May 27, 1983

, . <u>.</u>

DISTRIBUTION SEPB Docket PKapo NRC PDR Local PDR DVassallo ORB Reading NSIC DCrutchfield HSmith RGilbert RBevan **HNicolaras** OELD ELJordan **JMTaylor** ACRS (10)

Docket Nos. 50-237/249/254/265 LS05-83-05-060

> Mr. Dennis L. Farrar Director of Nuclear Licensing Commonwealth Edison Company Post Office Box 767 Chicago, Illinois 60690

Dear Mr. Farrar:

SUBJECT: NUREG-0737, ITEM II.F.1.4 CONTAINMENT PRESSURE MONITOR ITEM II.F.1.5 CONTAINMENT WATER LEVEL MONITOR ITEM II.F.1.6 CONTAINMENT HYDROGEN MONITOR

> Dresden Nuclear Power Station, Unit Nos. 2 and 3 Quad Cities Nuclear Power Station, Unit Nos. 1 and 2

The staff has reviewed your submittals dated December 15, 1980 and December 20, 1982 on TMI Action Plan Items II.F.1.4, "Containment Pressure Monitor," II.F.1.5, "Containment Water Level Monitor," and II.F.1.6, "Containment Hydrogen Monitor." The scope of the staff's review included all requirements except for the criteria requiring that the equipment be environmentally qualified (Appendix B of NUREG-0737). This latter issue will be reviewed separately under the scope of the Commission's environmental qualification program.

As discussed in the enclosed Safety Evaluation, the staff has concluded that the requirements of NUREG-0737, Items II.F.1.4, II.F.145 and II.F.1.6 for the Dresden Nuclear Power Station, Unit [Nos. 2 and 3 and the Quad Cities Nuclear Power Station, Unit Nos. 1 and 2 have been met and thus are considered resolved.

~		Sincerely,					
8305310028 830527 PDR ADDCK 05000237 PDR			Original signed by/			• •	
				Dennis M. Crutchfield, Chief Operating Reactors Branch #5 Division of Licensing			SEO (b)
	Enclosure: Safety Eva	luation	-	•. *		50	
	cc w/enclo See next p	sure: age	. A			Ner	m
OFFICE	DL:05095 RGUBert:ajs 04/27/83	DL:0BB#5 HSMILA 041783	04 <b>6</b> 1/83	DL:0RB#2 HNTCp]aras 0 <b>5</b> /7//83	DL70PB#5 DCrubchfield Q <b>5</b> /2783	<b>DL: ORB #2</b> PKapo <b>P</b> K <b>5</b> / 11 /83	DL : ORB #2 DVassallo 5 /26/83
	(10.80) NBCM 0240	. /	OFFICIAL	PECORD C			LISCRO: 1981-335.00

# Mr. D. Farrar

- 2 -

May 27, 1983

cc Isham, Lincoln & Beale Counselors at Law One First National Plaza, 42nd Floor Chicago, Illinois 60603

Mr. Doug Scott Plant Superintendent Rural Route #1 Morris, Illinois 60450

U. S. Nuclear Regulatory Commission Resident Inspectors Office Dresden Station RR #1 Morris, Illinois 60450

Chairman Board of Supervisors of Grundy County Grundy County Courthouse Morris, Illinois 60450

121 Inois Department of Nuclear Safety 1035 Outer Park Drive, 5th Floor Springfield, Illinois 62704

U. S. Environmental Protection Agency Federal Activities Branch Region V Office ATTN: Regional Radiation Representative 230 South Dearborn Street Chicago, Illinois 60604

James G. Keppler, Regional Administrator Nuclear Regulatory Commission Region III Office 799 Roosevelt Road Glen Ellyn, Illinois 60137

Mr. D. R. Stichnoth, President Iowa-Illinois Gas and Electric Company 206 East Second Avenue Davenport, Iowa 52801 Robert G. Fitzgibbons Jr. Isham, Lincoln & Beale Three First National Plaza Suite 5200 Chicago, Illinois 60602

Mr. Nick Kalivianakas Plant Superintendent Quad Cities Nuclear Power Station 22710 - 206th Avenue North Cordova, Illinois 61242

Resident Inspector U. S. Nuclear Regulatory Commission 22712 - 206th Avenue North Cordova, Illinois 61242

Mr. Marcel DeJaegher, Chairman Rock Island County Board of Supervisors Rock Island County Court House Rock Island, Illinois 61201

-



2.57

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

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

## RELATED TO TMI ACTION PLAN ITEMS (NUREG-0737)

II.F.1.4CONTAINMENT PRESSURE MONITORII.F.1.5CONTAINMENT WATER LEVEL MONITORII.F.1.6CONTAINMENT HYDROGEN MONITOR

TO PROVISIONAL OPERATING LICENSE NO. DPR-19 AND FACILITY OPERATING LICENSE NOS. DPR-25, DPR-29 AND DPR-30

COMMONWEALTH EDISON COMPANY

# IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

DRESDEN NUCLEAR POWER STATION, UNIT NOS. 2 AND 3

QUAD CITIES NUCLEAR POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-237, 50-249, 50-254 AND 50-265

#### 1.0 BACKGROUND

By a letter dated September 5, 1980 (Reference 1) to: (1) licensees of operating plants; (2) applicants for operating licenses; and (3) holders of construction permits, the staff issued a summary listing of all the approved TMI Action Plan Requirements. In November of 1980 the staff issued NUREG-0737, Clarification of TMI Action Plan Requirements (Reference 2), which specifies TMI Action Plan Items approved by the Commission for implementation. This Safety Evaluation (SE) addresses three of these items, II.F.1.4, 5, and 6. For items II.F.1.4, 5, and 6 there is no difference in the hardware being installed in the four plants being reviewed. Therefore, the discussion in this SE refers to all four plants.

## 2.0 II.F.1.4 CONTAINMENT PRESSURE MONITOR SYSTEM (CPMS)

#### 2.1 NUREG-0737 CPMS Position

A continuous indication of containment pressure shall be provided in the control room of each operating reactor. Measurement and indication capability shall include three times the design pressure of the containment for concrete, four times the design pressure for steel, and -5 psig for all containments.

- Measurement and indication capability shall extend 5 psia (-10 psig) for subatmospheric containments.
- (2) Two or more instruments may be used to meet the range requirements. However, instruments that need to be switched from one scale to another scale to meet the range requirements are not acceptable.
- (3) Continuous display and recording of the containment pressure over the specified range in the control room is required.
- (4) The accuracy and response time specifications of the pressure monitor shall be provided and justified to be adequate for their intended function.

# 2.3 Scope of CPMS Evaluation

The licensees have described the design for the CPMS in References 3 and 4. The staff's review of the licensees' submittals consisted of the following: (1) checking for deviations from staff requirements which are stated in Sections 2.1 and 2.2 above, (2) reviewing the adequacy of the accuracy specifications of the CPMS, and (3) reviewing the adequacy of the response time specifications of the CPMS. The figures quoted herein for system accuracy are the root-sum-square of the module accuracies quoted by the licensees. The accuracy figures are expressed as a percentage of full scale. The figures quoted for response time are the 100% response values. For linear transfer functions, the staff is using the convention that the time for 100% response is four time constants.

#### 2.4 Licensees' Compliance with NUREG-0737 CPMS Requirements

After reviewing the licensees' submittals, the staff finds that the CPMS design meets all the requirements of Sections 2.1 and 2.2 above.

# 2.5 Evaluation of CPMS Accuracy and Time Response

The CPMS indicator and recorder are separate devices. The CPMS indicator chosen by the licensees has a system accuracy of 7.1% of full scale and a response time of 3.8 seconds. The CPMS recorder has a system accuracy of 5.5% of full scale and a system response time of 1.3 seconds. These values, which are consistent with the present state of the art, will provide information over the intended range of the CPMS that is sufficiently accurate and useful to allow the plant operator to adequately assess pressure conditions within containment.

# 3.0 II.F.1.5 CONTAINMENT WATER LEVEL MONITOR SYSTEM (CWLMS)

# 3.1 NUREG-0737 CWLMS Position

A continuous indication of containment water level shall be provided in the control room for all plants. A narrow-range instrument shall be provided for PWRs and cover the range from the bottom to the top of the containment sump. A wide-range instrument shall also be provided for PWRs and shall cover the range from the bottom of the containment to the elevation equivalent to 600,000 gallon capacity. For BWRs, a wide-range instrument shall be provided and cover the range from the bottom to five feet above the normal water level of the suppression pool.

3 -

# 3.2 NUREG-0737 CWLMS Clarification

- (1) The measurement capability of 600,000 gallons is based on recent plant designs. For older plants with smaller water capabilities, licensees may propose deviations from this requirement based on the available water supply capability at their plant.
- (2) Narrow range water level monitors are required for all sizes of sumps inside the containment and shall meet the requirements of Regulatory Guide 1.89.
- (3) For BWR pressure-suppression containments, the Emergency Core Cooling System (ECCS) suction line inlets may be used as a starting reference point for the wide-range water level monitors, instead of the bottom of the suppression pool.
- (4) The accuracy requirements of the water level monitors shall be provided and justified to be adequate for their intended function.

# 3.3 Scope of CWLMS Evaluation

The licensees have described the design for the CWLMS in References 3 and 4. The staff's review of the licensees' submittals consisted of the following: (1) checking for deviations from staff requirements which are stated in Sections 3.1 and 3.2 above, and (2) reviewing the adequacy of the accuracy specifications for the CWLMS. The figures quoted herein for system accuracy are the root-sum-square of the module accuracies quoted by the licensees. The accuracy figures are expressed as a percentage of full scale.

## 3.4 Licensees' Compliance with NUREG-0737 CWLMS Requirements

After reviewing the licensees' submittals, the staff finds that the CWLMS design meets all the requirements of Sections 3.1 and 3.2 above.

## 3.5 Evaluation of CWLMS Accuracy

The licensees have installed the CWLMS in the torus only, which fulfills the requirements of Sections 3.1 and 3.2 above. The CWLMS has readout on both an indicator which has an accuracy of 9.4% of full scale and a recorder which has an accuracy of 8.3% of full scale. These values, which are consistent with the present state of the art, will provide information over the intended range of the CWLMS that is sufficiently accurate and useful to allow the plant operator to adequately assess water level considerations.

# 4.0 II.F.1.6 CONTAINMENT HYDROGEN MONITOR SYSTEM (CHMS)

#### 4.1 NUREG-0737 CHMS Position

A continuous indication of hydrogen concentration in the containment atmosphere shall be provided in the control room. Measurement capability shall be provided over the range of 0% to 10% hydrogen concentration under both positive and negative ambient pressures.

## 4.2 NUREG-0737 CHMS Clarification

The continuous indication of hydrogen concentration is not required during normal operation. If an indication is not available at all times, continuous indication and recording shall be functioning within 30 minutes of the initiation of safety injection.

## 4.3 Scope of CHMS Evaluation

The licensees have described the design for the CHMS in References 3 and 4. The staff's review of the licensees' submittals consisted of the following: (1) checking for deviations from staff requirements which are stated in Sections 4.1 and 4.2 above, (2) reviewing the adequacy of the accuracy specifications for the CHMS, and (3) reviewing the adequacy of the hydrogen sample port placement for the CHMS. The figures quoted herein for system accuracy are the root-sum-square of the module accuracies quoted by the licensees. The accuracy figures are expressed as a percentage of full scale.

#### 4.4 Licensees' Compliance with NUREG-0737 Requirements

After reviewing the licensees' submittals, the staff finds that the CHMS design meets all the requirements of Sections 4.1 and 4.2 above, In addition, the licensees have installed a CHMS indicator in the auxiliary electrical room.



#### - 5 -

#### 4.5 Evaluation of CHMS Accuracy and Sample Port Placement

The CHMS recorders, which are located in the control room, also serve as the CHMS indicators. The CHMS chosen by the licensees has a system accuracy of 4.7% of full scale. This value, which is consistent with the present state of the art, will provide information over the intended range of the CHMS that is sufficiently accurate and useful to allow the plant operator to adequately assess the hydrogen concentration in the drywell. The licensees have installed 8 hydrogen sample ports within the drywell which permits rapid detection of hydrogen in the containment.

#### 5.0 CONCLUSION

Based on the above evaluations, the licensees have met all the requirements of NUREG-0737 for items II.F.1.4, 5, and 6. The staff therefore finds the licensees' design for these three items acceptable.

#### 6.0 ACKNOWLEDGEMENT

Principal staff contributor: P. Kapo

#### 7.0 REFERENCES

- Letter from D. G. Eisenhut (NRC) to All Licensees of Operating Plants and Applicants for Operating Licenses and Holders of Construction Permits, dated 5 September 1980. Subject: Preliminary Clarification of TMI Action Plan Requirements.
- NUREG-0737, "Clarification of TMI Action Plan Requirements,"
  U. S. Nuclear Regulatory Commission, November 1980.
- (3) Letter from J. S. Abel (ComEd) to Darrell G. Eisenhut (NRC), 15 December 1980. Subject: System descriptions of the CPMS, CWLMS and CHMS.
- (4) Letter from E. Douglas Swartz (ComEd) to Darrell G. Eisenhut (NRC),
  20 December 1982. Subject: Response to NRC Request for Additional Information.

Dated: May 27, 1983