, do not exceed 0.4 $(1.2\ S_h + S_A)$.

D. In portions of ASME Code, Section III, Class 2 and 3 piping and non-nuclear piping located within, or outside, and adjacent to protective structures containing safety-related systems or components, through-wall leakage cracks are postulated where combined stresses, as defined previously, exceed 0.4 $(1.2\ S_h + S_A)$ except as exempted in sections 3.6.2.1.3.1.C and 3.6.2.1.3.1.E. The cracks are postulated to occur individually at locations that result in the maximum effects from fluid spraying and flooding, and the consequent hazards or environmental conditions developed.

the test is conducted routinely and not just during the initial low-power physics testing.

RESPONSE: PVNGS will conduct the CEA symmetry test described in CESSAR Section 14.2.12.4 during the low-power physics testing conducted during initial startup and following each subsequent core reload.

QUESTION 4A.3 (NRC Question 490.3) (4.2)

Please describe the details of the visual surveillance which will be conducted on PVNGS discharged fuel assemblies. This surveillance program should be adequate to identify gross problems of structural integrity, fuel rod failure, rod bowing, spacer grid strap damage, insufficient fuel rod shoulder gap spacing, or crud deposition on a limited number of fuel assem-
6 blies that are discharged at each refueling. If abnormalities are found during the examination, the licensee should agree to write an LER; otherwise, no reporting or licensing action is necessary.

RESPONSE: PVNGS shall visually inspect a limited number of randomly selected (about 10 to 15) discharged fuel assemblies during or following each refueling. The visual inspection shall be conducted with underwater viewing equipment (will include inspection of the four sides of each inspected fuel assembly) and is intended to detect gross problems of structural integrity, gross fuel rod failure, gross bowing, spacer grid strap damage, insufficient fuel rod shoulder gap spacing, or crud deposition. Underwater viewing equipment is separately provided on the refueling machine and in the spent fuel pool. Reporting of abnormalities will be in accordance with Section~~s~~ ~~16.6.9.1.8 or 16.6.9.1.9.~~ 6.9.2 of the Technical Specifications.

5.2.2.7 Material Specification

Refer to CESSAR Section 5.4.13. In addition, for material specifications related to the secondary system overpressurization protection refer to section 10.3.2

5.2.2.8 Process Instrumentation

Refer to CESSAR Section 5.2.2.7. In addition, refer to figures 5.1-1 and 10.3-1 for the instrumentation related to primary and secondary system overpressurization protection, respectively.

5.2.2.9 System Reliability

Refer to CESSAR Section 5.2.2.8. Also, refer to sections 5.1.5 and 10.3.2 for a discussion of secondary system overpressure protection reliability.

5.2.2.10 Testing and Inspection

Testing and inspection of primary and secondary valves are governed by ASME Section XI. Testing and inspection of the secondary safety valves is discussed in sections 3.9.3 and 14.2, and ~~16.3/4.2~~ Section 3/4.7.1 of the Technical Specifications.

5.2.2.11 Overpressure Protection During Low Temperature Conditions

Refer to CESSAR Section 5.2.2.10 except as specifically modified by the following changes:

- For PVNGS-specific Pressure-Temperature curves refer to the PVNGS Technical Specifications.
- CESSAR Figure 5.2-1 is superseded by figure 5.2-7.
- CESSAR Figure 5.2-2 is superseded by figure 5.2-8.
- CESSAR Subsection 5.2.2.10.2.3 pressure relief valve setpoint is 467 psig.

5.2.3.4.2 Control of Welding

5.2.3.4.2.1 <u>Avoidance of Hot Cracking.</u>

A. Components in C-E Scope of Supply

Refer to CESSAR Section 5.2.3.4.2.1-A.

B. Components Not in C-E Scope of Supply

In order to preclude microfissuring in austenitic stainless steel, PVNGS design is consistent with the recommendations of Regulatory Guide 1.31 except as noted in section 1.8.

5.2.4 INSERVICE INSPECTION AND TESTING OF REACTOR COOLANT PRESSURE BOUNDARY

Details of the inservice inspection program are included in section~~s~~ 6.6, and ~~16.3/4.~~ Section 3/4.4.5 of the Technical Specifications. Accessibility of inspection areas is
2 discussed in CESSAR Section 5.2.4.1.

5.2.4.1 DELETED

5.2.5 REACTOR COOLANT PRESSURE BOUNDARY LEAKAGE DETECTION SYSTEMS

Means for the detection of leakage from the reactor coolant pressure boundary are provided to alert operators to the existence of leakage above acceptable limits, which may indicate an unsafe condition for the facility. The leakage detection systems are sufficiently diverse and sensitive to meet the criteria of Regulatory Guide 1.45 for leaks from identified and unidentified sources.

5.2.5.1 <u>Leakage Detection Methods</u>

5.2.5.1.1 Unidentified Leakage

The four methods employed to detect unidentified leakage are presented in the following sections.

5.2.5.2.3.2 Sump Level Measuring System. The initiation of an additional or abnormal leak in the containment results in an increase in the flow rate to the sump. The additional sump flow initiates an excessive leakage flow alarm in the control room.

Upon actuation of the excessive leakage alarm, the operator follows these steps:

A. Records sump level measurements at equal time intervals.

B. Determines the sump level increase during these intervals.

C. Determines the leakage from the measured sump level increases.

5.2.5.3 Limits for Reactor Coolant Leakage

Refer to CESSAR Section 5.2.5.3. Also, refer to Section 3/4.4.5 of the technical specifications for RCS leakage. ~~in section 16.3/4.~~

5.2.5.4 Maximum Allowable Total Leakage

Refer to CESSAR Section 5.2.5.4. Also, refer to Section 3/4.4.5 of the technical specification limits for identified leakage. ~~in section 16.3/4.~~

5.2.5.5 Differentiation Between Identified and Unidentified Leaks

Refer to CESSAR Section 5.2.5.5. The systems used to detect unidentified leakage from the RCS to the containment are described in section 5.2.5.1.1.

5.2.5.6 Sensitivity and Operability Tests

Refer to CESSAR Section 5.2.5.6. Additionally, a description of tests to demonstrate the operability of the leakage detection systems are provided in section ~~16.3/4.~~ 3/4.4.5 of the Technical Specifications.

5.3.1.7 <u>Reactor Vessel Fasteners</u>

Refer to CESSAR Section 5.3.1.7.

6 Fracture toughness and tensile test data for reactor vessel
closure head bolting are presented for Palo Verde Unit-1 in
14 table 5.3-9, for Unit 2 in tables 5.3-12 and 5.3-13, and for
Unit 3 in tables 5.3-21 and 5.3-22.

6 Fracture toughness and tensile test data for all other fasten-
ers used in the reactor coolant pressure boundary (RCPB) for
12 Palo Verde Unit-1 are presented in tables 5.3-10 and 5.3-11,
14 for Unit 2 in tables 5.3-14 to 5.3-20, and Unit 3 in tables
5.3-23 to 5.3-29.

5.3.2 PRESSURE - TEMPERATURE LIMITS

Refer to CESSAR Section 5.3.2. ~~Technical Specification~~ Pressure-temperature limits are discussed in Section ~~16.3/4.~~ 3/4.7.8 of the Technical Specifications.

5.3.3 REACTOR VESSEL INTEGRITY

Refer to CESSAR Section 5.3.3.

5.3.3.1 <u>Design</u>

Refer to CESSAR Section 5.3.3.1.

5.3.3.2 <u>Materials of Construction</u>

Refer to CESSAR Section 5.3.3.2.

5.3.3.3 <u>Fabrication Methods</u>

Refer to CESSAR Section 5.3.3.3.

5.3.3.4 <u>Inspection Requirements</u>

Refer to CESSAR Section 5.3.3.4.

5.3.3.5 Shipment and Installation

Refer to CESSAR Section 5.3.3.5. For a discussion of compliance with Regulatory Guides 1.37 and 1.39 during installation, refer to section 1.8.

5.3.3.6 Operating Conditions

Refer to sections 3.9 and 4.4 for information on design transients and operating conditions, respectively.

5.3.3.7 Inservice Surveillance

Refer to CESSAR Section 5.3.3.7.

For a discussion of the inservice inspection program see sections 5.2.4 and 6.6, and ~~16.3/4.2~~ Section 3/4.4.9 of the Technical Specifications.

5.3.4 REFERENCES

1. "C-E Procedure for Design, Fabrication, Installation and Inspection of Surveillance Specimen Holder Assemblies," Combustion Engineering Topical Report, CENPD-155P, Approved August 11, 1975.

I. Operational/Controls

1. The SCS components shall be powered such that the operational and control requirements of Section 5.4.7.1.3 (A) are met.

2. The SCS shall meet the operation and control requirements of Section 5.4.7.1.2.

J. Inspection and Testing

1. All SCS ASME, Section III components shall be arranged to provide adequate clearances to permit inservice inspection.

2. Manually operated valves which contain reactor coolant or other potentially radioactive liquids during normal plant operations shall be provided with handwheel extensions and shielding, to allow periodic actuation.

3. SCS components which contain reactor coolant or other potentially radioactive liquids during normal plant operations, and which require access for periodic pressure tests and nondestructive examination, shall be capable of being flushed prior to testing. The low pressure safety injection pumps shall provide the driving head for flushing.

4. System components not designed to ASME, Section III, should be located such that the access for periodic visual inspection for leakage, structural distress, and corrosion is possible.

5. System and component arrangement shall allow adequate clearances for performance of inspections identified in ~~Chapter 16?~~ the Technical Specifications.

12

Section 3/4.4.4 of the Technical Specifications (formerly

3. Include the additional requirements listed in NUREG-0212 regarding eddy current testing in Section 4.4.5.2.b.3;

4. Change the wording in Section 4.4.5.3.b to be consistent with the corresponding in NUREG-0212;

5. Include additional requirement listed in NUREG-0212 regarding preservice inspection in Section 4.4.5.4.a.9;

6. Include additional requirement listed in NUREG-0212 with regard to the reporting requirements in Sections 4.4.5.5.a; 4.4.5.5.b, 4.4.5.5.c.

RESPONSE: The response is given in amended section 16.3/4.4.5.

QUESTION 5A.5 (NRC Question 251.1) (5.2)

Specify the edition and addenda to which all reactor coolant pressure boundary components were fabricated.

RESPONSE: The response is provided in amended table 5.2-0.

QUESTION 5A.6 (NRC Question 251.2)

To demonstrate compliance with the beltline material test requirements of Paragraph III.C.2 of Appendix G, 10 CFR Part 50.

a) Provide a schematic of the reactor vessel showing all welds, plates and/or forgings in the beltline. Welds should be identified by shop control number, weld procedure qualification number, the heat of filler metal, and type and batch of flux. Provide the chemical composition for these welds (particularly Cu, P, and S content). Identify material specification, type and grade of all base metal.

6 certified by qualified supervisory personnel. Records of the certification of personnel are maintained and available for review at C-E's Chattanooga facility.

7 Individuals performing inservice fracture toughness tests shall be qualified by training and experience and shall have demonstrated competency to perform the tests in accordance with written procedures and ASME Code, Section III, Subarticle NB-2300, Fracture Toughness Requirements for Materials. The recommendations for qualification of nuclear power plant inspection, examination, and testing personnel that are included in ANSI N45.2.6 - 1973 are generally acceptable and provide an adequate basis for complying with Paragraph III.B.4 of Appendix G, 10 CFR Part 50.

QUESTION 5A.10 (NRC Question 251.6)

Provide pressure temperature limit curves for the reactor pressure vessel.

RESPONSE: Pressure temperature curves are ~~will be~~ provided in Figure 3/4 3.4-2 of the Technical Specifications. ~~Chapter 16, by April 1, 1982.~~

QUESTION 5A.11 (NRC Question 251.7)

Provide the following data on the surveillance materials:

6 a) Origin of heat affected zone and base materials (heat number, plate identification number, and chemical composition),

b) Origin of weld metal (weld wire type, heat of filler metal, production welding process, plate material used to make weld specimens, chemical composition of deposited weld metal),

c) The lead factor of each surveillance capsule with respect vessel inner wall.

RESPONSE: The response is given in amended section 5.3.1.6 and table 5.3-4.

B. The containment spray system consists of two redundant and independent trains each of which is capable of providing 100% of the required heat removal capability and 100% of the required iodine removal capability.

C. The heat removal capacity of the CSS is discussed in section 6.2.1.

D. The containment heat removal system is designed to remain operable in the containment accident environment as discussed in section 3.11.

E. The CSS is designed such that single failure of any active component will not degrade system abilities as shown in the failure modes and effects analyses of CESSAR Appendix 6A, Table 4.5 (for further discussion of system actuation, see section 7.3).

F. The entire CSS is designed to Seismic Category I requirements. System components as appropriate are designed to meet ASME Code Section III, Class 2 requirements.

G. The CSS is protected against dynamic effects associated with postulated rupture of piping as discussed in section 3.6.

H. The CSS is designed to permit the periodic inspections and tests described in Section 3/4.6.2 of the Technical Specifications ~~16.3/4~~ and CESSAR Appendix 6A, Sections 7.10, 8.2 and 9.0.

I. The CSS is designed to add hydrazine to the spray water to reduce fission product iodine concentration in the containment atmosphere as discussed in section 6.5.

J. The CSS is sized based on the long-term heat rejection function of the system. The shutdown cooling heat exchangers used for rejecting heat from the containment are sized by the shutdown cooling function discussed in section 5.4.7.

Tests have verified that the hydrogen-oxygen recombination is not a catalytic surface effect associated with the heaters, but occurs due to the increased temperature of the process gases. As the phenomenon is not a catalytic effect, saturation of the unit is not predicted to occur. Results of testing a prototype electric hydrogen recombiner and production unit test results are given in reference 1. There is no difference between the hydrogen recombiner units to be installed in PVNGS and the unit for which the tests were conducted.

6.2.5.2.2.2 Hydrogen Monitoring Subsystem. The hydrogen monitoring subsystem for each unit consists of two completely redundant trains. Each train consists of a hydrogen sensor,
9 an electronic subassembly and local and remote readout/alarms. The electronic subassemblies for trains A and B are housed separately in cabinets located in the auxiliary building.

A bottled nitrogen and hydrogen supply is used to calibrate the sensors at those intervals specified in section ~~16.3/4.~~ 3/4.6.4 of the Technical Specifications.

Hydrogen measurement is accomplished by using a thermal conductivity cell and a catalytic reactor. The sample gas first flows through the sample section of the cell, then passes through the catalytic converter where hydrogen in the sample is catalytically combined with free oxygen to form water vapor,
9 then passes through the reference section of the cell. The hydrogen content is indicated by the difference in thermal conductivity between the sample and reference sides of the cell. Oxygen, in an amount sufficient to combine hydrogen at the highest range of the analyzer, is added to the sample gas, prior to passing through the sample section of the cell. The range and accuracy of the hydrogen analyzer is given in table 7.5-1. A single failure analysis is given in table 6.2.5-2.

reactor coolant system (short term), and containment sump water (long term) would provide the heat sources which establish and maintain upward natural convection flows within the containment. The water level in the containment post-LOCA has been calculated to be approximately 10 feet 6 inches above the floor and has a nominal temperature of 300F.

6.2.5.4 Test and Inspections

The analytical and test program for the hydrogen recombiners includes proof-of-principle tests and full-scale prototype tests on a production recombiner. The tests were completed and the results of these tests were submitted to the NRC in reference 1.

In the design of the equipment actually installed at PVNGS, all recombiner components can be inspected and are accessible for maintenance during normal plant operation.

Periodic testing of the containment hydrogen control system is described in ~~chapter 16.~~ Section 3/4.6.4 of the Technical Specifications. Initial testing is described in section 14.2.

6.2.5.5 Instrumentation Requirements

6.2.5.5.1 Hydrogen Recombiner Subsystem

A manual control station is provided for each train for starting and stopping the unit. The controller maintains the correct power input to bring the recombiner above the threshold temperature for the recombination process. The controller setting can be adjusted to accommodate variations in containment temperature and pressure in the post-LOCA environment. The system is designed to conform to the applicable portions of IEEE-279 and is powered from a Class IE source. No automatic initiating signals or alarms are provided. The hydrogen recombiners

3. Two independent vital instrument power sources shall be provided for the SIS instrumentation. See A.5 above.

G. Thermal Limitations

Not Applicable

H. Monitoring

1. Provisions shall be made for the detection, containment, and isolation of the maximum expected leakage from a moderate energy pipe rupture, as discussed in C.1 above.

2. Process instrumentation shall be available to the operator in the control room to assist in assessing post-LOCA conditions. The type of instrument, parameter measured, instrument range and accuracy are listed in Table 6.3-3.

I. Operational Controls

Not Applicable

J. Inspection and Testing

1. Inspection and testing requirements for the SIS are contained in Section ~~16.4.5~~ 3/4.5 of the Technical Specifications and shall be complied with.

2. Prior to initial plant startup, SIS flow tests shall be performed. An adequate supply of water and the necessary test connections at the containment sump shall be provided.

K. Chemistry/Sampling

1. The Sampling System shall provide a means of obtaining remote liquid samples from the SIS for chemical and radiochemical laboratory analysis.

3. Two independent vital instrument power sources

Design and testing of filtration systems is consistent with the recommendations of NRC Regulatory Guide 1.52, Design, Testing, and Maintenance Criteria for Atmosphere Cleanup System Air Filtration and Adsorption Units of Light Water-Cooled Nuclear Power Plants, except as discussed in section 1.8.

Inservice testing of the control room essential HVAC system is conducted in accordance with the surveillance requirements specified in Section ~~16.3/4.9~~ 3/4.7.7 of the Technical Specifications.

Portable equipment such as air samplers, personnel dosimeters, and other radiation analysis equipment applicable to control room habitability is tested and inspected periodically as noted in section 12.5.

6.4.6 INSTRUMENTATION REQUIREMENT

The following indications are displayed in the control room: fan status, damper positions, room temperatures, and outside air intake radioactivity. Alarms indicate open access doors 8
after transfer to the emergency mode, low fan differential pressure, and outside air intake airborne radioactivity greater than $10^{-6} \mu Ci/cm^3$ (Xe-133). (Refer also to sections 7.3 and 7.5.)

Instrumentation required for actuation of the control room essential HVAC system is discussed in section 6.4.2.2.2 and in section 7.3. System control logic diagram is shown in figure 7.3-6.

Details of the radiation monitors used to initiate CREFAS are given in sections 7.3 and 11.5. Information including detector locations, type of radiation detected, detector type, range, and sensitivity are given in table 11.5-1.

The instrumentation is designed as Seismic Category I. A description of initiating circuits logic interlocks and periodic testing requirements and redundancy of instrumentation relating to control room habitability appears in section 7.3.

test of a representative sample of the impregnated activated charcoal is performed to verify iodine removal efficiencies.

Design and testing of ESF filtration systems is consistent with the recommendations of NRC Regulatory Guide 1.52, Design, Testing and Maintenance Criteria for Atmosphere Cleanup System Air Filtration and Adsorption Units of Lightwater-Cooled Nuclear Power Plants, as discussed in section 1.8.

Preoperational testing is performed on systems in accordance with the test descriptions in section 14.2.

6.5.1.4.2 Inservice Testing

Inservice testing of the ESF filtration systems is conducted in accordance with the surveillance requirements of Section 3/4.6.4 of the ~~plant~~ Technical Specifications. ~~given in section 16.3/4.~~

6.5.1.5 Instrumentation Requirements

Controls and instrumentation for the control room and for the fuel building systems are discussed in section 7.3. Each system is designed to function automatically upon receipt of an ESF actuation system signal. Fans can also be controlled from the control room.

The status of the essential ventilation equipment is displayed in the control room during both normal and accident operations.

Section 1.8 addresses the extent to which the recommendations of NRC Regulatory Guide 1.52 are followed with respect to instrumentation.

6.5.1.6 Materials

The materials of construction used in or on the filter systems are given in sections 6.4.2.2 and 9.4.5.2. Each of the materials is compatible with the normal and accident environments postulated in the control room and the fuel building.

E. Pressure differentials between compartments are insignificant.

F. LOCA mass/energy sources are identified as being below the operating floor, or approximately the lower 25% of the containment volume.

G. Sprayed and unsprayed volumes each are homogeneous in terms of concentrations and distribution of mass/energy sources.

The PVNGS design utilizes 230 Spraco 17071417 (15.2 gal/min) 8
spray nozzles in each train of the primary spray headers. It
also uses 80 Spraco 17651308 (3 gal/min) nozzles in each train 8
of the auxiliary spray headers.

6.5.2.4 Tests and Inspection

Preoperational testing is performed on the system in accordance with the test description in section 14.2. Periodic testing is performed in accordance with the requirements of ~~chapter 16.~~ Section 3/4.6.2 of the Technical Specifications.

6.5.2.5 Instrumentation Requirements

The iodine removal system is provided with instrumentation and controls to allow the operator to monitor the status of the system. All instrumentation, with the exception of pressure instrumentation, receives emergency onsite power from separate, redundant, and train-aligned power supplies.

Level indication is provided locally and in the control room to monitor spray chemical storage tank (SCST) availability. A low level alarm will denote loss of the stored hydrazine solution. A low-low level signal will stop the spray chemical addition pumps (SCAP) and will close the SCST isolation valves. Level switches are also provided to close the IRS isolation valves at the low-low SCST level setpoint.

(RA)7.6.4 For mechanical independence, see (RA)7.3, (RA)7.4, and (RA)7.5.

(RA)7.7 THERMAL LIMITATIONS

Each CSS train is provided with an independent environmental control system, such that the safety-related equipment in each train operates within the environmental design limits specified in CESSAR Section 3.11.

(RA)7.8 MONITORING

Provisions are made for detection, containment, and isolation of the maximum expected leakage from a moderate energy pipe rupture in each train.

Redundant pressure, temperature, and flow instrumentation is available to the operator in the control room to assist in assessing post-LOCA conditions. The types of instrument, parameter measured, instrument range and accuracy are listed in CESSAR Section 6.2.

(RA)7.9 OPERATIONAL AND CONTROLS

See (RA)7.1.

(RA)7.10 INSPECTION AND TESTING

For inspection and testing, see section ~~16.3/4.~~ 3/4.6.2 of the Technical Specifications.

7.1.2.7 Conformance to IEEE 338

Refer to CESSAR Section 7.1.2.7.

In addition, in conformance to IEEE 338-1971, response time testing for all PPS channels and equipment is performed during pre-operational testing and each refueling interval. Section ~~16.3/4~~ 3/4.3 of the Technical Specifications describes testing frequency.

7.1.2.8 Conformance to IEEE 344

Refer to CESSAR Section 7.1.2.8.

Conformance to IEEE 344-1975, for non-C-E scope, is discussed in section 3.10.

7.1.2.9 Conformance to IEEE 379 as Augmented by Regulatory Guide 1.53

Refer to CESSAR Section 7.1.2.9.

In addition, the entire PPS as discussed in section 7.1.1.1 and essential safety-realted supporting systems listed in section 7.1.1.4 comply with the requirements of IEEE 379-1972 as augmented by Regulatory Guide 1.53. The single failure criterion is discussed in section 7.3.2.

7.1.2.10 Conformance to IEEE 384 as Augmented by Regulatory Guide 1.75

Refer to CESSAR Section 7.1.2.10.

In addition, compliance to General Design Criterion 17, IEEE 384-1974, and Regulatory Guide 1.75 is described in section 8.3.

7.1.2.11 Conformance to IEEE 387

Conformance to IEEE 387-1972 is discussed in section 8.1.

7.1.2.30 Conformance to Regulatory Guide 1.100

Conformance to Regulatory Guide 1.100 is presented in section 3.10.

7.1.2.31 Conformance to Regulatory Guide 1.105

Conformance to Regulatory Guide 1.105 is presented in section 1.8.

7.1.2.32 Conformance to Regulatory Guide 1.118

Conformance to Regulatory Guide 1.118 is given in section 1.8 and implemented in section ~~16.3/4.~~ 3/4.3 of the Technical Specifications. Specific test capabilities within the reactor protective system and the engineered safety features systems are described in sections 7.1.2.7, 7.2.1, and 7.3.1.1.

7.1.3 CESSAR INTERFACES

The following NSSS general interface requirements are repeated from CESSAR Section 7.1.3.

7.1.3.1 Power

Vital instrument power requirements for the safety-related systems are discussed in Section 8.3.1.

7.1.3.2 Protection from Natural Phenomena

Refer to Section 3.1.2. CESSAR Design Scope Class 1E equipment shall be located within the plant so as to ensure the various natural phenomena specified in GDC 2 which are applicable to the Applicant's site will not result in degradation of that equipment below the level required to allow it to perform required protective action assuming a single failure.

7.1.3.10 Inspection and Testing

The PPS, including sensors, shall be capable of being periodically tested in accordance with Section 3/4.3 of the Technical Specifications. ~~of chapter 16.~~ Those portions which could adversely affect reactor operations shall be capable of being tested when the reactor is shut down. All other safety-related instrumentation shall be capable of being tested during normal operation.

7.1.3.11 Chemistry/Sampling

The components of the safety-related equipment shall be located so as not to exceed the chemistry limits specified in section 3.11.

7.1.3.12 Materials

Not applicable to the safety-related instrument and controls equipment.

7.1.3.13 System Component Arrangement

Safety-related components shall be located so as to conform to the separation, independence, and other criteria specified in this section. The safety-related components shall be located to provide access for maintenance, testing and operation as required.

Analog and digital signals provided to the safety-related components shall not share the same multiconductor cable, unless specifically called for or approved by Combustion Engineering.

7.1.3.14 Radiological Waste

Radiological waste discharge lines or components shall not be routed or located next to protection system electronic components in a manner that will result in exceeding the radiation limits specified in section 3.11.

7.2 REACTOR PROTECTIVE SYSTEM

7.2.1 DESCRIPTION

Refer to CESSAR Section 7.2.1.1, except for the following additional discussions:

A. The required response time testing discussed in CESSAR Section 7.2.1.1.9.8 is addressed in section ~~16.3/4.2~~ 3/4.3 of the Technical Specifications. The methods, equipment and test frequency are also provided in ~~chapter 16.~~ Technical Specifications

B. Refer to section 8.3 for a discussion of how the PVNGS design meets the CESSAR interface requirements for vital instrument power supplies.

C. The Core Protection Calculator (CPC) System and CEA Calculators described in CESSAR Section 7.2.1.1.2.5 also provide their outputs and a number of their inputs as inputs to the Plant Monitoring System (PMS) by means of fiber-optic data links. The values transmitted represent the raw sensor count data. These values are converted to engineering units within the PMS. The data is transmitted to the PMS at least once every ten minutes. 12

The CPC/CEAC Data Link data processing programs within the PMS perform cross-channel comparisons for each input signal and generate an alarm whenever the difference between any single channel's value and the average value of all four channels is greater than a constant. On operator demand, a report is printed to show the results of the latest cross-channel comparison. The CPC and CEAC parameters are not used by any other program in the plant computer.

7.2.1.2 Design Bases

Refer to CESSAR Section 7.2.1.2.

Instrument location layout drawings are presented in figures 7.2-1, 7.2-2, 7.2-3, and 7.2-4.

interaction, the PVNGS design also provides a mono-directional data link from the Core Protection Calculator (CPC) system to the Plant Monitoring System by means of fiber-optic data links. These data links are identical to the hardware utilized at each CEA Calculator output (See CESSAR Section 7.2.1.1.2.2). The non-conducting fiber-optic cable used ensures that no electrical failure at the Plant Monitoring System will affect the Core Protection Calculators or the CEA Calculators. 12

7.2.2.3.3 Testing Criteria

Refer to CESSAR Section 7.2.2.3.3. In addition, for the organization for testing and documentation, refer to chapter 13. Minimum frequencies for checks, calibration and periodic testing are given in Section ~~16.3/4.~~ 3/4.3.1 of the Technical Specifications.

7.2.2.4 <u>Failure Modes and Effects Analysis</u>

Refer to CESSAR Section 7.2.2.4.

7.2.3 REACTOR PROTECTIVE SYSTEM (RPS) INTERFACE REQUIREMENTS

The following interface requirements are repeated from CESSAR Section 7.2.3.

The interface requirements discussed below are specific to the RPS. General interface requirements are discussed in section 7.1.3.

7.2.3.1 <u>Power</u>

Vital instrument power interface requirements are discussed in section 8.3.1.

Table 7.3-1

ONE-OUT-OF-TWO ESFAS BYPASSES

Title	Function	Initiated By	Removed By
Trip Channel Bypass[(a)]	Disables any given trip channel	Manually by controlled access switch	Same switch

a. Interlocks allowed only one channel for any type trip to be bypassed at one time

is acceptably low during maintenance bypass periods. The bypass is manually initiated and manually removed. An electrical interlock allows only one channel for any one type trip to be bypassed at one time. Bypasses are annunciated visually and audibly to the operator.

In some cases, bypass of more than one parameter within a channel may be required in the event of an equipment failure. Specific requirements are provided in section ~~16.3/4.3.2~~ 3/4.3.2 of the Technical Specifications.

7.3.1.1.3.2 Operating Bypasses. For two-out-of-four operating bypass capability refer to CESSAR Section 7.3.1.1.3.2. For the one-out-of-two logic there are no operating bypasses.

7.3.1.1.4 Interlocks

For two-out-of-four interlocks refer to CESSAR Section 7.3.1.1.4. The one-out-of-two ESFAS interlocks prevent the operator from bypassing more than one trip channel for a type trip at a time. Different type trips may be bypassed simultaneously, either in the same channel or in different channels.

B. The equipment can perform as required.

C. The interactions of protective actions, control actions, and the environmental changes that cause, or are caused by, the design basis events do not prevent the mitigation of the consequences of the event.

D. The system cannot be made inoperable by the inadvertent actions of operating and maintenance personnel.

In addition, the design is not encumbered with additional components or channels without reasonable assurance that such additions are beneficial.

7.3.1.1.7 Sequencing

There is no sequencing for any ESF equipment other than that necessary for ESF bus loading. The automatic load sequencer is discussed in section 8.3.1.1.3.

7.3.1.1.8 Testing

For two-out-of-four testing capabilities see CESSAR Section 7.3.1.1.8. In addition, provisions are made to permit periodic testing of the one-out-of-two ESFAS. These tests cover the trip actions from sensor input through the protection system and the actuation devices. The system test does not interfere with the protective function of the system. The testing system meets the criteria of IEEE Standard 338-1971 and of Regulatory Guide 1.22.

Since actuation of the ESF systems controlled by the one-out-of-two ESFAS does not disturb normal plant operating conditions, the one-out-of-two ESFAS is tested by complete actuation as described below. Frequency of accomplishing the tests is listed in section ~~16.3/4.3.2~~ 3/4.3.2 of the Technical Specifications.

7.3.1.1.8.1 Sensor Checks. During reactor operation, the measurement channels providing an input to the ESFAS are checked by comparing the outputs of similar channels, and by cross-checking with related measurements.

During extended shutdown periods or refueling, these measurement channels are checked and calibrated against known standards.

7.3.1.1.8.2 Trip Bistable Test. Testing of the system is accomplished by manually varying the input signal to the trip setpoint level on one bistable at a time and observing the trip action.

When the bistable of a protective channel is in a tripped condition, the following conditions should exist.

- The bistable output relay is deenergized.
- The group relay in each actuation channel is deenergized.
- The ESF components are in the ESFAS actuation position.
- Actuation is annunciated on the control room annunciator panel.

Proper operation may be verified by the following:

- Checking the position of each ESF component
- Checking the actuation annunciation
- Checking the ESF component status indication

The test is repeated for the other bistable.

7.3.1.1.8.3 Response Time Tests. Refer to CESSAR Section 7.3.1.1.8.8. Response time testing required at refueling intervals are given in Section ~~16.3/4.3.2~~ 3/4.3.2 of the Technical Specifications. These tests

the ESFAS signal. Maintenance and calibration of the bypassed channel can be accomplished in a short time interval. Probability of failure of the remaining channel is acceptably low during such maintenance periods.

4.12 Operating Bypasses

There are no operating bypasses.

4.15 Multiple Setpoints

There are no multiple setpoints.

4.21 System Repair

Identification of a defective channel will be accomplished by observation of system status lights or by testing as described in section 7.3.1.1.8. Replacement or repair of components in the actuation logic is accomplished with the affected channel bypassed. The affected trip function then operates in a single active channel trip logic.

7.3.2.3.3 Testing Criteria

IEEE Standard 338-1971 and Regulatory Guide 1.22 provide guidance for development of procedures, equipment, and documentation of periodic testing. The basis for the scope and means of testing are described in this section. Test intervals and their bases are included in section ~~16.3/4.3.~~ The organization for testing and for documentation is described in chapter 13. Since operation of the ESF system is not expected, the systems are periodically tested to verify operability. Complete channels can be individually tested without violating the single failure criterion and without inhibiting the operation of the systems. The system can be checked from the sensor signal through the actuation devices during reactor operation since ESF system operation does not damage equipment or disturb reactor operation. Thus, testing completely simulates valid actuation.

3/4.3.2 of the Technical Specifications.

Minimum frequencies for checks, calibration, and periodic testing of the ESFAS instrumentation and control are given in section ~~16.3/4.3.2~~ 3/4.3.2 of the Technical Specifications.

The use of individual trip and ground detection lights, in conjunction with those provided at the supply bus, ensure that possible grounds or shorts to another source of voltage will be detected.

The response time from an input signal to protect system trip bistables through the opening of the actuation relays is verified by measurement during plant startup testing. Sensor responses are measured during factory acceptance tests. Section 7.3.1.1.8.3 provides additional information on response time testing.

7.3.2.4 Failure Modes and Effects Analysis

Refer to CESSAR Table 7.2-5. The failure modes and effects analysis for the additional ESF systems is given in tables 7.3-14 through 7.3-18.

7.3.3 CESSAR ESFAS INTERFACE REQUIREMENTS

The following interface requirements are repeated from CESSAR Section 7.3.3:

The interface requirements discussed below are specific to the ESFAS.

General requirements are discussed in Section 7.1.3. Those items specific to the RPS are discussed in Section 7.2.3.

7.3.3.1 Power

Refer to Section 8.3.

7.3.3.2 Protection from Natural Phenomena

Refer to Sections 3.1.2 and 7.1.3.2.

7.4.1.2 Design Basis Information

Refer to CESSAR Section 7.4.1.2 for design bases of the systems in the CESSAR scope. For systems not in the CESSAR scope, refer to the design bases discussion in the appropriate section of this chapter.

7.4.1.3 Final System Drawings

For final system drawings in the CESSAR scope, refer to CESSAR Section 7.4.1.3. In addition, section 1.7 includes a list of applicable electrical and instrumentation drawings and piping and instrumentation diagrams which have been provided. Furthermore, equipment location layout drawings are included in section 1.2.

7.4.2 ANALYSIS

Refer to CESSAR Section 7.4.2.

7.4.2.1 Conformance to IEEE 279-1971

In addition to the analysis provided in CESSAR Section 7.4.2, certain IEEE 279-1971 criteria, not in the CESSAR scope, are addressed below (heading numbers correspond to the section numbers in IEEE 279-1971).

4.5 CHANNEL INTEGRITY

See section 14.2 for preoperational test procedures.

4.10 CAPABILITY FOR TEST AND CALIBRATION

See section~~s~~ 13.5, and ~~16.4~~ [Section 3/4.3 of the Technical Specifications] for periodic testing procedures.

7.4.2.2 Conformance to IEEE 308-1971

Refer to CESSAR Section 7.4.2.2.

to determine if cooling water is available to each pump and to take appropriate action in less than 30 minutes to protect the reactor coolant pump affected.

The instrumentation is provided in compliance with the requirements of IEEE Standard 279-1971.

7.6.2.1.3.2 Safety Injection Tank Pressure Monitoring. Monitoring the SIT pressure with two visual status alarms for each channel on low SIT pressure provides information to the operator to determine the unavailability of the SITs to perform their core flooding function in the event of a LOCA. The instrumentation is provided in compliance with the requirements of IEEE 279-1971.

7.6.2.1.3.3 Auxiliary Building ESF Pump Room Level Monitoring. Monitoring each ESF pump room level with one visual status alarm for each room provides sufficient information and 30 minutes of time for the operator to take appropriate action to prevent equipment flooding at a leakage rate of 50 gal/min. The instrumentation is provided in compliance with the requirements of IEEE-279-1971, except for the redundancy requirements.

7.6.2.2 Analysis of Equipment Design Criteria

7.6.2.2.1 Shutdown Cooling System Suction Line Valve Interlocks

Refer to CESSAR Section 7.6.2.2.1. In addition, for periodic testing requirements, see ~~chapter 16~~ Section 3/4.3 of the Technical Specifications; for access procedures for setpoint adjustments, calibration, and test points, see section 13.5.

7.6.2.3 Fire Protection Instrumentation and Detection System

An analysis of the fire protection system is discussed in section 9.5.1.

PRINT ON PINK

B. Interrupted auxiliary feedwater flow to the steam
generator(s) is fully reestablished within 23
C-14 seconds. The deviation from the CESSAR requirement
of 15 seconds is acceptable to Combustion Engineering
as discussed in section 1.9.2.4.10.

8.3.1.1.4.7 Testability. Refer to sections 14.2, and ~~16.3/4~~ Section 3/4.8.2 of the Technical Specifications for testing requirements.

3 During testing if an SIAS or AFAS occurs while the diesel generator is paralleled to the preferred power supply with the
3 control switch in the REMOTE or LOCAL position, the diesel generator breaker will be automatically tripped by a momentary tripping pulse. The diesel generator will continue running and automatically revert to the isochronous mode. All non-critical protective devices are bypassed. If a non-critical trip occurs
3 during testing, the diesel generator will trip. On a subsequent
14 SIAS or AFAS or LOP the diesel generator will automatically start and run in the isochronous mode.

The LOCAL control position is selected from the local control panel for diesel generator maintenance testing. A diesel generator LOCAL POSITION alarm will be annunciated in the control room. To prevent any starting of the diesel generator during maintenance, the OFF position is selected at the local control
3 panel and a DIESEL GENERATOR INOPERABLE alarm is initiated at the safety equipment status system annunciator.

If the preferred power source is lost while paralleled to the diesel generator during testing, the diesel generator will trip on overcurrent and the diesel generator breaker will trip automatically on a diesel generator shutdown signal. Upon detection of undervoltage on the Class IE 4.16 kV bus, load shedding and sequencing will be initiated as described in section 8.3.1.1.4.6.

8.3.1.2.2.17 Regulatory Guide 1.81--Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants. The requirements of Regulatory Guide 1.81 are met. Each unit has separate and independent onsite ac and dc electric systems capable of supplying minimum ESF loads and loads required for attaining a safe and orderly cold shutdown of the unit assuming a single failure and loss of offsite power. No emergency and shutdown electric systems are shared between units.

8.3.1.2.2.18 Regulatory Guide 1.89--Qualification of Class IE Equipment for Nuclear Power Plants. Regulatory Guide 1.89 endorses IEEE Standard 323-1974, IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations. Comparison of the design with the recommendations of Regulatory Guide 1.89 is discussed in section 1.8.

8.3.1.2.2.19 Regulatory Guide 1.93--Availability of Electric Power Sources. The position of Regulatory Guide 1.93 is accepted (refer to section ~~16.3/4).~~ 3/4.8 of the Technical Specifications).

8.3.1.2.2.20 IEEE 308-1974--IEEE Standard Criteria for Class IE Electric Systems for Nuclear Power Generating Stations. The Class IE ac power systems are designed to assure that any design basis event, as listed in table 1 of IEEE 308, does not cause the following:

A. A loss of electric power to more than one load group, surveillance devices, or protection system devices sufficient to jeopardize the safety of the unit.

B. A loss of electric power to equipment that could result in a reactor power transient capable of causing significant damage to the fuel or to the reactor coolant system.

The Class IE system is capable of performing its function when subjected to the effects of any of the design basis events.

The Class IE loads are designed to perform their functions adequately for the design variations of voltage and frequency in the Class IE systems.

Controls and indicators for the Class IE 4.16-kV bus supply breakers are provided in the control room and on the switchgear. Controls and indicators for the standby diesel generator power supplies are provided in the control room and in the diesel generator control rooms.

Class IE equipment and associated design, operating, and maintenance documents are distinctly identified as described in section 8.3.1.3.

Each type of Class IE equipment is qualified either by analysis, by successful use under similar conditions, by actual test or by a combination of analysis and test to demonstrate its ability to perform its function under applicable design basis events.

Supplementary design criteria of IEEE 308 are addressed in the applicable sections describing specific Class IE equipment.

The surveillance requirements of IEEE 308 are followed in the design, installation, and operation of Class IE systems. Preoperational tests are performed in accordance with the procedures described in section 14.2. Periodic equipment tests are performed as discussed in Section ~~16.3/4.9~~ 3/4.8 of the Technical Specifications.

With regard to Section 7 of IEEE 308, refer to Section ~~16.3/4.9~~ 3/4.8 of the Technical Specifications for operating alternatives under degraded Class IE ac system conditions.

8.3.2.1.2.2 Battery Charger Capacity. The capacity of each Class IE battery charger is based on the largest combined demand of all the steady state loads and the charging current required to restore the battery from the design minimum charge state to the fully charged state within 12 hours regardless of the status of the plant during which these demands occur. This is in accordance with Regulatory Guide 1.32.

8.3.2.1.2.3 Inspection, Maintenance, and Testing. Testing of the dc power system is performed prior to plant operation in accordance with IEEE 450-1972 as described in section 14.2.

Subsequent tests and inspections will be as described in section ~~16.3/4.2~~ 3/4.8.2 of the Technical Specifications.

8.3.2.1.3 Separation and Ventilation

The Class IE batteries, chargers, and dc switchgear are located in separate rooms of the Seismic Category I control building, as described in section 8.3.1.1.8.

Each battery room is provided with separate and independent exhaust fans. The ventilation system is designed to preclude the possibility of hydrogen accumulation. Refer to sections 8.3.1.1.8 and 9.4 for details regarding the battery room ventilation system.

8.3.2.2 Analysis

8.3.2.2.1 Compliance with Design Criteria and Guides

The analysis in this section demonstrates compliance of the Class IE dc power system with General Design Criteria 17 and 18, Regulatory Guides 1.6, 1.22, 1.29, 1.30, 1.32, 1.40, 1.41, 1.47, 1.53, 1.75, 1.81, 1.89, 1.93 and IEEE Standards 308, 323, 344, 383, 384, and 450.

8.3.2.2.1.17 Regulatory Guide 1.89--Qualification of Class IE Equipment for Nuclear Power Plants. Regulatory Guide 1.89 endorses IEEE Standard 323-1974, IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations. Comparison of the design with the recommendations of Regulatory Guide 1.89 is discussed in section 1.8.

8.3.2.2.1.18 Regulatory Guide 1.93--Availability of Electric Power Sources. The position of Regulatory Guide 1.93 is accepted (refer to section ~~16.3/4).~~ 3/4.8 of the Technical Specifications).

8.3.2.2.1.19 IEEE Standard 308, 1974--IEEE Standard Criteria for Class IE Electric Systems for Nuclear Power Generating Stations. The Class IE dc system provides dc electric power to the Class IE dc loads and for control and switching of the Class IE systems. Physical separation, electrical isolation, and redundancy are provided to prevent the occurrence of common failure modes. Design of the Class IE dc system includes the following:

A. The dc system is separated into four subsystems.

B. The safety actions by each group of loads are independent of the safety actions provided by its redundant counterpart.

C. Each dc subsystem includes power supplies that consist of one battery and one battery charger.

D. The batteries are not interconnected.

E. The redundant batteries cannot be made inoperative by a single design basis event.

Each Class IE distribution circuit is capable of transmitting sufficient energy to start and operate all required loads in that circuit. Distribution circuits to redundant equipment are independent of each other. The distribution system is

system. Instrumentation is provided to monitor the status of the battery charger as follows:

A. Output voltage at the charger and in the control room

B. Output current at the charger and in the control room

C. AC and dc breaker position indications at the charger

D. Charger malfunction alarm in control room, including input ac undervoltage, dc undervoltage, dc overvoltage, and output breaker open.

Each battery charger has an input ac and output dc circuit breaker for isolation of the charger. Each battery charger power supply is designed to prevent the ac supply from becoming a load on the battery due to a power feedback as the result of the loss of ac power to the chargers. Battery chargers are provided with built-in overvoltage shutdown protection that is capable of tripping the AC input breaker in the event of DC overvoltage. 7

Equipment of the Class IE dc system is protected and isolated by fuses or circuit breakers in case of short circuit or overload conditions. Indication is provided to identify equipment that is made unavailable (refer to table 8.3-7).

The Class IE 125V dc subsystem is designed to meet Seismic Category I requirements as stated in section 3.10. The batteries, battery chargers, inverters, and other components of dc subsystem are housed in the control building, which is a Seismic Category I structure.

The periodic testing and surveillance requirements for the Class IE batteries are detailed in section ~~16.3/4.8.2~~ 3/4.8.2 of the Technical Specifications.

8.3.2.2.1.20 DELETED 3

8.3.2.2.1.21 <u>IEEE 323-1974--Standard for Quality Class IE Equipment for Nuclear Power Generating Stations</u>. Refer to section 8.3.1.2.2.22.

8.3.2.2.1.25 <u>IEEE 384-1974--Criteria for Separation of Class IE Equipment and Circuits</u>. Refer to section 8.3.1.4 for compliance.

8.3.2.2.1.26 DELETED 3

8.3.2.2.1.27 <u>IEEE Standard 450-1972--Recommended Practice for Maintenance, Testing, Replacement of Large Stationary Type Power Plant and Substation Lead Storage Batteries</u>. Recommended practices of IEEE 450 for maintenance, testing and replacement of batteries are implemented as follows:

A. Maintenance and inspections are carried out on a regular scheduled basis to comply with the requirements of IEEE 450-1972 (refer to section ~~16.3/4).~~ 3/4.8.2 of the Technical Specifications).

B. Performance discharge tests are carried out as discussed in section ~~16.3/4.~~ 3/4.8.2 of the Technical Specifications.

C. The rating of the battery is approximately 25% greater than that required to supply the emergency load requirements. This margin allows a battery replacement criteria of 80% rated capacity (see section 8.3.2.1.2.1).

D. An acceptance test of battery capacity is performed at the factory to determine that it meets the specified discharge rate and duration.

E. Records of the data obtained from inspections and tests are kept along with test procedures to comply with the requirements.

F. Whenever any cell's electrolyte level reaches the low level mark, water will be added to increase the level to approximately the midpoint between the high and low electrolyte level marks. 12

function. Components are below grade with the exception of the spray nozzles over the essential spray ponds. Redundant nozzle systems are available. Each spray pond and its associated train is separated from the other spray pond and its associated train.

9.2.1.8 Tests and Inspections

Preoperational testing is performed in accordance with the test descriptions of section 14.2. Periodic surveillance testing is described in section ~~16.3/4.8~~ 3/4.7.4 of the Technical Specifications.

9.2.1.9 Instrument Application

The ESPS instrumentation facilitates automatic operation, remote control, and continuous indication of system parameters (ESP water temperature, ESPS pump flow, ESP inlet flow, pH, ESP water level) both locally and in the control room.

Controls and instrumentation necessary for operation of the ESPS pumps are located in the control room. Local instrumentation and controls also are provided at ESPS pumps and ECWS heat exchangers for maintenance, testing, and performance evaluation.

Specifically, control room process indication and alarm is provided to enable the operator to evaluate the ESPS performance and to detect malfunctions. ESPS pump discharge pressure is displayed and alarmed to detect an abnormally low pressure (pump failure, piping break) or abnormally high pressure (piping blockage, closed valves). Spray pond levels and temperatures are indicated to show a low or high level condition or a high temperature condition in a spray pond. Control conditions of level and temperatures are also alarmed in the control room. The ESPS water discharge temperatures from the ECWS heat exchangers are indicated in the control room. A high temperature condition is

the fuel pool heat exchangers must be supplied cooling water by the essential cooling water system (ECWS). Each fuel pool heat exchanger is supplied water separately by each train of the ECWS; i.e., one heat exchanger by train A and the other heat exchanger by train B.

Valves associated with switching service from the NCWS to the ECWS are manually operated, Seismic I, and Safety Class 3. These valves are also used to isolate the ECWS from the NCWS. They are located in the auxiliary building.

Sufficient time would be available for the operator to access the auxiliary building to manually actuate these valves since the fuel pool does not require continuous cooling.

J. Safety Evaluation Ten

Components of the ECWS are located such that missiles from any source would not impair the system's functional requirements. The two trains of the ECWS are physically separated and are routed such as to be protected from missiles that could be potentially generated from other sources. Refer to section 3.5 for a discussion of missile protection.

9.2.2.1.8 Tests and Inspections

Preoperational testing is performed in accordance with the test descriptions of section 14.2. Periodic surveillance testing is described in section ~~16.3/4.2~~ 3/4.7.3 of the Technical Specifications.

9.2.2.1.9 Instrument Application

Refer to section 9.2.1.9 for a presentation of the ECWS interfaces to the ESPS.

9.2.5.5 Tests and Inspections

Refer to section 14.2 for a discussion of preoperational test procedures. Refer to section ~~16.3/4~~ 3/4.7.4 of the Technical Specifications for a description of periodic surveillance testing.

9.2.5.6 Instrumentation Applications

The water level in the ESP is monitored continuously so that there is always sufficient water to ensure the continuous capability of the ESP to perform its safety functions. The water temperatures of the ESP are also monitored.

useable water is reserved. This ensures a sufficient supply to the auxiliary feedwater pumps. A separate line is connected to the tank at a lower elevation to supply the auxiliary feedwater pumps with the reserved water supply. A single active failure analysis for the condensate storage facility is provided in table 9.2-23.

9.2.6.4 CESSAR Interface Evaluation

Refer to sections 5.1.5 and 9.3.4.2.

9.2.6.5 Tests and Inspections

Preoperational testing is performed in accordance with the test descriptions of section 14.2. Periodic surveillance testing is described in section ~~16.3/4.~~ 3/4.7.1 of the Technical Specifications.

9.2.6.6 Instrumentation Applications

A flow transmitter with output to the computer is provided on the condensate tank fill line.

A level detection system is installed on the condensate tank with level signals transmitted to the automatic tank level controller. Level indication is provided locally and in the control room. Low and high level alarms are provided in the control room. The low level alarms annunciate when the tank volume falls below 530,000 gallons, 330,000 gallons and 20,000 gallons.

9.2.7 SHUTDOWN COOLING SYSTEM

Refer to section 5.4.7.

9.2.8 TURBINE COOLING WATER SYSTEM

The turbine cooling water system (TCWS) provides cooling for the nonnuclear related components in the various turbine plant

9.2.9.2.4 Tests and Inspections

Preoperational testing is performed in accordance with the test decriptions of section 14.2. Periodic surveillance testing is described in section ~~16.3/4.~~ 3/4.7.6 of the Technical Specifications.

9.2.9.2.5 Instrumentation Applications

The chiller units and chilled water pumps for the essential chilled water system are automatically actuated upon receiving any of the signals shown on figure 9.2-10.

After automatic startup of the two essential chilled water trains, train A and train B, the operator has manual override capability on the essential trains. The operator is able to determine which train he wishes to remain in operation, which train he wishes to deactivate, and can reactivate the standby train manually, as required.

A temperature and capacity controller is provided with each essential chiller unit and maintains a constant chilled water supply temperature when the unit is working. Integral flow switches prevent the chiller from operating unless there is cooling water flow through the condenser and chilled water flow in the evaporator. A trip of any chiller or pump causes an alarm and the operator puts the appropriate standby unit into service. Essential chilled water system differential pressure indication and alarm and essential chiller outlet temperature indication and alarm are provided in the control room to monitor system operation and efficiency. Additional local display instrumentation and test points are placed in the equipment areas for periodic checkout of the system.

The essential chilled water expansion tank is provided with level gage glass to show low or high level condition in the closed loop. Critical conditions of the tank level and pressure are alarmed in the control room for leak detection.

G. Thermal Limitations

1. The ventilation systems are designed in accordance with CESSAR Section 3.11 to maintain the ambient conditions in the auxiliary building between 50 and 104F, and in the containment building between 50 and 120F, under normal operating conditions (refer to section 9.4).

2. Following a loss-of-coolant accident, including the subsequent recirculation mode of operation, the ambient air conditions of the CVCS equipment located in the auxiliary building are controlled in accordance with the requirements of section 3.11.

H. Monitoring

Not applicable.

I. Operational controls

Not applicable.

J. Inspection and Testing

1. Inspection and testing requirements for the CVCS are given in Section ~~16.3/4~~ 3/4.1.2 of the Technical Specifications and comply with CESSAR Chapter 16.

K. Chemistry/Sampling

Not applicable.

L. Materials

1. The insulation used on austenitic stainless steel is discussed in section 5.2.3. Cleaning and contamination procedures are also discussed in section 5.2.3. Conformance to Regulatory Guides 1.36 and 1.37 is discussed in sections 6.1 and 1.8, respectively.

capable of measuring 150% of rated capacity of the largest fire pump.

Fire detection instrumentation will be tested and inspected at regular intervals as necessary to maintain highly reliable systems. The regular intervals of testing and inspection will be as described in section ~~16.3/4.2~~ 3/4.3.3 of the Technical Specifications.

9.5.1.5 Personnel Qualification and Training

9.5.1.5.1 Overall Requirements of the PVNGS Fire Protection Program

Ultimate responsibility for the overall fire protection program at PVNGS rests with the Director of Nuclear Operations. The responsibility for formulation and assurance of program implementation has been delegated to staff personnel having training and experience in fire protection and nuclear plant safety. The fire protection program provides: 1: 1: 1:

A. Inspection and maintenance of fire protection equipment.

B. An organization to fight fires and deal with related emergencies when they occur.

C. Determination that fire apparatus functions properly and that procedures and practices are in accordance with accepted rules and regulations.

D. Maintenance of records on fire protection equipment.

E. Fire fighting training for station employees.

F. Inspection of the station and control of transient fire loads. 12

G. Fire investigation and reporting including review of fire incidence and corrective action.

9.5.4.5 Inspection and Testing Requirements

The diesel generator fuel oil storage tank for each diesel generator is tested by nondestructive methods in accordance with ASME Boiler and Pressure Vessel Code, Section III, Class 3 and is subjected to routine tests and inspections during construction and installation.

Refer to Section 3/4.8.1 of the technical specifications ~~in chapter 16~~ for operational tests and inspections.

9.5.4.6 Instrumentation Applications

A pressure switch, installed on the transfer pump discharge initiates an alarm in the control room and local diesel generator control panel if the day tank level is low and low pressure exists in this header. The alarm indicates that fuel oil is not being pumped to the day tank.

Level switches on each day tank start or stop the transfer pump at preset level points. Level switches also initiate low-low day tank level alarms in the control room and diesel generator panel in the generator room. Refer to section 7.4 for the DGFOS fuel oil transfer logic.

9.5.5 DIESEL GENERATOR COOLING WATER SYSTEM

The diesel generator cooling water system (DGCWS) removes the waste heat of combustion from the diesel engine. Each engine is provided with an independent DGCWS, and the description 4
which follows applies to each system.

6.9.2 of the Technical Specifications

reactor coolant system specific activity, and requires chemical analysis of reactor coolant for gross activity and iodine activity. The required periodic measurements of Dose Equivalent I-131 will be used to monitor cladding integrity during operation. Should these trends indicate cladding failure, the reports described in ~~sections 16.6.9.1.8 or 16.6.9.1.9~~ and CESSAR Section 16.3.4.8 will be made to the NRC. A program of fuel assembly sipping will be conducted at the next refueling to determine the location and number of failed fuel rods, if a significant number is indicated.

QUESTION 9A.41 (NRC Question 410.7) (9.3.1)

Concerning the compressed air system, provide the following additional information:

a) Describe the means provided to verify that proper instrument air quality will be maintained over the plant life to assure the safety function of the system (i.e., air operated valves will fail in their safe position on loss of instrument air supply). Include the air quality limits which should not be exceeded in order to assure the above safety function. 6

b) Verify that a single failure of any air operated valve to assume its fail safe position will not prevent the function of a safety-related system or compromise the ability to safely shut down.

RESPONSE:

a) In the PVNGS design the instrument air system is not a safety-related system. However, local annunciation is provided for the following changes in instrument air quality:

(1) High differential pressure across the prefilter

(2) High differential pressure across the dryer

H. Safety Evaluation Eight

A branch connection upstream of the MSIVs from each steam generator provides steam to operate the auxiliary feedwater pump turbine. Refer to section 10.4.9.

10.3.3.2 <u>CESSAR Interface Evaluation</u>

Refer to section 5.1.5.

10.3.4 INSPECTION AND TESTING REQUIREMENTS

Refer to section 14.2 for pre-operational testing requirements. Refer to sections 3.9 and ~~16.3/4~~ Section 3/4.7.1 of the Technical Specifications for inservice testing and inspection requirements.

10.3.5 WATER CHEMISTRY (PWR)

10.3.5.1 <u>Chemistry Control Basis</u>

Refer to CESSAR Section 10.3.4.1.

10.3.5.2 <u>Corrosion Control Effectiveness</u>

Refer to CESSAR Section 10.3.4.2.

10.3.5.3 <u>Chemistry Control Effects on Iodine Partitioning</u>

Refer to CESSAR Section 10.3.4.3. The partition factor assumed for the condenser vacuum pump outlet is discussed in section 11.1.8.

10.3.6 STEAM AND FEEDWATER SYSTEM MATERIALS

10.3.6.1 <u>Fracture Toughness</u>

The materials are in compliance with the ASME Boiler and Pressure Vessel Code, Sections II and III, 1974 Edition through the Winter, 1975 Addenda. The fracture toughness properties meet

13.4.3 AUDIT PROGRAM

A comprehensive program of planned and documented audits is carried out to verify compliance with, and effectiveness of, implementation of the administrative controls and Quality Assurance (QA) program and to assist the NSG in the execution of its responsibility for independent review of operating activities that affect nuclear safety.

Audits are performed in accordance with approved procedures. The frequency and scope of the audits is discussed in section ~~16.6.5.2.2~~ 6.5.3 of the Technical Specifications.

Audit assignments are such that the Audit Team members will not perform audits of activities for which they have immediate responsibility.

Written reports of audits are reviewed by the NSG and by appropriate members of management, including those having responsibility in the area audited. Appropriate and timely followup action, including re-audit of deficient areas as appropriate, is taken to ensure overall effectiveness of the review and audit program.

The QA audit program for operations is discussed in section 17.2.

13.5.1.3 Procedures

The following are descriptions of administrative procedures that will be prepared for PVNGS:

A. Procedures for Shift Supervisors and Operators

1. Senior reactor operator's authority and responsibilities

    a. Describes senior reactor operator's duties, responsibilities, and authority.

2. Reactor operator's authority and responsibilities

    a. Describes the reactor operator's duties, responsibilities, and authority.

3. Conduct of operations

    a. Procedures are written to implement the provisions of section ~~16.6.2~~ 6.2 of the Technical Specifications concerning licensed personnel on shift. These procedures will include provisions of 10CFR50.54 (i) through (m).

    b. The "at the controls" area of the control room is shown in figure 7.5-1.

B. Special Orders of a Transient or Self Cancelling Nature

Special orders will be written to issue instructions which have short term applicability and which require dissemination. These orders will be reviewed on at least an annual basis for the purpose of purging and updating.

C. Equipment Control Procedures

Equipment control procedures are written to provide control over the status of station equipment, of purchased material, and of nonconforming material. Such procedures will include:

1. Work authorization.

14B.14 REACTOR CONTAINMENT INTEGRATED AND LOCAL LEAK RATE TESTS

1.0 OBJECTIVE

1.1 To demonstrate, prior to initial reactor
2 operation, that leakage through the primary reactor containment and systems and components penetrating primary containment do not exceed the allowable leakage rate values as specified in the Technical Specifications.

9

2.0 PREREQUISITES

2 2.1 Construction activities completed.

2.2 Structural integrity test (described in subsection 3.8.1.7) satisfactorily completed.

9 2.3 Leakage rate determination instrumentation available and properly calibrated.

2.4 Containment ventilation system, personnel airlock and isolation valves are operable.

2.5 Containment inspection completed.

3.0 TEST METHOD

2 3.1 Perform individual local leakage tests on containment isolation valves and penetrations as described in Section 6.2.

9 3.2 Perform a containment building integrated leakage rate test at the calculated peak internal pressure per Section 6.2.

4.0 ACCEPTANCE CRITERIA

6 4.1 The containment leakage shall not exceed the plant technical specification limits stipulated
9 in ~~Subsection 16.3/4.6.1~~ Section 3/4.6.1 of the Technical Specifications.