PSNH

SEABROOK STATION
Engineering Office

Public Service of New Hampshire

New Hampshire Yankee Division

February 24, 1986

SBN- 950
T.F. B7.1.2

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Mr. Vincent S. Noonan, Project Director
PWR Project Directorate No. 5

References:
(a) Construction Permits CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) PSNH Letter SBN-903, dated November 27, 1985, "Resolution of Power System Branch Confirmatory Items," J. DeVincentis to G. W. Knighton
(c) PSNH Letter SBN-899, dated November 21, 1985, "Seabrook Station Voltage Regulation Study," J. DeVincentis to G. W. Knighton

Subject: Resolution of Power System Branch Confirmatory Item; SER Section 8.3.1.1.3, Item (2) (SER Confirmatory Issue No. 22)

Dear Sir:

SER Section 8.3.1.1.3, Item (2), regarding compliance with Position B3 of Branch Technical Position (BTP) PSB-1, requires confirmation that the starting and running of Non-Class 1E loads coincident with the start of accident loads have been considered in the Voltage Regulation Study [Reference (c)] and are reflected in Table 3 of the same study.

The running of Non-Class 1E loads coincident with the start of accident loads has been addressed in a previous response [Reference (b)]. To address the concern regarding the starting of Non-Class 1E loads during accident conditions, we have performed a review to determine the potential for these loads to randomly start coincident with accident loads and any subsequent effects on the Class 1E bus voltages. The results of our evaluation indicate that the consideration of the random start loads coincident with accident loading does not reduce the Class 1E bus voltages, as presented in Table 3 of the Voltage Study, to unacceptable levels.

In the course of this review, we identified some additional loads which receive a start signal during accident conditions via the Containment Isolation (T) Signal. Previously, only those starts initiated by a Safety Injection (SI) Signal were considered. Table 3 of the Voltage Regulation Study has been revised to incorporate the simultaneous start of these loads during accident conditions. A copy of the revised Table 3 is attached.

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As can be seen in the enclosed table, all voltages are above the 80% required for starting except the voltages at the terminals of fans EAH-FN-4A and 4B. This condition is determined to be acceptable based on the following reasons:

1. Adequate voltage exists for the acceleration of all 4kV safeguards motors, and as these large motors accelerate (typically one to two seconds), voltage at the 480V buses will recover within two seconds such that the voltage at the terminals of the subject 460V motors will exceed the required 80%.

2. Discussions with the fan vendor indicate that there would be no problem in starting and accelerating the subject fans with terminal voltages as low as 75% from zero to two seconds, followed by voltage recovery above 80% after two seconds. Vendor's reasons for justification include: a) subject motors are only 72% loaded, b) motors utilize Class H insulation, and 3) motors are only 7.5 hp but have frame size comparable to 20 hp motor.

3. It should also be noted that during PSB-1 verification testing, it was identified that the computer model used to simulate motor start conditions yielded conservative results.

Based on the results of our evaluation which considers the starting and running of Non-Class 1E loads coincident with the start of accident loads, we believe that this submittal resolves that portion of SER Confirmatory Issue No.22 involving SER Section 8.3.1.1.3, Item (2); and we request that the resolution of this item be reflected in the next supplement to Seabrook Station's SER.

Very truly yours,

John DeVincentis, Director
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TABLE 3

BUS AND MOTOR TERMINAL VOLTAGES
WHEN STARTING ALL ACCIDENT LOADS SIMULTANEOUSLY
UNIT RUNNING AT FULL LOAD
UTILITY GRID AT MINIMUM ANTICIPATED VOLTAGE
(ALL VOLTAGES ARE ON MOTOR VOLTAGE BASE)

BUS OR MOTOR TAG NO.	HP	NOMINAL VOLTAGE, V	SOURCE FROM UAT, pu	SOURCE FROM RAT, pu
EDE-SWG-5	---	4160	0.9208	0.9344
* SI-P-6A	450	4000	0.9183	0.9318
* RH-P-8A	400	4000	0.9190	0.9325
* CS-P-2A	600	4000	0.9171	0.9306
EDE-US-51	---	480	0.8789	0.8936
EDE-MCC-512	---	460	0.8751	0.8898
* EAH-FN-4A	7.5	460	0.7971	0.8105
* CS-V-142	1.9	460	0.8404	0.8545
* CS-LCV-112B	1.9	460	0.8279	0.8418
* CS-LCV-112D	0.7	460	0.8497	0.8640
* CS-V-196	0.7	460	0.8579	0.8724
EDE-US-52	---	480	0.8868	0.9016
EDE-MCC-521	---	460	0.8852	0.9000
* CBA-FN-16A	15	460	0.8398	0.8538
CBA-FN-19	40	460	0.8781	0.8930
EDE-US-53	---	480	0.8879	0.9029
EDE-SWG-6	---	4160	0.8986	0.9145
* SI-P-6B	450	4000	0.8966	0.9126
* RH-P-8B	400	4000	0.8971	0.9130
* CS-P-2B	600	4000	0.8952	0.9111
* FW-P-37B	900	4000	0.8924	0.9083
EDE-US-61	---	480	0.8506	0.8672
EDE-MCC-612	---	460	0.8466	0.8632
* EAH-FN-4B	7.5	460	0.7728	0.7880
* SW-V-5	0.33	460	0.8396	0.8561
* CS-LCV-112C	1.9	460	0.8007	0.8165
* CS-LCV-112E	0.7	460	0.8295	0.8458
* CS-V-197	0.7	460	0.8317	0.8480
EDE-US-62	---	480	0.8693	0.8866
EDE-MCC-621	---	460	0.8674	0.8848
CBA-FN-32	40	460	0.8611	0.8786
* CBA-FN-16B	15	460	0.8367	0.8534

NOTES: * SIMULTANEOUS STARTING LOAD

1) OTHER SAFETY AND NON SAFETY LOADS ARE RUNNING
2) THE FOLLOWING LOADS ARE LUMPED TOGETHER AS BULK STARTING LOAD ON RESPECTIVE BUSES:

LOAD	HP	MCC	LOAD	HP	MCC
CS-V-167	0.7	EDE-MCC-512	CS-V-143	1.9	EDE-MCC-612
CC-V-145	0.33	EDE-MCC-512	CS-V-168	1.0	EDE-MCC-612
CS-V-149	0.7	EDE-MCC-512	CC-V-272	0.33	EDE-MCC-612
SW-V-4	0.33	EDE-MCC-512			
CGC-V-14	0.33	EDE-MCC-521	CGC-V-28	0.33	EDE-MCC-621

TERMINAL VOLTAGES FOR THESE LOADS ARE NOT LISTED IN THE TABLE BECAUSE THE LOADS IN THE TABLE REPRESENT THE WORST CASE VOLTAGE DROPS.