PSNH PUBLIC SERVICE
Company of New Hampshire

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April 15, 1982

SBN-259
T.F. B 7.1.2

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

Attention: Mr. Frank J. Miraglia, Chief
Licensing Branch No. 3
Division of Licensing

References:
(a) Construction Permits CPPR-135 and CPPR-136, Docket Nos. 50-443 and 50-444
(b) PSNH Letter, dated April 8, 1982, "Response to 460 Series RAIs; (Effluent Treatment Systems Branch)," J. DeVincentis to F. J. Miraglia
(c) PSNH Letter, dated April 9, 1982, "Response to 460 Series RAIs; (Effluent Treatment Systems Branch)," J. DeVincentis to F. J. Miraglia

Subject: Response to RAI 460.13; (Effluent Treatment Systems Branch)

Dear Sir:

Enclosed is the response to the subject RAI.

This response was not included with Reference (b) or Reference (c), which together submitted the balance of the 460 series RAI respones.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

John R. Devincentis

John DeVincentis
Project Manager

Enclosure

B001
S/1

460.13 There is a concern on the part of the staff as to the capability of the SGB system to treat the SGB if primary to secondary leaks are occurring in SGs of both units. Our experience indicates that it is not unusual to find SGB rates of 30 gpm/SG. It does not appear that the system has the capability to treat this flow rate even if the leak is occurring in the SG of only one of the units since the evaporators are limited to 25 gpm per evaporator and there are only 3 evaporators and since additional capability could not always be guaranteed from the liquid waste evaporator. Although the SGB system has demineralizers for treatment of SGB during periods of no primary to secondary leak, the discharge from the demineralizers can only be discharged to the condenser, and not to the circulating water system. Our concern is that if the evaporators do not have the capability to handle the amount of SGB, then discharges to the waste test tank discharge header can only occur without treatment of the SGB. Explain the capability of the SGB system to treat the blowdown under conditions where one of the SGB evaporators is inoperative, primary to secondary leaks are occurring in the SG's of both units, and the basis for limiting SGB to a maximum of 75 gpm under these conditions.

RESPONSE: FSAR Section 10.4.8 describes the steam generator blowdown system and its capacity to process blowdown liquid, both with and without a steam generator tube leak. This section also states that with a primary to secondary leak rate of 0.5 gpm, a blowdown rate of approximately 30 gpm would be required to limit the total dissolved solids concentration in the steam generators. It should be noted that this number is conservative in as much as the Technical Specifications limit the primary to secondary leak rate in any one steam generator to a maximum of 500 gpd or less than 0.35 gpm.

It is recognized that normal blowdown rates without a primary to secondary leak might also be on the order of 30 gpm. It would therefore appear that a processing capacity of 120 gpm per unit would be necessary. However, this is not necessarily the case.

First of all, the discussion of blowdown processing with a steam generator tube leak in Section 10.4.8 does not consider that only 70% of the blowdown flow is actually processed by the blowdown evaporators. The other 30% is flashed to steam in the flash tank, condensed in the flash steam condenser and subsequently discharged to the waste test tanks. Thus the evaporator processing capacity required under the above assumptions is less than 85 gpm per unit.

Secondly, continuous operation with a primary to secondary leak rate of 0.5 gpm, or even 0.35 gpm, is not a normal anticipated occurrance. The Seabrook operating philosophy is to maintain zero leakage from the primary to secondary systems and many design and material changes have been implemented to achieve this. However, it is obvious that the potential for tube leakage will always exist. For this reason, a limited primary to secondary leak rate is permitted. This allows flexibility in the scheduling of an outage to repair the leaking steam generator. The urgency of repairs is obviously dependent on the leak rate, the primary

system chemistry and the resulting secondary side chemistry. Therefore, recognizing that unlimited, continuous plant operation with a 0.5 gpm steam generator tube leak will not occur, other modifications to normal operating practices can be instituted during the interim between the initiation of a tube leak and the time until repairs are affected. One of these modifications could be the reduction of blowdown from the unaffected steam generators. By reducing the blowdown rate from the unaffected steam generators to 10-12 gpm per steam generator, and assuming 30 gpm blowdown from the affected steam generator, and recognizing that only 70% of the blowdown liquid requires processing by the blowdown evaporators, the required processing capacity of the blowdown evaporators is now less than 50 gpm per unit.

Finally, as mentioned in Section 10.4.8, should excess evaporator processing capacity be required, a cross-connect is provided with the liquid waste evaporator through the floor drain system. This evaporator has a capacity of 25 gpm and is described in FSAR Section 11.2.3.1. Additionally, as can be seen from FSAR Figures 11.2-1, 9.3-18, 9.3-19 and 9.3-20, the discharges from the floor drain system can be directed to the two boron recovery system evaporators, each of which has a capacity of 25 gpm.

Therefore, looking at the total site evaporative capacity to which the steam generator blowdown could be directed, the following is available:

a) Three steam generator blowdown recovery evaporators, each with a capacity of 25 gpm,

b) Two boron recovery evaporators, each with a capacity of 25 gpm,

c) One Liquid Waste Evaporator with a capacity of 25 gpm.

Thus, the total evaporative capacity available is 150 gpm. Assuming this is the unflashed liquid portion of the steam generator blowdown, this would relate to a total blowdown flow rate of about 215 gpm or in excess of 107 gpm per unit.

If one were to hypothesize a tube leak in one of the steam generators in each unit and additionally assume the unavailability of any <u>two</u> of the above mentioned evaporators, it can be shown that sufficient blowdown evaporative capacity exists using the assumptions mentioned before. Should any postulated series of events result in a required steam generator blowdown rate which exceeds the available capacity of the evaporative processing systems, one or both units would be shut down to affect repairs.