

THE CINCINNATI GAS & ELECTRIC COMPANY



CINCINNATI, OHIO 45201

October 26, 1983
LOZ-83-0202

J. WILLIAMS, JR.
SENIOR VICE PRESIDENT
NUCLEAR OPERATIONS

Docket No. 50-358

U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Attention: Mr. J.G. Keppler
Regional Administrator

Gentlemen:

RE: WM. H. ZIMMER NUCLEAR POWER STATION - UNIT 1
INDEPENDENT DESIGN REVIEW (IDR)
W.O. 57300, JOB E-5590, FILE NO. 956C,

PRINCIPAL STAFF			
RA	✓	DPRP	
D/RA		DE	
A/RA		DRMSP	
RC		DRMA	
PAO		SCS	
SGA		ML	
ENF		File	✓

orig. + 3

This letter requests your concurrence in the approach being taken by CG&E in the conduct of an Independent Design Review (IDR) of the Zimmer Station.

In the Course of Action (COA) document submitted to the NRC October 5, 1983, CG&E proposed to conduct an IDR of the Zimmer Station. The IDR is described under COA Item 10, on Page 59. CG&E advised that requests for proposals for the IDR had already been sent to seven (7) qualified firms. Copies of the request for proposal, dated September 9, 1983, were submitted to NRC Region III and to other NRC offices. Attachment 1 is a copy of the request for proposal and includes the list of prospective contractors. Proposals were received October 14, 1983.

CG&E is proceeding to evaluate the proposals. The evaluation is being performed by CG&E personnel and outside consultants who have had no prior responsibility for the design of the Zimmer Station. Award of a contract will be deferred pending receipt of your response to this letter.

CG&E intends that the results of the IDR augment the results of the Program to Verify the Quality of Construction (PVQC) and the results of plant startup testing to provide a basis for assuring that the Zimmer plant meets its licensing requirements. CG&E also intends that this IDR satisfy any NRC requirement for an IDR or other independent design verification. We, therefore, consider it necessary to have your concurrence in our approach to the IDR before we award a contract.

8311210239 831026
PDR ADOCK 05000358
A PDR

OCT 27 1983

1801/1

Mr. J.G. Keppler
Regional Administrator
October 26, 1983
LOZ-83-0202
Page 2

Upon completion of our selection of a contractor, we propose to proceed as follows:

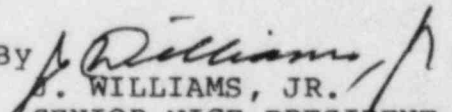
- A) Advise NRC Region III and Office of Nuclear Reactor Regulation of the identify of the selected contractor and the basis for the selection.
- B) Follow the protocol document imposed in relation to the November 12, 1982 "Show Cause Order". Although this protocol was not specifically imposed on an IDR, the protocol appears suitable to cover the conduct of the IDR.
- C) Submit to the NRC Region III and Office of Nuclear Reactor Regulation for your review, the contractors plan for the IDR. It will be submitted about 6 weeks after selection of the contractor.

These proposed actions are consistent with the Course of Action submitted October 5, 1983.

Your early response to this proposed approach is requested to enable us to proceed with an IDR that concurrently meets our and any NRC requirements. Should you have any questions, please call D'. K.K. Chitkara (513) 632-2681 of my staff.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

BY 
J. WILLIAMS, JR.
SENIOR VICE PRESIDENT

JW/EJW/sfr

Attachment 1

Mr. J.G. Keppler
Regional Administrator
October 26, 1983
LOZ-83-0202
Page 3

cc: NRC Office of Inspection & Enforcement
Washington, D.C. 20555
ATTN: R.C. DeYoung, Director
NRC Resident Site Supervisor
ATTN: W.M. Hill
NRC Zimmer Project Inspector, Region III
ATTN: E. R. Schweibinz
NRC Office of Nuclear Reactor Regulation
Washington, D.C. 20555
ATTN: L.L. Kintner

INDEPENDENT DESIGN REVIEW

BIDDERS LIST

1. Cygna Energy Services
101 California St.
Suite 1000
San Francisco, Cal 94111
Attn: Larry L. Kammerzell
(415) 397-5600
2. Ebasco Services, Inc.
Two World Trade Center
88th Floor
New York, N. Y. 10048
Attn: Ben Tenzer
(212) 839-2944
3. E. G. & G. Services
P. O. Box 2266
Idaho Falls, Idaho 83403
Attn: Bob Schultz
(208) 529-8700
4. Gilbert/Commonwealth
P. O. Box 1498
Reading, Pa. 19603
Attn: William Sailer
(215) 775-2600 Ext. 7543
5. M. P. R. Assoc., Inc.
1050 Connecticut Ave. N.W.
Washington, D.C. 20036
Attn: Theodore Rockwell
(202) 659-2320
6. Teledyne Engineering Services
Division of Teledyne, Inc.
130 Second Avenue
Waltham, Mass. 02254
Attn: G. A. Carpenter
(617) 890-3350
7. Technical Audit Associates Inc.
589 Oencke Ridge
New Canaan, Ct 06840
Attn: Frank B. Jewett, Jr.
(203) 966-0383

THE CINCINNATI GAS & ELECTRIC COMPANY



J. WILLIAMS, JR.
SENIOR VICE PRESIDENT
NUCLEAR OPERATIONS

September 9, 1983
JW-SC-0089g
Req. No. 828

Technical Audit Associates Inc.
589 Oenoke Ridge
New Canaan, Ct. 06840

Attention: Mr. Frank B. Jewett, Jr.

Dear Mr. Jewett:

This is a request for proposal (RFP) for performing certain engineering functions in connection with a Cincinnati Gas & Electric Co.'s (CG&E) program to review the quality of design of the William H. Zimmer Nuclear Power Station ("Zimmer"). This review will supplement additional efforts being made to verify the quality of construction under a separate CG&E program for the NRC. The results of these two reviews combined with the results of pre-startup plant tests will provide a basis to assure that the "as built" Zimmer Plant meets its licensing requirements.

Background

On November 12, 1982, the NRC issued an "Order to Show Cause and Order Immediately Suspending Construction" (SCO) which has the effect of suspending all safety-related construction at Zimmer. A copy of the SCO is enclosed for your information. Construction may be resumed only after certain evaluations are completed, among them a plan to verify the quality of construction (PVQC). (See section IV.B(2) (a) of the SCO). The PVQC will be performed as a separate operation. The results of the PVQC will provide a basis to address the adequacy of the quality of construction of the Zimmer Plant.

Although not required by the SCO, CG&E considers that these evaluations should be extended to include design considerations as well as the construction element. This request is to solicit your interest in performing this independent design review which will be used in conjunction with PVQC to provide added assurance that the Zimmer Plant has been designed and constructed in accordance with approved criteria to meet applicable NRC requirements and regulations.

To: Frank B. Jewett, Jr.
September 9, 1983
Page 2

Scope

The elements of the design review have been identified and are outlined in Attachment I. It should be understood that Attachment I may be modified as a result of on-going activities under the SCO and action thereon by the NRC.

Independence

The selected organization must address the independence criteria set forth in Attachment II. In discussing your independence, please be mindful of the fact that the Zimmer project is owned by The Cincinnati Gas & Electric Company, (CG&E), The Dayton Power and Light Company and Columbus and Southern Ohio Electric Company, a subsidiary of the American Electric Power Co. The architect-engineer is Sargent & Lundy and the constructor is H. J. Kaiser. Bechtel Power Corporation has tentatively been selected to manage the development of the PVQC and its implementation and to direct completion of construction of Zimmer. Prior associations with any of these organizations on the part of your company and/or your employees should be addressed in a section of your proposal dealing with the independence of your company.

Limitation

The contractor selected to perform the PVQC audit will not be eligible for the Independent Design Review discussed in this RFP.

Content of Proposal

Your proposal should cover at the least the following:

- (1) Relevant prior experience of your company and employees
- (2) Persons who will be assigned to this job and their resumes
- (3) Your approach to performing the work described in Attachment I
- (4) Your commercial terms (including hourly rates)
- (5) Your independence from the Zimmer project.
- (6) Proposed schedule

To: Frank B. Jewett, Jr.
September 9, 1983
Page 3

Four copies of your proposal should be addressed as follows:

(1 copy)

Mr. D. C. Funke
Materials Management Department
P.O. Box 960
Cincinnati, Ohio 45201

(3 copies)

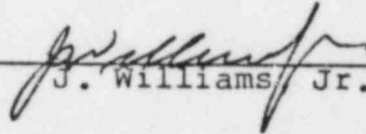
Mr. E. J. Wagner
Zimmer Nuclear Power Station
U.S. Route 52
R. R. #1 Box 2023
Moscow, Ohio 45153

and should be received at the office of The Cincinnati Gas & Electric Company not later than October 14, 1983.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By: _____


J. Williams Jr.

JW/dab

Enclosure A

Attachment I

Attachment II

Order to Show Cause and Order
Immediately Suspending Construction
Elements of the Design Review Program
Independence Criteria

cc: NRC Region III Regional Administrator,
ATTN: J. G. Keppler

NRC Office of Inspection & Enforcement
Washington, D.C. 20555

NRC Zimmer Senior Resident Inspector

NRC Zimmer Project Inspector, Region III
ATTN: E. R. Schweibinz

To: Frank B. Jewett, Jr.
September 9, 1983
Page 4

bcc: E.J. Wagner
G.F. Cole
H.C. Brinkman
B.K. Culver
J.R. Schott
J.F. Shaffer
K.K. Chitkara
D.R. Hyster
J.A. Vennemann
G.C. Ficke

Bechtel Power Corporation
Attn: G.B. Jones
General Electric Company
Attn: I.L. Gray
T.E. Bloom
Sargent & Lundy Engineers
Attn: R.J. Pruski
L.M. Gordon
T.J. Daley
Henry J. Kaiser Company
Attn: M.E. Noffsinger

Basic Energy Technology Associates, Inc.
Rosslyn Center
Suite 825
1700 N. Moore Street
Arlington, VA 22209

Attn: W. Wegner

Pickard, Lowe & Garrick, Inc.
Suite 612
1200 - 18th Street NW
Washington, D.C. 20036

Attn: W. W. Lowe

Lowenstein, Newman, Reis & Axelrad, P.C.
1025 Connecticut
Suite 1214
Washington, D.C. 20036

Attn: J. R. Newman, Esq.

Conner and Wetterhahn
Suite 1050
1747 Pennsylvania Avenue, NW
Washington, D.C. 20006

Elements of the Program to Review
the Quality of Design

I. The Project and its Current Status

William H. Zimmer Unit 1 is an 810 MW nuclear power station, incorporating a Boiling Water Reactor BWR 5, Mark II containment, and related facilities ("Zimmer" or "Project"). Construction of the Project is estimated to be approximately 85% complete. The Project is located in the state of Ohio near the town of Moscow, approximately 25 miles Southeast of Cincinnati.

The Project is owned by The Cincinnati Gas & Electric Company (CG&E), Dayton Power and Light Company, and Columbus and Southern Ohio Electric Company, a subsidiary of the American Electric Power Co., (hereinafter referred to as "Owners"). CG&E is the Project Manager. The architect-engineer is Sargent & Lundy (S&L). The constructor is H. J. Kaiser Co. (Kaiser). The Project Director of the PVQC and the Continuation of Construction Plan (CCP) has tentatively been selected as Bechtel Power Corporation.

II. Show Cause Order

On November 12, 1982, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an "Order to Show Cause and Order Immediately Suspending Construction" ("SCO") regarding the Project. The SCO was followed by a NRC evaluation, NUREG-0969, which identified both discrepancies in design and construction of the Zimmer project. In addition to immediately suspending all safety-related construction at Zimmer, the SCO directed that CG&E undertake the following actions prior to commencing any additional safety-related construction activities:

- (1) Retain an independent organization to review the management of the Project. to consider as a minimum alternative management structures described in the SCO, and to recommend measures to ensure that construction of Zimmer can be completed in conformance with the Commission's regulations and the construction permit. This was completed by submission of the Torrey Pines Technology Report GA-C17173 of August 1983.
- (2) Submit for approval a recommended course of action on the basis of the independent organization's review (Torrey Pines Technology) and a schedule for implementing the recommendations.

- (3) Submit for approval a comprehensive plan to verify the quality of construction (PVQC) of Zimmer.
- (4) Submit for approval a comprehensive plan for the continuation of construction (CCP) based upon the results of the PVQC.

CG&E has decided to extend the above SCO actions to include an Independent Design Review (IDR). The IDR, the PVQC and the pre-operational plant test program will provide a sound basis for determining that the Zimmer Plant meets applicable NRC requirements and regulations.

III. Purpose

The results of this IDR, the PVQC and the pre-operational plant test program will be used to enable CG&E to determine whether the Zimmer Nuclear Power Station has been designed and built in accordance with its licensing bases. The IDR is to be of sufficient scope to permit the reviewer to conclude that the design features under review meet the license application requirements or to identify the specifics of the design that are exceptions to the requirements.

This IDR will consider the existence of the PVQC and the pre-operational plant test program. Hence matters relating to construction QA and design elements that will be confirmed by the pre-operational plant test program will not be included in the IDR.

This IDR will be a multi discipline review. Emphasis will be placed on design, design QA, and design construction interfaces. Attention will be directed to subcontracted design efforts. The level of detail must be sufficient to achieve the above stated objectives. Depending on the results of the IDR it may be necessary to expand the scope of the review to resolve items with potential generic impact.

IV. Scope of the Independent Design Review

This IDR will consist of two segments; a review of the QA program for design and a review of design of specific elements of a safety-related systems. The review of design will be used to determine if the design is consistent with the bases and criteria specified in the licensing application (all docketed information) and meets the functional licensing requirements of the system. The review will be of the Residual Heat Removal (RHR) System design parameters delineated in Section V.

The following criteria must be used as the basis for development of the proposal for the IDR.

1. The IDR is to be structured such that the reviewer can make objective conclusions concerning the adequacy of the design elements identified. In-depth reviews of the identified elements of this system are to be performed rather than a sampling technique based upon a statistical approach.
2. The IDR is to be limited to the scope of design details listed in Section V. Design analysis, calculations, construction implementation, etc., of the specific features listed are to be reviewed.
 - (a) Design Technical Review - Review the design for selected areas (systems, components, structures, and interfaces) for compliance with required licensing bases and criteria. The scope of this work must be carefully identified; procedures and evaluation criteria must be developed to guide this review.
 - (b) Field Implementation Review - Review the as-built configuration in the field in the selected areas to verify the validity of design assumptions.
3. The interfaces with NSSS vendor (GE) and between design and construction are to be reviewed.
4. The review is to utilize the bases and criteria contained in the licensing application as "given" information. The adequacy of the criteria and bases of the licensing application will not be evaluated.
5. The review mechanism must recognize and consider the vintage of design and of the acceptable licensing criteria in evaluating the degree of compliance (e.g., a feature designed in the 1970's may have different codes and standards applicable than a similar feature designed in 1982).
6. A mechanism for identifying and resolving potential findings (items that may be deficient) during the review is to be established. A determination of the implications of each finding is to be conducted.
7. The entire independent review is to be conducted under a quality assurance program in compliance with 10CFR50, appendix B and must meet the reporting requirements of 10CFR21 and 10CFR50.55(e). The reviewer organization will submit its QA program for CG&E review and approval prior to start of the review.
8. A scoping document is to be prepared that identifies all steps in the review process, the detailed scope of the

independent review, the procedures controlling the review, and the evaluation criteria for evaluating compliance and for evaluating potential findings. This program is to be presented to CG&E for concurrence.

9. A final report is to be prepared with a presentation of the findings, and a statement that the features meet the license application requirements or meets the license application requirements with identified exceptions.
10. The IDR should include an evaluation of the pre-operational test program as it applies to the areas under review. This is to assure those elements of the design that can be confirmed by testing are included in the test program and that acceptance criteria are correctly identified.

V. The Review Elements

1. This IDR will have two segments. The first segment will consist of a review of the QA program for design. This effort will require familiarization with CG&E's and Sargent & Lundy's design control programs and a determination whether they were correctly implemented and provide an adequate basis for assuring a satisfactory design. To the maximum extent possible, the Residual Heat Removal (RHR) System review discussed below should be used as a basis to determine the adequacy of the design Q.A. program. For those elements of the program not covered by the RHR System review, the contractor will have to expand the review to assure all elements have been included.
2. The second segment of the IDR will consist of a review of the design of the Residual Heat Removal System. Sections of the system are identified for the review. The objective of the selection is to assure the review includes:
 1. Major Engineering Disciplines
 2. A Major Design Category I Structure
 3. A Major Class I Valve Supplier
 4. A Major Class I Pump Supplier

Specifically the review will include the following elements of the RHR System.

- . Review Pipe Stress Analyses

- For in-containment shutdown cooling system suction piping
- . Review Pipe Support Design
 - For Class I: In-Containment RHR Cooling System Suction Piping
 - For Class C RHR Complex Piping Element: in-reactor building section of the service water piping to RHR heat exchanger
- . Review Structural Design
 - Service water structure foundation
- . Review Electrical Power Supply and Control Circuit Design
 - Service water loop "A" pumps
- . Review Equipment (Seismic) Qualification
 - Class I MOV containment isolation valves
 - Class I service water pumps
- . Review of the adequacy to convey and control details of construction
- . Perform Plant Walkdown
 - Design assumptions vs as-built conditions

The reviews will include the following elements:

- . Design Input Documents
- . Design Analysis Control
- . Drawing Control
- . Procurement Control
- . Design QA

Internal/External Interface Control:

- . Design Verification
- . Document Control

- . Design Change Control
- . Corrective Action
- . Internal/External Audits and Surveillance
- . Test Program

VI

Schedule

The schedule for completion of this IDR is to be based upon a maximum period of 8 months from the signing of the contract to completeness of the final report. The contractor is to provide a schedule for all contractor activities including the proposed start of the review, completion of the review, issuance of conclusions on all potential findings, and issuance of the final report.

Q. A. REVIEW	
BY	<u>AC. Prince</u>
DATE	<u>7/9/83</u>

Attachment II

Independence Criteria

CG&E will utilize the answers to the following questions to evaluate the independence of the company which will conduct the Independent Design Review and the individuals which the company will utilize in the review. Minimal or insignificant contacts will not necessarily disqualify candidates for the independent review.

- (1) Has the company or individuals involved had any previous involvement with the Zimmer Project? If yes, please provide details.
- (2) Has the company or individuals involved been previously hired by any of the Owners, Sargent & Lundy (S&L), H. J. Kasier Co. (Kaiser), or Bechtel Power Corporation (Bechtel) to perform similar audit work? If yes, please provide details.
- (3) Has any individual involved been previously employed by any of the Owners, S&L, Kaiser, or Bechtel? If yes, please provide details.
- (4) Does the company or any individual involved own or control stock of any of the Owners, S&L, Kaiser, or Bechtel? If yes, please provide details.
- (5) Is any member of the present household of any individual involved employed by any of the Owners, S&L, Kaiser, or Bechtel? If yes, please provide details.
- (6) Is any relative of any individual involved employed by any of the Owners, S&L, Kaiser, or Bechtel? If yes, please provide details.
- (7) Has the company or any individuals involved been offered future employment by any of the Owners, S&L, Kaiser, or Bechtel? If yes, please provide details.

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gilinsky
John F. Ahearne
Thomas M. Roberts
James K. Asselstine

82 NOV 12 P4:50

11-70

In the Matter of

CINCINNATI GAS & ELECTRIC COMPANY

(William H. Zimmer Nuclear
Power Station)

SERVED NOV 12 1982

Docket No. 50-358

Construction Permit No. CPPR-88

EA 82-129

(4)

ORDER TO SHOW CAUSE AND
ORDER IMMEDIATELY SUSPENDING CONSTRUCTION
(CLI-82-33)

I.

The Cincinnati Gas and Electric Company (CG&E) holds Construction Permit No. CPPR-88 which was issued by the Commission in 1972. The permit authorizes the construction of the William H. Zimmer Nuclear Power Station Unit 1, a boiling water reactor to be used for the commercial generation of electric power. The Zimmer plant is located on the licensee's site in Moscow, Ohio.

II.

A. Initial Identification of QA Problems

In early 1981 the NRC conducted an investigation into allegations made by present and former Zimmer site employees and by the Government Accountability Project. The NRC investigation revealed a widespread breakdown in CG&E's management of the Zimmer project as evidenced by numerous examples of non-compliance with twelve of the eighteen quality assurance Criteria of

62-1160392

RECEIVED NOV 1

Appendix B to 10 CFR Part 50. Consequently, CG&E paid a civil penalty of \$200,000 for the failure to implement an acceptable quality assurance program, false quality assurance documents, and intimidation and harassment of quality control inspectors. (See Notice of Violation and Proposed Imposition of Civil Penalties, dated November 24, 1981 and Investigation Report No. 50-358/81-13.) In addition CG&E agreed to take actions to correct identified QA failures and prevent their recurrence and to determine quality of completed construction work.

1. Actions to Correct Identified QA Failures and Prevent Recurrence

A meeting was conducted by Region III on March 31, 1981, and the utility agreed to implement ten actions to correct quality assurance failures identified during the January - March 1981 investigation and to preclude their recurrence. These actions included: (1) increasing the size and technical expertise of the CG&E QA organization; (2) taking action to assure independence and separation of the QA/QC function performed by Kaiser from the construction function; (3) conducting 100% reinspections of the quality control (QC) inspections performed after that date by Kaiser and other contractors; (4) reviewing for adequacy, and revising as appropriate, all QC inspection procedures; (5) training QA/QC personnel on new and revised procedures; (6) reviewing for adequacy, and revising as appropriate, the procedures governing the identification, reporting, and resolution of deviations from codes and Final Safety Analysis Report (FSAR) statements; (7) reviewing for adequacy the procedures governing nonconformance reporting and justifying the disposition of each voided nonconformance

report; (8) establishing an adequate program for control of QA and QC records; (9) performing a 100% review of all future surveillance and non-conformance reports written by contractor personnel; and (10) reviewing and revising the CG&E audit program so that it included technical audits of construction work and more comprehensive and effective programmatic audits. These commitments were confirmed in an Immediate Action Letter to the licensee on April 8, 1981.

2. Actions to Determine Quality of Completed Construction Work

Following the identification in 1981 of significant quality assurance problems and related management breakdowns, CG&E agreed to establish a comprehensive program to determine the quality of the completed construction work. The Quality Confirmation Program (QCP) was submitted to the NRC by the licensee on August 21, 1981. The QCP addressed problems identified by the investigation in the following areas: (1) structural steel; (2) weld quality; (3) traceability of heat numbers on piping; (4) socket weld fitup; (5) radiographs; (6) electrical cable separation; (7) nonconformance reports; (8) design control and verification; (9) design document changes; (10) subcontractor QA programs; and (11) audits.

3. Results of Actions Taken by the Licensee to Determine the Quality of Completed Construction Work

Many construction deficiencies have been identified by the licensee during the conduct of the QCP and other quality reviews and reported to

the NRC pursuant to 10 CFR 50.55(e) which could have been prevented or identified in a timely manner by the licensee and its contractors had there been a properly managed QA program. Major construction deficiencies identified to date by the quality reviews are listed in order of identification and include the following:

- . Welds performed using an unqualified welding procedure for welds greater than 0.864 inches.
- . Unauthorized stamping of fittings and use of "high-stress" stamps.
- . ASME structural weld and welder qualification deficiencies.
- . Welds performed and welders not qualified for weld thickness range per ASME requirements.
- . Approximately 2400 feet of small bore piping identified with questionable heat treatment.
- . Welder qualifications with a substantial number of documentation discrepancies.
- . Carbon steel weld rod may have been used for a portion of several stainless steel recirculation line welds.

Electrical cable tray installation and inspection deficiencies.

- . Hangers installed for the control rod drive system are of indeterminate quality.
- . Both weld and radiograph quality deficiencies for sacrificial shield welds and radiograph deficiencies identified for the containment monorail and the ventilation stack.
- . Deficiencies in the H. J. Kaiser procurement program for structural steel and other materials.
- . Inadequate design control by Sargent & Lundy (architect engineer) for electrical separation.
- . Inadequate weld preparation prior to radiography (ripples not removed) which caused masking of discontinuities in some welds.
- . Reactor control, reactor protection, and neutron monitoring panels, including field installed wiring do not, in some cases, conform to design drawings with regard to cable separation.
- . Inadequate engagement of "gamma plugs" in large-bore piping and lack of heat number traceability of the "gamma plugs." (During radiography of a pipe weld, a gamma source is sometimes inserted through a small

hole in the side of the pipe. After radiography the hole is plugged to provide a pressure boundary.)

- . Inadequate inspection program and installation procedures for "Nelson stud" installation for cable tray hangers.
- . Concrete and steel coating program not in accordance with the QA Program and the Sargent & Lundy specification requirements.
- . Design changes made to the Fire Protection System piping in the cable spreading room in 1979 were inadequately controlled.
- . The Sargent & Lundy (architect engineer) dynamic stress analysis of small bore piping is questionable.
- . Cable separation problem with regard to division separation between non-essential cables being bundled with essential cables of different divisions.
- . Pipe support installation procedures did not contain seismic clearance criteria between pipe supports and cable trays or conduit and associated supports as required by the specification.

These deficiencies represent those which the staff considers most significant. There were additional 10 CFR 50.55(e) reports made by the licensee and the licensee has identified a large number of

nonconformances (which could reflect construction or other types of deficiencies). As of September 30, 1982 the licensee's continuing quality confirmation program reviews had identified approximately 4,200 nonconformances of which about 800 have been "dispositioned", i.e., the licensee had made a determination as to resolution. (Inspection Report No. 50-358/82-12, report pending.) The large number of nonconformance reports and the significance of the matters being identified corroborate the staff's 1981 finding of significant breakdown in the licensee's quality assurance program.

B. Findings Subsequent to Licensee Actions Taken to Correct QA Failures and Prevent Recurrence

Since the Immediate Action Letter was issued on April 8, 1981 and quality assurance and management deficiencies were brought to the attention of the licensee, hardware and programmatic QA/QC problems have been identified by the NRC and the National Board of Boiler and Pressure Vessel Inspectors. These problems are discussed in the following paragraphs and indicate the licensee and the constructor are still having difficulty implementing satisfactory QA/QC programs:

During an inspection conducted the latter part of 1981 and the early part of 1982 (Inspection Report No. 50-358/82-01, issued on June 24, 1982) three items of noncompliance were identified. The findings concerned (1) the failure to clearly establish and document the authorities and duties of all QA Department personnel, (2) the failure to provide

adequate certification of qualifications of all QA Department personnel, and (3) the failure to provide adequate procedures. The licensee failed to adequately address the provisions of Regulatory Guide 1.58 (ANSI N45.2.6-1978) concerning personnel in the QA Department. Additionally, inadequately qualified personnel were reviewing and approving quality procedures controlling electrical activities, which contained deficiencies.

Furthermore, as a result of the licensee reviews it was revealed that some weld inspectors involved in the QCP Task I, Structural Steel, were not adequately certified and the task was stopped. The task was restarted following upgrade of the inspectors through training provided by additional certified weld inspectors.

During an inspection conducted in March and April 1982 (Inspection Report No. 50-358/82-05, issued on July 1, 1982) two items of noncompliance were identified. The findings concerned the lack of implementation and timeliness of corrective actions and the failure to adequately review and document potentially reportable matters.

During an inspection conducted in April, May, and June of 1982 (Inspection Report No. 50-358/82-06, issued on November 2, 1982) two items of noncompliance were identified. The findings concerned (1) the performance of quality activities required of the welding engineers by inadequately qualified clerks and (2) the failure to perform required calibrations

during a critical quality activity, Induction Heating Stress Improvement (IHSI) program.

A recent inspection conducted during June and July of 1982 (Inspection Report No. 50-358/82-10, report pending) identified a number of significant concerns. These concerns were discussed with the licensee on July 9, July 15, August 15, and October 19, 1982. Four significant items of concern (potential items of noncompliance) were identified:

- (1) the inadequate control and documentation of welder qualifications;
- (2) the failure to take corrective actions following the identification of inadequate records to support welder qualifications; (3) the unauthorized correction, supplementation, and alteration of quality records; and (4) the failure to follow procedures controlling weld filler metal control, logging and control of requests for information/evaluation, and imposition of reporting requirements on contractors. The NRC findings concerning welder qualifications resulted in the requalification of approximately 100 active onsite welders and the need for the licensee to develop a program to evaluate the previous work of the welders whose qualifications were not adequately documented.

An inspection was conducted following notification of the Region III Office that a CG&E Stop Work Order (SWO) had been initiated on August 5, 1982, pertaining to Catalytic, Inc. (CI) activities in the area of the control rod drive system hangers and supports. CI is a contractor of the licensee performing construction work

including rework activities identified by the QCP program. During this inspection conducted during August and September of 1982 (Inspection Report No. 50-358/82-13, report pending), significant concerns were identified regarding the implementation of CG&E's quality assurance program and its management program established to control and monitor the activities of Catalytic, Inc. (CI).

The concerns involved the areas of (1) the description of organization and functional interfaces, (2) training of CI personnel, (3) design control measures, (4) procedure content and implementation, (5) document control, (6) inspection and surveillance activities, (7) nonconforming conditions, (8) corrective actions, (9) records, and (10) audits. The findings were discussed with the licensee on August 12, September 10 and 17, and October 19, 1982.

As a result of the inspection findings and subsequent discussions with the licensee, Stop Work Orders were issued by the licensee, stopping all essential work by CI on October 11, 1982, pending resolution of the programmatic problems identified by the NRC and licensee reviews.

The licensee has initiated Stop Work Orders in addition to those affecting CI due to inadequate quality assurance in the areas of application of coatings (October 12, 1982), electrical cable installation (October 12, 1982), and special process procedures (November 1, 1982). The Stop Work Orders involve ongoing activities. The November 1, 1982 Stop Work Order involved procedures not meeting requirements notwithstanding that the procedures had been specifically

reviewed by CG&E for adequacy subsequent to the issuance of the April 8, 1981 Immediate Action Letter.

Additionally, during the week of October 10, 1982, the Authorized Nuclear Inspector (ANI) for the H-stamp holder (H. J. Kaiser) recalled ASME work packages then being used in the field because of the performance of ASME code work (hanger attachment removal and piping cutouts) was outside the approved QA Program procedures. The ASME code work was being controlled and performed utilizing an H. J. Kaiser administrative memo which bypassed the ANI's required involvement in the code activities. The NRC was apprised of the required corrective actions during a meeting involving CG&E and H. J. Kaiser on October 15, 1982. The corrective actions taken and planned were considered acceptable by the Authorized Nuclear Inspector.

The National Board of Boiler and Pressure Vessel Inspectors, at the request of the State of Ohio, have been onsite since March 1, 1982. The National Board has issued three interim reports documenting findings regarding ASME code activities. The National Board findings include deficiencies in the following areas regarding on-going ASME code activities: design control, procurement, procedures, special processes, nonconforming conditions, and corrective actions. The findings are generally consistent with past and present NRC findings.

C. Rework Activities

As a result of the information obtained from the licensee's reviews of plant quality, the licensee is proceeding, prior to completion of the relevant QCP tasks, to initiate rework activities. A major example of rework activities is the area of structural steel welding. The reinspection and rework of structural steel welds located in a number of areas of the plant have been in process for a number of months.

Approximately 70 percent of the structural welds are being reworked to make the welds acceptable. In the case of these welds, rework is being undertaken prior to the completion of the quality reviews to determine the acceptability of all structural steel welds and beam/hanger materials. The rework of these welds prematurely may result in the addition of new weld material over unacceptable weld material or beam/hanger materials. Following completion of the quality reviews unacceptable areas may require additional rework activities. This approach to rework activities indicates a lack of a comprehensive management program to address rework activities and the safety impact of those activities on the facility.

III.

The foregoing information indicates that: 1) the Zimmer facility has been constructed without an adequate quality assurance (QA) program to govern construction and to monitor its quality, resulting in the construction of a facility which currently is of indeterminate quality; 2) substantial efforts are underway to determine the quality of past construction activities and numerous construction deficiencies have been

identified and are continuing to be identified such that both reanalysis and rework will be required to bring the facility into conformance with the application and regulatory standards on the basis of which the construction permit was originally issued; and 3) rework of deficiencies identified by the Quality Confirmation Program (QCP) has been undertaken prior to completion of other relevant QCP tasks and other reviews, resulting in the potential for additional reworking of the same item if further deficiencies are found, as has been the case, by the quality reviews. Consequently, the NRC presently lacks reasonable assurance that the Zimmer plant is being constructed in conformance with the terms of its construction permit and 10 CFR Part 50, Appendix B, and that there is adequate management control over the Zimmer project to ensure that NRC requirements are being met.

The verification of the facility's quality and appropriate actions to correct deficiencies in construction are of utmost importance to the public health and safety should the licensee receive a license to operate the facility. Moreover, the licensee must be in a position to assure that its construction activities have been properly carried out in accordance with Commission requirements, as the Commission inspectors are not able to personally verify every individual aspect of construction that may impact on safety. In view of the importance to safety of construction verification and corrective actions and the past pattern of quality assurance deficiencies, the Commission has concluded that safety-related construction, including rework activities, should be suspended until there is reasonable assurance that future construction activities will be appropriately managed to assure that rework activities and all other construction activities will be conducted in

accordance with 10 CFR Part 50, Appendix B, and other Commission requirements. The Commission has further determined that in light of the foregoing considerations the public health, safety and interest require suspension of construction, effective immediately pending further authorization.

IV.

Accordingly, pursuant to sections 103, 161i, 182 and 186 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED THAT:

- A. Effective immediately, safety-related construction activities, including rework of identified deficient construction, shall be suspended.
- B. The licensee shall show cause why safety-related construction activities, including reworking activities, should not remain suspended until the licensee:
 - (1) Has obtained an independent-review of its management of the Zimmer project, including its quality assurance program and its quality verification program, to determine measures needed to ensure that construction of the Zimmer plant can be completed in conformance with the Commission's regulations and construction permit.
 - (a) The independent organization conducting this review shall be knowledgeable in QA/QC matters and nuclear plant construction and shall be acceptable to the Regional Administrator. The independent organization shall make

recommendations to the licensee regarding necessary steps to ensure that the construction of the facility can be completed in conformance with the Commission's regulations and the construction permit. A copy of the independent organization's recommendations and all exchanges of correspondence, including drafts, between the independent organization and CG&E shall be submitted to the Regional Administrator at the same time as they are submitted to the licensee. In making recommendations, the independent organization shall consider at a minimum the following alternatives for management of the Zimmer project and shall weigh the advantages and disadvantages of each alternative:

1. Strengthening the present CG&E organization.
2. Creation of an organizational structure where the construction management of the project is conducted by an experienced outside organization reporting to the chief executive officer of CG&E.
3. Creation of an organizational structure where the quality assurance program is conducted by an experienced outside organization reporting to the chief executive officer of CG&E.
4. Creation of an organizational structure with both quality assurance and construction project management conducted by an experienced outside

organization reporting to the chief executive officer of CG&E.

(b) The licensee shall submit to the Regional Administrator the licensee's recommended course of action on the basis of this independent review. In evaluating the recommendations of the independent organization, the licensee shall address why it selected particular alternatives and rejected others. The licensee's recommendations and its schedule for implementation of those recommendations shall be subject to approval by the Regional Administrator.

(2) Following the Regional Administrator's approval in accordance with section IV B(1)(b),

(a) Has submitted to the Regional Administrator an updated comprehensive plan to verify the quality of construction of the Zimmer facility and the Regional Administrator of NRC Region III has approved such plan. In preparing this updated comprehensive plan, the licensee shall review the ongoing Quality Confirmation Program to determine whether its scope and depth should be expanded in light of the hardware and programmatic problems identified to date. The updated plan shall include an audit by a qualified outside organization, which did not perform the activities being audited, to verify the adequacy of the quality of construction; and

- (b) Has submitted to the Regional Administrator a comprehensive plan, based on the results of the verification program, for the continuation of construction, including reworking activities, and the Regional Administrator has confirmed in writing that there is reasonable assurance that construction will proceed in an orderly manner and will be conducted in accordance with the requirements of the Commission's regulations and the Construction Permit No. CPPR-88.

- (3) The Regional Administrator may relax all or part of the conditions of section IV.B for resumption of specified construction activities, provided such activities can be conducted in accordance with the Commission's regulations and the provisions of the construction permit.

V.

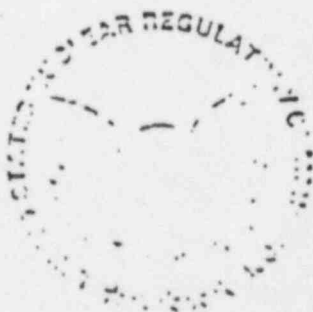
Within 25 days of the date of this order, the licensee may show cause why the actions described in section IV should not be ordered by filing a written answer under oath or affirmation that sets forth the matters of fact and law on which the licensee relies. As provided in 10 CFR 2.202(d), the licensee may answer by consenting to the order proposed in section IV of this order to show cause. Upon the licensee's consent, the terms of

section IV.B of this order will become effective. Alternatively, the licensee may request a hearing on this order within 25 days after the issuance of this order. Any request for a hearing or answer to this order shall be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. A copy of the request or answer shall also be sent to the Director, Office of Inspection and Enforcement, and to the Executive Legal Director at the same address, and to the Regional Administrator, NRC Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137. A request for a hearing shall not stay the immediate effectiveness of section IV.A of this Order.

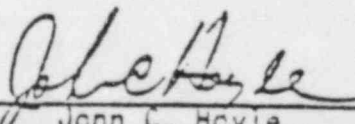
If the licensee requests a hearing on this order, the Commission will issue an order designating the time and place of hearing. If a hearing is held, the issues to be considered at such a hearing shall be whether the facts set forth in sections II and III of this order are true and whether this order should be sustained.

Commissioners Ahearne and Roberts dissent from this decision. Their dissenting views are attached.

It is so ORDERED.



For the Commission


John C. Hoyle
Acting Secretary of the Commission

Dated at Washington, D.C.
this 12th day of November, 1982.

DISSENTING VIEWS OF COMMISSIONER AHEAPNE

I agree with both the substance and the direction for change described in this order. However, I would have simply issued a Show Cause Order and would not have made it immediately effective.

DISSENTING VIEW OF COMMISSIONER ROBERTS

I disagree with the action taken by the Commission majority on several grounds. First, I believe the Commission's action in immediately suspending construction at the Zimmer facility is precipitous. Earlier this year, Cincinnati Gas and Electric Company (CG&E) made substantial changes in its management structure in order to manage more effectively construction activities and to monitor more carefully quality assurance programs. Despite the fact that this new organizational structure is relatively untested, the Commission is now suspending effective immediately all construction and corrective actions at the site. Additionally, the NRC Staff admits that CG&E's enhanced Quality Confirmation Program (QCP) and large quality control staff is effectively identifying existing construction problems. Moreover, to the extent that actual construction deficiencies have been found, CG&E's management has demonstrated its willingness to take strong remedial actions by issuing stop work orders in those areas where construction deficiencies have been found. In a plant that is approximately 98 percent complete, the Commission is requiring the relatively few remaining construction activities and the ongoing corrective actions necessitated by the QCP to stop immediately while additional organizational changes are implemented.

Second, I believe the Commission's action does not comport with its own practice. In Licensees Authorized to Possess . . . Special Nuclear Materials, CLI-77-3, 5 NRC 16, 20 (1977), the Commission said that "[a]vailable information must demonstrate the need for [such] emergency

actions and the insufficiency of less drastic measures" (emphasis added). See also Consumers Power Co. (Midland Plant, Units 1 & 2), CLI-73-38, 6 AEC 1082, 1083 (1973). I believe that, in this case, some of the less drastic alternatives proposed by the Staff would be adequate to resolve the problems at this facility. For example, the Commission could send CG&E a letter indicating that at this time the Commission does not have sufficient information to conclude that Zimmer has been constructed in substantial conformance with the construction permit. The Commission could request the provision of information on the part of CG&E which, if available, would provide the Commission with the necessary assurance. See 10 CFR 50.54(f).

Third, in the absence of willfulness, the Commission may suspend construction effective immediately in accordance with Section 9b of the Administrative Procedures Act and the Commission's regulations only if the Commission finds that the public health, safety, or interest requires such action. I do not believe that the concerns listed in the Commission's Order show that the public health and safety requires immediate suspension of all construction and corrective actions at the Zimmer site. Indeed, Mr. James Keppler, the Region III Administrator, has stated that CG&E's QCP has been successful in identifying existing construction problems. Transcript of Public Meeting on the Status of Zimmer, October 28, 1982 at 5. Additionally, most of the NRC inspection findings arising out of the QCP point to administrative or procedural deficiencies, rather than to actual material or construction errors. While the NRC's level of confidence in the adequacy of the plant

construction has been reduced, it has not been shown by the NRC that problems exist which require immediate resolution to protect the public health and safety. Moreover, I do not believe this action is in the public interest.

I am also concerned that the Order has been approved without consideration for the Applicant's proposal to correct management and construction problems. That proposal, outlined in a letter to the Commissioners dated November 10, 1982, contained all of the essential elements approved by this Order. Specifically, the proposal calls for obtaining new project management, stopping all rework on quality confirmation matters, and an independent third party review to confirm the acceptability of selected safety systems. In view of the voluntary agreement by CG&E to such drastic measures, I feel that this Order is primarily punitive in nature and does little to correct problems in the interest of public health and safety.

Finally, I disagree with the Commission's Order because of the potential for delay inherent in this procedure. CG&E has an absolute right to a hearing on the Commission's Order. If CG&E avails itself of this right, then other "interested persons" will be entitled to demand a hearing. Once started, the hearing would be difficult to bring to an expeditious close. Even if the Staff and CG&E were to reach agreement on the corrective actions to be taken, litigation of the requirements imposed by the Commission Order would continue. Consumers Power Co. (Midland Plant, Units 1 & 2), ALAB-315, 3 NRC 101 (1976); Dairvland Power Cooperative (LaCrosse Boiling Water Reactor), LBP-81-7, 13 NRC 257, 264-65 (1981).