

TABLE OF CONTENTS
(Continued)

<u>LIMITING CONDITIONS OF OPERATION</u>	<u>Page No.</u>	<u>SURVEILLANCE</u>
3.5 CORE AND CONTAINMENT COOLING SYSTEMS.....	99 ...	4.5
A. Core Spray and Low Pressure Coolant Injection.....	99 ...	A
B. Containment Spray Cooling Capability.....	102 ...	B
C. Residual Heat Removal (RHR) Service Water System.....	103 ...	C
D. Station Service Water and Alternate Cooling Tower Systems.....	104 ...	D
E. High Pressure Coolant Injection (HPCI) System.....	105 ...	E
F. Automatic Depressurization System.....	106 ...	F
G. Reactor Core Isolation Cooling System (RCIC).....	107 ...	G
H. Minimum Core and Containment Cooling System Availability.....	108 ...	H
I. Maintenance of Filled Discharge Pipe.....	109 ...	I
BASES	110	
3.6 REACTOR COOLANT SYSTEM.....	115 ...	4.6
A. Pressure and Temperature Limitations.....	115 ...	A
B. Coolant Chemistry.....	116 ...	B
C. Coolant Leakage.....	119 ...	C
D. Safety and Relief Valves.....	120 ...	D
E. Structural Integrity.....	120 ...	E
F. Jet Pumps.....	121 ...	F
G. Single Loop Operation.....	122 ...	
H. Recirculation System.....	126 ...	
I. Shock Suppressors.....	128 ...	I
J. Thermal Hydraulic Stability.....	134 ...	J
BASES	139	
3.7 STATION CONTAINMENT SYSTEMS.....	146 ...	4.7
A. Primary Containment.....	146 ...	A
B. Standby Gas Treatment.....	152 ...	B
C. Secondary Containment System.....	155 ...	C
D. Primary Containment Isolation Valves.....	156 ...	D
E. Reactor Building Automatic Ventilation System Isolation Valves (RBAVSIVs).....	158a ...	E
BASES	163	
3.8 RADIOACTIVE EFFLUENTS.....	172 ...	4.8
A. Deleted	172 ...	A
B. Deleted	172 ...	B
C. Deleted	172 ...	C
D. Liquid Holdup Tanks	172 ...	D
E. Deleted	173 ...	E

BASES:3.2 PROTECTIVE INSTRUMENTATION

In addition to reactor protection instrumentation which initiates a reactor scram, station protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the reactor operator's ability to control, or terminate a single operator error before it results in serious consequences. This set of Specifications provides the limiting conditions of operation for the primary system isolation function and initiation of the core standby cooling and standby gas treatment systems. The objectives of the Specifications are (i) to assure the effectiveness of any component of such systems even during periods when portions of such systems are out of service for maintenance, testing, or calibration, and (ii) to prescribe the trip settings required to assure adequate performance. This set of Specifications also provides the limiting conditions of operation for the control rod block system and surveillance instrumentation.

Isolation valves are installed in those lines that penetrate the primary containment and must be isolated during a loss-of-coolant accident so that the radiation dose limits are not exceeded during an accident condition. Actuation of these valves is initiated by protective instrumentation shown in Table 3.2.2 which senses the conditions for which isolation is required.

Such instrumentation must be available whenever primary containment integrity is required. The objective is to isolate the primary containment so that the limits of 10 CFR 100 are not exceeded during an accident. The objective of the low turbine condenser vacuum trip is to minimize the radioactive effluent releases to as low as practical in case of a main condenser failure. Subsequent releases would continue until operator action was taken to isolate the main condenser unless the main steam line isolation valves were closed automatically on low condenser vacuum. The manual bypass is required to permit initial startup of the reactor during low power operation.

The instrumentation which initiates primary system isolation is connected in a dual channel arrangement. Thus, the discussion given in the bases for Specification 3.1 is applicable here.

The low reactor water level instrumentation is set to trip when reactor water level is 127" above the top of the enriched fuel. This trip initiates closure of Group 2 and 3 primary containment isolation valves. For a trip setting of 127" above the top of the enriched fuel, the valves will be closed before perforation of the clad occurs even for the maximum break and, therefore, the setting is adequate.

The top of the enriched fuel (351.5" from vessel bottom) is designated as a common reference level for all reactor water level instrumentation. The intent is to minimize the potential for operator confusion which may result from different scale references.

The low-low reactor water level instrumentation is set to trip when reactor water level is 82.5" H₂O indicated on the reactor water level instrumentation above the top of the enriched fuel. This trip initiates closure of the Group 1 primary containment isolation valves and also activates the ECCS and RCIC System and starts the standby diesel generator system. This trip setting level was chosen to be low enough to prevent spurious operation, but high enough to initiate ECCS operation and primary system isolation so that no melting of the fuel cladding will occur, and so that post-accident cooling can be accomplished and the limits of 10CFR100 will not be violated.

3.5 LIMITING CONDITION FOR OPERATION

4. From and after the date that a LPCI Subsystem is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days unless it is sooner made operable, provided that during that time all active components of the other LPCI and the Containment Cooling Subsystem, the Core Spray Subsystems, and the diesel generators required for operation of such components if no external source of power were available, shall be operable.

4.5 SURVEILLANCE REQUIREMENT

4. Deleted.

3.5 LIMITING CONDITION FOR OPERATION

5. All recirculation pump discharge valves and bypass valves shall be operable or closed prior to reactor startup.
6. If the requirements of Specifications 3.5.A cannot be met, an orderly shutdown of the reactor shall be initiated and the reactor shall be in a cold shutdown condition within 24 hours.

B. Containment Spray Cooling Capability

1. Both containment cooling spray loops are required to be operable when the reactor water temperature is greater than 212°F except that a Containment Cooling Subsystem may be inoperable for thirty days.
2. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

4.5 SURVEILLANCE REQUIREMENT

5. Recirculation pump discharge valves shall be tested to verify full open to full closed in $27 \leq t \leq 33$ seconds and bypass valves shall be tested for operability in accordance with Specification 4.6.E.

B. Containment Spray Cooling Capability

1. Surveillance of the drywell spray loops shall be performed as follows. During each five-year period, an air test shall be performed on the drywell spray headers and nozzles.
2. Deleted.

3.7 LIMITING CONDITIONS FOR OPERATION

ΔP is reduced to <1.7) during required operability testing of the HPCI system pump, the RCIC system pump, the drywell-suppression chamber vacuum breakers, and the suppression chamber-reactor building vacuum breakers, and SGTS testing.

- d. If the specifications of 3.7.A.9.a cannot be met, and the differential pressure cannot be restored within the subsequent six (6) hour period, an orderly shutdown shall be initiated and the reactor shall be in a Hot Shutdown condition in six (6) hours and a Cold Shutdown condition in the following eighteen (18) hours.

B. Standby Gas Treatment System

- 1. a. Except as specified in Specification 3.7.B.3.a below, whenever the reactor is in Run Mode or Startup Mode or Hot Shutdown condition, both trains of the Standby Gas Treatment System shall be operable at all times when secondary containment integrity is required.
- b. Except as specified in Specification 3.7.B.3.b below, whenever the reactor is in Refuel Mode or Cold Shutdown condition, both trains of the Standby Gas

4.7 SURVEILLANCE REQUIPMENTS

B. Standby Gas Treatment System

- 1. At least once per operating cycle, not to exceed 18 months, the following conditions shall be demonstrated.
 - a. Pressure drop across the combined HEPA and charcoal filter banks is less than 6 inches of water at 1500 cfm $\pm 10\%$.
 - b. Inlet heater input is at least 7.1 kW.

3.7 LIMITING CONDITIONS FOR OPERATION

D. Primary Containment Isolation Valves

1. During reactor power operating conditions all containment isolation valves and all instrument line flow check valves shall be operable except as specified in Specification 3.7.D.2.

2. In the event any containment isolation valve becomes inoperable, reactor power operation may continue provided at least one containment isolation valve in each line having an inoperable valve is in the mode corresponding to the isolated condition.

3. If Specifications 3.7.D.1 and 3.7.D.2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

4.7 SURVEILLANCE REQUIREMENTS

D. Primary Containment Isolation Valves

1. Surveillance of the primary containment isolation valves should be performed as follows:
 - a. The operable isolation valves that are power operated and automatically initiated shall be tested for automatic initiation and closure time at least once per operating cycle.
 - b. Operability testing of the primary containment isolation valves shall be performed in accordance with Specification 4.6.E.
 - c. At least once per quarter, with the reactor power less than 75 percent of rated, trip all main steam isolation valves (one at a time) and verify closure time.

2. Whenever a containment isolation valve is inoperable, the position of at least one other valve in each line having an inoperable valve shall be logged daily.

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BASES: 3.7 (Cont'd)

An alternate electrical power source for the purposes of Specification 3.7.B.1.b shall consist of either an Emergency Diesel Generator (EDG) or the Vernon Hydro tie line. Maintaining availability of the Vernon Hydro tie line as an alternative to one of the EDGs in this condition provides assurance that standby gas treatment can, if required, be operated without placing undue constraints on EDG maintenance availability. Inoperability of both trains of the SGTS or both EDGs during refueling operations requires suspension of activities that represent a potential for releasing radioactive material to the secondary containment, thus placing the plant in a condition that minimizes risk.

Use of the SGTS, without the fan and the 7.1 kW heater in operation, as a vent path during torus venting does not impact subsequent adsorber capability because of the very low flows and because humidity control is maintained by the standby 1 kW heaters, therefore operation in this manner does not accrue as operating time.

D. Primary Containment Isolation Valves

Generally, double isolation valves are provided on lines that penetrate the primary containment and communicate directly with the reactor vessel and on lines that penetrate the primary containment and communicate with the primary containment free space. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss-of-coolant accident.

E. Reactor Building Automatic Ventilation System Isolation Valves (RBAVSIVs)

The function of the RBAVSIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs). The operability requirements for RBAVSIVs help ensure that an adequate secondary containment boundary is maintained during and after an accident by minimizing potential paths to the environment. The RBAVSIVs must be operable (or the penetration flow path isolated) to ensure secondary containment integrity and to limit the potential release of fission products to the environment. The valves covered by this Limiting Condition for Operation are included in the Inservice Testing Program.

In the event that there are one or more RBAVSIVs inoperable, the affected penetration flow path(s) must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. The required action must be completed within the eight hour or four hour completion time, as applicable. The specified time periods are reasonable considering the time required to isolate the penetration, and the probability of a DBA occurring during this short time.

If any required action or completion time cannot be met as a result of one or more inoperable RBAVSIVs, the plant must be placed in a mode or condition where the Limiting Condition for Operation does not apply. To achieve this status during reactor power operation, the reactor must be brought to at least hot shutdown within 12 hours and to cold shutdown within 36 hours. If applicable, core alterations and the movement of irradiated fuel assemblies and the fuel cask in the secondary containment must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be immediately initiated to suspend OPLRVs in order to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

5.0 DESIGN FEATURES5.1 Site

The station is located on the property on the west bank of the Connecticut River in the Town of Vernon, Vermont, which Entergy Nuclear Vermont Yankee, LLC either owns or to which it has perpetual rights and easements. The site plan showing the exclusion area boundary, boundary for gaseous effluents, boundary for liquid effluents, as well as areas defined per 10CFR20 as "controlled areas" and "unrestricted areas" are on plant drawing 5920-6245. The minimum distance to the boundary of the exclusion area as defined in 10CFR100.3 is 910 feet.

No part of the site shall be sold or leased and no structure shall be located on the site except structures owned by Entergy Nuclear Vermont Yankee, LLC or related utility companies and used in conjunction with normal utility operations.

5.2 Reactor

- A. The core shall consist of not more than 368 fuel assemblies.
- B. The reactor core shall contain 89 cruciform-shaped control rods. The control material shall be boron carbide powder (BC) or hafnium, or a combination of the two.

5.3 Reactor Vessel

The reactor vessel and applicable design codes shall be as described in Section 4 of the FSAR.

5.4 Containment

- A. The principal design parameters and applicable design codes for the primary containment shall be as given in Table 5.2.1 of the FSAR.
- B. The secondary containment shall be as described in subsection 5.3 of the FSAR and the applicable codes shall be as described in Section 12.0 of the FSAR.
- C. Penetrations to the primary containment and piping passing through such penetrations shall be designed in accordance with standards set forth in subsection 5.2 of the FSAR.

5.5 Spent and New Fuel Storage

- A. The new fuel storage facility shall be such that the effective multiplication factor (K_{eff}) of the fuel when dry is less than 0.90 and when flooded is less than 0.95.
- B. The K_{eff} of the fuel in the spent fuel storage pool shall be less than or equal to 0.95.
- C. Spent fuel storage racks may be moved (only) in accordance with written procedures which ensure that no rack modules are moved over fuel assemblies.

6.2 ORGANIZATION (Cont'd)C. Unit Staff Qualifications

Each member of the unit staff shall meet or exceed the minimum qualifications of the American National Standards Institute N-18.1-1971, "Selection and Training of Personnel for Nuclear Power Plants," except for the radiation protection manager who shall meet the qualifications of Regulatory Guide 1.8, Revision 1 (September 1975) and the Shift Engineer, who shall have a bachelor's degree or equivalent in a scientific or engineering discipline with specific training in plant design, and response and analysis of the plant for transients and accidents.

6.3 ACTION TO BE TAKEN IF A SAFETY LIMIT IS EXCEEDED

Applies to administrative action to be followed in the event a safety limit is exceeded.

If a safety limit is exceeded, the reactor shall be shutdown immediately.

6.4 PROCEDURES

Written procedures shall be established, implemented, and maintained covering the following activities:

- A. Normal startup, operation and shutdown of systems and components of the facility.
- B. Refueling operations.
- C. Actions to be taken to correct specific and foreseen potential malfunctions of systems or components, suspected Primary System leaks and abnormal reactivity changes
- D. Emergency conditions involving potential or actual release of radioactivity.
- E. Preventive and corrective maintenance operations which could have an effect on the safety of the reactor.
- F. Surveillance and testing requirements.
- G. Fire protection program implementation.
- H. Process Control Program in-plant implementation.
- I. Off-Site Dose Calculation Manual implementation.

6.5 HIGH RADIATION AREA

As provided in paragraph 20.1601(c) of 10 CFR 20, the following controls shall be applied to high radiation areas in place of the controls required by paragraphs 20.1601(a) and 20.1601(b) of 10 CFR 20: