

THE CINCINNATI GAS & ELECTRIC COMPANY



CINCINNATI, OHIO 45201

December 8, 1983
LOZ-83-0232

J. WILLIAMS, JR.
SENIOR VICE PRESIDENT
NUCLEAR OPERATIONS

Docket No. 50-358

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

RE: WM. H. ZIMMER NUCLEAR POWER STATION
UNIT 1 - TRANSMITTAL INFORMATION

The attached letters have been transmitted to NRC Region III and are being provided for your information and use.

Letter LOZ-83-0180 dated November 8, 1983 "Evaluation of Cable Tray and Conduit Support Welding Along With The Adequacy of Threaded Nelson Studs Used on Cable Tray Supports."

Letter LOZ-83-0165 dated November 9, 1983 "Structural Steel Bolting."

These letters contain reference to FSAR changes which will be required if approval is received. Therefore, they are being sent to you to enable close coordination with Region III and an early review by NRR Staff on the impact of the FSAR changes required.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By


J. WILLIAMS, JR.
SENIOR VICE PRESIDENT

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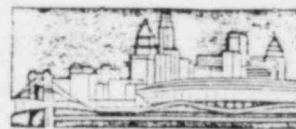
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THE CINCINNATI GAS & ELECTRIC COMPANY



CINCINNATI, OHIO 45201

November 8, 1983

LOZ-83-0180

J. WILLIAMS, JR.
SENIOR VICE PRESIDENT
NUCLEAR OPERATIONS

Docket No. 50-358

Mr. J.G. Keppler,
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

RE: WM. H. ZIMMER NUCLEAR POWER STATION - UNIT 1
EVALUATION OF CABLE TRAY AND CONDUIT SUPPORT
WELDING ALONG WITH THE ADEQUACY OF THREADED
NELSON STUDS USED ON CABLE TRAY SUPPORTS
(10CFR50.55(e), ITEMS E-20 & E-29)
W.O. 57300, JOB E-5590, FILE #503

This letter submits an evaluation plan for your review and identifies rework for which CG&E intends to request relaxation of the NRC November 12, 1982 "Order to Show Cause and Order Immediately Suspending Construction" (CLI-82-33) in accordance with Section IV.B(3). This letter also constitutes an interim report for the subject conditions which were initially reported to the Commission on May 3, 1982 (Item E-20) and September 28, 1982 (Item E-29) as potentially reportable deficiencies under the requirements of 10CFR50.55(e).

On August 11, 1983, a meeting was held at the Wm. H. Zimmer site between the Nuclear Regulatory Commission (NRC) and The Cincinnati Gas & Electric Company (CG&E). The NRC was represented by Messrs. L. Kintner, C. Scheibelhut, D. Keating, and W. Christianson. During this meeting, CG&E's program for evaluating cable tray and conduit support welding along with the adequacy of threaded Nelson Studs used on cable tray supports was presented. The proposed program is summarized below and activities for which relaxation will be requested are identified. Program details are provided in Attachment A to this letter.

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EVALUATION OF CABLE TRAY AND CONDUIT SUPPORT WELDING (E-20)
ALONG WITH THE ADEQUACY OF THREADED NELSON STUDS USED ON
CABLE TRAY SUPPORTS (E-29)

The E-20 program addresses the concerns that hot-dip galvanizing or spray-on galvanox coating on welds may hinder reinspection efforts, and that the original inspection was not 100% complete. Sample destructive tests will be utilized to obtain existing weld strength since removal of the hot dip galvanizing is difficult and may present additional problems. The capacity of existing welds with minor weld discontinuities shall be verified in order to minimize rework. Except for the use of sampling, this program is in conformance with the design and construction requirements described in the FSAR. The results of this program will be used during the 100% reinspection of cable tray and conduit support for configuration and location.

The E-29 sampling program addresses the concerns related to the adequacy of the threaded Nelson Studs, and provides an evaluation of base metal discontinuities caused by the removal of a stud used for temporary support of a locating template.

The program presented on August 11, 1983 for Nelson Studs and described in "Attachment A" differs from the commitments discussed in our previous interim report on Item E-29 (LOZ-83-0018). Those differences are as follows:

1. Sampling will be used to verify hanger foot connection adequacy instead of torque testing individual studs for each connection.
2. The size limitation was removed from the acceptance criteria for base metal discontinuities.

CG&E intends to request relaxation of the Show Cause Order in order to conduct the following safety related work associated with the proposed programs:

1. The Item E-20 program requires disassembly of support hangers to provide destructive

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Regional Administrator
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test samples. Reassembly with new hangers is also requested.

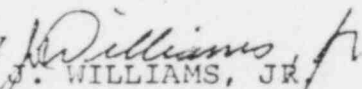
2. Item E-29 program requires the dismantling of cable tray supports to evaluate base metal discontinuities.

We are planning to perform this evaluation and rework under the organization described in CG&E's Course of Action and in accordance with the approved procedures developed for use during the implementation of the Plan for the Verification of the Quality of Construction (PVQC) and Continuation of Construction Plan (CCP). The programs developed in response to your letter of October 4, 1983 will be utilized, as appropriate, in the implementation of this work.

We request your concurrence in this plan so that we can effectively do the necessary procedure development and planning. We trust this letter will also be found acceptable as an interim report under 50.55(e) for Items E-20 and E-29.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By 
J. WILLIAMS, JR.
SENIOR VICE PRESIDENT

RRW/sfr

cc: NRC Office of Inspection & Enforcement
Washington, D.C. 20555
NRC Resident Site Supervisor
ATTN: W.M. Hill
NRC Zimmer Project Inspector, Region III
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ATTACHMENT A

Evaluating Cable tray and Conduit Support Welding Along With the Adequacy of Threaded Nelson Studs Used on Cable Tray Supports

These topics were initially reported to the Commission on 5/3/82 and 9/28/82 respectively, as potentially reportable deficiencies under 10CFR50.55(e), Items E-20 and E-29.

The E-20 program addresses the concerns that hot-dip galvanizing or spray-on galvanox coating on welds may hinder reinspection efforts and that the original inspection was not 100% complete. This program also supports the resolution of problems with materials, welder identification, welder qualification and weld procedure qualifications. Destructive tests will be utilized to obtain existing weld strength since removal of the hot-dip galvanizing is difficult and may present additional concerns. The capacity of existing welds with minor weld discontinuities shall be verified in order to minimize rework.

This program utilizes a sampling plan which is based on MIL-STD-414. The allowable weld strength shall be determined with a 95/95 (Confidence/Reliability) factor. The number of supports, not individual welds, are used to determine the total sample population. The sample size shall be consistent with the Level V requirement of MIL-STD-414 (more samples than normal inspection level).

A visual inspection, to AWS D 1.1, shall be performed on all welds of the sample cable tray and conduit support hangers. The samples with spray on galvanox coatings will be wire brushed until the coating is removed prior to inspection, while the hot-dip galvanizing will not be removed for reasons described above. Welds found acceptable through visual inspection will not be subjected to the shear strength test. Samples of unacceptable welds will be subjected to such tests. Weld deficiencies not meeting the visual inspection criteria shall be documented on NR's. Traceable identification will be provided for the unacceptable welds. Whether the unacceptable weld is hot-dip galvanized, galvanox coated, shielded metal arc or gas metal arc welded will be documented to the extent possible.

Unacceptable welds identified by the visual inspection shall be reviewed and test samples shall be randomly selected. The selected samples shall be cut out from the existing hangers and subjected to shear strength testing to determine the allowable weld strength. MIL-STD-414 shall be used to verify that the weld strength determined corresponds to a 95/95 (Confidence/Reliability) factor. The allowable weld stresses shall be established utilizing safety factors in the original design codes.

Allowable weld stresses established from the shear strength testing shall be used to evaluate the capacities of connections containing welds with discontinuities in the original hanger sample. Welds with discontinuities shall be considered acceptable if all connections in the hangers are evaluated and found to have adequate capacity. If this program is successful, all accessible welds will be visually reinspected to verify weld size, length, and that no cracks exist. All inspection activities shall be documented. Connections which do not have adequate capacity shall either be reworked in accordance with site approved procedures or the applicable hanger shall be replaced.

The following exceptions to industry standards described in the FSAR are taken in regard to the Cable Tray and Conduit Support Welding Reinspection Program:

FSAR Section 3.13.10.1.1 Welded Connections

Exception to AWS Structural Welding Code D1.1-1972; Strength testing of sample support connections is used to establish acceptance of connection welds with discontinuities.

FSAR Section 3.13.10.2 Inspection of Weldments

Exception to AWS Structural Welding Code D1.1-1972; Modified acceptance criteria is used for support weld acceptance, based on strength testing of sample support connections.

The FSAR will be revised to document the above AWS Code exceptions.

The E-29 sampling program resolves concerns relating to the adequacy of the threaded Nelson studs and provides an evaluation of the base metal discontinuities caused by the removal of a stud used for temporary support of a locating template. This sampling plan is based on MIL-STD-105D and the sample being large enough to result in a 95/95 (Confidence/Reliability) factor. The capacity of the supports will be the attribute tested rather than the capacity of individual studs. This program is in conformance with all design and construction requirements described in the FSAR. The program outline is as follows:

- (1) Test torquing Nelson studs to the values specified in AWS D 1.1, Section 7.6.

- (2) Evaluate cable tray support adequacy based on torque test results from Step 1.
- (3) Dismantling cable tray supports and evaluating base metal discontinuities by visual inspection. Base metal cracks are not acceptable.

All inspection activities will be documented and will be in accordance with site approved procedures. This program shall be appropriately integrated into the reinspection activities of the Item E-20 program.

THE CINCINNATI GAS & ELECTRIC COMPANY



J. WILLIAMS, JR.
SENIOR VICE PRESIDENT
NUCLEAR OPERATIONS

November 9, 1983
LOZ-83-0165

Docket No. 50-358

Mr. J.G. Keppler
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

RE: WM. H. ZIMMER NUCLEAR POWER STATION - UNIT 1
10CFR50.55(e), ITEM S-11, STRUCTURAL STEEL
BOLTING
W.O. 57300, JOB E-5590, FILE #956C, S-11

This letter constitutes an interim report concerning the subject condition initially reported to the Commission on May 13, 1983 as a potentially reportable deficiency under the requirements of 10CFR50.55(e). Based on a November 1, 1983 telephone conversation between Messrs J. Harrison (NRC) and R. Wrucke (CG&E), it was agreed that an extension would be granted for the submittal of this report from November 1, 1983 to November 15, 1983.

On August 11, 1983, a meeting was held at the Wm. H. Zimmer site between the Nuclear Regulatory Commission (NRC) and The Cincinnati Gas & Electric Company (CG&E). The NRC was represented by Messrs. L. Kintner, C. Scheibelhut, D. Keating, and W. Christianson. During this meeting, CG&E's program for Reinspection and Rework of Structural Steel High Strength Bolting was presented and is summarized below. Program details are provided in Attachment A to this letter.

REINSPECTION AND REWORK OF STRUCTURAL STEEL HIGH STRENGTH
BOLTING - SUMMARY

In order to resolve the concern of inadequate inspection documentation for high strength bolting, a comprehensive reinspection program for accessible connections has been developed. This program is part of the expansion of the Quality Confirmation Program (QCP), as addressed in our letter LOZ-83-0038, dated June 13, 1983. The reinspection program includes sampling for hole size which is a

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modification to the Bolting Task Description which was attached to that letter. This program is in conformance with the design and construction requirements cited in the FSAR except for bolt length acceptability criteria; verification of contact surfaces and hole alignment of friction-type connections; and the use of sampling. An FSAR revision will be submitted indicating these exceptions to the design and construction requirements cited in the FSAR.

As part of the reinspection program, connections not meeting acceptance criteria will be documented as unacceptable. CG&E intends to disposition nonconformances concurrent with inspections so rework can be accomplished immediately. On-the-spot rework shall be limited to changing bolts, nuts, washers, and retorquing. It is considerably more efficient to perform this type of rework in conjunction with the inspection.

Procedures governing the reinspection/rework program are currently being developed by CG&E and the proposed Project Director (Bechtel). Upon completion of procedure development, the NRC will be notified and a review meeting scheduled. As requested in NRC Region III letter of October 4, 1983, the procedures and QA program to be applied to this rework would be the same as if the work were being performed under the organization proposed in our Course of Action document submitted to Region III on October 5, 1983.

CG&E intends to request relaxation of the Show Cause Order in association with the rework defined above, contingent upon an acceptable procedural review by the NRC.

Mr. J.G. Keppler
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We trust this letter will be found acceptable as an interim report under 10CFR50.55(e).

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By *J. Williams Jr.*
J. WILLIAMS, JR.
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ATTACHMENT A

Reinspection and Rework of Structural Steel High Strength Bolting

The inadequate inspection of safety-related high strength steel bolting was initially reported to the Commission on May 13, 1983 as a potentially reportable deficiency under 10CFR50.55(e) Item S-11. In order to resolve the concern of inadequate inspection documentation for high strength bolting, a comprehensive reinspection program for accessible connections has been developed. In addition to reinspection, the program also calls for immediate rework of nonconforming bolts, nuts and washers. This program is a part of the expansion of the Quality Confirmation Program (QCP) addressed in CG&E letter LOZ-83-0038, dated June 13, 1983.

Class I Structures included in the program are as follows:

- (1) Auxiliary Building, Reactor Building below Elevation 627' - 0" and Diesel Generator Building.
- (2) Service Water Pump Structure
- (3) Reactor Building at and Above Elevation 627' - 0"
- (4) Gallery Steel in Class I Structures
- (5) Intake Flume

The Reactor Building has been divided into two reinspection areas because El. 627' - 0" is the refueling floor and a restricted area. The reinspection scope proposed at El. 627' - 0" and above differs from that below so as not to be detrimental to the cleanliness of the restricted area.

Bolted connections of the following accessible framing are included in this program for Class I structures referenced:

- (1) Structural steel framing as shown on Sargent & Lundy (S&L) structural drawings, fabricated and erected per Specification H-2174, Sections 5-2 and 5-3, including bracing and trolley beams.
- (2) Seismic block wall columns attached to the exterior surface of blockwalls as shown on S&L architectural drawings.
- (3) Mechanical gallery framing.
- (4) Bolted connections in the Service Water Pump Structure and Intake Flume.

The extent of reinspection for the identified Class I structures is described below. The use of sampling for hole size is a modification to the task description for QCP Task XII which was previously sent to NRC Region III (LOZ-83-0033, June 13, 1983).

(1) Auxiliary Building, Reactor Building below Elevation 627' - 0" and Diesel Generator Building:

- a. 100% of all slotted hole connections and all blockwall seismic columns located on the exterior surface of the wall.
- b. 100% of all connections when bearing capacity is less than friction capacity.
- c. Connections where bearing capacity is greater than the friction capacity will be reinspected for all attributes of "Bearing Connections" as identified later in this attachment, and will be initially sampled and reinspected as follows:
 1. After an initial sampling of a statistically adequate number of connections for hole sizes has been completed, an evaluation will be made to justify the use of bearing load allowables. If the initial hole sampling is not acceptable, the sample size will be expanded or the connection design allowables will revert back to friction load allowables. The sampling will be of sufficient size to obtain a 95/95 (Confidence/Reliability) based on MIL-STD-105D sampling procedure.
 2. After hole sampling has been completed, 100% of all connections shall continue to be inspected in accordance with the Specification for Structural Joints using ASTM A-325 or A-490 Bolts (2 bolts per connection) contained within the 7th Edition of the Manual for Steel Construction by the American Institute of Steel Construction (AISC), for all items except hole size.

(2) Service Water Pump Structure:

- a. 100% of all slotted hole connections.

- b. Connections where bearing capacity is greater than the friction capacity will be reinspected for all attributes of "Bearing Connections" as identified later in this attachment, and will be initially sampled and reinspected as follows:
 - 1. After an initial sampling of a statistically adequate number of connection hole sizes has been completed, an evaluation will be made to justify the use of bearing load allowables. If the initial sampling is not acceptable, the sample size will be expanded or the connection design allowables will revert back to friction load allowables. The sampling will be of sufficient size to obtain a 95/95 (Confidence/Reliability) based on MIL-STD-105D sampling procedure.
 - 2. After hole sampling has been completed, 100% of all connections shall continue to be reinspected in accordance with the Specification for Structural Steel Joints using ASTM A-325 or A-490 bolts (2 bolts per connection) for all items except hole size.
- (3) Reactor Building at and above Elevation 627' - 0":
 - a. 100% of all connections (bolt, nut, washer type and torque attributes only).
- (4) Gallery Steel in Class I Structures:
 - a. 100% of all Mechanical Gallery Steel.
- (5) Intake Flume:
 - a. 100% of all bracing.

The Reinspection Scope of applicable connections is as follows:

(1) Bearing Connections

- a. Bolt type
- b. Edge distance
- c. Hole size
- d. Torque
- e. Nut and washer
- f. Hole condition
- g. Thread projection

(2) Friction Connections

- a. Bolt type
- b. Edge distance
- c. Nut and washer
- d. Torque
- e. Exposed holes
- f. Thread projection

(3) Slotted Hole Connections With Member Axial Load

- a. Bolt type
- b. Edge distance
- c. Nut and washer
- d. Torque
- e. Thread projection

(4) Sliding Connections

- a. Bolt type
- b. Torque 50-100 ft-lbs
- c. Bolt - Slot position
- d. Beam end clearance
- e. Jam nut
- f. Hole size and condition
- g. Thread projection
- h. Edge distance
- i. Nut and washer

The adequacy of bolted connections will be determined by the following criteria:

- (1) Connections which are in conformance with specifications, approved design drawings (or other

approved design documents), and referenced codes shall be considered acceptable and documented as such.

This reinspection program is in conformance with FSAR commitments with the following exceptions:

Bolt Length

FSAR Table 3.8-2. "List of Specifications, Codes and Standards" references ANSI N45.2.5-1972. This ANSI standard specifies inspection of bolting for correct length "as indicated by at least two threads extending beyond the nut." The reinspection program specifies inspection of bolting for correct length based on the end of the bolt being flush with, or extending beyond the face of the nut. This reinspection criteria is consistent with ANSI N45.2.5-1978, and the "Specification for Structural Joints using ASTM A-325 or A-490 Bolts", of AISC dated 1976.

Contact Surface Condition and Hole Alignment

ANSI N45.2.5-1972 also requires "...verification of the condition of contact surfaces of friction type connections and bolt hole alignment." The reinspection program does not specify verification of these attributes. However, the reinspection criteria is consistent with the Seventh Edition of the AISC, 1973 Issue. Contact surfaces for friction connections are generally uncoated. Connections which may have been coated will be in conformance with AISC requirements based on a contact surface having an approved inorganic zinc coating. Verification of bolt hole alignment for friction type connections is not being conducted since the 1973 issue of AISC allowed oversize holes.

Sampling

AISC requires in-process inspection of bolt holes for ASTM A-325 and A-490 bolts. The reinspection program specifies sampling of a statistically adequate number of bearing type connections for bolt hole size in accordance with MIL-STD-105D.

An FSAR revision addressing the exceptions will be prepared and submitted to the NRC Office of Nuclear Reactor Regulation.

- (2) Connections not meeting the above criteria shall be considered unacceptable and documented on Nonconformance Reports. These connections shall be reworked during the inspection program to correct certain deficiencies found. Concurrent rework shall be limited to changing bolts, nuts, washers and retorquing.

Deficiencies which can not be corrected by the rework mentioned above will be dispositioned appropriately on Nonconformance Reports (NR's). If the as-found condition of the connection has the capacity to support the design loads within AISC code allowable stresses, no rework will be required and the NR disposition shall be "Accept-As-Is".

As stated above, all deficiencies found will be documented. CG&E intends to support the reinspection program with sufficient engineering and construction personnel so that non-conformances can be identified and dispositioned immediately to allow rework to be accomplished concurrent with the inspection. After a connection has been inspected, dispositioned and appropriately reworked (if applicable), the connection shall be documented as acceptable and further reinspection shall not be considered necessary.