

SEABROOK STATION
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June 20, 1984
SBN- 671
T.F. B7.1.2

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

Attention: Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket
Nos. 50-433 and 50-444
(b) PSNH Letter SBN-427, dated January 20, 1983, "Open Item
Responses", J. DeVincentis to G. Knighton
(c) PSNH Letter SBN-587, dated December 1, 1983, "Electrical
Interconnections Between Redundant Divisions",
J. DeVincentis to G. Knighton

Subject: Electrical Interconnections Between Redundant Divisions

Dear Sir:

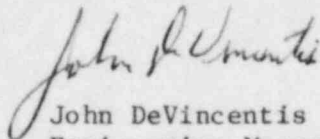
Reference (c) transmitted the results of a study performed to identify any cables between redundant divisions where physical separation is not fully in accordance with the criteria established in the FSAR. Identified deviations and proposed corrective actions were also documented as part of the study.

At the time of the submittal, the analysis of Item 10 of the study, pertaining to the computer Intelligence Remote Terminal Units (IRTU) 1, 2, 4, and 6 had not been completed. We had indicated in Reference (c) that the result of this analysis will be submitted as soon as they become available.

The analysis is now complete and is forwarded herewith for your review.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY



John DeVincentis
Engineering Manager

cc: Atomic Safety and Licensing Board Service List

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PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SEABROOK STATION - UNITS 1 AND 2

CABLES BETWEEN REDUNDANT SEPARATION GROUPS

<u>ITEM</u>	<u>EQUIPMENT DESCRIPTION</u>	<u>NODE NO.</u>	<u>ANALYSIS/RECOMMENDED MODIFICATION EVALUATION</u>
10.	Computer IRTU		
	IRTU 1 SC-CP-122	FD9	The Separation Group B Intelligence Remote Terminal Unit (IRTU) contains Separation Group A (Train A Associated) and Separation Group B (Train B Associated) cables. The Separation Group A cables are for the scan synchronization circuits between the host computers and the IRTU. These circuits are pulse circuits operating at 30 volt maximum and are considered low power circuits, incapable of propagating the power required to damage other circuits. The train A Associated power supply to the IRTU does not interface with Train B or Train B Associated power supplies, except through isolation devices or low power semiconductor devices. The Separation Group B cables are for analog, digital, RTD, and thermocouple inputs to the IRTU, which gathers and preprocesses the information for the host computer. The Separation Group A and Separation Group B cables and wiring are in proximity to one another inside the IRTU. The analysis below indicates that a failure involving Train A associated circuits in an IRTU will not challenge Separation Group B circuits. Therefore, this deviation from the independence between separation groups is acceptable and no modification is required. The following is a discussion of each type of Train B Associated input. 1. <u>Westinghouse Digital Inputs</u> These inputs to the IRTU are through a Modcomp Model 1125 Isolated Current Input Card which contains an optically coupled LED-photo transistor and provides up to 200 volts isolation.
	IRTU 2 SC-CP-125	FE5	
	IRTU 4 SC-CP-204	GY5	
	IRTU 6 SC-CP-212	JWO	

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In addition, all inputs to the IRTU are protected by surge suppression equipment (varistors for digital inputs and transorbs for analog inputs) located in the IRTU termination cabinet. Further, all of these circuits are very low power circuits which are protected by a variety of fuses, circuit breakers and current/voltage limiting devices. These protective measure will prevent propagation of failure from one separation group to another.

2. Other Digital Inputs

These inputs are isolated field contacts that are scanned by monitoring the voltage applied to the contacts by the IRTU. The inputs are not isolated from their Train A Associated power supply; however, they are electrically separate from other Train B and Train B Associated circuits.

Additional protection is provided as noted in the second paragraph of #1 above,
Westinghouse Digital Inputs

3. Analog Inputs

For these inputs isolation credit can be claimed by the following design features:

- a. The analog multiplexer selects only one input at a time; hence, the Train A Associated and Train B Associated inputs do not connect directly to each other.
- b. There is isolation in the wide range analog input subsystem between the scanning analog to digital (A/D) conversion circuitry and the computer interface point. This isolation is in the form of an isolating transformer; hence, there is no electrical connection between the computer circuitry and the wide range analog subsystem circuitry.

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			<p>c. The multiplexing A/D Conversion module is powered by a Train A Associated power source. However, this module is a very low power microelectronic semiconductor unit which is incapable of propagating the power required to damage other circuits. The power to this module comes from an internal low voltage power supply, which includes an isolating transformer. This transformer acts as a barrier between Train A Associated power supply and the internal circuitry of the module.</p> <p>Additional protection is provided as noted in the second paragraph of #1 above, Westinghouse Digital Inputs</p>
			<p>4. <u>Thermocouples Inputs</u></p> <p>These inputs are similar to the analog inputs with the exception that they come from electrically separate thermocouples whose circuitry does not interface with Train B Associated power supplies.</p>
			<p>5. <u>RTD Inputs</u></p> <p>These inputs are similar to the analog inputs with the exception that they come from the conversion cabinets (see Item 11) and are ultimately powered from Train A Associated power supplies. The RTDs do not interface with Train B or Train B Associated power supplies.</p>