NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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April 12, 1984

Docket No. 50-423
B11107

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: (1) B. J. Youngblood to W. G. Counsil, Draft SER for Millstone Nuclear Power Station, Unit No. 3, dated December 20, 1983.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Submittal of Responses to the Effluent
Treatment Systems Branch Draft SER Open Items

In Reference (1) several items were identified as open and required further information with respect to effluent treatment systems.

Below is the status of each identified item:

Item	Subject	Status
ETSB 01 (58)	ESF Atm. Cleanup Sys. (6.5.1)	Response due
ETSB 02 (94)	Turb. Gland Seal Cond. (10.4.3)	Response attached
ETSB 03 (95)	Liquid Rad. Waste Management Sys. (11.2.1)	NRC required to complete review
ETSB 04 (96)	Cont. Vac. Steam Air Ejector (11.3.1) (11.3.2)	Response attached
ETSB 05 (97)	Gaseous Waste Management System (11.3.1)	NRC required to complete review
ETSB 06 (98) 460.10	BRS Hold-up Tanks (11.3.1) (11.3.2)	Response attached
ETSB 07 (99)	Warehouse No. 5 Vent. Exhaust (11.3.2)	Response attached

B001
1/1

Item	Subject	Status
ETSB 08 (100)	Potential Gaseous Rad. Effluent Release	NRC Item Nos. 94, 96 and 99 respond to this item.
ETSB 09 (144)	Postulated Rad. Releases Liquid Tank Failures (15.7.3)	NRC required to complete review
ETSB 10 (145)	TMI Item III.D.1.1 (15.9.15)	Item's category should be changed to confirmatory
ETSB 1.9 (2)	Mech. Vacuum Pump Discharges	This item was listed as a license condition. Response attached.

Attachment 1 provides our responses. Please note that for three remaining open items the NRC is required to complete their review. For two of these items, Nos. 95 and 144, the NRC staff reviewer has acknowledged this commitment within the Draft SER. Concerning the third item, No. 97, the reviewer has stated that the assessment will be published in the DES and also addressed in the final SER. In view of the schedule to publish the DES we believe that the "assessment" of this item should be complete at this time. Therefore, we request the NRC inform us of any additional information requests now so this item as well as Nos. 95 and 144 can be closed before the SER is issued formally. We request Item No. 145 be converted to the "confirmatory" status since we have made a commitment to submit a detailed program description four months prior to fuel load. If necessary, further details of our plans can be discussed in a meeting. Additionally, note that item ETSB 1.9 (2) was categorized as a license condition. We are responding to close this item.

As a follow-up to this submittal we request a meeting with your staff reviewer on a mutually acceptable date. If you have any questions, please contact our licensing representative directly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY
ET. AL.
By NORTHEAST NUCLEAR ENERGY COMPANY
Their Agent

W. G. Counsil
Senior Vice President

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, an Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Lorraine J. D'Amico
Notary Public

My Commission Expires March 31, 1988

ETSB 02 (94)

Turbine Gland Seal Condenser Vent

The venting of the turbine gland seal condenser's noncondensible gases is not monitored as required by Table 1 of SRP Section 11.5. The applicant stated in response to the staff's inquiry that he does not consider the turbine gland seal condenser a principal source of radionuclide release and, therefore, it does not require monitoring because the expected activity is far below guideline values. Although the turbine gland seal condenser is not a principal source, it is, nevertheless, a source that, according to GDC 64, requires monitoring for radioactivity.

Because of the commitment by the applicant to meet the acceptance criteria of the SRP, the staff can conclude that the turbine gland sealing system meets the requirements of GDC 60 and 64 with respect to the control and monitoring of releases of radioactive materials to the environment by providing a controlled and monitored turbine gland sealing system.

Response:

NUREG-0473 provides guidance for establishment of radiological effluent technical specifications (RETS) for BWRs. Table 3.3.7.12-1 of this NUREG specifically outlines monitoring requirements for the turbine gland seal condenser vent. However, similar RETS guidance for PWRs provided in NUREG-0472 fails to indicate that the effluents from the turbine gland seal system are a concern for monitoring. In addition, the ratio of the turbine gland seal steam flow rate to the portion of main steam that does not bypass the condenser is 0.003. Since the radioactive concentration in each source of steam is the same, this ratio provides an estimate of the radioactive non-condensible gases released via the gland seal steam system as compared to the radioactive non-condensible gases released via the air ejector. Therefore, since the radioactive effluents arising from the direct atmosphere release of the turbine gland seal steam will never be more than 0.3% of the radioactive air ejector releases, installation of a costly monitoring system is not warranted nor necessary.

ETSB 04 (96)

Containment Vacuum Steam Ejector Exhaust

During plant startups after cold shutdown (refueling and extended plant maintenance), the containment vacuum steam ejector, operating with the plant auxiliary steam, is used to achieve an initial negative pressure before switching to the containment vacuum pumps. The containment vacuum pump exhaust is discharged through the Millstone Unit 1 stack after it is monitored for radioactivity, but the containment vacuum steam ejector exhaust is discharged to the atmosphere without in-line monitoring for radioactivity. The applicant has not provided complete information related to the operation of the vacuum steam ejector. When this information is received, the staff will complete its review and provide the evaluation in the final SER.

Response:

The staff has noted that the containment vacuum pump exhaust is discharged through the MP1 stack but the exhaust from the containment vacuum steam ejector, which is used to achieve initial negative containment pressure, is not monitored. The containment vacuum steam ejector exhaust is required for short periods of time during plant start-up after cold shutdown. In the event containment airborne radioactivity exceeded ALARA considerations for work activities in containment or otherwise as required, containment atmosphere would be purged of radioactivity through a monitored pathway. This ensures that subsequent to extended plant maintenance and/or refueling the use of the containment vacuum steam ejector exhaust would not result in significant radiological releases to atmosphere. In addition, the continuous operation of the containment air monitor, before and during operation of the vacuum steam ejector exhaust system will provide an indirect means of monitoring the ejector exhaust. The containment air monitor is shown in Figure 3.8-62 of the FSAR and is designated as 3CMS-RE 22A & B.

ETSB 06 (98)

BRS Hold-up Tanks, Potential for Hydrogen Explosion.

Refer to the revised response to NRC question 460.10.

NRC Letter: May 3, 1983

Question No. Q460.10 (Sections 11.3)

Acceptance Criterion II.B.6 requires special provisions for radioactive gaseous wastes that have the potential for a hydrogen explosion. Section 11.3.2.2, 9.3.5.2, and 15.7.2, describing the use of the GWS degasifier on input to the BRS tanks does not clearly state that hydrogenated reactor coolant cannot be collected in the BRS holdup tanks. Your description of the BRS tanks does not indicate provisions, such as diaphragms on the holdup and test tanks, to assure that hydrogen gas cannot mix with the air above the liquid with an open vent to the atmosphere.

a. Provide all possible flow directions for the four 3-way valves on the input to the BRS shown on Figure 9.3-4 (Sheet 1).

b. Provide an analysis of 3-way valve and control failure for the valving in a. above.

c. Describe how you plan to mitigate explosive gas mixtures of hydrogen and air in the BRS components and vents.

Response:

a. There are 3 Flow Paths

1. Letdown (Figure Q460.10-1)

Flow is from the RCS to the degasifier via 3CHS-AOV71, returned to 3CHS LCV112A. 112A modulates flow between the VCT and the BRS.

2. Drains Degas (Figure Q460.10.2)

3CHS-AOV71 allows flow to 3CHS LCV112A, bypasses the degasifier. 3GWS-AOV57 is open to the degasifier. 3GWS-AOV54 directs flow to the BRS. LCV112A modulates flow between the VCT and degasifier. 3GWS-AOV58 isolates the BRS and directs the diverted letdown to the degasifier.

3. Degasifier Shutdown (Figure Q460.10.3)

Flow as above, except AOV57 is shut. AOV58 is open to BRS. LCV 112A modulates between VCT and BRS.

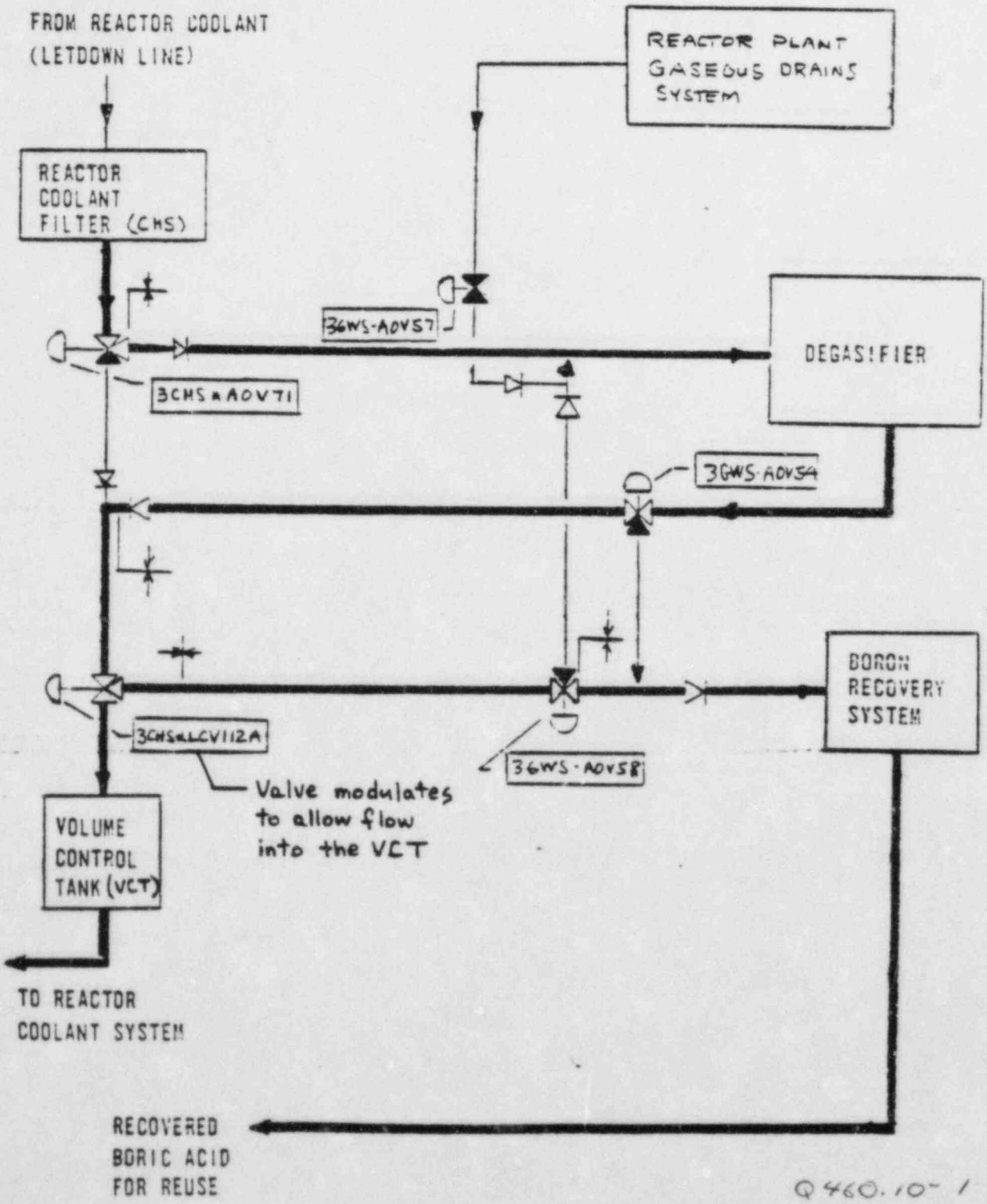
b. Failure - Loss of air or power to all 3-way valves

The 3-way valves are designed to vent air on loss of electrical power to their associated solenoid valves. Letdown flow bypasses the degasifier and is directed in its entirety to the VCT. Flow from the reactor plant gaseous drains system is automatically isolated. No hydrogenated fluid is directed to the BRS in this failure mode.

The flow paths for operation mode cases where failure of valves AOV 71 and AOV 58 to move to their "loss of air" position would result in flow bypassing the degasifier. In both of these cases, the liquid level in the VCT must be above its normal operating range or valve LCV112A set to the "open to BRS" position for hydrogenated liquid to be diverted to the BRS.

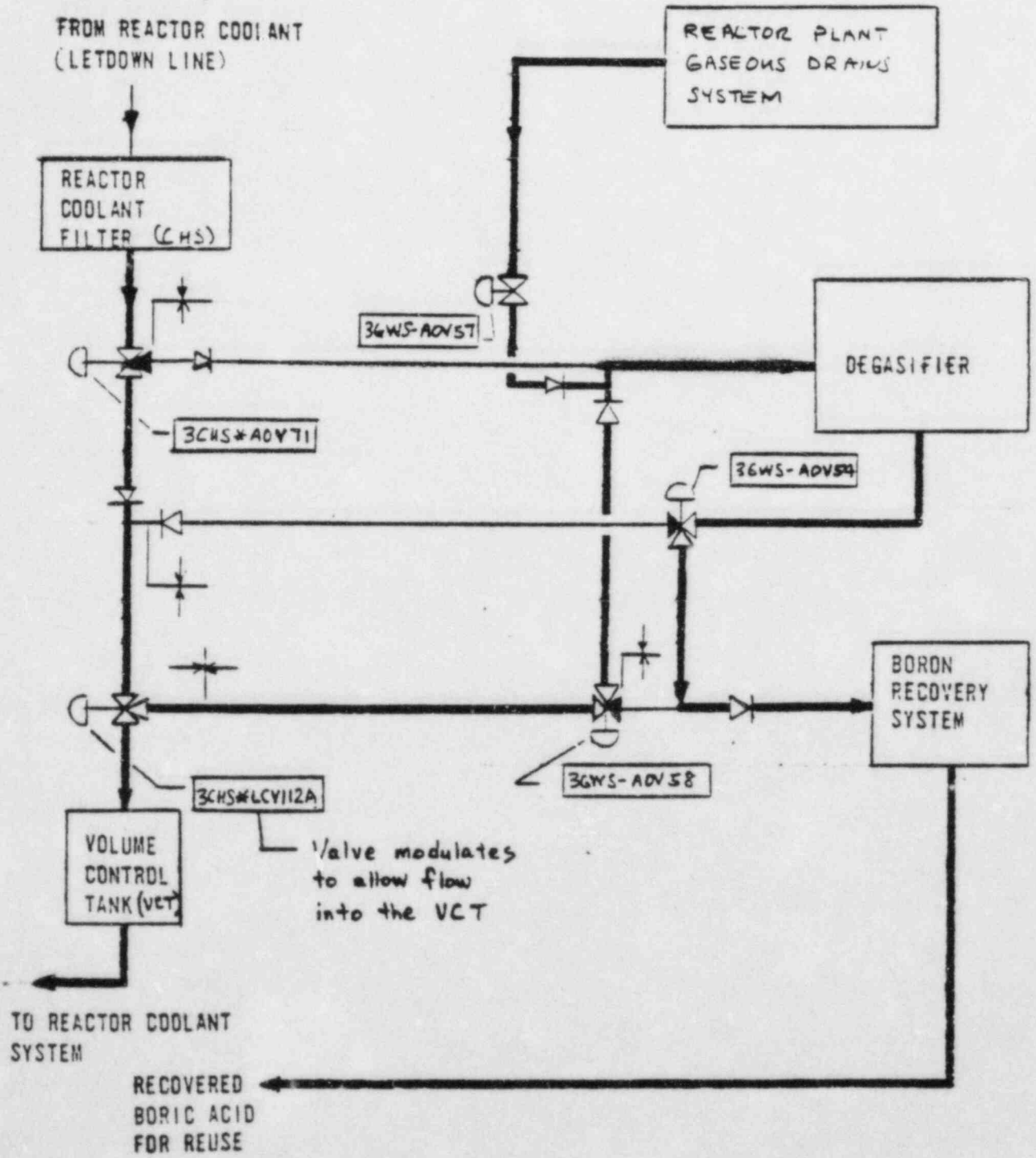
c. Operationally, hydrogenated liquid is not sent to the boron recovery system. This prevents explosive gas mixtures of hydrogen and air from occurring in BRS components. Because of the administrative controls (operating procedures) on BRS and GWS, the only way hydrogenated liquid can reach the boron recovery tanks is by failure of a control valve. Analyses have been performed which indicate that an explosive hydrogen and air mixture in the boron recovery tanks could result only from multiple failures or a noncredible sequence of events.

Any hydrogen that evolves during degasifier shutdown will normally escape to the reactor plant aerated vents of the boron recovery tanks. This vent path will preclude hydrogen from reaching the lower limit of flammability. If the reactor plant aerated vent path is lost due to loss of forced air flow, the tank, which is located outside, will vent to atmosphere such that the lower limit of flammability can not be reached.



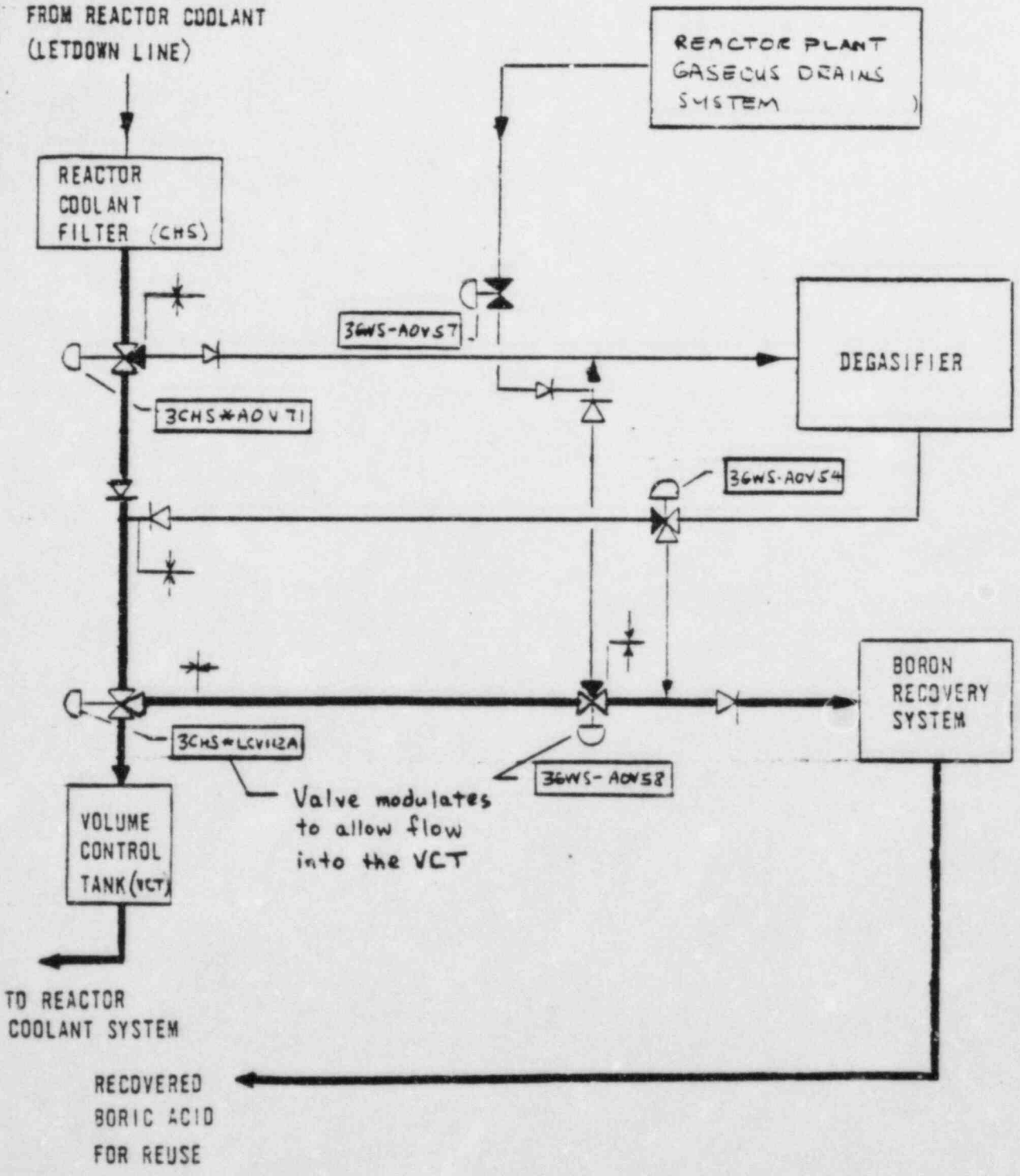
Q460.10-1

FIGURE ~~2.1.1a~~
LETDOWN DEGAS
FLOW PATH



Q460.10-2

FIGURE 2.1.1b
DRAINS DEGAS MODE
FLOW PATH



Q460.10-3

FIGURE ~~3.1.1c~~
DEGASIFIER SHUTDOWN
FLOW PATH

ETSB 07 (99)

Warehouse No. 5 Ventilation Exhaust

The applicant has not met the requirements of GDC 64 with respect to monitoring releases of radioactive material to the environment by ensuring that the design of the gaseous waste management system includes the equipment and instruments necessary to control and monitor the release of radioactive materials in gaseous effluents. Warehouse No. 5 at Millstone Unit 3 houses chemical radwaste process equipment for the condensate demineralizer liquid radwaste subsystem, including the chemical regenerant evaporator, evaporator feed tanks, chemical regenerant sumps, and regenerant demineralizer and filter, which are all vented to the rooms. GDC 64 requires that means be provided for monitoring effluent discharge paths for radioactivity that may be released from normal operations, including anticipated operational occurrences. The Warehouse No. 5 ventilation exhaust is discharged through the building roof vent without being monitored for radioactivity and, therefore, does not meet GDC 64.

Response:

The staff has noted that the Warehouse No. 5 ventilation exhaust is discharged through the building vent without being monitored for radioactivity. Continuous monitoring of the Warehouse No. 5 vent is not warranted based on prior operating history. During the most current MP-2 fuel cycle, the unit operated at high fractions of the technical specification limits for iodine dose equivalent in the primary coolant and primary to secondary leakage. Subsequent radiochemical analysis of the regenerant waste from the condensate polishing facility (CPF), (Warehouse No. 5) indicated the radioisotopes of C_o-60, C_s-134, C_s-137 and I-131 were only sporadically observed at levels at, or slightly greater than, minimum detectable levels (10^{-6} or 10^{-7} uci /ml). Therefore, even without taking credit for a partition factor, the particulate releases from the process equipment would result in airborne concentrations which are much less than 10^{-12} uci /cc. This activity concentration does not provide justification for continuous monitoring of the effluents from the CPF vent. In lieu of installing a costly monitoring system, the applicant proposes to commit to monitoring of the CPF atmosphere on a periodic basis based upon radioactivity concentration action levels observed in the regenerant waste. This monitoring will consist of particulate samples taken with a high volume air sampler. This argument, based on previous operational experience in lieu of mathematical models employing conservative assumptions, provides a more sound basis for an appropriate decision concerning the insignificant releases from this vent.

ETSB 1.9 (2)

Mechanical Vacuum Pump (Originally made a Licensing Condition)

The air and noncondensible gases removed by air removal mechanical vacuum pumps are directly discharged to the atmosphere through a vent stack on the condensate polishing enclosure roof of Warehouse No. 5 without being monitored for radioactivity. This discharge is a potential pathway for release of radioactivity and does not meet the requirements of GDC 64 for monitoring releases of radioactive materials in effluents.

It is the staff's position that the release of the gaseous effluent during hogging operations must be monitored as noted in Table 1 of SRP Section 11.5. Therefore, the staff will make it a license condition that no discharges may occur from the mechanical vacuum pumps unless the effluent is monitored.

Response:

Due to the inconsequential nature of the releases from the mechanical vacuum pump, this item should not be made a licensing condition but should be treated as an open item. NUREG-0473 provides guidance for establishment of radiological effluent technical specifications (RETS) for BWRs. Table 3.3.7.12-1 of this NUREG specifically outlines monitoring requirements for the mechanical vacuum pump exhaust. However, the applicant notes that similar RETS guidance provided in NUREG-0472 for PWRs fails to indicate that this effluent pathway is a concern in regard to monitoring. The mechanical vacuum pumps operate at a flow rate of 53.5 SCFM. However, using an 80% unit capacity factor and an assumption of 4 cold shutdowns per year, the total volume of gases released via the mechanical vacuum pumps are only 1.6% of the volume of gases released via the condenser air ejectors due to the sporadic operation of the mechanical vacuum pumps. Additionally, the vacuum pumps are only used after a shutdown in which case the concentration of radioactive gases will be significantly less than for air ejector exhaust due to radioactive decay and dilution of the noncondensible gases in the condenser by air. Therefore, the radioactive effluents arising from the unmonitored releases from the mechanical vacuum pump are an insignificant ($\leq$ 1%) fraction of the potential non-condensible radioactive gases that are released via the condenser air ejector. Since the concentration of radioactivity in the mechanical vacuum pump exhaust is necessarily less than that of the air ejector exhaust, monitoring the air ejector exhaust in essence provides an upper bound monitoring of vacuum pump exhaust. An adjustment factor could be applied to the measured activity released from the air ejector to account for vacuum pump releases. However, as noted above, this adjustment would be an insignificant fraction and hence less than the uncertainty in monitoring air ejector releases. Hence, such an adjustment is not warranted, nor is the significant expense of installing an effluent monitor.