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October 28, 1987

Mr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Conformance to Regulatory Guide 1.97, Rev. 2
NRC Docket Nos. 50-237 and 50-249

Reference: M. Grotenhuis letter to L. D. Butterfield dated
August 31, 1987.

Dear Mr. Murley:

The referenced letter provided the Technical Evaluation Report (TER) on Dresden conformance with Regulatory Guide 1.97 Revision 2, and requested a response to the associated open items. Our responses are provided in the enclosure for each of the items identified in the TER, including any additional information and comments as requested.

With regard to hardware modifications, we plan on proceeding with the addition of Diesel Generator cooling flow instrumentation as suggested in section 3.3.13 of the TER. This modification is expected to be completed in the 1989-1990 time frame for all three diesel generators at Dresden Station.

It should also be noted that the Dresden Unit 3 outage referred to on page 4 of the TER is currently scheduled to begin in the first quarter of 1988.

If there are any further questions regarding this matter, please contact this office.

Very truly yours,

J. A. Silady
Nuclear Licensing Administrator

Attachment

cc: M. Grotenhuis - NRR
Regional Administrator - RIII
Resident Inspector - Dresden

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ATTACHMENT A

COMMONWEALTH EDISON COMPANY
RESPONSE TO NRC TECHNICAL EVALUATION
REPORT NO. EGG-NTA-7762

CONFORMANCE OF DRESDEN STATION, UNITS 2 & 3 TO
REGULATORY GUIDE 1.97, REVISION 2

OCTOBER 27, 1987

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 01

NAME: Neutron Flux

TYPE/CATEGORY: B1

NRC CONCLUSION (REF. 2):

The existing instrumentation is acceptable until Category 1 instrumentation is developed and installed (Section 3.3.1).

UTILITY RESPONSE:

The design criteria and requirements for the existing instrumentation are those of the original system design, as provided by General Electric Company.

The attenuated power levels at the SRM (when fully withdrawn) change directly as the core power level changes. A period meter is provided which indicates the e-folding time of the exponentially changing power level. Therefore, this meter is capable of showing power level changes down to minimum sensitivity of the detector even when the detector is fully out of the core. This gives the operator information on the direction of power changes. Two SRM channels are powered from 24V/48V Bus 2A(3A); the other two channels are powered from 24V/48V Bus 2B(3B).

The source of power to the SRM drive system is Buses 28-1, 29-1 (38-1, 39-1); two SRM drives per bus. The probability that all four SRM drives would lose power is remote. It seems likely that at least one SRM drive will operate.

The intermediate range (IRM) lower level instrumentation may be relied upon as a backup. These eight detectors (similar to the SRM's) are capable of correlated power level down to about $5 \times 10^{-4}\%$ when fully inserted. The IRM's are also powered from the same buses as the SRM's. The probability of at least one of the these eight operating is very high, as shown in GE Company studies.

RESPONSE TO NRC/EG&G IDAHO

REG. GUIDE 1.97, REVISION 2 CONCERNS,
DRESDEN STATION, UNITS 1 & 2

VARIABLE NO. (REF. 1): 01

Page 2

UTILITY RESPONSE (CONTINUED):

If needed to monitor increasing power levels, the eight APRM channels may be useable since they come on scale at less than 1% of full power and overlap the IRMs through approximately 30% of full power when the IRMs reach their upper range limit. The need for post-accident monitoring with APRM is remote, however, due to the strong negative reactivity available from control rods, the Doppler coefficient, and the moderator void coefficient. Under the conditions of a design basis LOCA event, the scram system is assumed to operate properly. A scram can be verified by diverse means, such as:

- a. indication of scram relay operation
- b. scram valve position indication
- c. CRD scram accumulator low pressure indication
- d. Scram discharge volume high level alarms
- e. Indication of expected responses; i.e., makeup to the vessel, pressure decay, torus temperature rise, etc.

By operator action, if the control rods fail to insert sufficient negative reactivity to safely shut down the reactor, then the Standby Liquid Control System (SLCS) would be initiated and continue to inject the sodium pentaborate solution until it is depleted.

Adequate redundant indications powered from reliable power sources and diverse indications assure that the operator can ascertain the reactivity status of the reactor.

When proven SRM (or wider range) instrumentation is available for continuous incore use, CECO will consider that option for implementation at Dresden. However, existing instrumentation utilized as Category 3 is considered sufficient to monitor this variable.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS,
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): A3

NAME: Drywell Pressure

TYPE/CATEGORY: A1

NRC CONCLUSION (REF. 2):

The licensee should record this variable (Section 3.3.2).

UTILITY RESPONSE:

Drywell pressure is recorded in the Main Control Room both as B1 variable No. 07, and as C1 variable No. 18 on a GE Model 531 Pressure recorder 2(3)-8540-2/4 (-5 to 70psig). This recorder was qualified to the original General Electric design specifications. Drywell pressure is also recorded as a B1 variable on the safety-related qualified, 1E divisional wide range Westronics, 2 pen, Model D4E recorders 2(3)-1640-13A and 13B (-5 to 250psig). This recorder is seismically qualified to IEEE Standard 344 after environmental aging in accordance with IEEE Standard 323. Both recorders adequately cover the range requirement for maximum internal design drywell pressure of 62psig with sufficient resolution over the 0 to 5 psig range provided by Recorder 2(3)-8540-2/4. This recorder has an accuracy of $\pm 0.5\%$ of calibrated span (75 psig) or ± 0.375 psig which is sufficient for operator information.

Since the variable is already recorded on qualified, independent, separate and diverse recorders, another degree of redundancy afforded by recording it as an A1 variable is unnecessary. Therefore, the existing instrumentation is considered adequate to meet the intent of RG 1.97 regarding this variable.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS,
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 51

NAME: Primary Containment Area Radiation

TYPE/CATEGORY: E1

NRC CONCLUSION (REF. 2):

The licensee should show that this instrument meets the original station seismic criteria (Section 3.3.8).

UTILITY RESPONSE:

The components of the existing High Range Radiation Monitoring System are qualified as identified in the attached table. The documents listed verify that the existing instrumentation meets and exceeds the original station seismic design criteria specified for the drywell and reactor building in the FSAR Sections 5.2.3 and 12.1.2, respectively.

It has also been verified in station calibration procedure DIS 1600-16 and on Instrument Data Sheets 1361 and 31261 that the instrument is calibrated over the range from 1 to 10^8 R/hr. The actual calibrated range exceeds the required range by one decade and is, therefore, adequate to monitor the 1 to 10^7 R/hr range.

VARIABLE 51
 COMPONENT QUALIFICATION DATA FOR
 PRIMARY CONTAINMENT AREA RADIATION MONITORS

EQ QUALIFICATION STATUS

SEISMIC QUALIFICATION STATUS

MANUFACTURER MODEL NO.	INSTRUMENT NO.	FILE NO. / TEST REPORT NO. / CONFORMANCE TO	FILE NO. / TEST REPORT NO. / CONFORMANCE TO
General Atomic Sensor (R) RD-23	2(3)-2418 A&B	CQD-014802/ GA Report / IE Bulletin E-254-960, 79-01B May, 1981 IEEE-323-1974 IEEE-381-1977 RG. 1.89	EMD-029835 / GA Report / IEEE-344-1975 E-254-960
	2(3)-2418 C&D	Not Required (Mild Environment)	"
General Atomic Monitor RP-26	2(3)-2419 A&B	Not Required (Mild Environment)	EMD-029835 / GA Report / IEEE-344-1975 E-254-960
General Atomic Power Supply RP-23	-----	Not Required (Mild Environment)	EMD-029835 / GA Report / IEEE-344-1975 E-254-960
GE 531 Display	2(3)-2420 A&B	Not Required (Mild Environment)	(Original equipment installed with original board)
General Atomic Monitor Rack RP-20-01	-----	Not Required (Mild Environment)	EMD-029835 / GA Report / IEEE-344-1975 E-254-960

RESPONSE TO NRC/EG&G IDAHO

REG. GUIDE 1.97, REVISION 2 CONCERNS
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 24

NAME: Radiation Exposure Rate

TYPE/CATEGORY: C2

NRC CONCLUSION (REF. 2):

Radiation exposure rate - The licensee should show that the ranges supplied for this variable encompass the radiation levels expected at the instrument locations (Section 3.3.10).

UTILITY RESPONSE:

The area monitoring system has a range of 10^{-1} to 10^3 mR/hr (10^{-4} to 1 R/hr). The original intent of the area monitoring system was to indicate normal operation dose rates and to alarm under abnormal circumstances in a non-LOCA situation.

The calculated post-LOCA dose rates in the reactor building (secondary containment) exceed 1 R/hr (NUREG 0578 II.b.2 shielding report and calculations for similarly designed stations). This post-LOCA dose rate is due to postulated airborne leakage from the primary containment and to post-LOCA water being circulated through exposed piping in the reactor building.

Based on post-LOCA zone maps in the above-stated NUREG 0578 response the dose rate in the reactor building exceed 500 R/hr for the first seven days of the design basis accident. Accident mitigation does not include entry into this radiation environment.

As the plant enters the recovery phase, a significant time post-LOCA, entry into reactor building is governed by portable meters with an upper end of the range at 10^3 R/hr.

The calculated post-LOCA doses in the reactor building are of a magnitude which precludes entry in the building for equipment repair during the initial accident phase. During the recovery phase the dose rates in the reactor building are expected to be less than 10^3 R/hr and entry would be governed by health-physics access control using portable meters with an upper end of the range at 10^3 R/hr. Therefore, the station will rely on access control and portable survey meters with an upper end of the range at 10^3 R/hr for entry into the reactor building.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS,
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 47

NAME: Cooling Water Flow to ESF System Components

TYPE/CATEGORY: D2

NRC CONCLUSION (REF. 2):

The licensee should provide Category 2 flow instrumentation for the diesel generator cooling water system (Section 3.3.13).

UTILITY RESPONSE:

The RG 1.97 Rev. 2 guidance concerning type D variables is that an indication of the operation of individual safety system (in this case the diesel generator cooling water system) is required by control room operating personnel during an accident to make decisions regarding accident mitigation. The guide does not require explicitly that the means of indication be in the control room but nevertheless should be readily accessible to the operator.

CECo agrees that Category 2 flow instrumentation should be provided in this case and will provide a flow element to measure total flow and accessible local indicators for each of the three diesel generator cooling water pumps (2-3903B, 2/3-3903B and 3-3903B).

Direct measurement of the total flow of each of the three pumps will require placing a flow element in the safety-related, Class 3, outlet piping in the pump room. This will provide accessibility and a controlled environment for a local indicator and/or flow transmitter, as required by the detailed design. Alternatives to be considered for the flow element are the:

- . Orifice Plate
- . Annubar
- . Vortex Shedding

Depending upon the required accuracy flow, correction for pressure and temperature may also be required.

VARIABLE NO. 47 (Cont.)

As required by NUREG 0737, Supplement 1, Section 6.2, "Documentation and NRC Review," the instrumentation used to implement the measurement of diesel generator cooling water flow will meet the following design requirements:

- a) Instrument Range: 0-1000 GPM
- b) Environmental Qualification: N/A
- c) Seismic Qualification: RG 1.100 (safety-related components only)
- d) Quality Assurance: ANSI N45.2 or ANSI/ASME NQA-1
- e) Degree of Redundancy: Zero
Sensor Location: Diesel generator cooling water pump room
- f) Power Supply: Essential Service Bus
- g) Location of Display: Local or main control room, or both, as required by Supplement 1 to NUREG 0737.
- h) Schedule: a) Unit 3 refueling outage (starting Oct., 1989*)
b) Unit 2 refueling outage (starting April, 1990*)

* These scheduled dates may change, as the CECO generating station overhaul schedule is modified to meet system requirements.

RESPONSE TO NRC/EG&G IDAHO

REG. GUIDE 1.97, REVISION 2 CONCERNS,
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 49

NAME: Emergency Ventilation Damper Position

TYPE/CATEGORY: B2

NRC CONCLUSION (REF. 2):

The licensee should verify that the alternate instrumentation is Category 2 (Section 3.3.14).

UTILITY RESPONSE:

In lieu of position switches on the diesel room ventilation dampers, an alternative room-high-temperature monitor and alarm are provided. The loop comprises a temperature sensor in diesel generator ventilation Panel No. 2252-47 (Johnson Control Co. Pneumatic Temperature Transmitter, Model T1220-9) and a local indicator. An alarm is provided at Annunciator No. 3872 on alarm points 3531 (Unit 3) and 2531 (Unit 2). These instruments are not safety-related and are located in a mild environment Zone 19. They are qualified to the original system design criteria.

The main control room damper valves 2/3-5741B and 2/3-5741C are provided with non-safety-related position indicating switches and lights 2/3-5741-054B and 2/3-5741-054C. These switches and lights are qualified to the environmental and seismic requirements specified for environmental Zone 30 and are Category 2.

The inlet/outlet differential pressure of fans 2/3-5731 and 2/3-5728 is monitored by a pneumatic differential pressure transmitter, local indicator, pressure switch and status light mounted in Panel P-35 with an alarm on annunciator circuit No. 3216. Panel P-35 is qualified to the original station seismic criteria.

Since the equipment involved is in a mild environment and is not safety-related, environmental and seismic qualification is not required in accordance with RG 1.97, Rev. 2, Paragraph 1.3.2(a). Therefore, the existing instrumentation is considered adequate to meet the intent of RG 1.97 regarding this variable.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 52

NAME: Secondary Containment Radiation

TYPE/CATEGORY: E/2

NRC CONCLUSION (REF. 2):

Secondary containment area radiation - The licensee should show that the ranges supplied for this variable encompass the radiation levels expected at the instrument locations (Section 3.3.15).

UTILITY RESPONSE:

The area monitoring system has a range of 10^{-1} to 10^3 mR/hr (10^{-4} to 1 R/hr). The original intent of the area monitoring system was to indicate normal operation dose rates and to alarm under abnormal circumstances in a non-LOCA situation.

The calculated post-LOCA dose rates in the reactor building (secondary containment) exceed 1 R/hr (NUREG 0578 II.b.2 shielding report and calculations for similarly designed stations). This post-LOCA dose rate is due to postulated airborne leakage from the primary containment and to post-LOCA water being circulated through exposed piping in the reactor building.

Based on post-LOCA zone maps in the above-stated NUREG 0578 response the dose rate in the reactor building exceed 500 R/hr for the first seven days of the design basis accident. Accident mitigation does not include entry into this radiation environment.

As the plant enters the recovery phase, a significant time post-LOCA, entry into reactor building is governed by portable meters with an upper end of range at 10^3 R/hr.

The calculated post-LOCA doses in the reactor building are of such a value as to preclude entry in the building for equipment repair during the initial accident phase. During the recovery phase the expected dose rates in the reactor building would likely be less than 10^3 R/hr and entry would be governed by health-physics access control using portable meters with an upper end of the range at 10^3 R/hr. Therefore, the station will rely on access control and portable survey meters with an upper end of the range at 10^3 R/hr for entry into the reactor building.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 59

NAME: Noble Gases

TYPE/CATEGORY: E/2

NRC CONCLUSION (REF. 2):

Noble gases; all other identified release points - The licensee should demonstrate the adequacy of the instrumentation provided for this variable (Section 3.3.16).

UTILITY RESPONSE:

Each isolation condenser vent will be monitored by one General Atomics RD-1-03 and one General Atomics RD-1-05. The ranges of these detectors are 10^0 to 10^5 mR/hr for the RD-1-03 and 10^{-2} to 10^{+3} mR/hr for the RD-1-05.

Based on previous calculations, the sensitivities of the GA detectors in the present geometries are approximately $1 \mu\text{Ci/cc/R/hr}$ for a typical normal operational BWR noble gas mix, a one-minute old noble gas mix from a control rod drop accident, and a T=0 LOCA noble gas-halogen mix. With overlapping ranges of the two detectors on each vent, the range of the system is 10^{-2} to 10^5 mR/hr (10^{-5} to 10^2 R/hr). With the calculated sensitivities this corresponds to 10^{-5} to $10^2 \mu\text{Ci/cc}$.

The upper range limit of Reg. Guide 1.97, $10^2 \mu\text{Ci/cc}$, is met.

The lower value of the Reg. Guide 1.97 range, $10^{-6} \mu\text{Ci/cc}$, is not met. The licensee takes exception to the lower limit, since $10^{-5} \mu\text{Ci/cc}$ corresponds to dose rates that are on the order of natural background or less. 10CFR20 concentration in the vent pipe is $2.78 \times 10^{-3} \mu\text{Ci/cc}$ of normal operational mix. The lower range of the installed detector system is more than adequate for 10CFR20 noble gas concentrations or reasonable fractions thereof.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 60

NAME: Particulates and Halogens

TYPE/CATEGORY: E/3

NRC CONCLUSION (REF. 2):

Particulates and halogens - The licensee should demonstrate that the provided range encompasses the recommended range (Section 3.3.17).

UTILITY RESPONSE:

The main stack effluent monitoring consists of an Eberline SPING-4 and a Victoreen PAARM (Post-Accident Airborne Radiation Monitor). This combination of instruments is for normal and post-accident situations.

During normal operations station technical specifications require that an iodine/particulate filter be counted once every seven days. This requirement is fulfilled by removing the filter from the SPING skid and counting it on a GE(Li) detector. A typical measured operational concentration is on the order of 10^{-12} $\mu\text{Ci/cc}$.

In a design basis accident situation a high radiation signal on the SPING skid transfers the process stream to the Victoreen PAARM from which a filter is collected every 30 minutes. This modification was installed to meet the NUREG 0737 requirement for iodine and particulate of 10^2 $\mu\text{Ci/cc}$ for 30 minutes.

Dresden Station uses grab sampling to quantify iodine and particulate releases for normal and post-accident applications. This methodology quantifies releases on the order of 10^{-12} to 10^{+2} $\mu\text{Ci/cc}$, more than adequate for Reg. Guide 1.97 purposes.

RESPONSE TO NRC/EG&G IDAHO
REG. GUIDE 1.97, REVISION 2 CONCERNS,
DRESDEN STATION, UNITS 2 & 3

VARIABLE NO. (REF. 1): 63

NAME: Plant & Environs Radiation

TYPE/CATEGORY: E/None

NRC CONCLUSION (REF. 2):

Plant and environs radiation - The licensee should provide instrumentation that covers the recommended range (Section 3.3.18).

UTILITY RESPONSE:

The reactor building is expected to be inaccessible for an extensive post-accident period. Most other areas of the plant, exclusive of the SGB area, are expected to be less than 500 R/hr (NUREG 0578 II.b.2 shielding report and calculations for similarly designed stations). Therefore the present survey equipment has adequate range (0-10³ R/hr).

REFERENCES

1. CECO Summary Report, Dresden Station, Units 2&3, Compliance to Regulatory Guide 1.97, Revision 2, July 31, 1985.

2. A. C. Udy, NRC Technical Evaluation, Report No. EGG-NTA-7762, Conformance to Regulatory Guide 1.97, Dresden Station, Units 2&3, August, 1987.