



Commonwealth Edison
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September 21, 1992

Dr. Thomas Murley, Director
 U. S. Nuclear Regulatory Commission
 Washington, D. C. 20555

Attention: Document Control Desk

Subject: Response to Supplement 1 to Generic Letter (GL) 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors", SQUG Resolution of USI A-46.

Dresden Nuclear Power Station
 NRC Docket Numbers 50-237 and 50-249
Quad Cities Nuclear Power Station
 NRC Docket Numbers 50-254 and 50-265
Zion Nuclear Power Station
 NRC Docket Numbers 50-295 and 50-304

Reference: SQUG letter to Mr. James Partlow of the NRC, dated August 21, 1992.

On February 19, 1987, the NRC issued Generic Letter 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46". This Generic Letter encouraged utilities to participate in a generic program to resolve the seismic verification issues associated with USI A-46. As a result, the Seismic Qualification Utility Group (SQUG) developed the "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Power Plant Equipment." On May 22, 1992, the NRC Staff issued Generic Letter 87-02, Supplement 1, which constituted the NRC Staff's review of the GIP and which included Supplemental Safety Evaluation Report Number 2 (SSER-2) on the GIP, Revision 2, corrected on February 14, 1992. The Generic Letter requests that SQUG member utilities provide a schedule for implementing the GIP to the NRC, within 120 days. Commonwealth Edison's response for the Dresden, Quad Cities and Zion Stations is presented in the Attachment. The Attachment is divided into five sections; section I) introduction, II) commitment to the GIP, III) the in-structure response spectra, IV) the plant-specific schedules, and V) the plant specific licensing basis. CECO is committed to the GIP, in its entirety, including the clarifications, interpretations, and exceptions identified in SSER-2 and clarified in the referenced August 21, 1992 letter with no exceptions.

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We have provided clarifications to the anchorage verification described in section 4.1.4 of the GIP in the attachment, section II to this letter. CECO will be guided by the remaining (non-SQUG) commitments to the GIP.

To the best of my knowledge and belief, the statements in the attachment contained herein are true and correct. 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 direct any questions that you may have concerning this response to this office.

Respectfully,



Marcia A. Jackson
Generic Issues Administrator

cc: A. B. Davis, Regional Administrator, RIII
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ATTACHMENT
Commonwealth Edison Response to Generic Letter 87-02

I) Introduction

As a result of Generic Letter 87-02 issued February 19, 1987, the Seismic Qualification Utility Group (SQUG) developed the Generic Implementation Procedure (GIP) for seismic verification of nuclear power plant equipment. On May 22, 1992, the NRC Staff issued Supplement 1 to the Generic Letter which constituted the Staff's review of the GIP and which included Supplemental Safety Evaluation Report Number 2 (SSER-2) on the GIP, revision 2, corrected on February 14, 1992. This attachment represents CECo's response to Generic Letter 87-02, Supplement 1 for Dresden, Quad Cities, and Zion Nuclear Stations.

II) Commitment to the GIP, Revision 2

As a member of SQUG, Commonwealth Edison (CECo) commits to use the SQUG methodology as documented in the GIP, where "GIP" refers to GIP Revision 2, corrected February 14, 1992, to resolve USI A-46 at the Dresden, Quad Cities, and Zion Nuclear Stations. The NRC Staff evaluation of the GIP permits licensees to deviate from the SQUG commitments embodied in the Commitment sections, provided that the Staff is notified of any deviations prior to implementation. CECo recognizes that the Staff's position in SSER-2 is that if licensees use other methods that deviate from the criteria and procedures as described in SQUG commitments and in the implementation guidance of the GIP, without prior NRC approval, the method may not be acceptable to the Staff, and therefore may result in deviations from the provisions of Generic Letter 87-02.

Specifically, CECo commits to the SQUG commitments as defined in the GIP and clarifications, interpretations, and exceptions identified in the SSER-2 and clarified in the referenced August 21, 1992 letter with no exceptions. CECo does offer the following clarifications:

Section 4.1.4 Anchorage Verification

Clarification Number 1

CECo previously performed anchorage evaluations for Dresden, Quad Cities, and Zion Stations. Where possible, CECo will use these evaluations to expedite and/or minimize the GIP verification efforts.

Clarification Number 2

CECo will utilize the GIP methodology for demonstrating acceptable anchorage and to ensure operability of equipment documented in our Safe Shutdown Equipment List (SSEL). For equipment on the SSEL qualified to IEEE 344-1975, we will utilize the existing seismic qualification test reports.

CECo will perform the appropriate walkdowns using the GIP to evaluate this equipment to meet interaction concerns.

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GIP Guidance

CECo will be guided by the remaining (non-commitment) sections of the GIP, i.e., GIP implementation guidance, which comprises suggested methods for implementing the applicable commitments.

III) In-Structure Response Spectra (ISRS)

For defining seismic demand, CECo will use the "conservative, design" in-structure response spectra for Dresden, Quad Cities, and Zion Stations. As an alternative, we may use the "realistic, median-centered" in-structure response spectra. The reduced IPEEE spectra is one acceptable example of realistic median centered spectra as stated in the GIP. If any other method is used to generate realistic, median-centered ISRS, then CECo will forward the procedures and criteria used to generate this spectra for your review and approval prior to use. The following paragraphs address each Station's ISRS.

Dresden Station

The design basis spectra as described in Dresden FSAR Sections 12.1.1.3 and 12.1.2 will be used for both units 2 and 3 as conservative, design basis spectra.

In Table A of SSER-2, Dresden Unit 2 is listed as a Category 2 SEP plant. Dresden Units 2 and 3 are connected, duplicate units; the design basis spectra is the same for both units. Accordingly, CECo believes that the spectra for Dresden Unit 3 is acceptable. Therefore, CECo plans to use the same ISRS for both Dresden Units 2 and 3.

Quad Cities Station

CECo recently completed a review of the history of the development of the ISRS at Quad Cities Station. This review concluded that similar analytical methods were used at Quad Cities as compared to those used at Dresden Station. These methods were consistent with the state-of-the-art at the time of development. However, Quad Cities Station employed a higher, more conservative, peak ground acceleration and ground response spectrum. The design basis spectra for Quad Cities is described in FSAR Sections 12.2.2. The Quad Cities design basis spectra included a time history method which overestimated the seismic response.

Dresden and Quad Cities are considered sister plants, with very similar structural arrangements. Accordingly, the original seismic modeling is also very similar. For purposes of the resolution of USI A-46 at Quad Cities Station, CECo proposes to employ the Dresden "design basis" spectra (both ground and ISRS) at Quad Cities as "conservative, design" response spectra.

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The Dresden design basis spectra is described in Dresden FSAR sections 12.1.1.3 and 12.1.2. Our justification for proposing to use the Dresden spectra at Quad Cities is as follows:

1. Seismological Similarity

Both Dresden and Quad Cities belong to the same seismological province. The earthquake history, as documented in the plant's "Recommended Earthquake Criteria", (References a and b) for both sites is very similar. An earthquake having an intensity of VII on the Modified Mercalli Scale is the maximum anticipated for both sites.

2. Lawrence Livermore Lab (LLL) and the Electric Power Research Institute (EPRI) Studies

Two of the most comprehensive and recent studies for seismic risk at nuclear power plant sites, located east of the Rocky Mountains, have been performed by LLL and EPRI. The LLL study was sponsored by the NRC. Both studies showed that, in terms of uniform hazard spectra and probability of exceedance of peak ground acceleration, Quad Cities has a slightly lower seismic risk than that of Dresden.

3. Geological/Foundation Similarity

Both Dresden and Quad Cities plants are founded on rock. Dresden is founded on deep, competent rocks, consisting of sandstone and limestone. Quad Cities is founded on dolomite bedrock.

4. Plant Structures

The Quad Cities Units 1 and 2 were designed as sister units to Dresden Units 2 and 3 by the same NSSS supplier, using the same architect/engineer. A review of the plants structural drawings for parameters which affect the seismic models (i.e., mass and stiffness) has confirmed that the two plants are quite similar in terms of their seismic behavior. The review included comparison of building dimensions, major floor slab elevations, plan dimensions, thickness of slabs and concrete walls, and steel bracing dimensions which contribute to the horizontal stiffness of the buildings.

5. SSER-2 Approval of Dresden Unit 2 Spectra

Dresden Unit 2 is listed as one of the SEP plants in Table A of SSER-2. This listing allows use of the Dresden design basis spectra as the conservative, design ISRS for use in USI A-46 efforts.

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Zion Station

The licensing basis Safe Shutdown Earthquake (SSE) in-structure response spectra is described in Zion FSAR section 3.7. As noted in the FSAR, the SSE is based on a horizontal ground acceleration of 0.17g. All ISRS were generated by the time-history method. The scaled N-S El Centro 1940 accelogram was used as the basis for developing these ISRS. CECO proposes to use the licensing basis spectra as the conservative, design ISRS for resolution of USI A-46.

IV) Plant-Specific Schedules

CECO submits the following plant-specific schedules for the implementation of the GIP and a report to the staff summarizing the results of the USI A-46 review.

Dresden Station

The report summarizing the results of the A-46 program at Dresden Station is planned to be submitted to the NRC by November, 1995 following the D2R14 (11/94) and D3R14 (4/95) refueling outages.

Quad Cities Station

The report summarizing the results of the A-46 program at Quad Cities Station is planned to be submitted to the NRC by November, 1995 following the Q1R13 (3/94) and Q2R13 (12/94) refueling outages.

Zion Station

The report summarizing the results of the A-46 program at Zion Station is planned to be submitted to the NRC by June, 1996 following the Z1R14 (1/95) and Z2R14 (10/95) refueling outages. The current Zion refueling outage schedule projects outages to begin in September, 1993 for both units, January, 1995 for Unit 1 and October, 1995 for Unit 2. A dual unit outage is required to complete the field walkdowns due to the requirement for containment access and the requirement to open/inspect essential cabinets. Major resources will be committed to support the dual unit outages in 1993 which will include an overhaul of the Plant's Service Water and Component Cooling Systems. And since extensive preparation and training is required, it will not be possible to perform the walkdowns at Zion in 1993..

It is the intent to begin the walkdowns in mid 1994 and to be completed by the end of the unit 2 (Z2R14) refueling outage (12/95). Due to the extensive documentation and peer review requirements, final report submittal will not occur until June, 1996. The delay in implementation can be further justified due to the fact that Zion Unit 2 was utilized as a trial plant walkdown in 1987. That walkdown identified outliers that were

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later resolved via engineering analysis or physical repair. Furthermore, unit 1 was addressed for those same outliers, which subsequently required additional engineering analysis and repair. The implementation of the GIP at Zion station is not expected to result in many additional outliers.

These schedules may be affected by coordination with the seismic IPEEE response, the completion of the SQUG training, significant outage schedule changes, and the availability of industry resources committing to support the large number of licensees implementing this program. The above schedules assumes prompt notification of the acceptability of our schedules and commitments in this letter. If NRC acceptance of this letter is not received by November 21, 1992, then the A-46 completion date must be rescheduled to permit coordination with planned refueling outages.

As stated in the GL supplement regarding the in-structure response spectra, "The licensee's in-structure response spectra is considered acceptable for USI A-46 unless the Staff indicates otherwise during a review period of sixty days." It is CECO's understanding that if the NRC Staff does not respond by accepting, questioning, or rejecting the spectra within sixty days, then the Staff has accepted our spectra, and we may proceed with implementation.

V) Plant Seismic Licensing Basis

CECO intends to change its licensing basis for verifying the seismic adequacy of new and replacement, as well as existing, electrical and mechanical equipment prior to receipt of final plant-specific SER resolving USI A-46. This change will be conducted under the requirement of 10 CFR 50.59 and will be consistent with the guidance in sections 2.3.3 or Part I of the GIP, revision 2, and with the clarifications, interpretations, and exceptions identified in SSER-2 as clarified by the referenced August 21, 1992 letter. Any changes to the FSAR will be provided in accordance with 10 CFR 50.71(e).

- References:
- a) John A. Blume & Associates, "Quad Cities Station, Unit 1, Recommended Earthquake Criteria," dated May 25, 1966.
 - b) John A. Blume & Associates, "Dresden Station Unit 2 Nuclear Plant Recommended Earthquake Criteria," dated November 3, 1965.