NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 666-6911

May 15, 1984

Docket No. 50-423
B11185

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

References: (1) B. J. Youngblood to W. G. Counsil, Draft Safety Evaluation Report (DSER) for Millstone Nuclear Power Station, Unit No. 3, dated December 20, 1983.

(2) W. G. Counsil to B. J. Youngblood, B11111, dated April 19, 1984.

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit No. 3
NRC Procedures and Systems Review Branch
Transmittal of Revised Responses to DSER Open Items

Reference (2) transmitted our responses to the NRC's Procedures and Systems Review Branch (PSRB) open items identified to us in Reference (1). Attachment I of Reference (1) summarized the status of each PSRB open item up to that time.

Conversations with the NRC Staff since that time have resolved and/or revised our responses to several of these open items. Revised Attachment I provides the most current status for all of the PSRB open items. Attachment II provides revised responses for open items PSRB-13, PSRB-15, and PSRB-18.

If you have any concerns related to the information contained herein or any questions related to our responses, please contact our licensing representative, Ms. P. Capello-Bandzes at (203) 665-3714.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY et. al.
By Northeast Nuclear Energy Company, Their Agent

W. G. Counsil
Senior Vice President

A001
1/1

cc: Mr. R. A. Becker
NRC Procedures and Systems Review Branch

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, an Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Marjorie J. Belles
Notary Public

My Commission Expires March 31, 1988

ATTACHMENT I

Status of Each DSER PSRB Open Item

Open Item	Subject	Status
PSRB-01	TMI Action Item I.C.1	Open**
PSRB-02	ANSI/ANS 3.2-1981 (Draft 7) or 1982, Section 5.3	Closed
PSRB-03	Procedures Generation Package Familiarization	Closed
PSRB-04	Alarm Response Procedures	Closed
PSRB-05	Procedures that Include Immediate Actions to be Memorized	Closed
PSRB-06	Commitment Concerning Plant Operations	Closed
PSRB-07	Procedures for Abnormal Release of Radioactivity	Closed
PSRB-08	Temporary Operating and Maintenance Procedures	Closed
PSRB-09	TMI Action Items I.C.7 and I.C.8	Closed
PSRB-10	ATWS Procedures	Closed
PSRB-11	Tests of Failed Fuel Monitors (Q640.2)	Confirmatory*
PSRB-12	Automatic Closure of Main Steam Isolation Valves (Q640.3)	Confirmatory*

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* NNECO considers these items to be closed, however, the NRC Reviewer has requested that we categorize these items as confirmatory, until the follow-up FSAR changes appear in a FSAR amendment.

** NNECO considers this item to be confirmatory.

Open Item	Subject	Status
PSRB-13	Conformance to Regulatory Guide 1.52 (Q640.5)	Confirmatory*
PSRB-14	Conformance to Regulatory Guide 1.95 (Q640.4)	Confirmatory*
PSRB-15	Test Abstract Descriptions (Q640.7)	Confirmatory*
PSRB-16	Loss of Instrument Air Test (Q640.13)	Confirmatory*
PSRB-17	Solid State Protection System (Q640.17)	Confirmatory*
PSRB-18	Regulatory Guide 1.68, Rev. 2, Appendix A.1.2 and A.5.T (Q640.19)	Confirmatory*
PSRB-19	Real or Dummy Fuel Assemblies for Vibration Test (Q640.20(2))	Closed
PSRB-20	NUREG-0694, Item I.G.1 (Q640.22)	Confirmatory*
PSRB-21	Regulatory Guide 1.62, Rev. 2, Appendix A (Q640.26)	Confirmatory*
PSRB-22	Preoperational Tests 76-84 (Q640.27)	Confirmatory*
PSRB-23	Swing Load Test (Q640.28)	Confirmatory*
Q640.15	BTP PSB-1	Confirmatory*
Q640.16	Preoperational Test Number 51 (Diesel Generator)	Confirmatory*

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* NNECO considers these items to be closed, however, the NRC Reviewer has requested that we categorize these items as confirmatory, until the follow-up FSAR changes appear in a FSAR amendment.

ATTACHMENT II

Response to DSER PSRB Open Items

Millstone Nuclear Power Station, Unit No. 3

Open Items

Procedures and Systems Review Branch

PSRB-13 Conformance to Regulatory Guide 1.52,
Paragraphs C.2.1, C.3.1, and C.3.p. - Question 640.5 (Draft SER Section 14.2.7)

Question Q640.5:

Certain exceptions to Regulatory Guide 1.140 (Design, Testing, and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants) listed in FSAR Section 1.8 need to be deleted or modified as described below to be acceptable.

1. Modify exception to Paragraph C.2.f to delineate how the ductwork leak tests performed using the methods of the Associated Air Balance Council differ from the requirements given in Section 6 of ANSI N510:1975, and provide technical justification for any testing that does not address those differences.

2. Modify exception 1 to Paragraph C.3.i to provide assurance that the data provided in the certified fan performance curves will most closely represent the manner in which the fan will be installed in the appropriate system.

3. Modify exception 2 to Paragraph C.3.i to either reference the displacement criteria that will be used, or agree to meet the criteria given in the 1980 revision to ANSI N509 Section 5.7.3.

4. The exception to Paragraph C.3.1 states that an exception is taken to the following: "Class B leakage rates shall be determined for one damper of each type instead of every damper." If the intent is to not test each damper's leak rate, expanded technical justification will be required and the exception rewritten to clarify what is actually intended.

5. Modify FSAR Subsection 14.2.7.15 to either include the exceptions listed in FSAR Section 1.8 or to reference FSAR Section 1.8.

Response:

Refer to revised FSAR Section 14.2.7.15 and revised Table 1.8-1 for the response to this question.

Additional Concerns Identified in Draft SER:

The exceptions noted in this item should also be addressed in the statement of conformance to RG 1.52, Paragraphs C.2.1, C.3.1, and C.3.p.

Response:

Refer to revised FSAR Table 1.8-1.

Revision 1

Millstone Nuclear Power Station, Unit No. 3

Open Items

Procedures and Systems Review Branch

PSRB - 13 (Cont.)

With regard to Paragraph C.3.p., our response to Q460.12 was accepted for testing a representative damper rather than all dampers. Except for two backdraft dampers on the SLCRS system fan discharge, all construction class B leakage class II and III dampers on ESF atmosphere cleanup air filtration and adsorption units have beer tested for leakage in accordance with AMCA 500. The site of the two untested backdraft dampers is bounded by both larger and smaller size dampers which have been satisfactorily tested to 50% of allowable leakage rates. The only non-tested dampers are associated with non-ESF atmosphere cleanup system air filtration and adsorption units and are leakage class IV which do not require leakage testing.

TABLE 1.8-1 (Cont)

PSRB-13

R.G. No.	Title	Degree of Compliance	FSAR Section Reference

filter components on a cell by cell basis. Demisters, heaters, fans and casings will be decontaminated by wash down process; wash down liquid will drain to an aerated drain system.

Paragraph C.2.i

~~Housing leak tests are performed in accordance with the provisions of Section 6 of ANSI N510-1975 as recommended in this paragraph. However, ductwork tests are performed using acceptable methods of the Associated Air Balance Council.~~ Delete

INSERT A →

Paragraph C.3.d (Clarification)

All HEPA filters are shipped to an NRC Quality Assurance Station for testing. However, if data confirm that HEPA filters are damaged by the additional transportation, and/or the handling at the NRC facility, the decision to send all HEPA filters for additional testing will be reconsidered. If HEPA filters are not sent to the NRC Quality Assurance Station, sufficient additional testing remains to ensure HEPA filter reliability. The HEPA filter cell testing is conducted initially at the manufacturer's facilities and again after installation at the plant site. All HEPA filters furnished are equipped with face guards in accordance with MIL-F-51068. When installed in the filter housing, the HEPA filters and housing are inspected for defects and tested for leak tightness in accordance with ANSI N510-1975. 3

Paragraph C.3.e (Clarification)

Filter and adsorber mounting frames are constructed and designed in accordance with the recommendations of Section 4.3 of ERDA 76-21, except for the frame tolerance guidelines in Table 4.2. The tolerances selected for HEPA and adsorber mountings are sufficient to satisfy the bank leak test criteria of Paragraphs C.5.c and C.5.d of Regu-

PSRB-13

TABLE 1.8-1 (Cont)

R.G. No.	Title	Degree of Compliance	FSAR Section Reference
		latory Guide 1.52, Rev. 2. Paragraph C.3.g Millstone 3 is in accordance with ANSI N509, except access to the control building filter units is not provided with hinged doors or inspection windows. Access is via 20-inch by 40-inch bolted panels. Other units are provided with hinged doors or bolted panels with inspection windows. There is no internal lighting. Paragraph C.3.h Exception is taken to the recommendations of Section 4.5.8 of ERDA 76-21 relative to drain sizes and arrangement. Normally closed manual valves, instead of water seals and traps, will be provided to control the discharge of the fire sprinkler flow. Sprinkler flow will be a timed discharge, and the water will be contained within the housing until it is removed to the liquid radwaste system at a controlled rate. Paragraph C.3.i The dwell time for the minimum 2 inches of the carbon adsorber unit is 0.25 sec. For bed depths greater than 2 inches, where the dwell time is less than 0.2 sec per 2 inches of total bed depth, experimental verification of filter assembly will be provided. Paragraph C.3.k When conservative calculations show that the maximum decay heat generation from collected radioiodines is insufficient to raise the carbon bed temperature above 250°F with no system overflow, small capacity ESF atmosphere cleanup systems may be designed without an air bleed cooling mechanism. Exception is taken to the requirement of any cooling mechanism satisfying single-failure criteria because a backup mechanism is provided.	

TABLE 1.8-1 (Cont)

PSRB-13

R.G. No.	Title	Degree of Compliance	FSAR Section Reference

In addition, exception is taken to provide humdity control for the decay heat removal system cooling air flow which uses room air of less than 70 percent relative humidity.

Paragraph C.3.l

System resistances will be determined in accordance with Section 5.7.1 of ANSI N509-1976 except that fan inlet and outlet losses will not be calculated in accordance with AMCA 201. Fan blast area data necessary to calculate inlet and outlet losses, per AMCA 201, are the responsibility of fan manufacturers, and are not available from them.

~~Exception is taken to Section 5.7.2 of ANSI N509-1976: copies of fan ratings or test reports are not necessary when certified fan performance curves are furnished.~~

~~Exception is taken to balancing techniques defined in Section 5.7.3 of ANSI N509-1975. Displacement criteria following normal industry practice will be used when maximum vibration velocity method imposes unrealistic requirements at certain operating speeds.~~

Delete

Documentation will not be furnished in accordance with Section 5.7.5 where AMCA certification ratings are submitted.

Paragraph C.3.n

Exception is taken to Section 5.10.3.5 of ANSI N509-1976: ductwork, as a structure, will have a resonant frequency above 25 Hz, but this may not be true for the unsupported plate or sheet sections. The design provides for specification of the resonant frequency range of the support hangers. Specifying the resonant frequency of the unsupported plate or sheet has no meaning in the design.

Paragraph C.3.p

Exception is taken to the provisions in Section 5.9 of ANSI N509-1976 of designing dampers to ANSI B31.1 and to using butter-

PSRB-13

TABLE 1.8-1 (Cont)

R.G. No.	Title	Degree of Compliance	FSAR Section Reference
		fly valves. Class B dampers may be designed and tested to meet the verification of strength and leaktightness necessary for use in a ~~containment~~ contaminated air stream. (Note: This exception does not pertain to containment penetrations.)	
		In addition, exception is taken to the following:	Q460.12
		Class B leakage rates shall be determined for one damper of each type instead of every damper.	
		INSERT B →	
		Paragraph C.4.a	
		Exception is taken to full compliance with Section 2.3.8 of ERDA 76-21, i.e., the plant does not use any communications system, floor drains are as noted in Paragraph C.3.h above, decontamination areas and showers are not "nearby," filters are not used at duct inlets, and duct inspection hatches are not provided.	
		Paragraph C.4.b	
		Partial compliance, with a minimum spacing between filter frame of 2 ft-6 in. instead of a minimum of 3 feet. This is deemed adequate since replacement of filter elements would be minimal due to system function, use, and location.	3
		Paragraph C.4.d (Clarification)	
		FSF atmosphere cleanup systems are run a minimum of 10 hours per month. However, if the field data confirms that it is unnecessary to run the trains 10 hours per month to reduce the amount of moisture present on the filters, this decision will be reconsidered.	
1.53*	Application of the Single-failure Criterion to Nuclear Power Plant Protection Systems (Rev. 0, June 1973)	Comply, with the following clarifications:	3.1.1
		1. Regulatory Position C.1	
		Due to the trial-use status of the source document, IEEE 379-1972, departure from certain provisions may occur. The phrase "any and all combinations of	

FSAR Table 1.8-1

(Paragraph C.2.1)

Insert A

Housing leak tests are performed in accordance with the provisions of Section 6 of ANSI N510-1975 as recommended in this paragraph. However, ductwork leak tests shall be performed per the AABC National Standards for Field Management and Instrumentation, 1974, Volume II No. 12173, Air Distribution Duct Leakage Test Methods and Standards Section. Test pressures shall be as specified by the engineers and shall be equal to the design pressures as defined in ANSI N509-1980 Paragraph 4.6. Leakage classes shall be as noted on Figures B2 and B3 and the leakage criteria corresponding to these classes shall be as found in Tables 4.3 and 4.4 in Paragraph 4.12 of ANSI N509-1980"

(Paragraph C.3.p.)

Insert B

Damper leakage will not impact on the air cleaning effectiveness of ESF systems.

NRC Letter: May 3, 1983 1.8

Question No. Q460.12 (Sections 6.5.1) 1.11

Regulatory Guide 1.52 and 1.140 recommend leak testing of dampers used in ESF and non-ESF air filtration systems. In Table 1.8-1, pages 21 and 55, you have taken exception to testing every damper, and propose to test every type of damper. Since leakage is a function of valve size, we recommend that you determine Class B leakage rates for at least one damper of each size and type used in the ESF and non-ESF atmospheric cleanup systems, as an acceptable alternative. 1.12 1.13 1.14 1.15

Response: 1.16

INSERT A

Except for two backdraft dampers on the supplementary leak collection and release system fan discharge, ~~all other dampers~~ on ESF atmosphere cleanup system air filtration and adsorption units have been tested for leakage rates. The size of the two untested backdraft dampers is bounded by both larger and smaller size dampers which have been satisfactorily tested to 50 percent of allowable leakage rates. 1.17 1.18 1.19 1.20

INSERT B

INSERT C

The only dampers associated with non-ESF atmosphere cleanup system air filtration and adsorption units are ANSI N509 leakage Class IV which do not require testing. 1.21 1.22

FSAR Question Q460.12

INSERT A

all construction class B, leakage class II and III dampers

INSERT B

in accordance with AMCA 500.

INSERT C

non-tested

Millstone Nuclear Power Station, Unit No. 3

Open Items

Procedures and Systems Review Branch

PSRB-15 Test Abstract Descriptions -
Question 640.7 (Draft SER Section 14.2.12)

Question Q640.7:

Regulatory Guide 1.70 Paragraph 14.2.12 states that test descriptions should include a "summary of acceptance criteria." To comply, you should include, for all tests listed below, acceptance criteria or a discussion of the sources for the acceptance criteria to be used when test procedures are prepared. This information is necessary for the NRC inspectors who review test procedures and evaluate test results. The test description should provide "traceability" to acceptance criteria sources such as: specific FSAR Subsections, Technical Specifications, topical reports, vendor-furnished test specifications, and/or accident analysis assumptions.

1. Preoperational Test Numbers 1-11, 13-14, 16-29, 31-60, 62-68, 71, and 73-75.

2. Startup Test Numbers 1-2, 7-8, 11-13, 17-19, 22-24, 26, 28-35, and 38.

Response:

The sources for acceptance criteria will be provided in the individual test procedures when they are prepared. Traceability to specific FSAR subsections, Technical Specifications, topical reports, vendor-furnished test specifications, and/or accident analysis assumptions will be provided.

Approved test procedures for satisfying FSAR test commitments will be made available to the NRC staff personnel from the office of Inspection and Enforcement approximately 60 days prior to their intended use as required by Regulatory Guide 1.68 or approximately 60 days prior to fuel load, whichever is sooner.

Additional Concerns Identified in Draft SER:

Test abstract descriptions should be expanded to indicate the sources of acceptance criteria.

Response:

Refer to FSAR Table 14.2-3.

Revision 1

PSRB-15

TABLE 14.2-3

PREOPERATIONAL/ACCEPTANCE/STARTUP TESTS

ACCEPTANCE CRITERIA SOURCES

Test Number	Title	Sources
P1	RCS Cold Hydro	FSAR Table 5.4-15
P2	Control Rod Drive	FSAR 4.6.3; Vendor Specification 001 (Westinghouse)
P3	Fuel Transfer	FSAR 9.1.4; Vendor Specification 001 (Westinghouse)
P4	Polar Crane	FSAR 9.1.4; Vendor Specification 014 (Harnischfeger)
P5	Volume Control (Charging and Letdown)	FSAR 9.3.4; Westinghouse (W) NSSS SU Manual (NEU-SU-2.2.3); W Precautions, Limitations, and Setpoints (PLS) Vendor Specifications 001 (W) and 459 (Combustion Engineering)
P6	Volume Control (Boric Acid)	FSAR 9.3.4; NEU-SU-2.2.3; IEB 81-02
P7	Volume Control (BTRS)	FSAR 9.3.4; NEU-SU-2.2.3; W PLS
P8	Fuel Pool Cooling	FSAR 9.1.3
P9	Containment Recirculation	FSAR 6.2.2.3
P10	Residual Heat Removal	FSAR 5.4.7, 6.3
P11	LP Safety Injection	FSAR 6.3; R.G. 1.79, 1.108
P12	HP Safety Injection	FSAR 6.3; R.G. 1.79, 1.108
P13	Quench Spray	FSAR 6.2.2; R.G. 1.1, 1.26, 1.29, 1.97
P14	Reactor Plant Sampling	FSAR 9.3.2, 9.3.4
P15	Containment Local Leak Rate Testing	FSAR 6.2.4, 6.2.6; 10CFR50 Appendix J
P16	Containment Ventilation	FSAR 6.2.5.4, 9.4.7, 9.5.10.4
P17	Auxiliary Bldg. Ventilation	FSAR 9.4.3.1
P18	Waste Building Vent	FSAR 9.4.2, 9.4.9.1
P19	Fuel Building HVAC	FSAR 9.4.2, 9.4.9.1
P20	ESF Building HVAC	FSAR 9.4.5
P21	Control Building HVAC	FSAR 6.4.3, 6.4.5, 9.4.1; R.G. 1.95

Test Number	Title	Sources
P22	Screen House HVAC	FSAR 9.4.8.1.1
P23	EGE Vent	FSAR 9.4.6.1.3, 9.4.6.5
P24	Supplementary Leak Detection and Release	FSAR 6.2.3.3
P25	Main Steam	FSAR 10.3.3; NEU-SU-2.8.3, 2.8.5
P26	Steam Dump Control	FSAR 7.7.1.8; NEU-SU-2.8.3, 2.8.5
P27	Steam Generator Blowdown	FSAR 10.4.8
P28	Main Feedwater	FSAR 10.4.7; Vendor Specification 021 (General Electric) and 008 (Byron-Jackson)
P29	Steam Generator Water Level Control	FSAR 10.4.7.2
P30	Auxiliary Feedwater	FSAR 10.4.9
P31	Service Water	FSAR 9.2.1, Table 9.2-1
P32	Reactor Plant Component Cooling	FSAR 9.2.2.1, Table 9.2-5
P33	Reactor Plant Chilled Water	FSAR 9.2.2.2.1, Table 9.2-7
P34	Charging Pump Cooling	FSAR 9.2.2.4.2, Table 9.2-10
P35	SI Pump Cooling	FSAR 9.2.2.5.2, Table 9.2-12
P36	NST Cooling	FSAR 9.2.2.3.2
P37	Reactor Plant Gaseous Drains	FSAR 9.3.3; R.G. 1.70
P38	Instrument Air and Containment Instrument Air	FSAR 9.3.1.1.4.1; R.G. 1.68.3
P39	Rad. Liquid Waste	FSAR 9.3.3, 11.2, 11.5; R.G. 1.70
P40	Boron Recovery	FSAR 9.3.5.1
P41	Rad. Gaseous Waste	FSAR 11.3
P42	Rad. Solid Waste	FSAR 11.4
P43	Steam Generator Chemical Feed	FSAR 10.4.7; Vendor Specification 053 (Yarway)
P44	Fire Protection - Water	FSAR 9.5.1

Test Number	Title	Sources
P45	Fire Protection - CO_2 and HALON	FSAR 9.5.1
P46	4KV Normal and Emergency Distribution	FSAR 8.3.1.1, Table 8.1-2
A/P47	480V Normal and Emergency Distribution	FSAR 8.3.1.1
P48	120 VAC Instrumentation Non-Vital Distribution	FSAR 8.3.1.1.1; Vendor Specification E261 (Solidstate Controls)
P49	120 VAC Instrumentation Vital Distribution	FSAR 8.3.1.1.2; Vendor Specification E622 (Elgar)
P50	125 VDC Distribution	FSAR 8.3.2.1, Table 8.3-5; Vendor Specification E262 (GE)
P51	Diesel Generator	FSAR 8.1.7, 9.5.6.1; R.G. 1.79, 1.108
P52	Diesel Generator Fuel	FSAR 9.5.4
P53	RSST	FSAR 8.3.1.1, Table 8.1-2
P54	Communications	FSAR 9.5.2; IEB 79-18
P55	Nuclear Instruments	FSAR 7.7.1.3.1; Westinghouse PLS
P56	Incore Nuclear Instrumentation	FSAR 7.7.1.9.2; Vendor Specification 001 (W)
P57	Process and Area Rad. Monitoring	FSAR 11.5; 12.3.4; Tables 11.5-1,2
P58	ESF Actuation (Diesel Sequencer)	FSAR 8.3
P59	Reactor Trip (Solid State Protection)	FSAR Table 15.0-4; W PLS
P60	Process Protection and Control Instrumentation Racks	FSAR 7.2, 7.3; Vendor Specification 001 (W)
P61	Protection/Safeguards System Response Time	FSAR Chapter 15
P62	DRPI	FSAR 7.7.1.3.2 Vendor Specification 001 (W)
P63	Loose Parts Monitor	FSAR 4.4.6.4
P64	Seismic Monitor	FSAR 3.7.4; Vendor Specification 319 (Terra Technology)

Test Number	Title	Sources
P65	Emergency Lighting	FSAR 9.5.3
P66	ESF Integrated Test w/o Loss of Normal Power	FSAR 7.3; R.G. 1.79
P67	ESF Test with Loss of Normal Power	FSAR 8.3.1.1.2.4; R.G. 1.108
P68	Leak Detection	FSAR 5.2.5.1; Technical Specifications; R.G. 1.79, 1.108
P69	Containment Isolation	FSAR 6.2.4
P70	Containment Integrated Leak Rate	FSAR 6.2.6; ANSI N45.4; 10CFR50 Appendix J
P71	Integrated Precore Hot Functional Testing	R.G. 1.68, 1.79; FSAR 3.9.2, 7.7.1, 9.3.4.4, 10.3.4, 10.4.7
P72	Reactor Coolant and Associated Systems Expansion and Restraint	R. G.1.68; FSAR 3.9.2
P73	Reactor Coolant and Selected Systems Piping Vibration	R.G.1.68; NETM-50; FSAR 3.9.2
P74	Thermal Expansion of Piping and Components of Secondary Systems	R.G. 1.68; NETM-50; FSAR 3.9.2
P75	Control System Test for Turbine Runback	FSAR 7.7.1.4.2; NEU-SU-2.74, 3.13
P76	RCIV	FSAR 5.4.12, 7.6.5 Vendor Specification 001 (W)
P77	Condensate and Condensate Storage	FSAR 10.4.7.4, 9.2.6.4
A78	Turbine Plant Sampling	FSAR 9.3.2.4,10.4.7.4
A79	Turbine Plant Component Cooling	FSAR 9.2.7.4
A/P80	Heat Tracing	FSAR 7.6.9; IEN 79-24
P81	RWST Cooling	FSAR 6.2.2.4, 6.3.4
P82	Reactor Vessel Head Vent	FSAR 5.4.15
A83	Condenser Air Removal	FSAR 10.4.2.1
A84	Leak Test of SFP Gates and Transfer Tube	*

Test Number	Title	Sources
S1	Initial Core Load	FSAR 9.1.4, 14.2.10.1; W Nuclear Design Report
S2	Post-Core Hot Functional	*
S3	CRDM	FSAR 4.2.4, 7.7.1.4; NEU-SU-2.5.1; R.G. 1.68
S4	RPI	FSAR 7.7.1.3.2, 7.7.1.3.3; NEU-SU-2.5.4
S5	Rod Drop Times	FSAR 4.2.4; NEU-SU-2.5.3; Technical Specifications; R.G. 1.68
S6	Rod Control System	FSAR 4.2.4, 7.7.1.2; NEU-SU-2.5.2
S7	Pressurizer Spray and Heater Capacity	FSAR 5.4.10; Technical Specifications; NEU-SU-2.1.5
S8	RTD Bypass Loop Flow	FSAR 5.4.3; NEU-SU-2.1.9
S9	Reactor Coolant System Flow	FSAR Table 4.4-1, Technical Specifications
S10	Reactor Coolant Flow Coastdown	FSAR 5.4.3
S11	Movable Incore Detectors	FSAR 7.7.1.9.2; NEU-SU-2.9.3
S12	Operational Alignment of Process Temperature Inst.	NEU-SU-2.9.6; R.G. 1.68
S13	Computer Programs	Baseline data aquisition
S14	Vibration and Loose Parts Monitoring	FSAR 4.4.6.4
S15	Water Chemistry Control	*
S16	Radiation Survey	FSAR 12.3.1
S17	Initial Criticality	FSAR 4.4.5, 14.2.10.3; Technical Specifications
S18	Low Power Physics Test	FSAR 4.4.5, 14.2.1.2; W Nuclear Design Report
S19	Boron Reactivity Worth	FSAR 4.4.5; W Nuclear Design Report
S20	Pseudo Rod Ejection	FSAR 15.4
S21	Natural Circulation	FSAR 14.2.10.2, 15.2.6; R.G. 1.68
S22	Power Ascension	FSAR 4.4.5, 14.2.1.2; R.G. 1.68
S23	Dynamic Automatic Steam Dump Control	FSAR 7.7.1.8; NEU-SU-2.8.5

PSRB-15

Test Number	Title	Sources
S24	Auto Steam Generator Level Control	FSAR 7.7.1.7; NEU-SU-2.8.2
S25	Shutdown from Outside Control Room	R.G. 1.68.2
S26	Station Blackout	FSAR 8.3.1.1; R. G. 1.68
S27	MSIV Closure	FSAR 10.3.3
S28	Operational Alignment of Nuclear Instrumentation	W PLS; Technical Specifications
S29	Process and Effluent Monitoring	FSAR 11.5.2, 12.3.4, Table 11.5-1,2
S30	Core Performance	FAR 4.4.5; Technical Specifications; R.G. 1.68
S31	Power Coefficient	FSAR 4.4.5; NEU-SU-2.9.11
S32	Axial Flux Difference Instrumentation Calibration	FSAR 4.4.5; Technical Specifications
S33	Ventilation Systems Operability	FSAR 9.4, Table 9.4-1; R.G. 1.68
S34	Turbine Generator and Feedwater Turbine Operability	Baseline data acquisition
S35	Calibration of Steam and Feedwater Flow Inst.	FSAR 10.3.7; NEU-SU-2.9.4
S36	Auto Reactor Control	NEU-SU-2.8.1; W PLS
S37	Load Swing	NEU-SU-3.4.7, 3.4.8
S38	Auxiliary Coolant Systems Performance	FSAR 9.2.2, 9.2.7
S39	Unit Trip From 100% Power	FSAR 15.2.3; R.G. 1.68
S40	Warranty Run	NEU-SU-3.5.1
S41	Secondary Plant Performance	FSAR 10.3, 10.4
S42	Containment Penetration Temperature Monitoring	FSAR 9.2.2.1

Note: This listing is only a partial summary of the acceptance criteria sources used to prepare the indicated test procedures. A detailed listing will be available in each test.

* The sources of acceptance criteria for these tests can be found in the test abstract descriptions.

Millstone Nuclear Power Station, Unit No. 3

Open Items

Procedures and Systems Review Branch

PSRB-18 Regulatory Guide 1.68, Rev. 2, Appendix A.1.2 and A.5.t - Question 640.19 (Draft SER Section 14.2.12)

Question Q640.19:

Regulatory Guide 1.68, Revision 2, Appendix A.1.2 and A.5.t prescribe testing for various valves. Modify Preoperational Test Number 71 (Integrated Precore Hot Functional Testing) to provide for a more complete demonstration of the operability of pressurizer power operated relief valves; main steam line relief valves; atmospheric steam dump valves; main steam bypass valves; and main steam control valves. Such a demonstration should include response times, relieving capacities, setpoints, and reset pressures. Open and reclosure setpoints for all relief valves should be checked at temperature. Where valves are not tested in-situ with the process fluid, testing should be conducted to verify that discharge piping is clear and will not choke or produce back-pressure affecting set-reset pressures of the valves. When referencing bench tests instead of performing installed capacity checks, technical justification should be provided.

(NOTE: This item is not applicable to ASME Code safety valves subject to ASME Section XI preservice tests.)

Response:

Refer to revised FSAR Table 14.2-1, Preoperational Test 71.

These valves will be tested at temperature, in place, with the process fluid. The relief capacity of the atmospheric dump values and main steam bypass valves is demonstrated in tests described in FSAR Table 14.2-2 test numbers 23, 37, and 39. The capacity of the PORV's is addressed in FSAR Section 5.4.13.2. ASME Code Safety Valves, will be subject to ASME Section XI testing.

Additional Concerns Identified at March 21, 1984 Meeting:

Relief capacity of the PORVs and atmospheric dump valves has not been adequately demonstrated. FSAR Subsection 5.4.13.2 addresses an evaluation program whose results will be reported to the NRC prior to fuel load, and startup tests 23, 37, and 39 do not specifically address determination of valve relief capacity. Provide reference to where specific testing is accomplished which ensures that the relief capacity of the PORVs and atmospheric dump valves is less than the value assumed in the safety analysis (FSAR Subsections 15.1.4 and 15.6.1).

Response:

Refer to revised FSAR Table 14.2-1, Preoperational Test 71.

Revision 1

PSRB-18 (Cont.)

Although specific testing is not performed to ensure that PORV and atmospheric dump valve relief capacity is less than the value assumed in the safety analysis, the following system design limits apply which limit the effect of excessive relief capacity:

1. As stated in FSAR Section 15.6.1.1, a PORV is sized to relieve approximately 50% of what a pressurizer safety valve would relieve. Bench test results provided by EPRI indicate that PORV relief capacity is 372,600 lbm/hr, while safety valve design relief capacity is 420,006 lbm/hr (refer to EPRI NP-2628-LD, dated September, 1982). Since the RCS is analyzed for inadvertent safety valve opening, inadvertent PORV opening is, therefore, bounded by the former event.

2. FSAR section 15.1.4 discusses inadvertent opening of a steam generator safety valve (atmospheric dump valve). This event is categorized as a condition II event. Westinghouse assumed a 268 lbm/sec (1200 psig) flow rate. The analysis for this condition II event shows that DNB design limits are not exceeded as stated in FSAR Section 15.1.4.3.

   a. A steam generator atmospheric dump valve is installed in an 8 inch line. Maximum relief capacity of the atmospheric dump valve is bounded by a 0.35 ft^2 line break.

   b. A main steam line rupture is a condition IV event as described in FSAR Section 15.1.5. The cross-sectional area assumed for the rupture is 1.4 ft^2. The analysis for this condition IV event shows that DNB design limits are not exceeded as stated in FSAR Section 15.1.5.3.

   c. The steam generator atmospheric dump valve inadvertent opening condition II event is bounded by the main steam line rupture condition IV event. Analysis for both events shows DNB design limits are not exceeded.

   d. Additional mitigating details are as follows:

      (i) Millstone Unit No. 3 utilizes an upstream remotely motor operated (MOV) block valve which could isolate an inadvertently opened atmospheric dump valve.

PSRB-18 (Cont)

(ii) Westinghouse ERGs require the steam generator atmospheric dump valve (PORVs) be specifically monitored after receipt of symptoms indicating a steam break. Specific plant procedures will require shutting the MOV block valve upstream in the event of a stuck open atmospheric dump valve.

(iii) Atmospheric dump valve design criteria specifies a maximum valve flow rate of 167 lbm/sec (1200 psig).

TABLE 14.2-1 (Cont)

71. PREOPERATIONAL TEST - INTEGRATED PRECORE HOT FUNCTIONAL TESTING

Prerequisites for Testing

General prerequisites have been met. The reactor coolant system cold hydrostatic test has been completed. All preoperational testing of systems required to support hot plant operations has been completed and reviewed for adequacy for the joint test groups with all test deficiencies corrected or specifically waived.

Test Objective and Summary

Testing will demonstrate the satisfactory performance of systems and components during the heatup of the reactor coolant system (RCS), operation at normal temperature, pressure, and cooldown. Specific testing will include:

1. Heatup of the RCS to normal operating temperature and pressure utilizing the reactor coolant pumps and pressurizer heaters. This test will include demonstration of solid system pressure control and the capability to add hydrazine to the RCS

2. Perform periodic vibration measurements of reactor coolant pumps

3. Demonstrate that the operation of pressurizer pressure and level control systems including heater and spray operation. Perform preliminary spray flow adjustments

4. Demonstrate that the operation of the steam generator atmospheric and condenser steam dump valves is acceptable within specific limits

INSERT A →

5. Demonstrate the capability of the chemical and volume control system to provide charging water at rated flow against normal RCS pressure, verify letdown flow rate for various operating modes and verify the excess letdown and seal water flows

6. Perform RCS incore thermocouple and RTD isothermal calibration

7. Verify ability to maintain steam generator levels and proper operation of feedwater control systems, steam dumps and level instrumentation

8. Demonstrate proper functioning of the main steam isolation valves at normal operating temperature and pressure

9. Demonstrate the proper operation of steam generator safety valves, verifying setpoints with a pressure-assist device and verifying proper reseating and leakage within specified limits

TABLE 14.2-1 (Cont)

10. Demonstrate the proper operation of pressurizer safety and relief valves, and the capability of the pressurizer relief tank to condense a steam discharge from the pressurizer

    a. Proper actuation, operation, and response time of the power operated relief valves (PORV) will be demonstrated by simulating a high pressure signal to each valve. RESET

    b. The PORV will be operated manually to confirm valve operability and the ability of the pressurizer relief tank (PRT) to condense a discharge. Leakage following operation will be verified within acceptable limits. Discharge header leakage detection instrumentation will be verified operable in accordance with design requirements.

    c. Operability of PORV and PRT instrumentation, controls, interlocks, and alarms will be verified.

    d. Safety valve leakage at RCS normal pressure will be verified within specified limits. Actual safety valve operation will be demonstrated by hydrostatic bench test to verify set points.

11. Operate the reactor coolant pumps for a minimum of 240 hours at full flow to achieve approximately 1 million vibration cycles on reactor internals. Following hot functional testing, the internals are removed and inspected for vibration effects

12. Demonstrate proper operation of reactor coolant pump trips and alarms

13. Demonstrate the operability of remote shutdown controls

14. Perform or complete those portions of the following system tests (see individual descriptions), which require the RCS to be at or near normal operating temperature and pressure:

    a. Reactor coolant system expansion and restraint

    b. Chemical and volume control

    c. Boron thermal regeneration

    d. Residual heat removal

    e. Low pressure safety injection

    f. High pressure safety injection

    g. Reactor plant sampling

    h. Containment ventilation

TABLE 14.2-1 (Cont)

i. Auxiliary building ventilation

j. Engineered safety features building HVAC

k. Main steam

l. Steam dump control

m. Steam generator blowdown

n. Main feedwater

o. Steam generator water level control

p. Auxiliary feedwater

q. Service water

r. Reactor plant component cooling

s. Reactor plant chilled water

t. Charging pump cooling

u. Safety injection pump cooling

v. Neutron shield tank cooling

w. Steam generator chemical feed

x. Reserve station service transformers

y. Loose parts monitor system

z. Reactor coolant and associated system piping vibration

aa. Thermal expansion of piping and components of secondary systems

15. Perform or complete tests as necessary to ensure the operability of the following systems:

a. Condensate system

b. Extraction steam system

c. Feedwater heater drains and vents system

d. Turbine plant component cooling system

e. Turbine plant sampling system

TABLE 14.2-1 (Cont)

f. Normal AC power distribution system

16. Perform a controlled plant cooldown, using the steam dump and residual heat removal systems. Demonstrate the capability to de-gas and add hydrogen to the RCS

INSERT B →

Acceptance Criteria

Systems and components tested will meet specified design, safety analysis, and Technical Specification requirements.

FSAR Table 14.2-1
Preoperational Test #71

INSERT A

a. Proper actuation, operation, reset and response time of the valves will be demonstrated.

b. Operability of instrumentation, controls, interlocks and alarms will be verified.

INSERT B

17. Demonstrate that the operation of the main steam control valves is acceptable within specific limits. Proper actuation and response time of these valves will be demonstrated.