

5.0 DESIGN FEATURES

5.1 Site

The station is located on the property on the west bank of the Connecticut River in the Town of Vernon, Vermont, which the Vermont Yankee Nuclear Power Corporation 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 the Vermont Yankee Nuclear Power Corporation 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 (B_4C) or hafnium, or a combination of the two.

5.3 Reactor Vessel

The reactor vessel shall be as described in Table 4.2-3 of the FSAR. The applicable design codes shall be as described in subsection 4.2 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.

VYNPS

STATION SITE AND ENVIRONSLIST OF FIGURES

<u>Figure No.</u>	<u>Reference Drawing No.</u>	<u>Title</u>
2.2-1		Location Map - 2-Mile Radius
2.2-2		Location Map - 10-Mile Radius
2.2-3		Location Map - 25-Mile Radius
2.2-4	G-191142	Station Plan
2.2-5	5920-6245	Plan Showing Exclusion Area and Restricted Area Boundaries
2.2-6		Station Site - Area Population Distribution - 5-Mile Radius - Year 1990
2.2-7		Station Site - Area Population Distribution - 10-Mile Radius - Year 1990 (Map)
2.2-8		Station Site - Area Population Distribution - 50-Mile Radius - Year 1990 (Map)

VYNPS

2.2 SITE DESCRIPTION

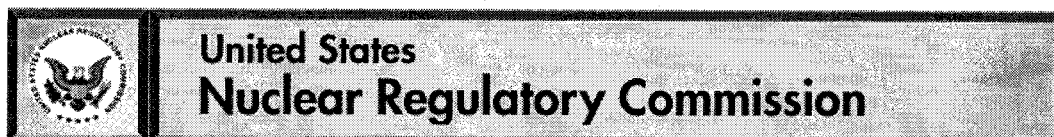
2.2.1 Location and Area

The site is located in the town of Vernon, Vermont in Windham County on the west shore of the Connecticut River immediately upstream of the Vernon Hydroelectric Station. The site contains about 125 acres owned by the Vermont Yankee Nuclear Power Corporation and a narrow strip of land between the Connecticut River and the east boundary of the Vermont Yankee property to which Vermont Yankee has perpetual rights and easements from the New England Power Company. This land is bounded on the north, south, and west by privately-owned land and on the east by the Connecticut River. Site coordinates are approximately 42° 47' north latitude and 72° 31' west longitude. Figures 2.2-1 through 2.2-3 locate the site. The site plot plan is shown on Figure 2.2-4. The site's exclusion area boundary and site area boundaries for both gaseous and liquid effluents are shown on Figure 2.2-5.

2.2.2 Population

The population density for 1980 was estimated to be about 106 people per square mile within a five-mile radius of the site. The population density in this same area was estimated to be 121 people per square mile in 1990, and projected to be about 127 people per square mile by 2000. Table 2.2.1 compares the growth of the estimated population and population density within 25 miles of the site between 1980 and 1990. In 1980, the total population within 25 miles was estimated to be 173,630, or an average density of 88 people per square mile. For 1990, the 25-mile radius population has been estimated to be about 189,038, or an average density of 96 people per square mile. This represents a growth factor of about 8.9% for this area over the ten-year period 1980 to 1990. Table 2.2.2 shows the current (1990) distribution of population in the area within a 50-mile radius of the site. The total resident population within 50 miles for 1990 is estimated to be about 1,435,699. Table 2.2.3 indicates the projected population by radial distance out to 50 miles for the year 2000 based on this region's projected growth rate of 5% over the next 10 years. The estimated 50-mile population for the year 2000 is 1,507,483.

Figures 2.2-6 and 2.2-7 show the estimated population in each 22-1/2° sectors around the site to a distance of 5 miles. Figure 2.2-7 shows the estimated population in each sector out to 10 miles from the site. The greatest concentration of population in these sectors is in the city of Brattleboro 4 to 5 miles NNW of the site. Figure 2.2-8 shows the estimated population in



Vermont Yankee Unit #1

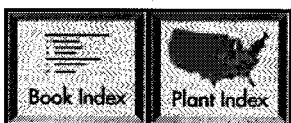
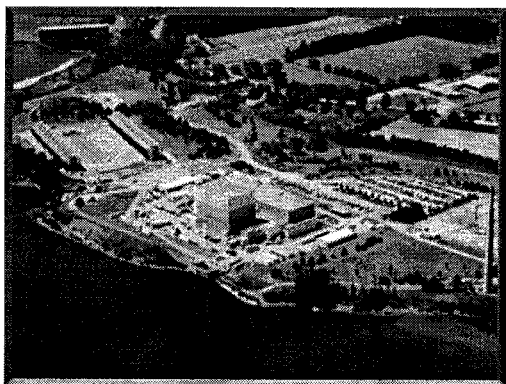


Table of Contents

A. Facility Statistics

- General Information
- Plant Summary

B. Emergency Response Information

- Emergency Response Facilities
- Site and Population
- Emergency Response Officials
- Appendix: Drawings, Charts and Maps
 - Site Plan
 - Emergency Planning Zone Sector Maps
 - Evacuation Routes
 - Emergency Planning Organization

C. Plant Description Summary

- General Plant Description
 - Site and Environs
 - Facility Arrangement
 - Nuclear System
 - Power Conversion Systems
 - Electrical Power Systems
 - Radioactive Waste Systems
- Nuclear Safety Systems and Engineered Safeguards
 - Reactor Protection System
 - Neutron Monitoring System
 - Control Rod Drive System
 - Nuclear System Pressure Relief Systems
 - Reactor Core Isolation Cooling System (RCIC)
 - Primary Containment System

- ☐ Reactor Vessel Isolation Control System
 - ☐ Secondary Containment
 - ☐ Main Steam Isolation Valves
 - ☐ Main Steam Line Flow Restrictors
 - ☐ Core Standby Cooling Systems
 - ☐ Residual Heat Removal System (Containment Cooling)
 - ☐ Control Rod Velocity Limiter
 - ☐ Control Rod Drive Housing Supports
 - ☐ Standby Gas Treatment System
 - ☐ Station Diesel Generator System
 - ☐ Station Battery System
 - ☐ Station Service Water System
 - ☐ Reactor Building Closed Cooling Water System
 - ☐ Main Steam Line Radiation Monitoring System
 - ☐ Reactor Building Ventilation Radiation Monitoring System
- ☐ Special Safety Systems
 - ☐ Standby Liquid Control System
 - ☐ Station Equipment Outside the Main Control Room
- ☐ Process Control and Instrumentation
 - ☐ Nuclear System Process Control and Instrumentation
 - ☐ Power Conversion System Process Control and Instrumentation
 - ☐ Radiation Monitoring and Control
- ☐ Auxiliary Systems
 - ☐ Normal Auxiliary AC Power Systems
 - ☐ Turbine Building Closed Cooling Water System
 - ☐ Alternate Cooling System
 - ☐ Fire Protection Systems
 - ☐ Heating, Ventilation, and Air Conditioning Systems
 - ☐ New and Spent Fuel Storage
 - ☐ Fuel Pool Cooling and Cleanup System
 - ☐ Service and Instrument Air Systems
 - ☐ Makeup Water Treatment System
 - ☐ Potable Water and Sanitary Systems
 - ☐ Equipment and Floor Drainage System
 - ☐ Process Sampling System
 - ☐ Post-Accident Sampling System
 - ☐ Station Communications Systems
- ☐ Station Shielding, Access Control, and Radiation Protection Procedures
 - ☐ Shielding
 - ☐ Access Control Procedures
 - ☐ Radiation Protection Procedures
- ☐ Implementation of Loading Criteria
- ☐ Plant Design Changes

D. Simplified Plant System Diagrams

- ☐ Primary Coolant System
- ☐ Reactor Core Isolation Cooling System (RCIC)
- ☐ HPCS, HPCI, and FWCI
- ☐ Isolation Condenser System
- ☐ Core Spray System
- ☐ Low Pressure Core Spray (LPCS) System
- ☐ Low Pressure Coolant Injection (LPCI) System
- ☐ Main Steam System
- ☐ Condensate and Feedwater System
- ☐ Emergency Electrical Distribution System
 - ☐ Electrical Distribution Systems
 - ☐ 125VDC Power Distribution System
 - ☐ 120/140 Electrical Distribution System
- ☐ Cooling Water Systems
 - ☐ Service Water System
 - ☐ Reactor Building Closed Cooling Water System
- ☐ Reactor Vessel and Internal Drawings
- ☐ Reactor Vessel Level Instrumentation Range Diagrams
- ☐ Neutron Monitoring System Range Diagrams
- ☐ Pressure Suppression Containment Drawings

☛ [ECCS Pump Performance Curves](#)

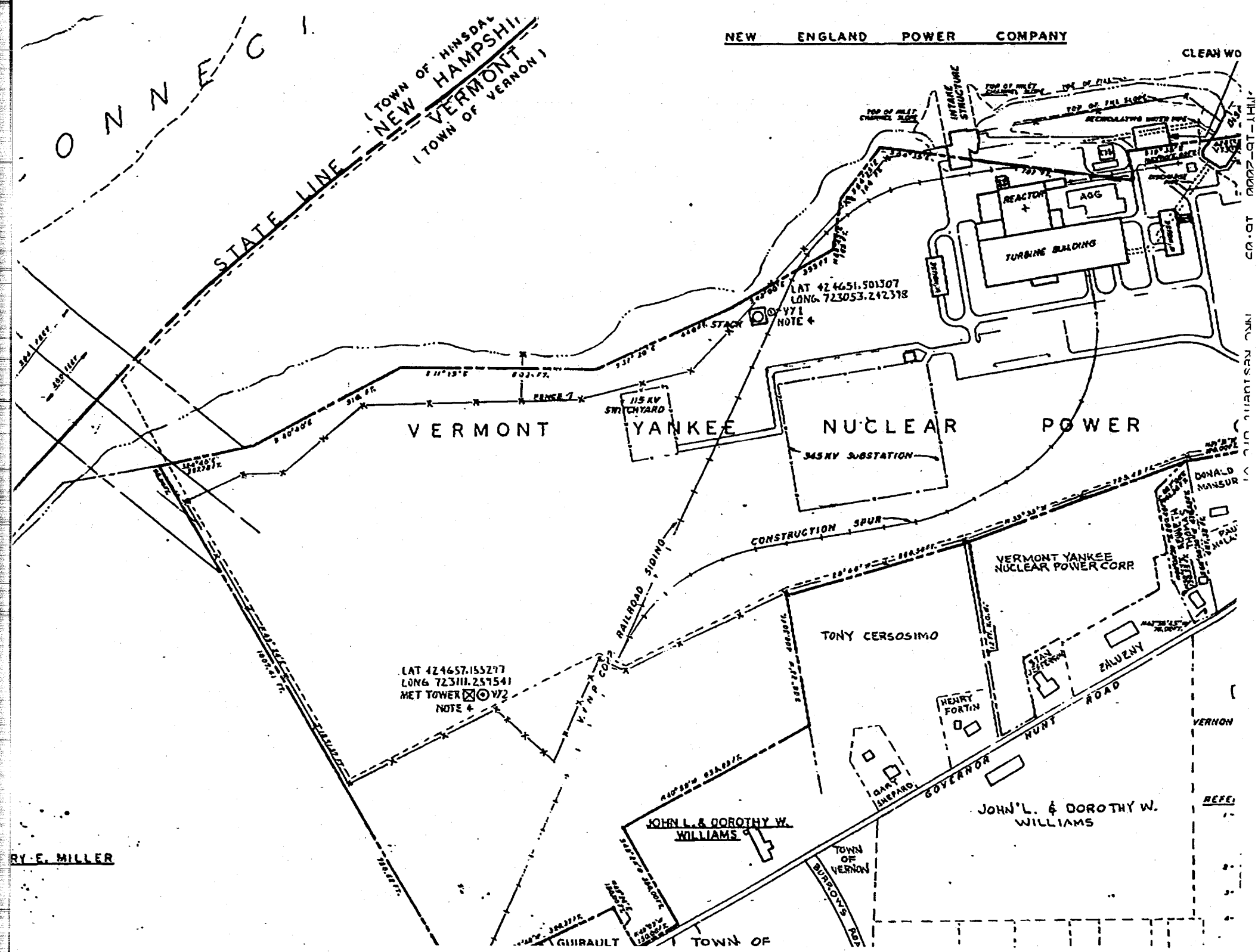
E. Detailed Plant System Data

- ☛ [Facility Statistics](#)
- ☛ [Primary Coolant System](#)
- ☛ [RPS and ESF Actuation Technical Specification Setpoints](#)
 - ☛ [RPS Technical Specification Setpoints](#)
 - ☛ [ECCS Instrumentation Setpoints](#)
 - ☛ [Recirculation Pump Trip Actuation Setpoints](#)
 - ☛ [Primary Containment Isolation Instrumentation Setpoints](#)
 - ☛ [RCIC Isolation Instrumentation Setpoints](#)
 - ☛ [SGTS Initiation Setpoints](#)
 - ☛ [Offgas System Isolation Instrumentation Setpoints](#)
- ☛ [Standby Liquid Control System](#)
- ☛ [Reactor Core Isolation Cooling \(RCIC\) System](#)
- ☛ [High Pressure Coolant Injection \(HPCI\) System](#)
- ☛ [Core Spray System](#)
- ☛ [Low Pressure Coolant Injection \(LPCI\)/Residual Heat Removal \(RHR\) System](#)
- ☛ [Condensate, Feedwater, and Circulating Water Systems](#)
- ☛ [Water Supply Sources](#)
- ☛ [Main Steam System](#)
- ☛ [Primary Containment](#)
- ☛ [Standby Gas Treatment System](#)
- ☛ [Alternate AC Power Sources](#)
- ☛ [Emergency Equipment Cooling Water System](#)
- ☛ [Residual Heat Removal Service Water System](#)
- ☛ [Reactor Building Cooling Water System](#)
- ☛ [Appendix A: Abbreviations](#)
- ☛ [View All of Section E.](#)

Last updated on Wednesday, February 4, 1998

Send comments to pib@nrc.gov

End of Page



[illegible]

1. VENOMOUS WATER MILLER POWER CO.
 - A - "CONSTRUCTION PLANT LAYOUT"
DATED NOV. 21 1940-12-18 (DATED 8-1-43)
 - B - "CIRCULATING WATER SYSTEM PLAN"
DATED DEC. 11 6-1943 (DATED 8-1-43)
 - C - "TOPOGRAPHICAL MAP OF VENOMOUS TRAIL AREA"
PLAN BY E. L. BURGESS, JR. (APR. 1943)
2. SCHEFFELT RIVER POWER CO.
 - A - "EXHIBIT 4-2, VENOMOUS PROJECT MAP"
DUE 11-10-1943, 3/11/44 (DATED 3-1-40)
3. WESTERN WATERWORKS ELECTRIC CO.
 - A - "FOURFIELD MOUNTAIN DAM TO STORAGE PROJECT-TOMMIE FALLS POND"
MAP 22 AND 33 OF 3 (JUN. 1943)
4. CENTRAL VENOMOUS PUBLIC UTILITY CO. (PLAN BY W. S. JAMES, JR.)
 - A - "PLAN SHOWING 112-12-42 ACRES IN VENOMOUS, VT."
FEB. 1920 1947, JULY 10, 1948
 - B - "PLAN SHOWING 60 ACRES IN VENOMOUS, WILLIAMS PROPERTIES, VENOMOUS, VT."
APRIL 1944
 - C - "PLAN SHOWING TWO PARCELS OF LAND BEING CONVEYED TO C.T.A.S., VERMONT"
OCTOBER 1948 (MILLER MAPS)

Enclosure

Station Plan Figures 2.2-4 & 2.2-5
are part of the
FINAL SAFETY ANALYSIS REPORT