UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 20 1976

DOCKET NOS.: 50-237, 50-249, 50-254, 50-265, 50-298

LICENSEES: COMMONWEALTH EDISON COMPANY, NEBRASKA PUBLIC POWER DISTRICT

FACILITIES: DRESDEN UNITS 2 AND 3, QUAD CITIES UNITS 1 AND 2, COOPER NUCLEAR STATION

SUMMARY OF MEETING REGARDING THE AIR CONTAINMENT ATMOSPHERE DILUTION (ACAD) HYDROGEN CONTROL SYSTEMS FOR THE ABOVE FACILITIES

On April 22, 1976, representatives of the Commonwealth Edison Company (CECo), Nebraska Public Power District (NPPD), Sargent and Lundy, Energy Incorporated (EI) and General Electric Company (GE) met with the Regulatory staff to discuss questions relating to the installation of ACAD and Containment Atmosphere Monitoring (CAM) systems at Dresden Units 2 and 3, Quad Cities Units 1 and 2, and Cooper Nuclear Station. Enclosure 1 is a list of meeting attendees. Enclosures 2 and 3 are questions resulting from preliminary review by C. Grimes and J. Knight (DOR-OT) of the CECo ACAD submittal. The purpose of the meeting was to discuss the answers to the questions in enclosures 2 and 3.

Summary

P. Bieniarz, of Energy Incorporated (EI), consultant to CECo and NPPD for ACAD design analysis, provided answers to questions 9, 11, 12, and 13 of enclosure 2. Methods of calibrating flow measuring devices were discussed. It was agreed that both CECo and NPPD devices would be calibrated to indicate flow rates for gases at standard temperature and pressure (STP). Mr. Bieniarz stated that flow rates in his analysis were for gases at STP.

The NRC staff agreed to clarify its position on implementing paragraph II.12 of Standard Review Plan 6.2.5 concerning backup purge requirements.

The licensees described their respective CAM systems including bases for selection of sensing locations. F. Rudek, GE Space Division, described the new Platinum-Electrochemical hydrogen detection system that CECo will use. The NRC staff asked CECo to submit additional information on the accuracy, qualification tests, calibration techniques, halide poisoning characteristics, and design life of the system. CECo agreed to provide this information. NPPD intends to modify the existing

hydrogen detection system at Cooper Station for use as the CAM system. The NRC may have to re-evaluate the Cooper hydrogen monitoring system in light of its being used as a safety system.

ACAD system design and operation were discussed. NPPD agreed to submit performance curves for their ACAD compressors. CECo has not yet procured compressors so performance curves will be provided later. During discussion of question 8 of enclosure 2, it became apparent that CECo and EI were not in agreement on ACAD operating procedures. The NRC staff asked CECo to clarify its intentions so that an orderly review of its ACAD submittal might continue. CECo agreed to do this.

In the course of answering questions 13 through 16 of enclosure 3, CECo agreed to submit additional data regarding design criteria and single failure analysis of instrumentation and control systems and isolation valve pilot solenoids, a description of the Instrument Air system, and physical separation of instrumentation and control cables for the CAM and ACAD systems.

Original signed by
M. Chad H. Fletcher

Michael H. Fletcher
Operating Reactors Branch #2
Division of Operating Reactors

Enclosures:
1. Attendance List
2. Questions
3. Questions

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ENCLOSURE NO. 1

ATTENDANCE LIST

COMMONWEALTH EDISON COMPANY

G. Abrell
R. T. Steen
C. A. Lindberg

NEBRASKA PUBLIC POWER DISTRICT

T. E. Kissam
J. M. Pilant
R. E. Wilbur

GE - SPACE DIVISION

F. Rudek

SARGENT & LUNDY

F. Tsai
W. J. Robinson

ENERGY INCORPORATED

P. B. Bieniarz

NRC - STAFF

R. P. Snaider
M. H. Fletcher
J. Slider
C. Grimes
J. E. Knight
C. W. Thayer

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DATE ➤						

CAM / ACAD QUESTIONS

1. Describe the manner by which the location of the hydrogen sensing points, inside both the drywell and wetwell, were selected.

2. Discuss the criteria the operator will use to manually activate the CAM system.

3. Indicate the frequency of the hydrogen sensor calibration testing.

4. Describe the manner by which a thermistor is matched to the palladium sensor to properly account for increased output from the hydrogen sensor with increasing temperature.

5. Provide typical fan performance curves for both the CAD compressors and the bleed purge fans.

6. Discuss the logic used to control CAD flow from the compressor to the air receiver and from the air receiver to the drywell and torus.

7. Indicate the manner by which switch over to a redundant train of either the ACAD or bleed system, should a single failure occur in an operating train.

8. Discuss the rationale for manually initiating the bleed system, while the CAD cut-off is automatic. Note that an early initiation of the bleed will unnecessarily extend the duration of the purge. Also, indicate whether the lower pressure cut-off of the bleed, 41 psia, is manual or automatic.

9. Provide the calculated durations of vent release by the bleed system and initiation times for a 30 day period.

10. Discuss the need for, and operation of, the flow control valve on the vent outlet line.

11. Provide an analysis which demonstrates that a backup purge flow rate of 25 cfm is sufficient to maintain the hydrogen concentration below 4 %.

12. Describe the manner by which the pressure equalizing capabilities of the drywell to torus vent system and the vacuum breakers have been factored into the analytical model.

13. Discuss the rationale for inputing the makeup and purge flow fractions to the drywell and wetwell as fixed constants.

1. Describe in more detail the design and principle of operation of the hydrogen detectors. Provide a sketch.

2. What periodic calibration is to be performed to assure a correct reading when needed?

3. Are there any possible palladium poisoning mechanisms at the detector locations?

4. What are the effects of radiation (expected during a LOCA) on the output of the hydrogen detection system?

5. What is the expected life of the detectors in the primary containment environment?

6. What is the accuracy of the calibration gas?

7. What is the accuracy of the hydrogen detection system with the sensor elevated to the LOCA temperature?

8. Describe the installation details of the hydrogen detector that assures that the calibration gas is not diluted during the calibration.

9. Describe the qualification tests performed on the hydrogen detectors which qualify them for a LOCA environment.

10. Is it possible for the detectors located in the suppression chamber to be immersed in water at any time during a LOCA and if so what effect does this have on the output?

11. Provide logic diagrams for the control systems.

12. The drawings appear to be incorrect for the flow control valves for both the air injection and venting systems. Explain the purpose of the air supply which is applied directly to the solenoid valve and give the controlled valve position for loss of air and loss of electrical power.

13. Describe the power train assignment to instrumentation, control system, and isolation valve pilot solenoids.

14. Describe the air supply system to the control and isolation valves.

15. Describe the criteria employed in the design i.e. Codes, Standards, Reg Guides etc. To which these systems are designed.

16. Describe the physical separation for electrical, instrumentation, and control cables for the CAM & ACAD Systems.

MEETING SUMMARY DISTRIBUTION:

Docket
NRC PDR
Local PDR
ORB #2 Reading
NRR Reading
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NRC Participants:

cc: licensees