UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 28, 2000

Mr. S. E. Scace - Director
Nuclear Oversight and Regulatory Affairs
c/o Mr. David A. Smith
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385-0128

SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2 - ISSUANCE OF AMENDMENT RE: FUEL HANDLING AND CASK DROP ACCIDENT ANALYSES (TAC NO. MA7712)

Dear Mr. Scace:

The Commission has issued the enclosed Amendment No. 245 to Facility Operating License No. DPR-65 for the Millstone Nuclear Power Station, Unit No. 2, in response to Northeast Nuclear Energy Company's (NNECO) application dated December 14, 1999, as supplemented February 11, March 30, and April 26, 2000.

The amendment proposes to change Technical Specifications (TSs): 3.3.2.1, "Instrumentation - Engineered Safety Feature Actuation System Instrumentation"; 3.3.3.1, "Instrumentation - Monitoring Instrumentation - Radiation Monitoring"; 3.7.6.1, "Plant Systems - Control Room Emergency Ventilation System"; 3.9.3.1, "Refueling Operations - Decay Time"; 3.9.4, "Refueling Operations - Containment Penetrations"; 3.9.9, "Refueling Operations - Containment Radiation Monitoring"; 3.9.10, "Refueling Operations - Containment Purge Valve Isolation System"; 3.9.13, "Refueling Operations - Storage Pool Radiation Monitoring"; 3.9.14, "Refueling Operations - Storage Pool Area Ventilation System - Fuel Movement"; 3.9.15, "Refueling Operations - Storage Pool Area Ventilation System - Fuel Storage"; 3.9.16.1, "Refueling Operations - Shielded Cask"; 3.9.16.2, "Refueling Operations - Shielded Cask"; 3.9.17, "Refueling Operations - Movement of Fuel in Spent Fuel Pool"; and 3.9.19.2, "Refueling Operations - Spent Fuel Pool - Storage Pattern"; and add new TS 3.3.4, "Containment Purge Valve Isolation Signal." In addition, by letter dated April 26, 2000, NNECO has withdrawn its request to amend TS 3.9.11, "Refueling Operations - Water Level - Reactor Vessel." This TS change can be resubmitted in a future submittal and its withdrawal did not affect any conclusions made in the Safety Evaluation. The Index pages and the Bases for these TSs will be modified to reflect these proposed changes. The staff has approved the TS changes as requested.

In their letter dated December 14, 1999, NNECO stated the proposed changes related to the revised fuel handling and cask drop accident analyses will be incorporated into the Millstone Unit No. 2 Final Safety Analysis Report (FSAR).

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/RA/

Jacob I. Zimmerman, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosures: 1. Amendment No. 245 to DPR-65
2. Safety Evaluation

cc w/encls: See next page

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In their letter dated December 14, 1999, NNECO stated the proposed changes related to the revised fuel handling and cask drop accident analyses will be incorporated into the Millstone Unit No. 2 Final Safety Analysis Report (FSAR).

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

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Jacob I. Zimmerman, Project Manager, Section 2
Project Directorate I
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2. Safety Evaluation

cc w/encls: See next page

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Unit 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

DOCKET NO. 50-336

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 245
License No. DPR-65

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Northeast Nuclear Energy Company, et al. (NNECO/the licensee) dated December 14, 1999, as supplemented February 11, March 30, and April 26, 2000. complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-65 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 245, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance, and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

James W. Clifford

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: April 28, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 245

FACILITY OPERATING LICENSE NO. DPR-65

DOCKET NO. 50-336

Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
V	V
IX	IX
XI	XI
XIV	XIV
3/4 3-11	3/4 3-11
3/4 3-14	3/4 3-14
3/4 3-17	3/4 3-17
3/4 3-19	3/4 3-19
3/4 3-20	3/4 3-20
3/4 3-24	3/4 3-24
3/4 3-26	3/4 3-26
3/4 3-27	3/4 3-27
3/4 3-28	3/4 3-28
3/4 3-61	3/4 3-61
3/4 3-62	3/4 3-62
3/4 7-16	3/4 7-16
3/4 7-16a	3/4 7-16a
3/4 9-3	3/4 9-3
3/4 9-4	3/4 9-4
3/4 9-9	3/4 9-9
3/4 9-10	3/4 9-10
3/4 9-11	3/4 9-11
3/4 9-13	3/4 9-13
3/4 9-14	3/4 9-14
3/4 9-15	3/4 9-15
3/4 9-16	3/4 9-16
3/4 9-17	3/4 9-17
3/4 9-18	3/4 9-18
3/4 9-19	3/4 9-19
3/4 9-20	3/4 9-20
3/4 9-21	3/4 9-21
3/4 9-26a	3/4 9-26a
B 3/4 3-1a	B 3/4 3-1a
B 3/4 3-2	B 3/4 3-2
B 3/4 3-2a	B 3/4 3-2a
B 3/4 3-5	B 3/4 3-5
B 3/4 3-6	B 3/4 3-6
B 3/4 7-4a	B 3/4 7-4a
B 3/4 9-1	B 3/4 9-1
B 3/4 9-1a	B 3/4 9-1a
B 3/4 9-2	B 3/4 9-2
B 3/4 9-3	B 3/4 9-3
B 3/4 9-3a	B 3/4 9-3a

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		PAGE
3/4.2 POWER DISTRIBUTION LIMITS		
3/4.2.1	LINEAR HEAT RATE	3/4 2-1
3/4.2.2	Deleted	
3/4.2.3	TOTAL INTEGRATED RADIAL PEAKING FACTOR - F_r^T	3/4 2-9
3/4.2.4	AZIMUTHAL POWER TILT	3/4 2-10
3/4.2.5	Deleted	
3/4.2.6	DNB MARGIN	3/4 2-13
3/4.3 INSTRUMENTATION		
3/4.3.1	REACTOR PROTECTIVE INSTRUMENTATION	3/4 3-1
3/4.3.2	ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION	3/4 3-10
3/4.3.3	MONITORING INSTRUMENTATION	3/4 3-26
	Radiation Monitoring	3/4 3-26
	Remote Shutdown Instrumentation	3/4 3-39
	Accident Monitoring	3/4 3-46
	Radioactive Liquid Effluent Monitoring Instrumentation	3/4 3-50
	Radioactive Gaseous Effluent Monitoring Instrumentation	3/4 3-56
3/4.3.4	CONTAINMENT PURGE VALVE ISOLATION SIGNAL	3/4 3-61
3/4.4 REACTOR COOLANT SYSTEM		
3/4.4.1	COOLANT LOOPS AND COOLANT CIRCULATION	3/4 4-1
	Startup and Power Operation	3/4 4-1
	Hot Standby	3/4 4-1a
	Shutdown	3/4 4-1b
	Reactor Coolant Pumps - Shutdown	3/4 4-1d

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION

		PAGE
3/4.9 REFUELING OPERATIONS		
3/4.9.1	BORON CONCENTRATION	3/4 9-1
3/4.9.2	INSTRUMENTATION	3/4 9-2
3/4.9.3	DECAY TIME	3/4 9-3
3/4.9.4	CONTAINMENT PENETRATIONS	3/4 9-4
3/4.9.5	DELETED	3/4 9-5
3/4.9.6	DELETED	3/4 9-6
3/4.9.7	DELETED	3/4 9-7
3/4.9.8	SHUTDOWN COOLING AND COOLANT CIRCULATION	3/4 9-8
3/4.9.9	DELETED	3/4 9-9
3/4.9.10	DELETED	3/4 9-10
3/4.9.11	WATER LEVEL - REACTOR VESSEL	3/4 9-11
3/4.9.12	STORAGE POOL WATER LEVEL	3/4 9-12
3/4.9.13	DELETED	3/4 9-13
3/4.9.14	DELETED	3/4 9-14
3/4.9.15	STORAGE POOL AREA VENTILATION SYSTEM	3/4 9-16
3/4.9.16	SHIELDED CASK	3/4 9-19
3/4.9.17	MOVEMENT OF FUEL IN SPENT FUEL POOL	3/4 9-21
3/4.9.18	SPENT FUEL POOL - REACTIVITY CONDITION	3/4 9-22
3/4.9.19	SPENT FUEL POOL - STORAGE PATTERN	3/4 9-26
3/4.9.20	SPENT FUEL POOL - CONSOLIDATION	3/4 9-27
3/4.10 SPECIAL TEST EXCEPTIONS		
3/4.10.1	SHUTDOWN MARGIN	3/4 10-1
3/4.10.2	GROUP HEIGHT AND INSERTION LIMITS	3/4 10-2
3/4.10.3	PRESSURE/TEMPERATURE LIMITATION - REACTOR CRITICALITY	3/4 10-3

INDEX

BASES

SECTION		PAGE
3/4.0 APPLICABILITY		B 3/4 0-1
3/4.1 REACTIVITY CONTROL SYSTEMS		
3/4.1.1	BORATION CONTROL	B 3/4 1-1
3/4.1.2	BORATION SYSTEMS	B 3/4 1-2
3/4.1.3	MOVABLE CONTROL ASSEMBLIES	B 3/4 1-3a
3/4.2 POWER DISTRIBUTION LIMITS		
3/4.2.1	LINEAR HEAT RATE	B 3/4 2-1
3/4.2.2	Deleted	
3/4.2.3	TOTAL INTEGRATED RADIAL PEAKING FACTOR - F_r^T	B 3/4 2-1
3/4.2.4	AZIMUTHAL POWER TILT	B 3/4 2-1
3/4.2.5	Deleted	
3/4.2.6	DNB MARGIN	B 3/4 2-2
3/4.3 INSTRUMENTATION		
3/4.3.1	PROTECTIVE INSTRUMENTATION	B 3/4 3-1
3/4.3.2	ENGINEERED SAFETY FEATURE INSTRUMENTATION	B 3/4 3-1
3/4.3.3	MONITORING INSTRUMENTATION	B 3/4 3-2
3/4.3.4	CONTAINMENT PURGE VALVE ISOLATION SIGNAL	B 3/4 3-5

SECTION PAGE

3/4.9.9 and 3/4.9.10 DELETED . . . . . B 3/4 9-2

3/4.9.11 and 3/4.9.12 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL WATER LEVEL . . . . . B 3/4 9-2a

3/4.9.13 DELETED . . . . . B 3/4 9-3

3/4.9.14 DELETED . . . . . B 3/4 9-3

3/4.9.15 STORAGE POOL AREA VENTILATION SYSTEM . . . . . B 3/4 9-3

3/4.9.16 SHIELDED CASK . . . . . B 3/4 9-3

3/4.9.17 MOVEMENT OF FUEL IN SPENT FUEL POOL . . . . . B 3/4 9-3

3/4.9.18 SPENT FUEL POOL - REACTIVITY CONDITION . . . . . B 3/4 9-3

3/4.9.19 SPENT FUEL POOL - STORAGE PATTERN . . . . . B 3/4 9-4

3/4.9.20 SPENT FUEL POOL - CONSOLIDATION . . . . . B 3/4 9-4

3/4.10 SPECIAL TEST EXCEPTIONS

3/4.10.1 SHUTDOWN MARGIN . . . . . B 3/4 10-1

3/4.10.2 GROUP HEIGHT AND INSERTION LIMITS . . . . . B 3/4 10-1

3/4.10.3 PRESSURE/TEMPERATURE LIMITATION - REACTOR CRITICALITY . . . . . B 3/4 10-1

3/4.10.4 PHYSICS TESTS . . . . . B 3/4 10-1

3/4.10.5 CENTER CEA MISALIGNMENT . . . . . B 3/4 10-1

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS . . . . . B 3/4 11-1

3/4.11.2 GASEOUS EFFLUENTS . . . . . B 3/4 11-2

3/4.11.3 TOTAL DOSE . . . . . B 3/4 11-4

SURVEILLANCE REQUIREMENTS (Continued)

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESF function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific ESF function as shown in the "Total No. of Channels" Column of Table 3.3-3.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. DELETED					
8. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage - level one	4/bus	2/Bus	3/bus	1, 2, 3	2
b. 4.16 kv Emergency Bus Undervoltage - level two	4/Bus	2/Bus	3/Bus	1, 2, 3	2

TABLE 3.3-3 (Continued)

ACTION 3 - DELETED

ACTION 4 - With the number of OPERABLE channels one less than the Total Number of Channels and with the pressurizer pressure:

a. < 1850 psia: immediately place the inoperable channel in the bypassed condition; restore the inoperable channel to OPERABLE status prior to increasing the pressurizer pressure above 1850 psia.

b. ≥ 1850 psia, operation may continue with the inoperable channel in the bypassed condition, provided the following condition is satisfied:

1. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be removed from service for up to 2 hours for surveillance testing per Specification 4.3.2.1.1 provided BOTH of the inoperable channels are placed in the bypassed condition.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
5. ENCLOSURE BUILDING FILTRATION (EBFAS)		
a. Manual EBFAS (Trip Buttons)	Not Applicable	Not Applicable
b. Manual SIAS (Trip Buttons)	Not Applicable	Not Applicable
c. Containment Pressure - High	$\leq$ 4.42 psig	$\leq$ 5.07 psig
d. Pressurizer Pressure - Low	$\geq$ 1714 psia	$\geq$ 1704 psia
6. CONTAINMENT SUMP RECIRCULATION (SRAS)		
a. Manual SRAS (Trip Buttons)	Not Applicable	Not Applicable
b. Refueling Water Storage Tank -Low	46 $\pm$ 3 inches above tank bottom	46 $\pm$ 6 inches above tank bottom
7. DELETED		

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
8. LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage - level one	≥ 2912 volts with a 2.0 ± 0.1 second time delay	≥ 2877 volts with a 2.0 ± 0.1 second time delay
b. 4.16 kv Emergency Bus Undervoltage - level two	≥ 3700 volts with an 8.0 ± 2.0 second time delay	≥ 3663 volts with an 8.0 ± 2.0 second time delay
9. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Steam Generator Level - Low	≥ 26.8%	≥ 25.2%
10. STEAM GENERATOR BLOWDOWN		
a. Steam Generator Level - Low	≥ 26.8%	≥ 25.2%

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
6. CONTAINMENT SUMP RECIRCULATION (SRAS)				
a. Manual SRAS (Trip Buttons)	N.A.	N.A.	R	N.A.
b. Refueling Water Storage Tank - Low	S	R	M	1, 2, 3
c. Automatic Actuation Logic	N.A.	N.A.	M(1)	1, 2, 3
7. DELETED				
8. LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage - level one	S	R	M	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage - level two	S	R	M	1, 2, 3
9. AUXILIARY FEEDWATER				
a. Manual	N.A.	N.A.	R	N.A.
b. Steam Generator Level - Low	S	R	M	1, 2, 3
c. Automatic Actuation Logic	N.A.	N.A.	M	1; 2, 3
10. STEAM GENERATOR BLOWDOWN				
a. Steam Generator Level - Low	S	R	M	1, 2, 3

3/4.3.3 MONITORING INSTRUMENTATION

RADIATION MONITORING

LIMITING CONDITION FOR OPERATION

3.3.3.1 The radiation monitoring instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3-6.

ACTION:

a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 2 hours or declare the channel inoperable.

b. With one or more radiation monitoring channels inoperable, take the ACTION shown in Table 3.3-6. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.1.1 Each radiation monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes and at the frequencies shown in Table 4.3-3.

4.3.3.1.2 The trip value shall be such that the containment purge effluent shall not result in calculated concentrations of radioactivity offsite in excess of 10 CFR Part 20, Appendix B, Table II. For the purposes of calculating this trip value, a $x/Q = 5.8 \times 10^{-6}$ sec/m^3 shall be used when the system is aligned to purge through the building vent and a $x/Q = 7.5 \times 10^{-8}$ sec/m^3 shall be used when the system is aligned to purge through the Unit 1 stack, the gaseous and particulate (Half Lives greater than 8 days) radioactivity shall be assumed to be Xe-133 and Cs-137, respectively. However, the setpoints shall be no greater than 5×10^5 cpm.

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Spent Fuel Storage and Ventilation System Isolation	2	*	100 mR/hr	10^{-1} - 10^{+4} mR/hr	13
b. Control Room Isolation	1	ALL MODES	2 mR/hr	10^{-1} - 10^{4} mR/hr	16
c. Containment High Range	1	1,2,3,&4	100 R/hr	10^{0} - 10^{8} R/hr	17
d. Noble Gas Effluent Monitor (high range) (Unit 2 stack)	1	1,2,3,&4	2×10^{-1} uci/cc	10^{-3} - 10^{5} uci/cc	17
2. PROCESS MONITORS					
a. Containment Atmosphere-Particulate	1	ALL MODES**	the value determined in accordance with specification 4.3.3.1.2	10 - 10^{+6} cpm	14
b. Containment Atmosphere-Gaseous	1	ALL MODES**	the value determined in accordance with Specification 4.3.3.1.2	10 - 10^{+6} cpm	14

* With fuel in storage building.
**These radiation monitors are not required to be operable during Type "A" Integrated Leak Rate testing.

TABLE 3.3-6 (Continued)

TABLE NOTATION

(a) DELETED

ACTION 13 - With the number of area monitors OPERABLE less than required by the MINIMUM CHANNELS OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

ACTION 14 - With the number of process monitors OPERABLE less than required by the MINIMUM CHANNELS OPERABLE requirement either (a) obtain and analyze grab samples of the monitored parameter at least once per 24 hours, or (b) use a Constant Air Monitor to monitor the parameter.

ACTION 15 - DELETED

ACTION 16 - With the number of OPERABLE channels less than required by the MINIMUM CHANNELS OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation.

ACTION 17 - With the number of OPERABLE channels less than required by the MINIMUM CHANNELS OPERABLE requirements, initiate the preplanned alternate method of monitoring the appropriate parameter(s), within 72 hours, and:

1) either restore the inoperable channel(s) to OPERABLE status within 7 days of the discovery or

2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following discovery outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

CONTAINMENT PURGE VALVE ISOLATION SIGNAL

LIMITING CONDITION FOR OPERATION

3.3.4 One Containment Purge Valve Isolation Signal containment gaseous radiation monitor channel, one Containment Purge Valve Isolation Signal containment particulate radiation monitor channel, and one Containment Purge Valve Isolation Signal automation logic train shall be OPERABLE.

APPLICABILITY: During CORE ALTERATIONS with the containment purge valves open.

During the movement of irradiated fuel assemblies inside containment with the containment purge valves open.

ACTION:

a. With no OPERABLE Containment Purge Valve Isolation Signal containment gaseous radiation monitor channel, immediately suspend CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment, or immediately place and maintain the containment purge valves in the closed position. Enter applicable conditions and required ACTIONS for the affected valves of Technical Specification 3.9.4, "Containment Penetrations."

b. With no OPERABLE Containment Purge Valve Isolation Signal containment particulate radiation monitor channel, immediately suspend CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment, or immediately place and maintain the containment purge valves in the closed position. Enter applicable conditions and required ACTIONS for the affected valves of Technical Specification 3.9.4, "Containment Penetrations."

c. With no OPERABLE Containment Purge Valve Isolation Signal automatic actuation logic train, immediately suspend CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment, or immediately place and maintain the containment purge valves in the closed position. Enter applicable conditions and required ACTIONS for the affected valves of Technical Specification 3.9.4, "Containment Penetrations."

SURVEILLANCE REQUIREMENTS

4.3.4.1 Perform a CHANNEL CHECK on each Containment Purge Valve Isolation Signal containment gaseous and particulate radiation monitor channel at least once per 12 hours.

4.3.4.2 Perform a CHANNEL FUNCTIONAL TEST on each Containment Purge Valve Isolation Signal containment gaseous and particulate radiation monitor channel at least once per 31 days.

4.3.4.3 Perform a CHANNEL FUNCTIONAL TEST on each Containment Purge Valve Isolation Signal automatic actuation logic train at least once per 31 days. This actuation logic shall include verification of the proper operation of the actuation relay.

4.3.4.4 Perform a CHANNEL CALIBRATION on each Containment Purge Valve Isolation Signal containment gaseous and particulate radiation monitor channel at least once per 18 months.

4.3.4.5 Verify Containment Purge Valve Isolation Signal response time at least once per 18 months. Each test shall include at least one containment gaseous and one containment particulate radiation monitor channel such that all channels are tested at least once every N times 18 months where N is the total number of containment gaseous or total number of containment particulate radiation monitor channels.

3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.6.1 Two independent Control Room Emergency Ventilation Trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6.

During fuel movement within containment or the spent fuel pool.

During movement of a shielded cask over the spent fuel pool cask laydown area.

ACTION:

MODES 1, 2, 3, and 4:

a. With one Control Room Emergency Ventilation Train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With both Control Room Emergency Ventilation Trains inoperable, immediately suspend the movement of fuel assemblies within the spent fuel pool and the movement of shielded casks over the spent fuel pool cask laydown area. Restore at least one inoperable train to OPERABLE status within 1 hour, or be in HOT STANDBY within the next 6 hours, and COLD SHUTDOWN within the following 30 hours.

3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

ACTION (continued)

MODES 5 and 6, and all other times:*

c. With one Control Room Emergency Ventilation Train inoperable, restore the inoperable train to OPERABLE status within 7 days. After 7 days, either initiate and maintain operation of the remaining OPERABLE Control Room Emergency Ventilation Train in the recirculation mode of operation, or immediately suspend CORE ALTERATIONS, the movement of fuel assemblies, and the movement of shielded casks over the spent fuel pool cask laydown area.

d. With both Control Room Emergency Ventilation Trains inoperable, or with the OPERABLE Control Room Emergency Ventilation Train required to be in the recirculation mode by ACTION (c.) not capable of being powered by an OPERABLE normal and emergency power source, immediately suspend CORE ALTERATIONS, positive reactivity changes, the movement of fuel assemblies, and the movement of shielded casks over the spent fuel pool cask laydown area.

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* In MODES 5 and 6, when a Control Room Emergency Ventilation Train is determined to be inoperable solely because its emergency power source is inoperable, or solely because its normal power source is inoperable, it may be considered OPERABLE for the purpose of satisfying the requirements of 3.7.6.1 Limiting Condition for Operation, provided: (1) its corresponding normal or emergency power source is OPERABLE; and (2) all of its redundant system (s), subsystem (s), train (s), component (s) and device(s) are OPERABLE, or likewise satisfy the requirements of the specification. Unless both conditions (1) and (2) are satisfied within 2 hours, then ACTION 3.7.6.1.c or 3.7.6.1.d shall be invoked as applicable.

DECAY TIME

LIMITING CONDITION FOR OPERATION

3.9.3.1 The reactor shall be subcritical for a minimum of 150 hours prior to movement of irradiated fuel in the reactor pressure vessel.

APPLICABILITY: MODE 6.

ACTION:

With the reactor subcritical for less than 150 hours, suspend all operations involving movement of irradiated fuel in the reactor pressure vessel.

SURVEILLANCE REQUIREMENTS

4.9.3.1 The reactor shall be determined to have been subcritical for at least 150 hours by verification of the date and time of subcriticality prior to movement of irradiated fuel in the reactor pressure vessel.

CONTAINMENT PENETRATIONS

LIMITING CONDITION FOR OPERATION

3.9.4 The containment penetrations shall be in the following status:

a. The equipment door closed and held in place by a minimum of four bolts,

b. The personnel air lock shall be either:

1. closed by one personnel air lock door, or

2. capable of being closed by an OPERABLE personnel air lock door, under administrative control, with containment purge in operation, and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either:

1. Closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. Be capable of being closed by an OPERABLE Containment Purge Valve Isolation System.

APPLICABILITY: During CORE ALTERATIONS.

During movement of irradiated fuel assemblies within containment.

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or movement of irradiated fuel in the containment.

SURVEILLANCE REQUIREMENTS

4.9.4.1 Verify each required containment penetration is in the required status at least once per 7 days.

4.9.4.2 Verify each required containment purge valve actuates to the isolation position on an actual or simulated actuation signal at least once per 18 months.

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REFUELING OPERATIONS

STORAGE POOL AREA VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.9.15 The Storage Pool Area Ventilation System shall be OPERABLE with at least one OPERABLE Enclosure Building Filtration Train operating in the auxiliary exhaust mode and exhausting through the HEPA filters and charcoal adsorbers with spent fuel pool area integrity maintained, except during normal entry and egress through spent fuel pool area access doors.

APPLICABILITY: During fuel movement within the spent fuel pool when irradiated fuel assemblies that have decayed less than 60 days are located within the spent fuel pool.

During movement of a shielded cask over the spent fuel pool cask laydown area.

ACTION:

a. With no OPERABLE Enclosure Building Filtration Train operating in the auxiliary exhaust mode and exhausting through the HEPA filters and charcoal adsorbers, immediately suspend all operations involving fuel movement within the spent fuel pool and immediately suspend movement of a shielded cask over the spent fuel pool cask laydown area.

b. With a loss of spent fuel pool area integrity, except as a result of normal entry and egress through spent fuel pool area access doors, immediately suspend all operations involving fuel movement within the spent fuel pool and immediately suspend movement of a shielded cask over the spent fuel pool cask laydown area.

SURVEILLANCE REQUIREMENTS

4.9.15.1 The above required Enclosure Building Filtration Train shall be demonstrated OPERABLE:

a. At least once per 31 days by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the train operates for at least 10 hours with the heaters on.

b. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the train by:

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that the cleanup train satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the train flow rate is 9000 cfm ± 10%.

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.*

3. Verifying a train flow rate of 9000 cfm ± 10% during train operation when tested in accordance with ANSI N510-1975.

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978.*

d. At least once per 18 months by verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is ≤ 2.6 inches Water Gauge while operating the train at a flow rate of 9000 cfm ± 10%.

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the train at a flow rate of 9000 cfm ± 10%.

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* ASTM D3803-89 shall be used in place of ANSI N509-1976 as referenced in table 2 of Regulatory Guide 1.52. The laboratory test of charcoal should be conducted at a temperature of 30°C and a relative humidity of 95% within the tolerances specified by ASTM D3803-89. Additionally, the charcoal sample shall have a removal efficiency of ≥ 95%.

SURVEILLANCE REQUIREMENTS (Continued)

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99% of a halogenated hydrocarbon refrigerant test gas when they are tested in place in accordance with ANSI N510-1975 while operating the train at a flow rate of 9000 cfm ± 10%.

4.9.15.2 The OPERABLE Enclosure Building Filtration Train shall be verified to be operating in the auxiliary exhaust mode and exhausting through the HEPA filters and charcoal adsorbers at least once per 12 hours during either fuel movement within the spent fuel pool or movement of a shielded cask over the spent fuel pool cask laydown area.

4.9.15.3 Each door in all spent fuel pool area access openings shall be verified closed, except when being used for normal entry and egress, at least once per 12 hours during either fuel movement within the spent fuel pool or movement of a shielded cask over the spent fuel pool cask laydown area.

REFUELING OPERATIONS

SHIELDED CASK

LIMITING CONDITION FOR OPERATION

3.9.16.1 All fuel within a distance L from the center of the spent fuel pool cask laydown area shall have decayed for at least 1 year. The distance L equals the major dimension of the shielded cask.

APPLICABILITY: Whenever a shielded cask is on the refueling floor.

ACTION:

With the requirements of the above specification not satisfied, do not move a shielded cask to the refueling floor. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.16.1 The decay time of all fuel within a distance L from the center of the spent fuel pool cask laydown area shall be determined to be $\geq$ 1 year within 24 hours prior to moving a shielded cask to the refueling floor and at least once per 72 hours thereafter.

SHIELDED CASK

LIMITING CONDITION FOR OPERATION

3.9.16.2 Prior to movement of a shielded cask over the spent fuel pool cask laydown area, the boron concentration of the pool shall be greater than or equal to 800 parts per million (ppm).

APPLICABILITY: Whenever a shielded cask is to be moved over the spent fuel pool cask laydown area.

ACTION:

With the boron concentration less than 800 ppm, suspend all movement of the shielded cask over the spent fuel pool cask laydown area.

SURVEILLANCE REQUIREMENTS

4.9.16.2 Verify that the boron concentration is greater than or equal to 800 ppm within 24 hours prior to any movement of a shielded cask over the spent fuel pool cask laydown area.

REFUELING OPERATIONS

MOVEMENT OF FUEL IN SPENT FUEL POOL

LIMITING CONDITION FOR OPERATION

3.9.17 Prior to movement of a fuel assembly, or a consolidated fuel storage box, in the spent fuel pool, the boron concentration of the pool shall be greater than or equal to 800 ppm.

APPLICABILITY: Whenever a fuel assembly, or a consolidated fuel storage box, is moved in the spent fuel pool.

ACTION:

With the boron concentration less than 800 ppm, suspend the movement of all fuel in the spent fuel pool.

SURVEILLANCE REQUIREMENTS

4.9.17 Verify that the boron concentration is greater than or equal to 800 ppm within 24 hours prior to any movement of a fuel assembly, or a consolidated fuel storage box, in the spent fuel pool and every 72 hours thereafter.

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3/4.3.1 AND 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION (continued)

ladders, testing one ladder matrix at a time will not remove an RPS channel from the overall logic matrix. Therefore, matrix testing will not remove an RPS channel from service or make the RPS channel inoperable. It is not necessary to enter an action statement while performing matrix testing. This also applies when testing the reactor trip circuit breakers since this test will not remove an RPS channel from service or make the RPS channel inoperable.

The provisions of Specification 4.0.4 are not applicable for the CHANNEL FUNCTIONAL TEST of the Engineered Safety Feature Actuation System automatic actuation logic associated with Pressurizer Pressure Safety Injection, Pressurizer Pressure Containment Isolation, Steam Generator Pressure Main Steam Line Isolation, and Pressurizer Pressure Enclosure Building Filtration for entry into MODE 3 or other specified conditions. After entering MODE 3, pressurizer pressure and steam generator pressure will be increased and the blocks of the ESF actuations on low pressurizer pressure and low steam generator pressure will be automatically removed. After the blocks have been removed, the CHANNEL FUNCTIONAL TEST of the ESF automatic actuation logic can be performed. The CHANNEL FUNCTIONAL TEST of the ESF automatic actuation logic must be performed within 12 hours after establishing the appropriate plant conditions, and prior to entry into MODE 2.

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. The Reactor Protective and Engineered Safety Feature response times are contained in the Millstone Unit No. 2 Technical Requirements Manual. Changes to the Technical Requirements Manual require a 10CFR50.59 review as well as a review by the Plant Operations Review Committee.

3/4.3.1 AND 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION (Continued)

SRAS Logic Modification

Action Statement 4 of Table 3.3-3, which applies only to the SRAS logic, specifies that during surveillance testing the second inoperable channel must also be placed in the bypassed condition. For the SRAS logic, placing the second inoperable channel in the tripped condition (as in Action Statement 2) could result in the false generation of a SRAS signal due to an additional failure which causes a trip signal in either of the remaining channels at the onset of a LOCA. The false generation of the SRAS signal leads to unacceptable consequences for LOCA mitigation.

With Action Statement 4, during the two-hour period when two channels are bypassed, no additional failure can result in the false generation of the SRAS signal. However, an additional failure that prevents a trip of either of the two remaining channels may prevent the generation of a true SRAS signal while in this Action Statement. If no SRAS is generated at the appropriate time, operating proceduresinstruct the operator to ensure that the SRAS actuation occurs when the refueling water storage tank level decreases. Due to the limited period of vulnerability, and the existence of operator requirements to manually initiate an SRAS if an automatic initiation does not occur, this risk is considered acceptable.

Steam Generator Blowdown isolation

Automatic isolation of steam generator blowdown will occur on low steam generator water level. An auxiliary feedwater actuation signal will also be generated at this steam generator water level. Isolation of steam generator blowdown will conserve steam generator water inventory following a loss of main feedwater.

Sensor Cabinet Power Supply Auctioneering

The auctioneering circuit of the ESFAS sensor cabinets ensures that two sensor cabinets do not de-energize upon loss of a D.C. bus, thereby resulting in the false generation of an SRAS. Power source VA-10 provides normal power to sensor cabinet A and backup power to sensor cabinet D. VA-40 provides normal power to sensor cabinet D and backup power to cabinet A. Power sources VA-20 and VA-30 and sensor cabinets B and C are similarly arranged.

If the normal or backup power source for an ESFAS Sensor Cabinet is lost, two sensor cabinets would be supplied from the same power source, but would still be operating with no subsequent trip signals present. However, any additional failure associated with this power source would result in the loss of the two sensor cabinets, consequently generating a false SRAS. The 48-hour Action Statement ensures that the probability of a Action Statement and an additional failure of the remaining power source, while in this Action Statement is sufficiently small.

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

The spent fuel storage area monitors provide a signal to direct the ventilation exhaust from the spent fuel storage area through a filter train when the dose rate exceeds the setpoint. The filter train is provided to reduce the particulate and iodine radioactivity released to the atmosphere. However, neither the analysis of a fuel handling accident or the analysis of a spent fuel cask drop accident in the spent fuel storage area credit automatic diversion of the spent fuel storage area ventilation exhaust through an enclosure building filtration train for accident mitigation.

The spent fuel storage area radiation monitors will detect an increase in radiation levels due to a lowering of spent fuel pool water level. This will provide additional indication to the plant operators of an unexpected decrease in spent fuel pool water level.

The containment airborne radiation monitors (gaseous and particulate) provide early indication of leakage from the Reactor Coolant System as specified in Technical Specification 3.4.6.1. In addition, these radiation monitors will initiate automatic closure of the containment purge valves upon detection of high airborne radioactivity levels inside containment. The requirements for the automatic closure of the containment purge valves is addressed by Technical Specification 3.3.4

The maximum allowable trip value for these monitors corresponds to calculated concentrations at the site boundary which would not exceed the concentrations listed in 10 CFR Part 20, Appendix B, Table II. Exposure for a year to the concentrations in 10 CFR Part 20, Appendix B. Table corresponds to a total body dose to an individual of 500 mrem which is well below the guidelines of 10 CFR Part 100 for an individual at any point on the exclusion area boundary for two hours.

Determination of the monitor's trip value in counts per minute, which is the actual instrument response, involves several factors including:. 1) the atmospheric dispersion (x/Q), 2) isotopic composition of the sample, 3) sample flow rate, 4) sample collection efficiency, 5) counting efficiency, and 6) the background radiation level at the detector. The x/Q of 5.8×10^{-6} sec/m^3 is the highest annual average x/Q estimated for the site boundary (0.48 miles in the NE sector) for vent releases from the containment and 7.5×10^{-8} sec/m^3 is the highest annual average x/Q estimated for an off-site location (3 miles in the NNE sector) for releases from the Unit I stack. This calculation also assumes that the isotopic composition is xenon-133 for gaseous radioactivity and cesium-137 for particulate radioactivity (Half Lives greater than 8 days). The upper limit of 5×10^5 cpm is approximately 90 percent of full instrument scale.

3/4.3.3.9 Radioactive Liquid Effluent Instrumentation

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to 10 CFR Part 50. Monitoring of the turbine building sumps and condensate polishing facility floor drains is not required due to relatively low concentrations of radioactivity possible.

3/4.3.3.10 Radioactive Gaseous Effluent Instrumentation

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63 and 64 of Appendix A to CFR Part 50.

Two types of radioactive gaseous effluent monitoring instrumentation, monitors and samplers, are being used at MP2 stack and MP1 main stack. Monitors have alarm/trip setpoints and are demonstrated operable by performing one or more of the following operations: CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST. Samplers are strictly collection devices made of canisters and filters. The CHANNEL CHECK surveillance requirements are met through (1) documented observation of the in-service rad monitor sample flow prior to filter replacement; (2) documented replacement of in-line iodine and particulate filters; and (3) documented observation of sample flow following the sampler return to service. The flow indicator is the only indication available for comparison. These observations adequately provide assurance that the sampler is operating and is capable of performing its design function.

There are a number of gaseous release points which could exhibit very low concentrations of radioactivity. For all of these release paths, dose consequences would be insignificant due to the intermittent nature of the release and/or the extremely low concentrations of radioactivity. Since it is not cost-beneficial (nor in many cases practical due to the nature of the release (steam) or the impossibility of detecting such low levels), to monitor these pathways, it has been determined that these release paths require no monitoring nor sampling.

3/4.3.4 Containment Purge Valve Isolation Signal

The containment purge valve may remain open during CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment provided the automatic closure of the purge valves on high containment radiation is OPERABLE. A high airborne radioactivity level inside containment will be

detected by the containment airborne radiation monitors (gaseous and particulate). The actuation logic for this function is one out of four. High radioactivity inside containment, detected by any one of the four radiation detectors (two gaseous and two particulate), will automatically isolate containment purge.

An OPERABLE system capable of generating a Containment Purge Valve Isolation Signal consists of at least one containment gaseous radiation monitor channel, at least one containment particulate radiation monitor channel, and the associated automatic actuation logic train. An actuation logic train consists of the detectors, sensor channels, and logic circuits up to and including the Engineered Safeguards Actuation System actuation module.

The analysis of a fuel handling accident inside containment credits automatic isolation of containment purge. Therefore, this function is required to be OPERABLE if the containment purge valves are to remain open during CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment. If this automatic isolation function is not OPERABLE, the containment purge valves must be maintained closed to perform CORE ALTERATIONS or the movement of irradiated fuel assemblies inside containment.

The ACTION requirements to immediately suspend CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment, or to immediately close the containment purge valves and maintain them closed, does not preclude completion of the movement of a component to a safe position.

3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 19 of Appendix "A", 10 CFR 50.

The control room radiological dose calculations use the conservative minimum acceptable flow of 2250 cfm based on the flowrate surveillance requirement of 2500 cfm ± 10%.

Currently there are some situations where the CREV System may not automatically start on an accident signal, without operator action. Under most situations, the emergency filtration fans will start and the CREV System will be in the accident lineup. However, a failure of a supply fan (F21A or B) or an exhaust fan (F31A or B), operator action will be required to return to a full train lineup. Also, if a single emergency bus does not power up for one train of the CREV System, the opposite train filter fan will automatically start, but the required supply and exhaust fans will not automatically start. Therefore, operator action is required to establish the whole train lineup. This action is specified in the Emergency Operating Procedures. The radiological dose calculations do not take credit for CREV System cleanup action until 10 minutes into the accident to allow for operator action.

When the CREV System is checked to shift to the recirculation mode of operation, this will be performed from the normal mode of operation, and from the smoke purge mode of operation.

The MODES 5 and 6 action requirement to suspend positive reactivity additions does not preclude completion of actions to establish a safe conservative plant condition.

The ACTION requirements to immediately suspend various activities (CORE ALTERATIONS, fuel movement, shielded cask movement, etc.) do not preclude completion of the movement of a component to a safe position.

3/4.9 REFUELING OPERATIONS

The ACTION requirements to immediately suspend various activities (CORE ALTERATIONS, fuel movement, CEA movement, etc.) do not preclude completion of the movement of a component to a safe position.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) sufficient boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. Reactivity control in the water volume having direct access to the reactor vessel is achieved by determining boron concentration in the refueling canal. The refueling canal is defined as the entire length of pool stretching from refuel pool through transfer canal to spent fuel pool.

For the Cycle 13 mid-cycle core offload activities, the boron concentration of the water volumes in the steam generators and connecting piping may be as low as 1300 ppm. During REFUELING and/or CORE ALTERATIONS, the water volumes in the steam generators and connecting piping are stagnant and do not readily mix with the water in the reactor vessel. The water volumes in the pressurizer and connecting piping, shutdown cooling system (including reactor vessel and connecting piping), and refueling pool shall be maintained greater than 1950 ppm.

A boron dilution analysis has been performed which accounts for dilution of the shutdown cooling system with the water volumes from the steam generators and connecting piping. This analysis demonstrates that, in the unlikely event in which all of the water in the steam generators and connecting piping mixes with the water in the shutdown cooling system, the resulting shutdown cooling system boron concentration will remain greater than the required refueling boron concentration.

The surveillance requirement to verify that the boron concentration in the steam generators is greater than 1300 ppm prior to entering MODE 6 is consistent with the assumptions of the boron dilution calculation. The sample points are only located on the cold leg side of the steam generators. These sample points are representative of the water volumes in the steam generators (both hot and cold legs) and their connecting piping, based on the fact that uniform mixing of these water volumes at a boron concentration of approximately 1320 ppm had occurred prior to shutting off the reactor coolant pumps. In March 1996, the reactor coolant system was drained and subsequently refilled with water having a boron concentration greater than or equal to 1320 ppm. The boron concentration of the water in the steam generators and connecting piping is greater than 1300 ppm.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel ensures that sufficient time has elapsed to allow the radioactive decay of the short-lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

3/4.9.4 CONTAINMENT PENETRATIONS

The requirements on containment penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

Both containment personnel airlock doors can be open during CORE ALTERATIONS and the movement of irradiated fuel assemblies inside containment provided the following conditions are met:

1. Containment purge is in operation providing air flow through the personnel air lock into containment.

2. At least one personnel air lock door is under administrative control such that the door can be closed within 10 minutes, which is the assumed containment purge isolation time. This will allow hoses and cables to be run through the personnel air lock, provided they can be rapidly removed to allow the door to be closed within the required time period. In addition, a designated individual must be continuously available for door closure.

3/4.9.5 DELETED

3/4.9.6 DELETED

3/4.9.7 DELETED

3/4.9.8 SHUTDOWN COOLING AND COOLANT CIRCULATION

The requirement that at least one shutdown cooling loop be in operation at ≥ 1000 gpm ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, (2) sufficient coolant circulation is maintained through the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification, and (3) is consistent with boron dilution analysis assumptions.

The requirement to have two shutdown cooling loops OPERABLE when the refuel pool is unavailable as a heat sink ensures that a single failure of the operating shutdown cooling loop will not result in a complete loss of decay heat removal capability. With the reactor vessel water level at or above the vessel flange, the reactor vessel pit seal installed, and a combined available volume of water in the refueling pool and refueling water storage tank in excess of 370,000 gallons, a large heat sink is readily available for core cooling. Adequate time is thus available to initiate emergency procedures to provide core cooling in the event of a failure of the operating shutdown cooling loop.

3/4.9.9 and 3/4.9.10 DELETED

3/4.9.13 DELETED

3/4.9.14 DELETED

3/4.9.15 STORAGE POOL AREA VENTILATION SYSTEM

The limitations of this specification on the operation of the Storage Pool Area Ventilation System ensure that the radioactive material that could be released from irradiated fuel assemblies as a result of a fuel handling or shielded cask drop accident will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. No credit is taken for automatic operation of this system, as a result of high spent fuel pool area radiation, to mitigate the consequences of these accidents. Therefore, the system must be in operation and exhausting through the HEPA filters and charcoal adsorber prior to fuel movement within the spent fuel pool when irradiated fuel assemblies that have decayed less then 60 days are located within the spent fuel pool, or during the movement of a shielded cask over the spent fuel pool cask laydown area.

An OPERABLE Enclosure Building Filtration Train operating in the auxiliary exhaust mode and exhausting through the HEPA filters and charcoal adsorber removes radioiodine from the Spent Fuel Pool area atmosphere following a fuel handling accident. After 60 days of decay, there is negligible radioiodine. Therefore, filtration is not necessary.

An OPERABLE Enclosure Building Filtration Train operating in the auxiliary exhaust mode and exhausting through the HEPA filters and charcoal adsorber removes radioactivity from the Spent Fuel Pool area atmosphere following a shielded cask drop accident. A shielded cask is a shielded container used for the transfer of irradiated (spent fuel, irradiated hardware, etc.) or radioactive (contaminated) materials. Filtration is required whenever a shielded cask is being moved over the spent fuel pool cask laydown area.

The ACTION requirements for this specification ensure that fuel movement within the spent fuel pool or shielded cask movement over the spent fuel pool cask laydown area will not occur unless an Enclosure Building Filtration Train is operating in the auxiliary exhaust mode. The ACTION requirement to suspend fuel movement within the storage pool and shielded cask movement over the cask laydown area does not preclude completion of the movement of a component to a safe position.

The requirements for spent fuel pool area integrity ensure that an Enclosure Building Filtration Train operating in the auxiliary exhaust mode collects and filters radioiodine following a fuel handling or shielded cask drop accident. Normal entry and egress through spent fuel pool area access doors is permitted and does not violate spent fuel pool area integrity. The acceptable access doors for normal entry and egress are designed to automatically close after use. Use of doors that are not capable of automatic closure (e.g., the roll-up door), will violate spent fuel pool area integrity.

The spent fuel pool area access doors and other openings, required to be closed, are listed in the Technical Requirements Manual.

The Millstone Unit No. 2 Auxiliary Building elevator shaft smoke/heat hole has been evaluated and determined to be an acceptable minor leakage pathway. Therefore, spent fuel pool area integrity is maintained, and the required Enclosure Building Filtration Train is OPERABLE, when the elevator shaft smoke/heat hole is open. 2-HV-171, Spent Fuel Pool Area Exhaust Damper, is not an acceptable bypass leakage path and must remain closed when necessary to maintain spent fuel pool area integrity.

The laboratory testing requirement for the charcoal sample to have a removal efficiency of ≥ 95% is more conservative than the elemental and organic iodine removal efficiencies of 90% and 70%, respectively, assumed in the DBA analyses for the EBFS charcoal adsorbers in the Millstone Unit 2 Final Safety Analysis Report. A removal efficiency acceptance criteria of ≥ 95% will ensure the charcoal has the capability to perform its intended safety function throughout the length of an operating cycle.

3/4.9.16 SHIELDED CASK

The limitations of this specification and 3/4.9.15 ensure that in the event of a shielded cask drop accident 1) the doses from ruptured fuel assemblies will be within the assumptions of the safety analyses, 2) K_{eff} will remain ≤ .95.

3/4.9.17 MOVEMENT OF FUEL IN SPENT FUEL POOL

The limitations of this specification ensure that in the event of a fuel handling accident involving a dropped, misplaced, or misloaded fuel assembly (or consolidated fuel storage box), the Keff of the spent fuel pool racks and fuel transfer carriage will remain less than or equal to 0.95.

3/4.9.18 SPENT FUEL POOL - REACTIVITY CONDITION

The limitations described by Figures 3.9-1a, 3.9-1b, and 3.9-3 ensure that the reactivity of fuel assemblies and consolidated fuel storage boxes, introduced into the Region C spent fuel racks, are conservatively within the assumptions of the safety analysis.

The limitations described by Figure 3.9-4 ensure that the reactivity of the fuel assemblies, introduced into the Region A spent fuel racks, are conservatively within the assumptions of the safety analysis.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 245

TO FACILITY OPERATING LICENSE NO. DPR-65

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

1.0 INTRODUCTION

By letter dated December 14, 1999, as supplemented February 11, March 30, and April 26, 2000, the Northeast Nuclear Energy Company, et al. (NNECO/the licensee), submitted a request for changes to the Millstone Nuclear Power Station, Unit No. 2 (Millstone Unit No. 2) Technical Specifications (TSs). The requested changes would make the TSs and the Final Safety Analysis Report (FSAR) consistent with the new analyses of the fuel handling and cask drop accidents. The February 11, March 30, and April 26, 2000, letters provided clarifying information and did not expand the scope of the original Federal Register Notice. In addition, by letter dated April 26, 2000, NNECO has withdrawn its request to amend TS 3.9.11, "Refueling Operations - Water Level - Reactor Vessel." The withdrawal did not affect any conclusions made in the Safety Evaluation.

2.0 BACKGROUND

As a result of the recovery effort for Millstone Unit No. 2, NNECO determined that the current analysis of a fuel handling accident inside containment is not valid since the current analysis is not conservative with respect to the amount of fuel damage that will occur. NNECO has changed several assumptions in the fuel handling and cask drop analyses and modified some of the operating procedures for fuel and cask movement. NNECO has proposed changes to the TSs in order to make the TSs consistent with the new fuel handling accident and cask drop accident analyses and new operating procedures. In addition, NNECO's letter identifies four unreviewed safety questions (as defined by 10 CFR 50.59) which result from assumptions made by NNECO in these analyses. NNECO's December 14, 1999, submittal itemized the proposed changes to the TSs: deletions, additions and relocations. Some of these changes are editorial or administrative in nature. Our evaluation of the proposed changes is provided below.

3.0 EVALUATION

3.1 TS 3.3.2.1, "Engineered Safety Feature Actuation System Instrumentation"

NNECO has proposed several changes to TS 3.3.2.1. This TS requires that engineered safety feature actuation system instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints consistent with those shown in the Trip Setpoint column of Table 3.3-4. NNECO proposes to relocate the requirements currently located in TSs 3.3.2.1, 3.9.9 and 3.9.10 into TS 3.3.3.1 and a new TS 3.3.4.

Surveillance Requirement 4.3.2.1.4 will be relocated from this specification to TS 3.3.3.1 as Surveillance Requirement 4.3.3.1.2. This does not change the surveillance requirement itself. NNECO states that this surveillance requirement provides information necessary to determine the setpoints for the containment gaseous and particulate radiation monitors to be used for containment purge operations. NNECO proposes to move this surveillance requirement to TS 3.3.3.1 since that TS contains the OPERABILITY requirements for these monitors. The staff concludes that this change is editorial in nature and finds this change to be acceptable.

NNECO is proposing to relocate the containment purge valve isolation function from TS 3.3.2.1 to a new TS 3.3.4, "Containment Purge Valve Isolation Signal." NNECO also proposes to change the applicability of this specification from MODES 5 and 6 to during CORE ALTERATIONS and movement of irradiated fuel assemblies inside containment when the purge valves are open. If the containment purge valves are closed, this automatic function is not required. NNECO states that the change in applicability of the requirement is consistent with the conditions under which a fuel handling accident inside containment is postulated. This is discussed further in Section 3.3.4.

3.2 TS 3.3.3.1, "Monitoring Instrumentation"

Surveillance Requirement 4.3.2.1.4 will be relocated to this TS as Surveillance Requirement 4.3.3.1.2. As stated under the discussion of TS 3.3.2.1, this change is editorial in nature and does not modify any requirement and, is therefore, acceptable.

3.3 TS 3.3.4, "Containment Purge Valve Isolation Signal"

This is a proposed new section of the Millstone Unit No. 2 TSs titled "Containment Purge Isolation Signal." This automatic signal closes the containment purge valves if they are open when a signal is received from the containment gaseous radiation monitor or the containment particulate radiation monitor. The containment purge isolation signal is credited with closing the containment purge valves if they are open following a fuel handling accident inside containment. The requirements for this function are being relocated from TSs 3.3.2.1, 3.9.9, and 3.9.10 (NNECO is proposing to delete the latter two specifications). The use of a separate TS is consistent with NUREG-1432, "Combustion Engineering Standard Technical Specifications."

The applicability of this specification is reduced from the current TS requirement. Currently, the containment purge isolation signal is required to be operable in MODES 5 and 6. NNECO proposes to limit the applicability to (1) CORE ALTERATIONS with the purge valves open, and (2) during the movement of irradiated fuel assemblies inside containment with the containment

purge valves open. Thus, movement of new fuel assemblies inside containment with the containment purge isolation signal inoperable would be permitted as long as the new fuel movement is not over the reactor vessel (which would be a CORE ALTERATION). NNECO states that when the plant is in MODE 5 or MODE 6 and not performing CORE ALTERATIONS or irradiated fuel assembly movement inside containment, a sudden release of radioactivity to the containment environment is unlikely since the reactor is shut down and the reactor pressure and temperature are low. NNECO also states that, if a loss of shutdown cooling were to occur, during the resultant heatup, sufficient time would be available to manually isolate the purge before a significant release of radioactivity to containment occurred. NNECO further stated that plant procedures direct the plant operators to "establish containment closure" following a loss of shutdown cooling. This change will also allow purging the containment in MODES 5 and 6 when CORE ALTERATIONS or movement of irradiated fuel are not taking place even if the automatic purge isolation function is not OPERABLE. NNECO states the TSs require that all releases from the containment to the Millstone Unit No. 2 stack be monitored and controlled by the Millstone Unit No. 2 stack gaseous effluent monitor. Millstone Unit No. 2 is allowed to purge even with the stack gaseous monitor inoperable with appropriate sampling. In addition, prior to purging, the containment atmosphere will be sampled prior to release. The Radiation Effluent Monitoring and Offsite Dose Calculation Manual (REMODCM) provides the criteria for normal releases including purging. The staff agrees with the licensee that purging containment in conformance with the REMODCM is not likely to result in an unacceptable radioactive release. Based on the above, NNECO's proposal to limit the applicability of the containment purge isolation signal to CORE ALTERATIONS and movement of irradiated fuel assemblies inside containment is acceptable.

The current TSs require all penetrations providing direct access from the containment atmosphere to the outside atmosphere to be closed when the Containment Purge Valve Isolation Signal is inoperable. NNECO stated (Attachment 1, Page 9 of the December 14, 1999, submittal) that the proposed action requirements of TS 3.3.4 will require only the containment purge valves to be closed if the Containment Purge Valve Isolation Signal containment gaseous radiation monitor, containment particulate radiation monitor or the automatic actuation logic train is inoperable. However, NNECO points out that the ACTION requirements of TS 3.3.4 require, in addition, that the "applicable conditions and Required Actions for the affected valves of TS 3.9.4, 'Containment Penetrations' must be entered." These applicable conditions and Required Actions specify that each penetration having direct access from the containment atmosphere to the outside atmosphere must be either closed or capable of being closed by an OPERABLE Containment Purge Valve Isolation System during CORE ALTERATIONS or during movement of irradiated fuel assemblies in containment. If TS 3.9.4 is entered from a TS 3.3.4 action statement because the Containment Purge Valve Isolation System is inoperable, the penetrations having direct access from the containment atmosphere to the outside atmosphere must be closed. Thus, there will not be any direct flow path from the containment atmosphere to the outside atmosphere when there is not an OPERABLE automatic closure.

In the event that the Containment Purge Valve Isolation System is inoperable, the required action is to suspend movement of irradiated fuel inside containment. NNECO stated that it is not necessary to stop the movement of new fuel assemblies inside containment except over the reactor vessel since any potential damage to the new fuel assemblies will not result in a radioactive release. The staff finds this to be acceptable.

TS 3.3.4 is consistent or conservative in comparison with Section 3.3.7, "Containment Purge Isolation Signal (CPIS) (Analog)" of NUREG-1432. While the applicability has been made less restrictive than the current TS, the staff concludes that the intent of these relocated TSs is maintained and finds the proposed changes to be acceptable.

3.4 TS 3.7.6.1, "Control Room Emergency Ventilation System"

This TS requires that two Independent Control Room Emergency Ventilation System trains be OPERABLE. NNECO proposes to modify this specification to make it consistent with the revised fuel handling and cask drop accidents and to apply to defueled conditions.

The applicability is expanded from all Modes to MODES 1, 2, 3, 4, 5, and 6 as well as during fuel movement within the containment or the spent fuel pool and during movement of a shielded cask over the spent fuel pool cask laydown area. This explicitly includes in the TSs the situation in which new or irradiated fuel or a shielded cask is moved with the core defueled. The proposed applicability is more conservative and includes all possible cases and, therefore, is acceptable.

The action requirements for both control room ventilation trains inoperable in MODES 1 through 4 will be expanded to require the suspension of fuel movement within the spent fuel pool, and suspension of shielded cask movement over the spent fuel pool cask laydown area. The proposed change is more conservative and, therefore, is acceptable.

With one Control Room Emergency Ventilation System train inoperable in MODES 5 and 6, the current TSs action requirement requires after 7 days that the remaining OPERABLE control room emergency ventilation train be placed in the recirculation mode. NNECO is proposing to expand the applicability of this TS to include fuel movement inside containment and the spent fuel pool and movement of a shielded cask over the spent fuel pool cask laydown area in addition to MODEs 5 and 6. The action statement has been modified so that if the inoperable train cannot be returned to operable status after 7 days, the remaining OPERABLE control room emergency ventilation train will be placed in the recirculation mode or immediately suspend CORE ALTERATIONS, fuel movement, or shielded cask movement over the spent fuel pool cask laydown area. This proposed change is consistent with the revised accident analyses. The staff finds this proposed change to be acceptable

With both Control Room Emergency Ventilation trains inoperable, or with the OPERABLE Control Room Emergency Ventilation train required to be in the recirculation mode but not capable of being powered by an OPERABLE normal and emergency power source, NNECO is proposing that CORE ALTERATIONS, positive reactivity changes, the movement of fuel assemblies, and the movement of shielded casks over the spent fuel pool cask laydown area be suspended immediately. The proposed modification is the addition of the requirement for immediate action and expanding the required actions to include the suspension of fuel movement within the spent fuel pool and shielded cask movement over the spent fuel pool cask laydown area. This proposed change is consistent with the revised accident analyses and, therefore, the staff finds this to be acceptable.

3.5 TS 3.9.3.1, "Refueling Operations - Decay Time"

NNECO proposes to increase the decay time from 72 hours to 150 hours after shutdown, prior to movement of irradiated fuel in the reactor pressure vessel. The staff has determined that the dose consequences for the revised fuel handling and cask drop accidents are well within Part 100 doses (25% of Part 100) for offsite releases and within GDC 19 limits for control room operation. The proposed TS is more conservative and keeps the dose consequences at an acceptable level. Therefore, this TS change is acceptable.

3.6 TS 3.9.4, "Refueling Operations - Containment Penetrations"

NNECO proposes to revise this TS to allow both personnel air lock doors to be open under administrative control during CORE ALTERATIONS or during movement of irradiated fuel inside containment. The TS will require that the containment purge be in operation so that the pressure inside containment will be less than that outside and air flow will, therefore, be into containment. The proposed Bases provide information on the proposed administrative controls:

> At least one personnel air lock door is under administrative control such that the door can be closed within 10 minutes, which is the assumed containment purge isolation time. This will allow hoses and cables to be run through the personnel air lock, provided they can be rapidly removed to allow the door to be closed within the required time period. In addition, a designated individual must be continuously available for door closure.

The Bases specify a "designated" individual rather than a "dedicated" individual. The difference is that a dedicated individual has no other duties except responsibility for the door. In response to a staff question, NNECO stated that the designated individual may have other duties in the vicinity of the door, depending on how many hoses and cables are going through the air lock. NNECO stated in its March 30, 2000, letter that:

> If there are no hoses or cables through the personnel air lock, the individual may be able to perform additional activities in the containment personnel air lock area. If there are hoses or cables through the personnel air lock, the individual will likely have no other duties.

NNECO states that this guidance will be incorporated in plant procedures and that closure of the air locks must be accomplished within 10 minutes, which is the assumed containment purge isolation time in the associated analyses. The staff considers this a reasonable time considering that personnel in the containment must be evacuated before the door can be closed. It is also consistent with NNECO's dose analyses. These changes are consistent with NUREG-1432 (TSTF 68).

NNECO proposes to change the surveillance requirement to verify that each penetration is in the isolated condition to verify the "required status." NNECO states that the reason for this change is that the air locks could be open while isolation valves could be closed. This change is reasonable since the required positions of each penetration (opened or closed) are specified in the TSs.

NNECO proposes to change the surveillance requirements for TS 3.9.4. The current surveillance requirements require that containment penetrations providing direct access from the containment atmosphere to the outside atmosphere shall be determined to be either in their isolated condition or capable of being closed by an OPERABLE containment purge valve within 72 hours prior to the start of CORE ALTERATIONS or the movement of irradiated fuel in the containment and at least once per 31 days during CORE ALTERATIONS or movement of irradiated fuel. The change would (1) eliminate the requirement to verify the position of the valves 72 hours prior to the start of CORE ALTERATIONS or fuel movement within the containment, and (2) change the surveillance frequency thereafter from 31 days to 7 days. The first change is acceptable since the Millstone Unit No. 2 TSs ensure that a surveillance will be performed before CORE ALTERATIONS or fuel movement takes place within the containment. The second change is acceptable because 7 days is a reasonably short interval and is consistent with NUREG-1432. The Millstone Unit No. 2 TSs do not permit any penetrations to be opened under administrative control with the exception of the personnel airlock under the applicability conditions of this specification. The containment purge penetrations can also be left open if the Containment Purge Valve Isolation Signal is operable. Based on the above, the staff concludes that the proposed changes are acceptable.

3.7 TS 3.9.9, "Refueling Operations - Containment Radiation Monitoring"

This specification will be deleted. The requirements of this specification will be retained in the current specifications 3.3.3.1 and 3.3.4.

The requirement that a minimum of one channel each of gaseous and particulate airborne radioactivity monitors that initiate containment purge valve isolation shall be OPERABLE will be relocated to TS 3.3.4. The applicability of the new TS 3.3.4 will be revised from MODE 6, as required by TS 3.9.9, to those conditions for which a fuel handling accident is postulated. This is discussed in Section 3.3.4.

NNECO proposes to eliminate the action requirement that with less than the minimum required gaseous and particulate airborne radiation monitors OPERABLE, and with all containment penetrations that provide direct access from the containment atmosphere to the outside atmosphere closed, CORE ALTERATIONS and fuel movement may only proceed for 7 days. This is acceptable since, with these penetrations closed and the assumptions of the safety analyses satisfied, there is no reason to limit the time for CORE ALTERATIONS or fuel movement within the containment.

Surveillance Requirement 4.9.9.1, which requires verification that the required minimum of one OPERABLE channel each of gaseous and particulate airborne radioactivity monitors that initiate containment purge valve isolation, will be retained in Surveillance Requirement 4.3.3.1. This is acceptable since Surveillance Requirement 4.9.9.1 merely references Surveillance Requirement 4.3.3.1. It is not a change in requirements.

NNECO proposes to delete surveillance requirement 4.9.9.2, which requires that the penetrations providing direct access from inside containment to the outside atmosphere be verified closed every 12 hours during CORE ALTERATIONS or fuel movement when less than the equipment specified in TS 3.9.9 (one channel each of gaseous and particulate radiation monitors) is OPERABLE. This is acceptable because TS Surveillance Requirement 4.9.4.1 will require this verification every 7 days. The difference in surveillance is reasonable since the penetrations are verified closed prior to CORE ALTERATIONS and fuel movement and the

Millstone Unit No. 2 TSs do not permit any penetrations to be opened under administrative control, with the exceptions discussed in Section 3.6, under the applicability conditions of this specification.

3.8 TS 3.9.10, "Refueling Operations - Containment Purge Valve Isolation System"

NNECO proposes to delete this specification. This specification will be deleted and the requirements of this specification, with modifications, will be relocated to TS Section 3.3.4. The evaluation of the proposed changes are evaluated under TS section 3.3.4.

3.9 TS 3.9.13, "Refueling Operations - Storage Pool Radiation Monitoring"

Current Technical Specification 3.9.13 requires that at least two spent fuel storage area radiation monitors that initiate automatic start of, or diversion of, the spent fuel storage pool ventilation system must be OPERABLE whenever irradiated fuel assemblies are in the storage pool.

The licensee proposes to delete the requirement for automatic diversion since neither the current analyses or the revised analyses of the fuel handling and shielded cask drop accidents in the spent fuel pool area credit automatic diversion of the spent fuel pool area ventilation exhaust through HEPA filters and charcoal adsorbers. Instead, the analyses assume that the spent fuel pool area ventilation is already exhausting through the HEPA filters and charcoal adsorbers during any fuel movement or shielded cask movement over the spent fuel pool cask laydown area.

In addition, for the same reason, the licensee states that the requirements of this specification for automatic diversion do not satisfy the criteria of 10 CFR 50.36c(2)(ii) for inclusion in the technical specifications. Technical Specification 3.3.3.1 requires that the Spent Fuel Storage Pool radiation monitors be operable. The staff concludes that the revised accident analyses does not credit this automatic function and removal of this TS is consistent with the revised fuel handling and cask drop accident analyses. Therefore, the proposed TS change is acceptable.

3.10 TS 3.9.14, "Refueling Operations - Storage Pool Area Ventilation System - Fuel Movement"

This specification will be deleted and the requirements of this specification, with modifications, will be relocated to TS 3.9.15 or deleted. The evaluation of these modifications and deletions is provided under the evaluation of the proposed changes to TS Section 3.9.15.

3.11 TS 3.9.15, "Refueling Operations - Storage Pool Area Ventilation System - Fuel Storage"

The applicability of TS 3.9.15 will be changed from, "whenever irradiated fuel is in the storage pool" to (1) fuel movement within the spent fuel pool, when irradiated fuel assemblies have decayed less than 60 days are located in the spent fuel pool, and (2) during movement of a shielded cask over the spent fuel pool cask laydown area. NNECO states that after 60 days there will be negligible radioiodine remaining and, therefore, filtration will not be necessary for mitigating the fuel handling accident in the spent fuel pool. During all shielded cask movement, the storage pool area ventilation system is operating in the auxiliary exhaust mode. The proposed change to the applicability of TS 3.9.15 is consistent with the revised analyses and,

therefore, is acceptable. The acceptability of the assumption of the 60 days decay time for these analyses is discussed in Section 3.16.2.2.

TS 3.9.14 requires that the auxiliary building doors specified in TSs Table 3.9-1 be closed and the spent fuel pool area ventilated by the Enclosure Building Filtration System operating in the auxiliary exhaust mode and exhausting through HEPA filters and charcoal adsorbers during either (1) fuel movement within the spent fuel pool storage pool, or (2) during crane operation with loads over the spent fuel pool. NNECO proposes to relocate TS 3.9.14 for an enclosure building filtration train to be operating in the auxiliary exhaust mode of operation to TS 3.9.15, "Storage Pool Area Ventilation System-Fuel Storage." This relocation does not change the function of the system as described in the FSAR and does not revise any requirements. Therefore, the relocation is acceptable.

NNECO proposes to relocate Table 3.9-1 "Access Doors to Spent Fuel Area" from TS 3.9.14 to the Technical Requirements Manual, which is not part of the TSs. This allows NNECO to make changes to this table in compliance with 10 CFR 50.59. NRC Generic Letter (GL) 91-08, "Removal of Component Lists from TSs" provides guidance on the removal of lists from the TSs. The licensee's request is consistent with the guidance of GL 91-08 and is, therefore, acceptable.

NNECO proposes to remove from the TSs the requirement that the auxiliary building doors be closed and the spent fuel pool area ventilated by the Enclosure Building Filtration System as specified in this TS during crane operation with loads over the spent fuel pool. The reason for removing this requirement is that it does not satisfy any of the four criteria for inclusion in the TSs given in 10 CFR 50.36(c)(2)(ii). NNECO stated in a March 30, 2000, letter that this requirement will be relocated to plant procedures. NNECO also stated in its December 14, 1999, letter that the operation of the crane will be consistent with the licensee's program for handling heavy loads. For the reasons stated above, the staff finds this change to be acceptable.

NNECO proposes to change the TSs to specify that "normal entry and egress" to the spent fuel area is not considered a loss of spent fuel pool area integrity. The proposed Bases will specify that the acceptable spent fuel pool area access doors for entry and egress are designed to automatically close after use and the use of doors that are not capable of automatic closure will violate spent fuel pool area integrity. NNECO states that the opening of the spent fuel pool area doors for normal entry and egress will not significantly affect the operation of the Enclosure Building Filtration System in the exhaust mode (Page 34 of Attachment 1 to the licensee's December 14, 1999 submittal). In addition, Surveillance Requirement 4.9.15.3 requires that each door in all spent fuel pool access openings be verified closed (except for normal entry and egress) every 12 hours under conditions of applicability of TS 3.9.15. The staff finds this to be acceptable. NNECO's December 14, 1999, letter stated that they will maintain the list of acceptable doors in NNECO's Technical Requirements Manual.

The required frequency of current Surveillance Requirement 4.9.15.a will be changed from "31 days on a staggered test basis" to 31 days. This is an editorial change, since a staggered test basis cannot be applied when only one train is required by the LCO.

Surveillance Requirement 4.9.15.d.2 will be deleted. This requires verifying automatic start of the Enclosure Building Filtration train on a spent fuel pool area high radiation signal and that the

exhaust flow is through the HEPA filters and charcoal adsorber banks. NNECO states that it is not necessary to verify this automatic function, since the revised spent fuel handling analysis (as well as the previous analysis) does not credit automatic diversion of the spent fuel pool area ventilation exhaust through the HEPA filters and charcoal adsorbers. This proposed change is consistent with the revised accident analyses and, therefore, the staff finds this to be acceptable.

Surveillance Requirements 4.9.15.2 and 4.9.15.3 will be added to incorporate surveillance requirements from Surveillance Requirement 4.9.14. Surveillance requirement 4.9.15.2 requires that the OPERABLE Enclosure Building Filtration Train be verified to be operating in the auxiliary exhaust mode and exhausting through the HEPA filters and charcoal adsorbers at least once per 12 hours. This is consistent with Surveillance Requirement 4.9.14. Surveillance requirement 4.9.15.3 was discussed above in this section.

3.12 TS 3.9.16.1, "Refueling Operations - Shielded Cask"

NNECO proposes to replace the phrase "set down" with the phrase "laydown." This change standardizes the terminology with that of TS Section 3.9.15. Since this does not change the requirements of this specification, the staff concludes that this change is editorial in nature and, therefore, is acceptable.

3.13 TS 3.9.16.2, "Refueling Operations - Shielded Cask"

NNECO proposes replacing the phrase "cask laydown pit" with the phrase "spent fuel pool cask laydown area." This change standardizes the terminology with TS Section 3.9.15. Since this does not change the requirements of this specification, the staff concludes that this change is editorial in nature and, therefore, is acceptable.

3.14 TS 3.9.16.2, "Refueling Operations - Shielded Cask" and 3.9.17, "Refueling Operations - Movement of Fuel in Spent Fuel Pool"

NNECO also proposes to modify a phrase related to the boron concentration in the spent fuel pool in TSs 3.9.16.2 and 3.9.17. The phrase "the boron concentration of the pool shall be maintained uniform and sufficient to maintain a boron concentration of greater than or equal to 800 parts per million" will be changed to "the boron concentration of the pool shall be greater than or equal to 800 parts per million." This will not change the LCO requirement to maintain the boron concentration in the spent fuel pool $\geq$ 800 ppm. The boron concentration will be uniform as a result of natural diffusion and the spent fuel pool cooling or shutdown cooling pumps system flow. This limit is verified within 24 hours before any movement of a fuel assembly or a consolidated fuel storage box in the spent fuel pool. The sampling is done at several locations to assure that the boron concentration is uniform throughout the pool. This is acceptable since the change in wording does not affect any plant procedures or measurements of boron concentration in the spent fuel pool or the processes which tend to maintain a uniform boron concentration in the spent fuel pool.

3.15 Assumption of An Unfiltered Bypass Release to Environment

NNECO has assumed, as part of the spent fuel pool handling and cask drop accident analyses, that 2 percent of the ventilation flow will be an unfiltered release to the environment. NNECO

considers this to be an unreviewed safety question under 10 CFR 50.59, since this assumption results in an increase in consequences of a fuel handling accident. By letter dated March 30, 2000, NNECO described the determination of this 2 percent bypass flow in response to a staff request for additional information. The bypass is associated with the auxiliary building elevator shaft smoke/heat hole. NNECO performed flow measurements to determine the worst bypass flow in different configurations (elevator doors opened at different elevations, Auxiliary Building Ventilation System on and off). The worst measured flow was approximately 1 percent. NNECO conservatively increased this amount to 2 percent. The staff finds that the method used to determine the bypass flow is appropriately conservative relative to actual flow measurements, and is, therefore, acceptable. The dose consequences due to the assumed 2 percent bypass leakage is discussed in Section 3.16.

3.16 Radiological Analysis

The licensee performed re-analyses of the Millstone Unit No. 2, FSAR Chapter 14 accidents involving fuel handling operations. Analyses were performed in conjunction with proposed changes in fuel-handling operations, some of which support TS changes. The licensee's revision of the fuel-handling and cask-drop accidents resulted in the determination that the revised analyses comprised unreviewed safety questions. These unreviewed safety questions were precipitated by:

1. The addition of a new malfunction not previously evaluated. This malfunction was associated with closure of the containment personnel airlock following a fuel-handling accident inside containment.

2. The inclusion of a 2 percent bypass flow due to the potential for air in the spent fuel pool area to bypass the charcoal adsorber and high-efficiency particulate air (HEPA) filter of the enclosure building filtration system (EBFS) when the auxiliary building elevator is in operation.

3. The inclusion of the control room operator doses resulting from fuel-handling operations.

4. A new evaluation of a fuel-handling accident in the spent fuel pool area assuming at least 60 days of decay.

The licensee analyzed the consequences of four fuel-handling accidents. They include a fuel-handling accident inside containment; a fuel-handling accident in the spent fuel pool area for fuel with <60 days decay and for fuel with >60 days decay; and a fuel-handling accident involving the drop of a fuel cask in the spent fuel pool area. The licensee calculated whole body, thyroid and skin doses to individuals located at the exclusion area boundary (EAB), low-population zone (LPZ) and in the control room. The licensee concluded that all of the control room operator doses met GDC 19 and that the EAB and LPZ doses were well within (i.e. 25 percent) of the dose limits of 10 CFR Part 100.

In the March 30, 2000, submittal NNECO assumed 50-percent containment mixing for a fuel-handling accident inside containment. In this evaluation the licensee determined that they could take credit for 50 percent of the containment free volume and dilute the radioactivity released in the event of a fuel-handling accident. In their calculation, reference is made to the

licensee's Engineering Evaluation M2-EV-98-0186, "Evaluate Containment Atmosphere Mixing During Purge Activities," Revision 1, October 1, 1998. The analysis for the 50-percent mixing in containment was determined by a containment walkdown and observation. This was a qualitative assessment for justifying the 50-percent mixing assumption. The staff reviewed the licensee's evaluation and concluded that there was insufficient information to justify 50-percent mixing within containment.

By letter dated April 26, 2000, NNECO proposed to use a 20-percent mixing in containment in lieu of the 50-percent value. In this letter NNECO submitted a figure which provided additional details concerning the fan configuration and mixing attributes in containment. After reevaluating the containment floor and equipment configuration at the fuel pool elevation and the fact that NNECO has proposed to require the operation of fans 24A and B during fuel activities, the staff concluded that an assumption of 20-percent mixing is more realistic and, therefore, is acceptable. If higher mixing rates are desired, the mixing rates should be based on actual test data or analytical modeling of air flows in containment during refueling outages.

The following sections provide the results of the staff's assessment of the licensee's re-analysis of the FSAR Chapter 14 fuel-handling accidents.

3.16.1 Fuel-Handling Accident Inside Containment

During fuel-handling operations within containment, the containment purge supply and exhaust systems are operating with the exhaust flow being greater than the supply flow to assure that leakage is into the containment rather than out of the containment. The licensee assumed that the drop of a fuel assembly within containment resulted in the release of gap activity of all of the rods in the assembly. Upon detection of high radioactivity in the containment by the containment gaseous and particulate radiation monitors, a containment purge isolation signal will be initiated and the containment purge exhaust valve will be closed. A high level of radioactivity in any one of four containment radiation monitors will result in a closure signal to the containment purge and exhaust valves. If the automatic containment purge valve isolation capability is not available, the containment purge valve must be maintained closed during core alterations or during irradiated fuel movement inside containment. The licensee assumed that if containment purge is in operation, the release to the environment following a fuel-handling accident inside containment would continue for 10 minutes, at which time containment purge would be secured, the containment isolated, and the release terminated. The revised containment fuel-handling accident analysis assumed that both containment personnel airlock doors are open during fuel movement. The containment personnel airlock doors will be controlled administratively to ensure that at least one door is closed within 10 minutes. In addition, containment purge must be in operation for both airlock doors to be open, to ensure airflow through the open airlock doors is into containment.

The staff's assessment incorporated a mixing volume of approximately 384,000 ft^3 (20 percent of containment volume) into the evaluation. This value is discussed in Section 3.16. The offsite doses met the staff's acceptance criteria of well within 10 CFR Part 100 (25 percent of the Part 100 dose) and within acceptance criteria for doses to the control room operators as required by General Design Criteria 19.

Table 3.16.1-1 contains details of the assumptions utilized by the staff in their assessment of the potential consequences of a fuel-handling accident inside containment. The doses are presented in Tables 3.16.4-1 and 3.16.4-2.

3.16.2 Fuel-Handling Accident In Spent Fuel Pool Area

3.16.2.1 Fuel Decayed Less Than 60 Days

The licensee considered two accident scenarios for fuel-handling accidents inside the spent fuel pool area. The first scenario assumed that the refueling accident occurred with fuel that has decayed for less than 60 days. In this scenario, it was assumed that a spent fuel assembly was dropped which resulted in the release of the gap activity of all of the rods in one fuel assembly. Since the fuel has decayed for less than 60 days, proposed technical specifications would require that the exhaust air from the fuel-handling ventilation system be manually aligned to exhaust to the EBFS prior to movement of the fuel assembly. In this configuration a negative pressure is maintained in the fuel-handling building and any radioactivity is channeled through HEPA filters and charcoal adsorbers prior to discharge through the Unit 1 stack. The licensee indicated that the integrity of the fuel-handling area is assured by verifying that the various auxiliary building doors are closed prior to fuel movement over the spent fuel pool and that no openings exist in the fuel-handling area boundary that could affect area integrity. The licensee's analysis assumed that a small amount of leakage would bypass the normal ventilation flow path resulting in an unfiltered release to the environment. This bypass results from the operation of the auxiliary building elevator during spent fuel movement. If the elevator shaft smoke/heat hole is covered, the elevator cannot be utilized. The licensee conducted a test and determined that 86 cubic feet per minute (cfm) would bypass the EBFS. However, in their revised fuel-handling accident analysis, that bypass amounted to 2 percent of the EBFS exhaust flow or 180 cfm.

In a Millstone Unit No. 2 amendment involving the control room ventilation system (TAC No. MA3672), the licensee performed loss-of-coolant accident and main steamline break accident analyses based upon new meteorological calculations of χ/Q. The staff assessed the new atmospheric dispersion values for that amendment and found them to be acceptable. Since the staff found the previous utilization of this meteorological data acceptable we did not re-review them for the purpose of this amendment. However, the licensee's analyses for accidents occurring in the spent fuel pool area assumed that a small amount of leakage would bypass the normal ventilation flow path resulting in an unfiltered release to the environment. This bypass results from the operation of the auxiliary building elevator during spent fuel movement. The elevator shaft is a potential source of bypass of the EBFS HEPA filters and charcoal adsorbers. If the elevator shaft smoke/heat hole is covered to eliminate this bypass, the elevator cannot be utilized and refueling operations efficiency is affected. The licensee generated a new control room χ/Q value for the bypass release pathway. This value had not previously been evaluated by the staff. The staff has reviewed this value for the evaluation of this TS change and has found it to be acceptable.

Table 3.16.2-1 contains details of the assumptions utilized by the staff in their assessment of the potential consequences of a fuel-handling accident in the spent fuel pool area for pool that has decayed less than 60 days. The doses associated with this accident are presented in Tables 3.16.4-1 and 3.16.4-2.

3.16.2.2 Fuel Decay Greater than 60 Days

The second scenario analyzed by the licensee for a refueling accident occurred in the spent fuel pool area involved a fuel assembly which had decayed for at least 60 days. For this situation the licensee's proposed mode of operation did not have the fuel-handling building exhaust air diverted to the EBFS. The licensee's re-analysis assumed that normal ventilation was occurring in the spent fuel pool area and that, in the event of a fuel-handling accident, the release would occur without mitigation by charcoal adsorber. The licensee's revised analysis also assumed that for this accident there would be no automatic isolation of the control room. The licensee did propose TSs for the control room emergency ventilation system to be operable for all fuel movement in the spent fuel pool area.

Table 3.16.2.2-1 contains details of the assumptions utilized by the staff in their assessment of the potential consequences of a fuel-handling accident in the spent fuel pool area for fuel that has decayed for at least 60 days. The doses are presented in Tables 3.16.4-1 and 3.16.4-2.

3.16.3 Spent Fuel Cask Drop Inside Spent Fuel Pool Area

The licensee assessed the consequences of a spent fuel cask drop in the spent fuel pool area. Prior to shielded cask movement in the spent fuel pool area, the exhaust air from the spent fuel pool area would be manually diverted from exhausting via the main exhaust system to being discharged by the EBFS operating in the auxiliary exhaust mode. The licensee proposes operating in this fashion to assure that, in the event of a spent fuel cask drop, the EBFS will maintain a negative pressure within the fuel-handling building such that all radioactive material will be processed through the EBFS HEPA filters and charcoal adsorbers with the exception of the 2 percent bypass flow associated with the auxiliary building elevator shaft.

The licensee's assessment assumed that the source term for this analysis consisted of 1560 fuel assemblies. A total of 1376 assemblies would have been decayed for 5 years while 184 would have decayed for 1 year. It was assumed that all of the gap radioactivity associated with the fuel assemblies would be released to the spent fuel pool and that the release would occur over a 2-hour time period. The release from the EABS would occur from the Millstone Unit No. 1 stack and the bypass would occur as a ground level release from Millstone Unit No. 2. No credit was taken for the adsorption capability of the control room charcoal.

Table 3.16.3-1 contains details of the assumptions utilized by the staff in their assessment of the potential consequences of a spent fuel pool cask drop in the spent fuel pool area. The doses are presented in Tables 3.16.4-1 and 3.16.4-2.

3.17 Tables 3.3-3, 3.3-4 and 4.3-2

The phrase "(Undervoltage relays)" will be removed from Functional Unit 8 in Tables 3.3-3, 3.3-4, and 4.3-2. Functional Unit 8 is the Loss of Power function associated with the safety-related 4160 VAC emergency busses at Millstone Unit No. 2. The Level 1 and Level 2 undervoltage protection scheme uses bistables, not relays, to detect the undervoltage condition. This information was incorrect and its removal will not affect any of the operability requirements for these protective functions. The staff agrees that this change is editorial in nature and, therefore, is acceptable.

3.18 TS 3.9.19.2, "Refueling Operations - Spent Fuel Pool - Storage Pattern"

TS 3.9.19.2 will be removed. NNECO has stated that this TS is identical to TS 3.9.19, which will be retained. The staff has confirmed that TS 3.9.19.2 and 3.9.19 are identical. The staff agrees that this change is editorial in nature and, therefore, is acceptable.

3.19 Changes to the Index pages

The following changes to the Index pages were proposed to make the Index consistent with the proposed TS changes:

a. An entry for TS 3.3.4, "Containment Purge Valve Isolation Signal," will be added to Index Page V.

b. The entries for TSs 3.9.9, "Containment Radiation Monitoring"; 3.9.10, "Containment Purge Valve Isolation System"; 3.9.13, "Storage Pool Radiation Monitoring"; and 3.9.14, "Storage Pool Area Ventilation System - Fuel Movement," will be replaced with "DELETED" on Index Page IX.

c. The phrase "- Fuel Storage" will be removed from the title for TS 3.9.15, "Storage Pool Area Ventilation System," on Index Page IX.

d. An entry for the Bases of TS 3.3.4, "Containment Purge Valve Isolation Signal," will be added to Index Page XI.

e. The entries for the Bases of TSs 3.9.9 and 3.9.10, "Containment and Radiation Monitoring and Containment Purge Valve Isolation System"; 3.9.13, "Storage Pool Radiation Monitoring"; and 3.9.14, "Storage Pool Area Ventilation System," will be replaced with "DELETED" on Index Page XIV.

The staff has reviewed these proposed changes and concludes they are editorial in nature and, therefore, are acceptable.

3.20 Bases Section Changes

The following Bases Sections have been revised, deleted or added: 3/4.3.1 AND 3/4.3.2, "PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION; 3/4.3.3.1, "RADIATION MONITORING;3/4, "CONTAINMENT PURGE VALVE ISOLATION SIGNAL"; 3/4.7.6, "CONTROL ROOM EMERGENCY VENTILATION SYSTEM; "3/4.9, "REFUELING OPERATIONS"; 3/4.9.4, "CONTAINMENT PENETRATIONS"; 3/4.9.9 AND 3/4.9.10, "CONTAINMENT RADIATION MONITORING AND CONTAINMENT PURGE VALVE ISOLATION SYSTEM"; 3/4.9.13, "STORAGE POOL RADIATION MONITORING"; 3/4.9.14, "STORAGE POOL AREA VENTILATION SYSTEM"; 3/4.9.17, "MOVEMENT OF FUEL IN SPENT FUEL POOL"; AND 3/4.9.18, "SPENT FUEL POOL - REACTIVITY CONDITION." Station Procedure RAC 02, "TS Change Requests and Implementation of License Amendments, Rev 1," provides instructions for initiation, review control, approval, and disposition of proposed changes to the Bases section of the TS. RAC 02 notes that for all Bases changes a 10 CFR 50.59 safety evaluation (SE) is required. All changes are reviewed against 10 CFR 50.59 but the SE is not submitted to the NRC. Therefore, Bases changes have an appropriate level of review. The staff has no objections to the proposed Bases changes.

3.21 Staff Conclusions Related to TS Changes

The staff evaluated the EAB and LPZ doses for the revised fuel-handling accidents using the dose guidelines presently contained in the Standard Review Plan (SRP) Sections 15.7.4 or 15.7.5. The acceptance criteria for these SRP sections are based on the requirements in 10 CFR Part 100. The staff concluded that the EAB and LPZ doses were well within (i.e. 25 percent of) the offsite dose limits of 10 CFR Part 100. In addition, the staff has evaluated the doses to control room operators as required by GDC 19. The staff concluded that all of the control room operator doses met GDC 19. Tables 3.16.4-1 and 3.16.4-2 present the EAB, LPZ, and control room operator doses for the four fuel-handling accidents which were analyzed. Therefore, the staff finds the proposed re-analyses of fuel-handling accidents and associated TS changes for Millstone Unit No. 2 are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Connecticut State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact was published in the Federal Register (65 FR 25003) for these TS changes related to the fuel handling and cask drop accidents.

Accordingly, based upon the environmental assessment, the Commission has determined that issuance of this amendment will not have a significant effect on the quality of the human environment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Table 3.16.1-1

Assumptions for Fuel-Handling Accident Inside Containment

Core Power (MWt)	2754
Number of Assemblies	217
Peaking Factor	1.83
Occurrence of Accident (hours after shutdown)	150
Damaged Fuel Rods	1 Assembly
Activity Released from the Gap	
Noble Gases except ^{85}Kr	0.10
^{85}Kr	0.30
Iodine	0.12
Iodine Chemical Form	
Organic (%)	.25
Elemental (%)	99.75
Water DF	
Organic (%)	1
Elemental (%)	133
Purge Isolation Time (seconds)	600
Purge Flow Rate (cfm)	32,000
Containment Mixing Volume (ft^3)	3.84E5
Breathing Rate (m^3/sec)	3.47E-4
Release Point	Unit 2 Vent
Atmospheric Dispersion (sec/m^3)	
EAB	3.66E-4
LPZ	4.80E-5
Control Room	2.92E-3

Control Room Features

Unfiltered Inleakage (cfm)	130
Recirculation Filter Flow Rate (cfm)	2,250
Recirculation Filter Efficiency (%)	90
Delay for Recirculation Filter Operation (sec)	600
Normal Makeup Isolation Time (sec)	10
Normal Makeup Flow (cfm)	800
Control Room Volume (ft^3)	35,650

Table 3.16.2-1
Assumptions for Fuel Handling Accident In Spent Fuel Pool Area
With Fuel Decayed Less Than 60 Days

Core Power (MWt)	2754
Number of Assemblies	217
Peaking Factor	1.83
Minimum Time after Shutdown for Fuel Transfer (hr)	150
Damaged Fuel Rods	1 Assembly
Activity Released from the Gap	
Noble Gases except ^{85}Kr	0.10
^{85}Kr	0.30
Iodine	0.12
Iodine Chemical Form	
Organic (%)	.25
Elemental (%)	99.75
Water DF	
Organic (%)	1
Elemental (%)	133
EBFS Filter Efficiency	
Organic (%)	70
Elemental (%)	90
Breathing Rate (m^3/sec)	3.47E-4
Release Point	Unit 1 Stack for EBFS Exhaust Ground Level for EBFS Bypass
Atmospheric Dispersion (sec/m^3)	
Unit 1 Stack	
EAB	1.00E-4
LPZ	2.69E-5
Control Room	2.51E-4

Ground Level for Bypass

EAB	3.66E-4
LPZ	4.80E-5
Control Room	5.46E-3

Control Room Features

Unfiltered Inleakage (cfm)	130
Recirculation Filter Flow Rate (cfm)	2,250
Recirculation Filter Efficiency (%)	90
Delay for Recirculation Filter Operation (sec)	600
Normal Makeup Isolation Time (sec)	10
Normal Makeup Flow (cfm)	800
Control Room Volume (ft^3)	35,650

Table 3.16.2.2-2
Assumptions for Fuel Handling Accident In Spent Fuel Pool Area
With Fuel Decayed at Least 60 Days

Core Power (MWt)	2754
Number of Assemblies	217
Peaking Factor	1.83
Minimum Time after Shutdown for Fuel Transfer (days)	60
Damaged Fuel Rods	1 Assembly
Activity Released from the Gap	
Noble Gases except ^{85}Kr	0.10
^{85}Kr	0.30
Iodine	0.12
Iodine Chemical Form	
Organic (%)	.25
Elemental (%)	99.75
Water DF	
Organic (%)	1
Elemental (%)	133
Breathing Rate (m^3/sec)	3.47E-4
Atmospheric Dispersion (sec/m^3)	
Unit 1 Stack	
EAB	**1.00E-4**
LPZ	**2.69E-5**
Control Room	**2.51E-4**
Ground Level for Bypass	
EAB	**3.66E-4**
LPZ	**4.80E-5**
Control Room	**5.46E-3**

Control Room Features

Normal Makeup Flow (cfm)	800
Control Room Volume (ft^3)	35,650

Table 3.16.3-1
Assumptions for Spent Fuel Cask Drop Accident In Spent Fuel Pool Area

Core Power (MWt)	2754
Number of Assemblies	184 Decayed 1 year 1376 Decayed 5 years
Peaking Factor	1
Damaged Fuel Rods	All within the Cask
Activity Released from the Gap	
Noble Gases except ^{85}Kr	0.10
^{85}Kr	0.30
Iodine	0.10
Iodine Chemical Form	
Organic (%)	.25
Elemental (%)	99.75
Water DF	
Organic (%)	1
Elemental (%)	133
EBFS Filter Efficiency	
Organic (%)	70
Elemental (%)	90
Breathing Rate (m^3/sec)	3.47E-4
Release Point	Unit 1 Stack for EBFS Ground Level for EBFS Bypass
Atmospheric Dispersion (sec/m^3)	
Unit 1 Stack	
EAB	1.00E-4
LPZ	2.69E-5

Control Room	2.51E-4
Ground Level for Bypass	
EAB	3.66E-4
LPZ	4.80E-5
Control Room	5.46E-3
Control Room Features	
Normal Makeup Flow (cfm)	800
Control Room Volume (ft^3)	35,650

Table 3.16.4-1
Thyroid Doses Associated with Fuel Handling Accidents

Accident	EAB	LPZ	Control Room
Fuel Handling Accident Inside of Containment	32	4.2	22
Fuel Handling Accident in Spent Fuel Pool Areas with Fuel Decayed Less Than 60 Days	3.4	7.5E-1	7.1
Fuel Handling Accident in Spent Fuel Pool Areas with Fuel Decayed Greater Than 60 Days	5.5E-1	7.2E-2	5.1
Spent Fuel Cask Drop Inside Spent Fuel Pool Area	3.8E-1	2.8E-1	3.1