New Hampshire
Yankee

George S. Thomas
Vice President-Nuclear Production

NYN-89057

May 8, 1989

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

References: a) Facility Operating License NPF-56, Docket No. 50-443

b) PSNH Letter, NYN-87136 dated November 23, 1987, "NUREG-0737, Task II.D.1, Performance Testing of Relief and Safety Valves," G. S. Thomas to USNRC

Subject: NRC Request for Additional Information Regarding NUREG-0737, Item II.D.1

Gentlemen:

In Reference (b), New Hampshire Yankee (NHY) responded to several NRC questions regarding the applicability of performance testing of safety and relief valves by the Electric Power Research Institute (EPRI) and the analyses performed on the Seabrook Station safety and relief valve piping systems.

The NRC Staff has recently requested further additional information from NHY regarding safety and relief valve load combinations, inlet water conditions and pressure settings. Responses to these additional information requests are contained in the Enclosure.

Should you have further questions concerning this response, please contact Mr. Robert E. Sweeney in our Bethesda Office at (301) 656-6100.

Very truly yours,

George S. Thomas

Enclosure

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cc: Mr. William T. Russell
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ENCLOSURE TO NYN- 89057

Question 1

a. Confirm that the safety valve and relief valve discharge loads were combined with earthquake loads.

b. At what service limit were they combined?

c. How does Seabrook's loading combinations compare to those in Electric Power Research Institute (EPRI) Report, "PWR Safety and Relief Valve Test Program Guide for Application of Valve Test Program Results to Plant-Specific Evaluation" Interim Report, July 1982, Tables 2A and 2B.

Response

a. As delineated in Attachment 1 hereto, the safety valve and relief valve discharge loads (TR) were combined with the earthquake loads (OBE and SSE). As discussed in NHY letter NYN-87136 [Reference (b)] in response to RAI 11.E, stresses from individual load cases were, in general, conservatively combined using absolute summation. Justification was also provided to allow the use of Square Root Sum of the Squares (SRSS) method of combination as an option for dynamic loads. (See NOTE 6 of Attachment 2 hereto.)

b. Attachment 2 hereto (Table 2A) has been annotated (shown in parentheses) to delineate the service limits used by NHY. It can be seen that NHY utilized more conservative service limits than required by Table 2A.

c. All the piping downstream of the pressurizer safety and relief valves is seismically designed and supported: therefore, a comparison of load combinations is made in Attachment 2 hereto with Table 2A only.

Attachment 2 hereto (Table 2A) has been annotated (shown in parentheses) to delineate the corresponding load combinations used by NHY in the design of the discharge system piping downstream of the valves. The applicable service limits used by NHY are also shown (in parentheses) Note, the load combinations, presented in Attachment 1 hereto and Attachment 2 hereto, do not differentiate between the relief valve and safety valve transient loadings. The term TR is used generically to represent transient loading for the piping system under review.

Question 2

In demonstrating safety relief valve operability in relatively cooler regimes (i.e., 569°F to 584°F), how does Seabrook consider effects of its inlet liquid water conditions? Are these inlet conditions still valid? Does WCAP-11677 provide details that show considerations of inlet liquid water conditions at these temperatures and their effects? Please provide WCAP-11677 or relative portions, if possible.

Response

The inlet water conditions used to determine operability of safety relief valves at Seabrook Station are identified in WCAP-11677. The site specific conditions in this report are still valid. A copy of WCAP-11677 is attached hereto as Attachment 3.

Question 3

Reaffirm that Seabrook's safety valve settings were the factory settings used in EPRI test.

Response

The pressure settings were not changed from factory settings of 2,500 psia. These settings were tested by the EPRI test, and the applicability of the test to the Seabrook safety valves was discussed in detail in NHY letter SBN-969 dated March 17, 1986.

Attachment 1 p 1 of 1

TABLE 7

ANSI B31.1 - NNS-1 SEISMICALLY DESIGNED PIPING SYSTEMS LOAD COMBINATIONS & STRESS LIMITS

SYSTEM CONDITION	LOAD COMBINATION	STRESS CATEGORY	LIMITS	STRESS COMBINATION
DESIGN	P	P_m	S_h	EQ(3) to EQ(5)
	P + D	$P_m + P_b$	S_h	EQ(8)
NORMAL	T OR	P_e	(SERVICE LIMITS) SA (A)	EQ(10)
	P + D + T	$P_m + P_t + P_e$	$S_h + S_A$ (A)	EQ(11)
OCCASIONAL	$P_{max.}$ + D + TR (EMERGENCY)	$P_m + P_t$	1.2 S_h (B)	EQ (9)
OCCASIONAL II	$P_{max.}$+D+TR+OBE+SAD(OBE) (UPSET) AND	$P_m + P_t$	1.8 S_h (C)	EQ(9)
	$P_{max.}$+D+TR+SSE+SAD(SSE) (FAULTED)	$P_m + P_t$	1.8 S_h (C)	EQ(9)

P - DESIGN PRESSURE
D - DEAD WEIGHT
T - DESIGN TEMPERATURE
P_{MAX} - PEAK PRESSURE
TR - VALVE DISCHARGE TRANSIENT (SAFETY OR RELIEF)
OBE - OBE INERTIA
SSE - SSE INERTIA
$SAD_{(OBE)}$ - SEISMIC ANCHOR DISPLACEMENT (OBE)
$SAD_{(SSE)}$ - SEISMIC ANCHOR DISPLACEMENT (SSE)

TABLE 2A

LOAD COMBINATIONS AND ACCEPTANCE CRITERIA FOR PRESSURIZER SAFETY AND RELIEF VALVE PIPING AND SUPPORTS - SEISMICALLY DESIGNED DOWNSTREAM PORTION

Combination	Plant/System Operating Condition	Load Combination		Service Stress Limit	
1	Normal	N	(P+D+T)	A	(A)
2	Upset	N + SOT_U	(P+D+TR)	B	(B)
3	Upset	N + OBE + SOT_U	(P_{MAX}+D+TR+OBE +$SAD_{(OBE)}$)	C	(C)
4	Emergency	N + SOT_E	(P+D+TR)	C	(B)
5	Faulted	N + MS/FWPB or DBPB + SSE + SOT_F	(P_{MAX}+D +TR+SSE +$SAD_{(SSE)}$)	D	(C)
6	Faulted	N + LOCA + SSE + SOT_F		D	

NOTES:

1.) Plants without an FSAR may use the proposed criteria contained in Tables 1-3. Plants with an FSAR may use their original design basis in conjunction with the appropriate system operating transient definitions in Table 3; or they may use the proposed criteria contained in Tables 1-3.

2.) This table is applicable to the seismically designed portion of downstream non-Category I piping (and supports) necessary to isolate the Category I portion from the non-seismically designed piping response, and to assure acceptable valve loading on the discharge nozzle.

3.) See Table 3 for SOT definitions and other load abbreviations.

4.) The bounding number of valves (and discharge sequence if setpoints are significantly different) for the applicable system operating transient defined in Table 3 should be used.

5.) Verification of functional capability is not required, but allowable loads and accelerations for the safety/relief valves must be met.

6.) Use SRSS for combining dynamic load responses.

Attachment 2 p 1 of 2

TABLE 3

DEFINITIONS OF LOAD ABBREVIATIONS

N	= Sustained Loads During Normal Plant Operation
SOT	= System Operating Transient
SOT_U	= Relief Valve Discharge Transient (1)
SOT_E	= Safety Valve Discharge Transient (1)
SOT_F	= Max (SOT_U; SOT_E); or Transition Flow
OBE	= Operating Basis Earthquake
SSE	= Safe Shutdown Earthquake
MS/FWPB	= Main Steam or Feedwater Pipe Break
DBPB	= Design Basis Pipe Break
LOCA	= Loss of Coolant Accident

(1) May also include transition flow, if determined that required operating procedures could lead to this condition.

(2) Although certain transients (for example loss of load) which are classified as a service level B conditions may actuate the safety valves, the extremely low probability of actual safety valve actuation may be used to justify this as a service level C condition with the limitation that the plant will be shut down for examination after an appropriate number of actuations (to be determined on a plant specific basis).

NOTE: Plants without an FSAR may use the proposed criteria contained in Tables 1-3. Plants with an FSAR may use their original design basis in conjunction with the appropriate system operating transient definitions in Table 3; or they may use the proposed criteria contained in Tables 1-3.