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August 15, 1985

Mr. John A. Zwolinski, Chief
Operating Reactors Branch No. 5
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Additional Information on
Recombiner Capability Requirements
of 10 CFR 50.44(c)(3)(ii)
NRC Docket Nos. 50-237 and 50-249

Reference: Letter from J. A. Zwolinski to D. L. Farrar
dated June 4, 1985

Dear Mr. Zwolinski:

The referenced letter requested additional information regarding our compliance with 10 CFR 50.44(c)(3)(ii) and Generic Letter 84-09 requirements for containment atmosphere control. Our responses to your questions are provided in the attachment. The due date for this response was extended during a telecon with R. Gilbert of your staff on July 19, 1985.

The responses to questions 1 and 2 also apply to the Quad Cities units. The operation of the Quad Cities drywell pneumatic system varies from the Dresden system. Details will be provided on the Quad Cities docket if formal questions are received.

If you have any further questions regarding this matter, please contact this office.

One signed original and forty (40) copies of this letter and the attachment are provided for your use.

Very truly yours,

J. R. Wojnarowski
Nuclear Licensing Administrator

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Attachment

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cc: R. Gilbert - NRR
Dresden Resident Inspector

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ATTACHMENT

RESPONSE TO NRC QUESTIONS ON RECOMBINER CAPABILITY REQUIREMENTS (G.L. 84-09) DRESDEN STATION UNITS 2 and 3

QUESTION 1:

"10 CFR 50.44(g) requires that plants such as Dresden Station, Units 2 & 3, be provided with a post-accident combustible gas control system such as the containment atmosphere dilution (CAD) system. The staff has indicated that the hydrogen generation rates provided in Regulatory Guide 1.7 should be used in assessing the adequacy of the system. It should be noted that the staff has not approved the revised source terms indicated in your June 25, 1984 submittal for use in DBA analyses. Indicate how the Dresden Station, Units 2 & 3, conforms to this regulation".

Regulation: 10 CFR 50.44(g)

For facilities with respect to which the notice of hearing on the application for a construction permit was published on or before December 22, 1968, if the combined radiation dose at the low population zone outer boundary from purging (and repressurization if a representation system is provided) and the postulated LOCA calculated in accordance with 10CFR 100.11(a)(2) of this chapter is less than 25 rem to the whole body and less than 300 rem to the thyroid, only a purging system is necessary, provided that the purging system and any filtration system associated with it are designed to conform with the general requirements of Criteria 41, 42, and 43 of Appendix A to this part. Otherwise, the facility shall be provided with another type of combustible gas control system (a repressurization system is acceptable) designed to conform with the general requirements of Criteria 41, 42, and 43 of Appendix A to this part. If a purge system is used as part of the repressurization system, it shall be designed to conform with the general requirements of Criteria 41, 42, and 43 of Appendix A to this part. The containment shall not be repressurized beyond 50 percent of the containment design pressure.

Response to Question 1:

10 CFR 50.44(g) requires that either a purging system designed to conform with General Design Criteria (GDC) 41, 42, and 43 or another type of combustible gas control system designed to conform with GDC 41, 42, and 43 be provided. The Dresden and Quad Cities Station comply with the latter requirement.

10 CFR 50.44 (h)(2) defines a combustible gas control system as a system that operates after a LOCA to maintain the concentrations of combustible gases within the containment below flammability limits. Operate, means to function effectively or to bring about a desired effect. The Dresden and Quad Cities Units have inerted containments that, based on the G.E. NEDO-22155 report, function quite effectively after a LOCA to maintain the concentrations of combustible gases within containment below flammability limits.

An inerted containment, which is a passive combustible gas control system, is in general conformance with GDC 41, 42, and 43.

In Generic Letter 84-09 it states, "...the BWR Mark I Owners Group (incorporating studies performed by Northeast Nuclear Energy Company) undertook a substantial program to demonstrate that the Mark I plants potentially affected by the recombiner capability requirements of the rule do not need to rely on use of the safety grade purge/repressurization system required by the 10 CFR 50.44 rule as the primary means of hydrogen control. Extensive review and independent studies by the NRC Staff supported the findings of the Mark I Owners Group Program..."

One finding of the Mark I Owners Group was that Regulatory Guide 1.7 source terms contain many unrealistic concentrations. Reg. Guide 1.7 assumes that radiolysis of water continues indefinitely at a very high rate. Section B of Reg. Guide 1.7 states that the values and assumptions in Table 1 (which include the proposed oxygen yield rate of .25 molecule/100 eV) are conservative and further states in Section C.5, Regulatory Position, that "these values may be changed on the basis for additional experimental evidence and analysis." The G.E. NEDO 22155 report more accurately models the time dependent behavior of post-LOCA radiolysis. The GE values of 0.1 molecules/100 eV for boiling water and 0.0 for non-boiling water are based on measurements from Dresden, Humboldt Bay and KRB. These values are also derived from analyses performed by Knolls Atomic Power Laboratory, Argonne National Lab and Northeast Utilities. We feel the use of the GE values is appropriate and within the flexibility provided for in Reg. Guide 1.7.

We feel it is inappropriate to incorporate excessive conservatism in an assessment of system adequacy that could result in backfits which we believe would not be justified on a cost/benefit basis. Although the staff has not approved the revised source terms in the NEDO 22155 report as indicated in your letter, we continue to support the calculations and assumptions of this document and will respond to any specific questions and/or concerns identified by your staff.

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QUESTION 2:

"The CAD System at Dresden Station, Units 2 & 3, has been designed to utilize atmospheric air and, therefore, is a potential source of oxygen to the containment in post-LOCA conditions. In light of this situation, how do you consider compliance with criterion three of Generic Letter 84-09 with this CAD system?"

Response to Question 2:

The Generic Letter 84-09 is directed at plants that have combustible gas control systems that control containment oxygen concentrations. The ACAD system is presently designed as a combustible gas control system that controls the concentrations of hydrogen in containment. The purge/repressurization system will maintain hydrogen concentrations below the flamability limits and was installed as an NRC requirement.

The ACAD System at Dresden and Quad Cities Stations have been designed to utilize air. The ACAD System was intended to be used in conjunction with a purge system to replace inerting as the combustible gas control system for containment.

The nitrogen inerting system is also a combustible gas control system. This system controls the concentration of oxygen in containment. If the oxygen concentration is low enough it will preclude the occurrence of a fire or explosion.

The Containment Atmospheric Monitoring (CAM) System Monitors both hydrogen and oxygen concentrations.

The ACAD system was installed in order to meet the requirements of 10 CFR 50.44. Generic letter 84-09 is directed at combustible control systems that control containment oxygen concentrations. Although the ACAD system does not literally comply with Criterion 3 of Generic letter 84-09, it does comply with and meet the intent of 10 CFR 50.44. Although the ACAD system woulld not be required for containment atmosphere control, the Generic Letter does not allow us the flexibility to disconnect the system to achieve full compliance with Criterion 3. Generic Letter 84-09 states "...To avoid any misunderstanding, we wish to make clear that a plant that has a "safety grade" purge/repressurization system designed to conform with the general requirements of Criteria 41, 42 and 43 of Appendix A of 10CFR Part 50 and installed in accordance with 10CFR 50.44(f) or 10CFR 50.44(g) must continue to have that system, even though it may be determined with respect to 10CFR 50.44(c)(3) that the plant does not rely on that system as the primary means of hydrogen control."

Special precautions have been taken in order to prevent the ACAD System from pumping air into containment. In order to start the ACAD System, Station Director approval is required. The ACAD System is normally deenergized, it would take operator action to start the compressors and open the isolation valves. The ACAD containment penetrations are pressure tested every outage to assure that there is no leakage through the double isolation valves. We feel this meets the intent of Criterion 3.

In references 1 and 3 we have requested relief from the requirement to maintain the ACAD System. We again request an exemption from this requirement.

QUESTION 3:

Provide a detailed discussion about how the drywell pneumatic supply system meets the redundancy requirement. In particular, describe the use of the Pump Back System as a backup to the normal Drywell Pneumatic Supply System. Include all necessary operator actions, if pertinent, as well as the instrumentation which will be used by the operator. Also is the inert gas supply to the drywell pneumatic systems designed against single failure?

Since the atmospheric air from the Instrument Air System can be used as a backup to the drywell pneumatic systems, describe the procedural controls you have in place to limit the use of this backup system. When air would be used, would this air supply line be automatically isolated? If so, what are the signals that will isolate it?

Response to Question 3 (Dresden)

At Dresden the pneumatic compressors are currently not in use. The Drywell pneumatic air accumulator is supplied with pressurized nitrogen from the accumulator of the pump-back air compressor system. The pump back system has redundant pumps that use the torus as a nitrogen supply. The nitrogen inerting system is a backup supply of nitrogen to the pump back air compressor system. Transfer to the backup supply is automatic on low pressure. No operator action is required.

An isolation valve on the drywell pneumatic supply is held open by the nitrogen pressure in the line. In the event of a failure of the nitrogen supply to the drywell pneumatic system, this valve will close. The drywell MSIV valves have accumulators that will supply nitrogen in the event the drywell pneumatic pressure is lost. If the accumulators lose pressure before drywell pneumatic pressure is restored, these valves will fail closed. All valves using drywell pneumatic nitrogen will fail closed on loss of pressure.

At Dresden, atmospheric air is not used as a backup for the drywell pneumatic system. During an outage instrument air can be connected in the drywell as an air supply for welders.

REFERENCES

1. Dresden 2/3 and Quad Cities 1/2. T. Rausch letter to D. G. Eisenhut dated September 15, 1982. Compliance with 10 CFR 50.44(c)(3)(ii) concerning combustible gas control.

2. May 8, 1984 D. G. Eisenhut to all licensees of Operating Reactors - Generic Letter 84-09 Recombiner Capability Requirements of 10 CFR 50.44(c)(3)(ii).

3. Dresden/Quad Cities Station - B. Rybak letter to H. R. Denton dated June 25, 1984 - Response to Generic Letter 84-09 - Recombiner Capability Requirement.