



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

P.O. BOX 618, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

August 31, 1982

SNRC-762

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

High Radiation Signal to Purge Valves
SER Issue II.E.4.2
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

Reference: 1) Letter BWROG-8222, BWR Owners' Group (T. J. Dente) to NRC (D. G. Eisenhut) dated 6/14/82 (Attachment 3)

Dear Mr. Denton:

In Supplement No. 1 to the Shoreham Safety Evaluation Report (SER), Item II.E.4.2, the staff has re-stated the requirement, as expressed in NUREG 0737, that the purge line used during normal operation have a high radiation signal to effect isolation. The staff also noted that LILCO had committed to follow the resolution of this issue between the BWR Owners' Group (BWROG) and the NRC, and found this commitment satisfactory. In SNRC-657 dated 1/11/82, LILCO committed to provide this isolation signal.

This isolation scheme cannot be installed prior to fuel load. LILCO believes that this status is acceptable because the reliability of the existing isolation signals is extremely high and the probability that automatic isolation on high radiation would be required is extremely low as it would require a specific break size coincident with purge valve operation. The BWROG has conducted an evaluation (refer to Reference 1) for a typical plant of the radiological consequences of the limiting reactor coolant system break which would not result in automatic containment isolation. Utilizing various key input assumptions and analytical procedures from this evaluation, a specific analysis has been done for Shoreham which determined that the offsite thyroid dose for this extremely remote event was approximately .003 Rem. This is well below the EPA's Protective Action Guide value of 5 Rem. A synopsis of this specific calculation including certain key input assumptions and plant specific data is included as Attachment 1.

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At Shoreham, the purge valves are 6" and 4" globe type valves, which isolate on the same signals that initiate the Reactor Building Standby Ventilation System, i.e., RPV low water level, high drywell pressure, refueling platform level high radiation and reactor building high differential pressure. A conceptual design has been developed as shown on the sketch included as Attachment 2. Basically, D11-PNL-19 (non-safety grade) would be modified to produce a single output signal. This single output signal will activate a suitable isolation device (electrical isolation) which would serve to "split" the signal into two trains. These two signals will then activate closure of the eight purge valves utilized during power operation.

Based on the high reliability of the existing isolation signals, the low probability that automatic isolation on high radiation signal will be required, and the negligible radiological consequences for such an event, it is felt that a delay in implementation of this modification is warranted until the first refueling outage to permit procurement of materials and system installation and testing.

Should you have any questions, please contact this office.

Very truly yours,

L. J. Britt for J. L. Smith

J. L. Smith
Manager, Special Projects
Shoreham Nuclear Power Station

RWG:mp

Attachment

cc: J. Higgins
All parties

NUREG-0737, Item II.E.4.2(7)
High Radiation Signal to Containment Vent and Purge Valves

The assumptions and procedures provided by the BWR Owners' Group were used for evaluation of the ten minute release due to a delay in closure of the containment vent and purge isolation valves. The offsite thyroid dose was found to be 2.7 mRem which is significantly smaller than the EPA's Protective Action Guide of 5 Rem. The corresponding offsite volumetric leakage and the break flow rates were 4,000 cfm and 70 gpm, respectively.

The assumptions or plant specific data which were used in addition to those given in the procedure are listed below:

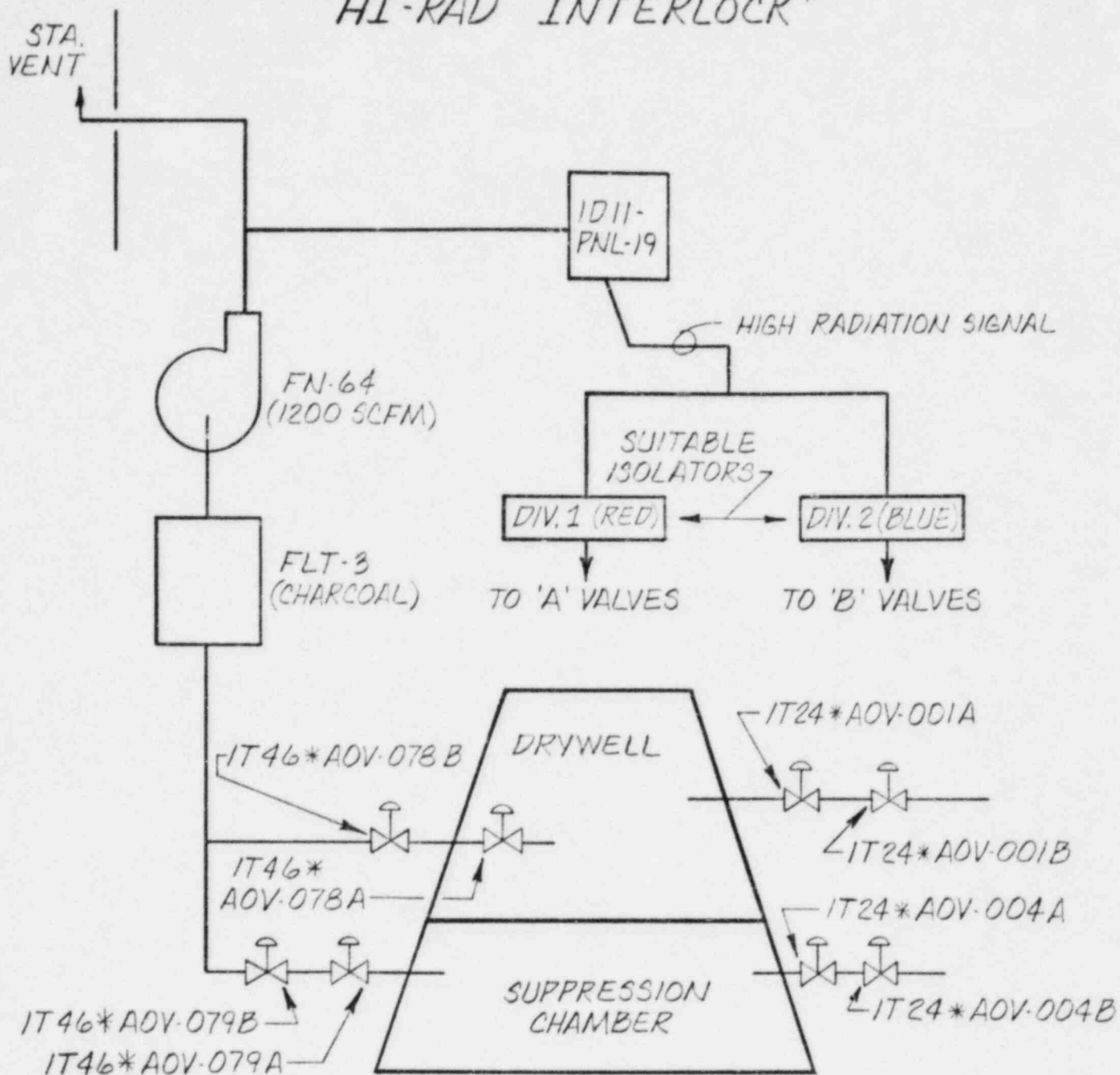
1. Flow out the vent line only,
2. Diameter of vent line = (*) 6 in.,
3. Four butterfly valves,
4. Seven 90° elbows
5. Ventpipe length (to stack inlet) = 120 ft.,
6. No elevation change ($Z_2 - Z_1 = 0$),
7. Primary coolant iodine Tech. Spec. limit = 0.2 uCi/g ,
8. Mass of primary coolant = 476,720. lbm,
9. No. of fuel bundles = 560,
10. Spiking activity per bundle = 3.27 Ci of Iodine,
11. I-131 dose conversion factor = $1.49 \times 10^6 \text{ Rem/Ci}$,
12. Breathing rate = $3.47 \times 10^{-4} \text{ m}^3/\text{sec.}$,
13. Site boundary 457m ESE, annual average atmosphere factor $X/Q = 8.44 \times 10^{-7} \text{ sec/m}^3$,

In addition, no credit was taken for iodine plateout, mixing in the drywell, or purge filters.

* This assumption was made based on the fact that the first 50 ft. of the purge line from the primary containment exit is 6 in ID.

CONCEPTUAL PURGE

"HI-RAD INTERLOCK"



NOTE :

SKETCH HAS BEEN DRAWN TO FUNCTIONALLY SHOW THE PURPOSE FOR WHICH THE VALVES WERE INSTALLED. THE SKETCH DOES NOT SHOW OTHER VALVES AND LINES BECAUSE THEY ARE NOT REQUIRED TO ISOLATE FOR THE PURGING AT POWER OPERATION.