VERMONT YANKEE
NUCLEAR POWER CORPORATION

RD 5, Box 169, Ferry Road, Brattleboro, VT 05301

2.C.2.1
REPLY TO: FVY 83-13
ENGINEERING OFFICE
1671 WORCESTER ROAD
FRAMINGHAM, MASSACHUSETTS 01701
TELEPHONE 617-872-8100

February 25, 1983

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Office of Nuclear Reactor Regulation
Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing

References: (a) License No. DPR-28 (Docket No. 50-271)
(b) Letter, USNRC to VYNPC, NVY 82-124, dated August 2, 1982
(c) Letter, USNRC to General Electric Co., dated February 23, 1979

Subject: Reactor Protection System (RPS) Power Supply

Dear Sir:

Reference (b) requested Vermont Yankee to provide you with certain design information regarding the Reactor Protection System (RPS) Power Monitoring System Modification. Reference (b) also forwarded, for our consideration, model Technical Specifications for RPS electric power monitoring.

The requested design information is provided in Attachments I and II. We have considered the proposed Technical Specifications and will forward a proposed change under separate cover.

We trust that this information is acceptable; however, should you have any questions, please contact us.

Very truly yours,

VERMONT NUCLEAR POWER CORPORATION

J.B. Sinclair

J. B. Sinclair
Licensing Engineer

JBS/jmb

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RESPONSES TO NRC REQUEST FOR DESIGN INFORMATION:

1) Request: Submit detailed drawings of the proposed design modification to the Monitoring System for the RPS power supplies (MGs and alternate source). The drawings should include component ratings, and schematic and wiring diagrams.

Response: Specifications are provided in Attachment II. The applicable drawings can be made available to you at our Engineering office.

2) Request: Submit a current revision of the electrical one-line diagram of the On-Site Distribution System and a schematic/elementary diagram that includes the RPS power distribution buses.

Response: One-line diagrams of the On-Site Distribution System may be found in Section 8.2 of the Vermont Yankee Final Safety Analysis Report (FSAR). Additional drawing can be made available to you at our Engineering office.

3) Request: Provide justification that proposed time delays, if any, will not result in damage to RPS System components or affect the performance of required safety functions.

Response: Each Electrical Protection Assembly (EPA) is provided with three independent time delay circuits, one each for undervoltage, overvoltage, and underfrequency. These are adjustable from approximately 0.1 to 3.0 seconds.

The time delay setting for the undervoltage monitoring circuit will be set at its maximum setting of approximately 3.0 seconds. This setting should avoid any nuisance tripping of the RPS due to transients and will not cause any damage to RPS components or affect RPS performance. We consider only sustained undervoltage as potentially damaging.

The time delay settings for the underfrequency and overvoltage monitoring circuits will be set at their minimum setting of approximately 0.1 seconds. With this minimum time delay, RPS components will not be subjected to transients outside the normal voltage and frequency range for any longer than dictated by the trip circuitry design.

4) Request: Provide justification that the design modification and components will meet the requirements of GDC 2 and GDC 21 of 10CFR Part 50, Appendix A.

Response: Vermont Yankee is installing the General Electric Reactor Protection System Circuit Upgrade package. The conceptual design of this package was presented to the NRC by General Electric for approval. The NRC letter to General Electric, Reference (c) of the cover letter, stated that the modification will bring the overall RPS design into full conformance with Criteria 2 and 21 of the General Design Criteria.

5) Request: Specify Monitoring System overvoltage, undervoltage, and underfrequency trip setpoints.

Response: It is anticipated that the following trip setpoints will be used:

Overvoltage: + 10% of nominal 120 V ac
Undervoltage: - 10% of nominal 120 V ac
Underfrequency: - 5% of nominal 60 Hertz

6) Request: Confirm that selected setpoints with time delays are based on the measured terminal voltage on the RPS components, including scram pilot solenoid valves, and will ensure rated voltage and frequency on the terminals of each of these components.

Response: Vermont Yankee has measured the terminal voltage on several RPS components, including solenoids, during normal operation. Based on these measurements and the expected operation of each Electrical Protection Assembly monitoring circuit, we conclude that rated voltage and frequency will be provided to these components.

SPECIFICATIONS

Following are the specifications to which the equipment was manufactured. These specifications meet or exceed Vermont Yankee's requirements.

1. ELECTRICAL

Nominal Voltage Range: 120 V ac (±2%)
Current Requirements:
  Startup Current: 280 mA for one second
  Running Current: 250 mA
Single Phase: Two Wire (plus ground)
Frequency: 50 hertz (Hz)/60 Hz
Time Delay: Continuously adjustable from approximately 0.1 to 3.0 seconds
Circuit Breaker Max Load: 175 amperes ac

2. OPERATING

Temperature: 40°F to 137°F
Humidity: Up to 95% Relative
Radiation: 2×10^4 RAD, Silcon Total Integrated Dose (TID) Group I
  2×10^5 RAD, Silcon Total Integrated dose (TID) Group II
Altitude: 0 - 10,000 feet above sea level

3. MECHANICAL

Weight: 60 pounds
Height: 20 inches
Depth: 8 inches
Width: 16 inches

4. SEISMIC

a. Operating Base Earthquake (OBE) 5.0 (G)
b. Safe Shutdown Earthquake (SSE) 7.0 G
C. Frequency Spectrum 1 to 33 Hz