October 9, 2003

Docket No. 50-346

Mr. Paul M. Blanch
(Address Withheld)

Dear Mr. Blanch:

In your July 16 and August 5, 2003, e-mails to me, you raised several questions based on the statements made by FirstEnergy's Public Affairs Spokesman, T. Schneider, concerning the control of hydrogen inside containment after an accident, given the inoperability of the containment gas analyzers reported in License Event Report 2003-005. You raised ten specific questions. A restatement of those questions, followed by our findings related to each are presented in the enclosure. Our review of the statements made by Mr. Schneider did not identify any examples where he provided inaccurate information.

We note that your comments on the statements made by Mr. Schneider focus on the aftermath of the events at Three Mile Island (TMI) in March of 1979. As you are aware, the TMI accident was a beyond-design-basis event. The requirements for both the equipment and licensee procedures are to respond to plant conditions to preclude an event from reaching a beyond-design-basis state. The licensee's equipment and procedures, by definition, are not designed to address beyond design basis events. However, they are also not so restrictive as to prevent them from dealing with many beyond-design-basis events. Nevertheless, in the event of the multiple equipment failures and personnel errors that would all have to occur during the same event for it to become a beyond-design-basis accident, the NRC's emergency planning regulations come in to play.

Those regulations focus on actions to be taken both by the licensee and offsite authorities to mitigate the impact of such an event on the public and the environment.

Should you have any questions regarding our findings, please contact me at (630) 829-9637.

Sincerely,

/RA/

John A. Grobe, Chairman
Davis-Besse Oversight Panel

Enclosure: As stated

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ATTACHMENT

RESPONSE TO SPECIFIC QUESTIONS

Q1. Does Davis-Besse have emergency procedures to support the proposed actions? Specifically, hydrogen dilution or purge.

A1. Yes. The implementing procedure is DB-OP-02000, "RPS, SFAS, SFRCS Trip, or SG Tube Rupture," Revision 07. There are two action levels specified in the procedure that require specific action.

- Action Level 1 (containment hydrogen concentration greater than or equal to 0.6 percent)

  Inform offsite support groups, TSC [Technical Support Center], and ECC [Emergency Control Center]

- Action Level 2 (containment hydrogen concentration greater than or equal to 3.0 percent)

  Initiate one Hydrogen Control System in the order listed below:

  1. Operate Hydrogen Recombiner using DB-OP-6502 [Containment Hydrogen Dilution and Hydrogen Purge System].
  2. Operate Hydrogen Dilution Blowers using DB-OP-6502.
  3. Operate Hydrogen Purge System using DB-OP-6502.

Q2. Does Davis-Besse have a qualified blower of sufficient capacity to dilute the hydrogen within the required time?

A2. Actually, the facility has two qualified hydrogen dilution blowers. The Davis-Besse Nuclear Power Station Updated Safety Analysis Report, Section 6.2.5.2.1, "Containment Hydrogen Dilution System (CHD)," documents, in part, the following information:

- The hydrogen dilution system consists of two full capacity, redundant, rotary, positive displacement type blowers to supply air to containment. The CHD system controls the hydrogen concentration by the addition of air to the Containment Vessel, resulting in a pressurization of the containment and suppression of the hydrogen volume fraction.

- With the maximum permissible containment inventory of aluminum and zinc, the hydrogen control limit of 3 percent can be reached in approximately 17 days [assuming no compensatory action taken]. At that time, the Containment Vessel pressure will then be 0.5 psig. CHD system operation will then be initiated.

Section 6.2.5.3, "Design Evaluation," also includes a discussion of the significant sources of hydrogen following the design basis loss-of-coolant accident, Containment Vessel pressure curves (as a function of time post accident) and Containment Vessel hydrogen concentration (as a function of time post accident). The licensee's design assumptions are in accordance with NRC's Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident." One of those design assumptions is that 5 percent of the available 44,815.9 pounds of zircaloy cladding reacts with the steam after the postulated accident to release hydrogen, and that this reaction occurs essentially instantaneously.

Q3. Has the impact of the increased post LOCA leak rate due to the increased containment pressure been evaluated?

A3. There is no increased leak rate because there are no increased containment pressure values in excess of analyzed regulatory limits. The Davis-Besse Nuclear Power Station Updated Safety Analysis Report , Section 6.2.5.2.1, "Containment Hydrogen Dilution System (CHD)," documents, in part, the following information:

- The Containment Hydrogen Dilution System blowers are each capable of developing 25 psig, (25 psig is the setpoint of each blower's relief valve) but, the containment internal pressure is administratively controlled to a maximum of 18 psig with the blower(s) in operation. 10 CFR 50.44 limits repressurization of containment by the blower(s) to 50 percent of the containment design pressure. Containment design pressure is 36 psig.

These limits are procedurally controlled by procedure DB-OP-6502, "Containment Hydrogen Dilution and Hydrogen Purge System," Step 5.2.15, which requires the operator to shut down the Containment Hydrogen Dilution System when containment pressure reaches 28 to 32 psia [approximately 13 to 17 psig]. Since the pressure is controlled well below the containment design pressure, the post LOCA leak rate would be below the leak rate at design pressure.

Q4. Has the analysis been performed evaluating the radiological consequences of purging hundreds of millions of curies of radioactive materials?

A4. Yes. The Davis-Besse Nuclear Power Station Updated Safety Analysis Report, Section 6.2.5.3, "Design Evaluation," contains an evaluation of the impact of utilizing the Hydrogen Purge System, post LOCA. Utilizing the design assumptions specified in Regulatory Guide 1.7, and the various times when filtered purge may be initiated, the doses calculated by the licensee to the low population zone range from .06 millirem to 11 millirem whole body dose and 0.05 millirem to 1.9 rem thyroid dose.

USAR Section 6.2.5.2.2 documents, in part the following information:

- The Hydrogen Purge System is available to release air from the Containment Vessel atmosphere through HEPA and charcoal filters to the station vent. Operation of the Containment Purge System functions in conjunction with the redundant Containment Hydrogen Dilution trains to relieve containment gases after the containment pressure limit is reached if operation of the Hydrogen Dilution blowers is still required.

- The Hydrogen Purge System would be used only when the concentration of hydrogen reached the 3 percent control limit (at 18 psig, the upper limit of pressurization of the CHD system blowers). This limit will be reached in excess of 60 days [if the Hydrogen Dilution System is operated], assuming hydrogen generation still occurs over this time period. When the Hydrogen Purge System is lined up to the station vent, only one Hydrogen Dilution Blower is left running to maintain pressure in the Containment Vessel. The capacity of the Hydrogen Purge System is equivalent to the capacity of one Hydrogen Dilution Blower (approximately 100 scfm). Therefore, when operating the Hydrogen Purge System and one Hydrogen Dilution Blower simultaneously, the containment should not increase in pressure beyond the 18 psig containment pressure limit.

Q5. Has the NRC approved these procedures?

A5. No. The NRC does not approve licensee procedures. However, inspectors periodically sample licensee procedures during the course of normal inspection activities. The licensee is required by Technical Specifications to establish, implement, and maintain procedures for combating emergencies and other significant events. The licensee procedures directly related to post accident containment hydrogen control are DB-OP-02000, "RPS, SFAS, SFRCS Trip, or SG Tube Rupture," and DB-OP-6502, "Containment Hydrogen Dilution and Hydrogen Purge System". That having been said, the NRC did conduct a detailed inspection of the licensee's emergency operating procedures, including DB-OP-02000, and the program for revising those procedures. That inspection is documented in Inspection Report 50-346/89-006, dated May 3, 1989. The conclusion of the inspection was that the licensee's program was adequate.

Q6. Does Davis-Besse have a qualified containment purge system as described by Mr. Schneider?

A6. Yes. USAR Section 6.2.5.2.2 documents, in part the following information:

- The Hydrogen Purge System is available to release air from the Containment Vessel atmosphere through HEPA and charcoal filters to the station vent. Operation of the Containment Purge System functions in conjunction with the redundant Containment Hydrogen Dilution trains to relieve containment gases after the containment pressure limit is reached if operation of the Hydrogen Dilution blowers is still required. The system, including the purge line and purge system filter unit is designed as Seismic Class I. Hence, the design of these systems is considered to be in compliance with the criteria for an engineered safety feature.

- The Hydrogen Purge System would be used only when the concentration of hydrogen reached the 3 percent control limit (at 18 psig, the upper limit of pressurization of the CHD system blowers). This limit will be reached in excess of 60 days [if the Hydrogen Dilution System is operated], assuming hydrogen generation still occurs over this time period. When the Hydrogen Purge System is lined up to the station vent, only one Hydrogen Dilution Blower is left running to maintain pressure in the Containment Vessel. The capacity of the Hydrogen Purge System is equivalent to the capacity of one Hydrogen Dilution Blower (approximately 100 scfm). Therefore, when operating the Hydrogen Purge System and one Hydrogen Dilution Blower simultaneously, the containment should not increase in pressure beyond the 18 psig containment pressure limit.

Q7. What are the other means described by Mr. Schneider to detect the formation of hydrogen?

A7. In addition to the gas analyzers, another means of measuring the hydrogen concentration inside containment is via a grab sample of the containment atmosphere. The licensee has a system in place to collect a post-accident sample from the containment atmosphere. However, it is most likely that given the conditions found and stated in Licensee Event Report 2003-005, the operators would have initiated the actions described in answer 1 above to address buildup of hydrogen inside containment during an accident. The licensee's engineering staff has determined that the effect of not having cooling water provided to the containment hydrogen analyzer heat exchangers would be that the readings from the analyzers would have indicated a level of hydrogen higher than that actually present in containment. As a result, the operators would likely have initiated actions to control hydrogen in containment earlier than required.

Q8. Is the equipment described by Mr. Schneider for measuring, purging, and diluting the hydrogen discussed in the FSAR?

A8. Yes. This equipment is described in the Davis-Besse Nuclear Power Station Updated Safety Analysis Report , Section 6.2.5, "Combustible Gas Control in Containment," Technical Specification 3.6.4.1, "Hydrogen Analyzers," Technical Specification 3.6.4.3, "Containment Hydrogen Dilution System," and Technical Specification 3.6.4.4, "Hydrogen Purge System."

Q9. Are these types of statements, apparently endorsed by Davis-Besse management consistent with a satisfactory safety culture?

A9. The specific quote in question, which is attributed to Mr. Schneider, as stated in your e-mail is:

- "If hydrogen gas builds up, workers can pump air inside the containment chamber to dilute it, he said. A fall-back option is to purge the hydrogen gas through filters into the environment, he said."

This statement is true. Mr. Schneider only addressed 2 of the 3 systems that could be used to address elevated hydrogen concentrations in containment. As stated in the response to the first question, there is a third option; the use of a Hydrogen Recombiner. Given that Mr. Schneider's statements were true, they should have no impact on the safety culture at the facility.

Q10. How do these types of statements, read by many knowledgeable employees, foster honest and truthful communications within the organization, with the NRC, and the media?

A10. The specific quote in question, which is attributed to Mr. Schneider, as stated in your e-mail is:

- “If hydrogen gas builds up, workers can pump air inside the containment chamber to dilute it, he said. A fall-back option is to purge the hydrogen gas through filters into the environment, he said.”

This statement is true. Knowledgeable employees and NRC inspectors assigned to Davis-Besse know that this statement is factual, therefore it should have no impact on the licensee’s efforts to foster honest and truthful communications. The Agency has no control over how the media portrays the statement.