George S. Thomas
Vice President-Nuclear Production

PSNH

Public Service of New Hampshire
New Hampshire Yankee Division

NYN- 88093

July 8, 1988

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

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

(b) NRC Bulletin 88-04, dated May 5, 1988, "Potential Safety-Related Pump Loss"

Subject: Response to NRC Bulletin 88-04

Dear Sir:

In response to Reference (b), this letter provides the results of analyses performed to date regarding the applicability or consequences of two design concerns affecting centrifugal pump minimum flow. The first design concern involves the potential for adverse interaction between two or more, safety-related, centrifugal pumps operating in a parallel configuration at minimum flow rates. The second design concern involves the adequacy of centrifugal pump installed minimum flow capacity. All active, safety-related fluid systems at Seabrook Station have been reviewed for the applicability of these two concerns.

In response to the first concern, each safety-related fluid system at Seabrook Station employing multiple centrifugal pumps capable of operating in parallel was reviewed to determine whether or not the system design configuration precludes pump-to-pump interaction during minimum flow operation which could result in dead-heading one or more pumps. Specifically reviewed were the Charging (CS), Safety Injection (SI), Residual Heat Removal (RH), Emergency Feedwater (EFW), Containment Building Spray (CBS) and Boric Acid Transfer systems. Of these, only the CBS system has a piping configuration that does not preclude the type of pump-to-pump interaction that could result in pump dead-heading.

The CBS system design includes a single recirculation line shared by the two CBS pumps. The recirculation line configuration provides a discharge cross-connect path between the two CBS pumps which creates the potential for pump-to-pump interaction. However, this recirculation line is utilized only during surveillance testing; and station procedures specify that during surveillance testing, only one CBS pump shall be operated at a time. When the CBS system is not under test, but is required to be operable, Station procedures specify a valve alignment which isolates the pump discharge cross-connect path between CBS pumps and precludes pump-to-pump interaction. Therefore, the CBS system piping configuration provides the potential for pump-to-pump interaction, but Station procedures preclude this interaction at all times.

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Each of the other identified systems has a piping configuration which precludes pump-to-pump interaction which could lead to pump dead-heading. Therefore, Seabrook Station safety-related systems that employ centrifugal pumps capable of operating in parallel on minimum-flow are not subject to pump-to-pump interaction which could result in the dead-heading of a pump.

The second concern is the adequacy of the installed minimum flow capacity for each safety-related centrifugal pump. This concern has arisen because the design criteria for establishing the minimum flow rate of a typical centrifugal pump may have been based solely upon pumped fluid temperature rise considerations without proper accounting for pump internal flow instabilities.

Enclosure 1 lists the currently-installed minimum flow rates for the identified centrifugal pumps. A detailed evaluation of the adequacy of this installed minimum flow capacity has been initiated for each pump. This evaluation will encompass the considerations delineated in Item #3 under "Actions Requested" in the Bulletin. A report on the results of this evaluation will be submitted to the NRC by December 31, 1988.

As explained above, the dead-heading concern is not applicable to safety-related systems at Seabrook Station. The identified centrifugal pumps have accumulated a short operating history during pre-operational, hot functional and surveillance testing. The performance of each pump is monitored as required by the ASME Section XI Pump Testing Program. To the best of our knowledge, no pump performance degradation attributable to an inadequate minimum flow rate has occurred thus far.

Should you have any questions regarding this information, please contact Mr. Geoffrey Kingston at (603)-474-9574, extension 3371.

Very truly yours,

George S. Thomas

Enclosure

cc: Mr. William T. Russell
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STATE OF NEW HAMPSHIRE

Rockingham, ss. July 8, 1988

Then personally appeared before me, the above-named George S. Thomas who, being duly sworn, did state that he is Vice President - Nuclear Production of Public Service Company of New Hampshire, that he is duly authorized to execute and file the foregoing information in the name and on the behalf of Public Service Company of New Hampshire, and that the statements therein are true to the best of his knowledge and belief.

Beverly E. Silloway

Beverly E. Silloway, Notary Public
My Commission Expires: March 6, 1990

ENCLOSURE 1 TO NYN- 88093

Tabulation of Centrifugal Pump Installed Minimum Flow Capacity

	Installed Minimum Flow Capacity	
Pump	Gallons per Minute	Percent of BEP [1]
Charging (CS)	66	18
Intermediate Head Safety Injection (SI)	42	10
Residual Heat Removal (RH)	590 - 660	15
Containment Building Spray (CBS)	1920 - 1935	63
Boric Acid Transfer	10	9
Emergency Feedwater (EFW)	270 - 290	31

Note 1: Best Efficiency Point Flow (BEP). Percentages are approximate.