

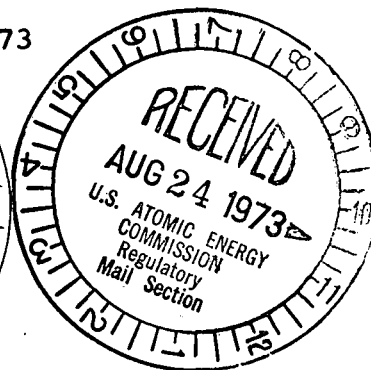
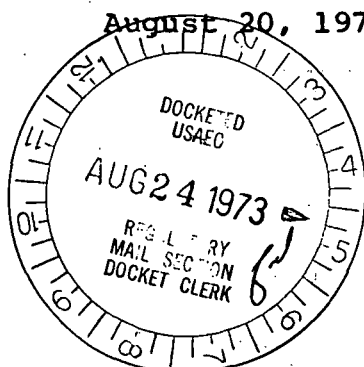


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Regulatory

File Cv.

Mr. D. L. Ziemann, Chief
Operating Reactors - Branch 2
Directorate of Licensing
U.S. Atomic Energy Commission
Washington, D.C. 20545



Subject: Dresden and Quad-Cities Stations
Supplement 4 to Dresden Special Report No. 14/
Supplement 2 to Quad-Cities Special Report No. 7,
Comparison of Dresden/Quad-Cities Containment
Atmospheric Dilution System with Duane Arnold
Containment Atmospheric Dilution (CAD) System -
AEC Dkts 50-237, 50-249, 50-254 and 50-265

Dear Mr. Ziemann:

Following are responses to your staff's requests for information concerning a comparison of the Dresden/Quad-Cities CAD system to Duane Arnold CAD system designs.

1. Duane Arnold has committed to a maximum 4% oxygen concentration in the containment.

Response:

The maximum normal operating O_2 concentration for Dresden and Quad-Cities will be maintained at less than 5% in accordance with the Technical Specifications and Regulatory Guide No. 1.7. The 5% will be considered an absolute upper limit.

Attempting to maintain a 4% O_2 limit involves increased purging using the Standby Gas Treatment System and added releases of treated containment atmosphere to the environment. These factors are of little real significance; however they far outweigh any advantage of an arbitrary 4% O_2 concentration limit.

The 5% limit is adequately justified by discussions in Supplement 2 to Dresden Special Report No. 14 in response to Question 4. With extremely conservative assumptions concerning the quantity of water vapor in the containment and a 5% initial O_2 concentration, it was calculated N_2 dilution would

Mr. D. L. Ziemann

- 2 -

August 20, 1973

not begin until at least two hours after a postulated design basis loss of coolant accident. This is more than adequate time to allow a thorough evaluation of the conditions and proper operator action.

2. They have specified the purge system they will use and have indicated that it will be seismic Class 1 and will contain active redundancy.

Response:

The CAD system, including its nitrogen dilution, monitoring, and relief functions, is designed as an engineering safety feature, meeting the redundancy and seismic requirements of such systems and also the requirements of IEEE 279. That part of the CAD system that could be used for purging, the relief function, discharges into the SGTS. Gases are passed through the SGTS and released from the 310 foot stack.

3. Duane Arnold has stipulated that the dose to the environment resulting from operation of this system will result in doses less than the dose specified in 10 CFR 100.

Response:

As stated in Supplement 1 of Special Report No. 14, Operation of the CAD system, assuming the Tech. Spec. leakage rate of 1.6%/day, does not result in any increased exposure to the public over that calculated and presented in Section 14 of the FSAR. If the leakage rate is less than the Tech. Spec. value, the operator can increase the leakage by venting the containment without exceeding the 10 CFR 100 limits (see response to Question 14 in Supplement 3 to Special Report No. 14).

4. Duane Arnold has indicated an alarm system and operational program for the Nitrogen-2 makeup system.

Response:

The CAD system includes a low level alarm system on the Nitrogen supply. The low level indication system alarms

when the level in the storage tank drops to 200,000 scf. As stated in Supplement 1 to Special Report No. 14, Page 4, the Tech. Spec. bases indicates that this amount of nitrogen is sufficient for oxygen control for the first seven days following a LOCA. Seven days is more than adequate time to provide replenishment of the N₂ supply if needed.

5. A series of curves on the maximum repressurization pressure in the containment have been submitted. We need to specify which curve we will use and what the maximum repressurization pressure will be.

Response:

The maximum containment pressure curve applicable is identified in Figure 3, Page 7, of Supplement 1 to Special Report No. 14, as "1.6% vol/day leakage (Tech. Spec. Limit)." Also, see response to Question 2, Supplement 2 to Special Report No. 14. The maximum repressurization pressure is 26 psig.

6. We need to specify the time and number of days after the LOCA when we will purge, the purge rate, and then need to specify that the purging will be taken through standby gas treatment and exhausted up the main chimney.

Response:

The CAD system is designed to operate at the Tech. Spec. containment leakage rate (1.6% vol/day) without purging. Should the need arise to purge due to containment pressurization (see response to 5 above) the gases would be discharged through the SBGTS (see response to Question 14d of Supplement 3 to Special Report No. 14) at such a rate as to make the total containment leakage equal to 1.6% vol/day (see responses to question 14 of Supplement 3 to Special Report No. 14).

7. Duane Arnold Station has apparently specified that they will mix containment atmosphere by periodic actuation of the drywell containment sprays.

Response:

The Duane Arnold Station Amendment No. 2 response to Question G.1.1.d was adequately conservative in the calculations of maximum O₂ concentration that could occur in the containment. The calculations were based on conservative mixing

Commonwealth Edison Company

Mr. D. L. Ziemann

- 4 -

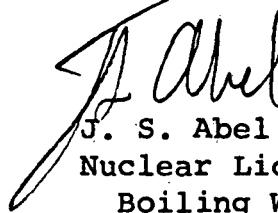
August 20, 1973

by basic diffusion models. With the conservative assumptions of Regulatory Guide 1.7, calculated non-uniformity of concentrations was below a magnitude which would justify any forced mixing. However, Commonwealth Edison will agree to operate drywell sprays during the post LOCA recovery period when other ECCS system requirements are met and O₂ concentration exceeds 4%.

The CAD system P&ID will be submitted by August 31, 1973.

One signed original and 59 copies of this report are submitted for your review.

Very truly yours,



J. S. Abel
Nuclear Licensing Administrator -
Boiling Water Reactors