



Commonwealth Edison
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Address Reply to: Post Office Box 767
Chicago, Illinois 60690

December 20, 1982

Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
NUREG 0737 Items II.F.1.4, 5 and 6
Containment Pressure, Water Level and
Hydrogen Monitoring
NRC Docket Nos. 50-237/249 and 50-254/265

Reference (a): D. M. Crutchfield letter to L. O. DelGeorge
dated November 9, 1982

Dear Mr. Eisenhut:

Reference (a) requested that the Commonwealth Edison Company provide, within thirty (30) days of receipt, certain additional information concerning NUREG 0737 Items II.F.1.4, 5 and 6 "Containment Pressure, Water Level and Hydrogen Monitoring" at our Dresden and Quad Cities Stations.

The Attachment to this letter provides the requested additional information. We are hopeful that this supplemental information will enable the completion of the NRC Staff review concerning these items.

To the best of my knowledge and belief, the statements contained in the Attachment are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees and Consultants. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

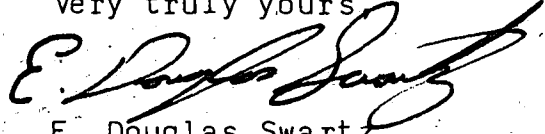
Please address any further questions that you or your Staff may have concerning this matter to this office.

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One (1) signed original and sixty (60) copies of this letter with Attachment are provided for your use.

Very truly yours,



E. Douglas Swartz
Nuclear Licensing Administrator

Attachment
Enclosure

cc: J. G. Keppler, Regional
Administrator - RIII
RIII Inspector - Dresden
RIII Inspector - Quad Cities
Roby B. Bevan - ORB 2
Paul W. O'Connor ORB 5

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ATTACHMENT
COMMONWEALTH EDISON COMPANY

Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2

Response to NRC Request
For Additional Information concerning
NUREG 0737 Items:

- II.F.1.4 Containment Pressure Monitor
- II.F.1.5 Containment Water Level Monitor
- II.F.1.6 Containment Hydrogen Monitor

The following accuracy and time response information is based upon the worst case accuracy expected to exist under post LOCA conditions.

1. Exceptions Being Taken to NUREG 0737 Requirements

- (1a) Commonwealth Edison believes that our current system installations and/or current commitments for future installations for Items II.F.1.4, II.F.1.5 and II.F.1.6 meet the intent of the requirements stated in the NUREG 0737 guidance document for these items.
- (1b) Our current Dresden and Quad Cities Station commitments are to install a Comsip Delphi K-14 Post LOCA Containment Hydrogen and Oxygen Monitoring System. The system will be qualified to IEEE 323-1974 and IEEE 344-1975, and is designed to withdraw a sample from containment, analyze it for percent hydrogen and oxygen, and return it to the containment. The analyzer works on the principle of measuring the thermal conductivity of the gases and provides an output in the form of two analog signals which are proportional to percent oxygen and percent hydrogen. In our judgement, the Comsip Hydrogen and Oxygen Monitoring System meets the intent of the requirements stated in the NUREG 0737 guidance document.

2. II.F.1.4 Pressure Monitoring System - Accuracy and Time Response

(2a) See the attached block diagram Fig. 1.

(2b) The following is a list of parameters which affect the accuracy of each module:

- a. Stability \pm 0.25%
- b. Total temperature effect \pm 1.1%
- c. Seismic performance \pm 0.25%
- d. Radiation performance \pm 0.70%
- e. Power supply effect \pm 0.005%
- f. Calibration error \pm 0.5%

The temperature and radiation effects are based on the specific location of the transmitter. The environmental figures used in our calculations are based upon a Bechtel report dated April, 1980 (CECo Response to IE Bulletin 79-01, Vol. 1, Dresden - Unit 3).

(2c) By combining the uncertainties within each module and then combining the uncertainties of each module within a loop by the square root of the sum of the squares method, the following overall loop uncertainties were derived:

- a. Transmitter to indicator: 7.06% error
- b. Transmitter to recorder: 5.51% error

(2d) The following is the time response for each component:

- a. Instrument tubing 0.1 sec. (estimate)
- b. Transmitter 0.2 sec. to 1.67 sec. adjustable (time constant)
- c. Indicator 2.5 sec. (maximum response time)
- d. Recorder 0.5 sec. full scale (step response)

(2e) Under the assumption that the transmitter time constant is set at its minimum value of 0.2 seconds, then the system response time to the recorder should be less than 1 second. Summing the response times of the components gives a system response time of less than 3 seconds.

Given the above, and when compared to the operator's response time, it is our judgement that the overall system time response is adequate for the intended system function and that the intent of the NUREG 0737 guidance document has been satisfied.

This system is also provided with a separate loop for narrow range monitoring.

3. II.F.1.5 Water Level Monitoring System - Accuracy

- (3a) See the attached block diagram Fig. 2.
- (3b) The following is a list of parameters which affect the accuracy of a module:
- a. Thermal effect
 - b. Radiation effect
 - c. Drift effect
 - d. Power supply effect
 - e. Calibration error

The overall effect on a module by these parameters is estimated to be + 10%. However, the effect of each parameter is not precisely known.

- (3c) By combining the uncertainty of each module in a loop using square root of the sum of the squares method, the following overall loop uncertainties were derived:
- a. Transmitter to indicator: 9.4% error
 - b. Transmitter to recorder: 8.3% error

This system is also provided with a separate loop for narrow range monitoring.

4. II.F.1.6 Hydrogen Monitoring System - Accuracy & Placement

- (4a) In lieu of a block diagram, we have included a system diagram for your information.
- (4b) The Comsip Hydrogen Monitoring System errors are as follows:
- a. \pm 2% error in reading due to calibrated gas.
 - b. \pm 1% error in reading due to analyzer electronics (electronics located outside of harsh area).
 - c. \pm 1% error in reading due to flow variations.
 - d. \pm 1/2% error in reading due to transducer (located outside of harsh area).
 - e. \pm 2% error due to long term drift.

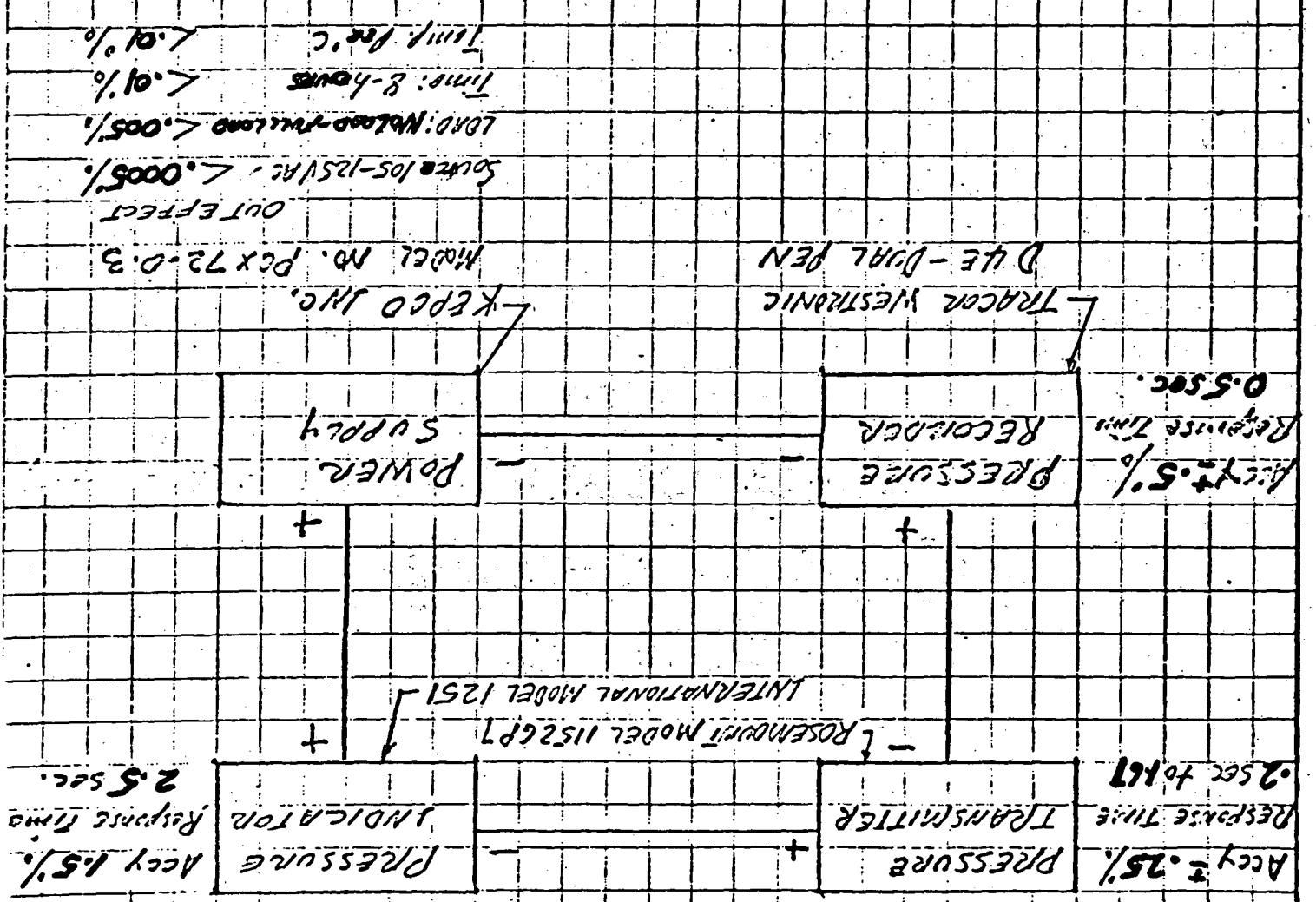
The above information was obtained from Mr. S. Lohmeyer of Comsip during telecons of November 30 and December 3, 1982. The errors are in % of full scale (10%).

Although the square root of the sums of these errors is only 3.2% error, Comsip believes that this value is low and that a conservative value of 4.5% should be used for the signal output of the system.

- (4c) Therefore, based on a 4.5% error and the accuracy of the indicator, the combined error is estimated to be 4.7%.
- (4d) There will be four hydrogen monitor intake ports on each of the two headers in each containment. The intake ports on each header will be located at four elevations approximately equidistant from each other. The headers will be on opposite sides of the reactor pressure vessel inside the containment. A globe valve on each intake port will allow throttling. The valves will be set to provide approximately equal flow into each intake port.
- (4e) There are no obstructions which would prevent hydrogen from reaching the intake ports quickly.

DRESDEN AND QUID CITIES STATIONS
NURGE 0737 ITEM II. F.I. 4
PRESSURE MONITORING SYSTEM

FIG 1



DRESDEN AND QUND CITIES STATION
NURGE 0737 STATION II. F. 1. 5
WATER LEVEL MONITORING

FIG 2

