

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-341/80-02

Docket No. 50-341

License No. CPPR-87

Licensee: Detroit Edison Company
2000 Second Avenue
Detroit, MI 48226

Facility Name: Enrico Fermi 2

Dates of Investigation: January 21-23 and February 11-12, 1980

Investigation At: Monroe, MI

Investigators:

G. A. Phillip
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3/7/80
Date

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Date

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Reviewed by:

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Assistant to the Director

3/10/80
Date

D. H. Danielson
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Chief, Engineering Support Section II

3/17/80
Date

Investigation Summary: Investigation on January 21-23 and February 11-12, 1980, (Report No. 50-341/80-02).

Areas of Investigation: In response to an allegation that personnel in the on-site pipe support design engineering group were not qualified, reviewed pertinent procedures and records, made observations of installed components and interviewed personnel. The investigation involved 59 investigation hours by three investigators.

Results: The investigation determined that personnel qualification requirements had not been established for the on-site small bore pipe support design group and the control of small bore pipe support design work was not adequate. One item of noncompliance, an infraction, relating to 10 CFR 50, Appendix B, Criterion III, Design Control, was identified. Two unresolved items were also identified.

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Reason for Investigation

By letters dated November 28, 1979, and December 4, 1979, and during a meeting on November 28, 1979, with NRC headquarters personnel, ABC News made allegations primarily relating to the small bore pipe support design work at the Fermi 2 facility.

Summary of Facts

Information provided by ABC News to the NRC raised the question as to the adequacy of the small bore pipe design work being performed at the Fermi 2 site, since the information indicated the resumes of personnel performing this work contained false information.

The investigation determined the resumes did contain false information, but the resumes were not relied upon in selecting the personnel, and no qualification requirements had been established. A review of the small bore piping design work and the design control procedures identified inadequacies in these areas resulting in one item of noncompliance. In addition, two unresolved items were identified. Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. These items will be pursued and resolved during a future inspection. The details concerning the item of noncompliance and the unresolved items are contained in Section II of this report.

DETAILS

1. Persons Contacted

Detroit Edison Company

*E. Hines, Assistant Vice-President and Manager Quality Assurance
*T. A. Alessi, Director, Quality Assurance
R. W. Barr, Project QA Director
*W. M. Everett, Project Superintendent
*J. Cartmill, Assistant Project Superintendent
A. Godosian, Assistant Construction Superintendent
*S. Noetzel, Director Field Engineering
*C. R. Bacon, Assistant Director for Field Engineering
*L. Bertani, Chief Field Design Engineer
*J. H. Casiglia, Engineering Specialist
*R. Adler, Engineering Work Leader
*L. Wieber, Assistant Engineer
*R. S. Lenard, Start-up/Technical Engineer
*H. A. Walker, Site Project QA Engineer
*J. R. Mullens, QA Engineer
*D. Ferencz, Senior Plant QA Engineer
E. H. Newton, Plant QA Engineer
G. Carter, QA Engineer

Daniel International Corporation

*W. J. Fahrner, Project Manager
M. Albertin, Assistant Project Manager
*J. G. Bolt, Project QA Manager
J. T. Blixt, Project QC Manager
*D. L. Vandergrift, QC Engineer
*D. Amaral, Discipline Engineer Piping
*J. D. Hooks, Small Bore Design Supervisor
*M. Laspisa, Small Bore Design Coordinator

* - The asterisk denotes those present at the exit meeting on February 12, 1980.

The investigation also included contacts and interviews with several other licensee and contractor personnel, including members of quality, construction, engineering and design staffs.

2. Introduction

On November 28, 1979, ABC News personnel visited the Office of Inspection and Enforcement NRC Headquarters in connection with the preparation of a segment for their 20/20 television program. At

this time, a letter was also presented containing several allegations. A copy of this letter, dated November 28, 1979, is attached to this report as Exhibit A. By letter dated December 4, 1979, ABC News provided additional specific information regarding inconsistencies in resumes for personnel supplied by Quan-Tech, who were employed in the small bore pipe support design group at Fermi 2.

During subsequent telephone conversations between ABC News and Region III it was agreed that an NRC investigation would be conducted, but that in the absence of more specific information regarding the other matters in the November 28, 1979, letter, the investigation would be limited to the qualification of and work performed by site design engineering personnel at the Fermi 2 site.

Section I of the report set forth below summarizes the review of personnel qualifications and the manner in which job shoppers are hired for design work. Section II sets forth the details of the program for small bore piping design at the Fermi 2 facility.

3. Background Information

It is common practice within the construction industry for companies to supplement their work forces by obtaining the services of technical, semi-professional and professional personnel from other organizations commonly referred to as job shops. The construction company enters into a contract with the job shop to provide personnel who then work under the direction of the construction company, but are paid by the job shop. Such personnel are commonly referred to as job shoppers.

The small bore design group at Fermi 2 functions under the direction of Daniel International Corporation (DIC), the site construction manager. This group utilizes the services of job shoppers provided by Quan-Tech, Butler Services, and Fluor Power Services, Inc. During an earlier period, October 1977, to November 1978, the small bore pipe design activity was carried on under the direction of Wismer and Becker, the piping contractor.

4. Management Discussion

On February 12, 1980, at the conclusion of the investigation, the findings were discussed with those licensee and contractor personnel identified in the Persons Contacted Paragraph of this report.

Section I

1. Review of Personnel Qualifications

Through interviews with the individuals, the discrepancies identified by ABC News were, for the most part, confirmed. In some instances, the individuals stated that they had supplied the incorrect information to Quan-Tech. In other instances, it was indicated that the typed resume furnished to Daniel International differed in some details from the handwritten resume the individual had supplied to Quan-Tech. Still other discrepancies, particularly those concerning past employments, were resolved. Individuals had shown periods of employment with various firms which could not be verified when ABC News contacted those firms. It was ascertained that the individuals were actually employees of a job shop while working at those firms and were therefore not recorded as employees by those firms.

Through discussions with Daniel International supervisory personnel of the small bore pipe design group, where these individuals were employed, it was determined that the accuracy of the resumes is not relied upon in the selection of personnel. The resume is used only as an indication of whether the individual may have the ability to do the job. Quan-Tech and other job shops who provide personnel are not required to certify that the individuals meet any established qualifications or experience standards, nor do they certify to the accuracy of the contents of the resumes. Daniel personnel said that no minimum requirements had been established for use in the selection of personnel. It was indicated that they attempt, however, to obtain personnel who have four or five years of experience in the piping field. The resume is merely used as a basis for direct contact with the individual by Daniel who then decides whether the individual will be brought into the group.

New members of the design group are given an orientation and are then assigned a work package. Upon completion of the work package, the work is checked carefully and if his work is satisfactory, the new employee is retained. If the first work package is not satisfactory but shows an understanding of the concepts involved, a second trial package is assigned with results determining whether he is to be retained. If the first work package is totally unsatisfactory, the individual is terminated.

The failure to establish personnel qualification requirements for a design engineering function is in noncompliance with 10 CFR 50, Appendix B, Criterion III, Design Control. The results of a review of the small bore pipe design work is described in Section II below.

Section II

1. Program Review

The ASME Class 2 and 3, Seismic Category 1 small bore piping and system suspension design is assigned to Daniel International (DI), the main site contractor. The DI Small Bore work group consists of subcontractor personnel from Fluor Power Services, Quan-Tech, and Butler Services. In review of their program and piping suspension calculations, and in observation of seismic restraint installations, the following findings were identified:

- a. The calculations performed by Wismer and Becker personnel from October 1977, to December 1978, were considered to be questionable since formal procedures and acceptance criteria had not been established for the activities performed. The inspector stated that all work involved should be reviewed and approved in a timely manner by qualified engineers.
- b. Field Design Change Request (DCR) No. 5B-0315A was written on May 30, 1979, and approved on June 26, 1979, to provide the design basis for small bore piping configuration and suspension. A review of this DCR revealed a number of program and technical deficiencies:
 - (1) The DCR was initiated by a DI field engineer and contained engineering design requirements which should have been incorporated into DECO Specification No. 3071-31, "Pipe Erection", Revision B, dated April, 1979. This DCR was approved by the DECO field engineer. The inspector stated that the approval and issuance of a design specification including installation tolerance, can only be performed by the DECO Design Engineering Department, as is specified in their established project and QA manual procedures.
 - (2) Requirements for restraint structural assembly and shear lug design for 2 1/2", 3", and 4" small bore piping were not included in the specification or the DCR; however, the DI Small Bore work group was performing piping design and calculations in these areas.
- c. DI Construction Procedure, No. AP-IV-05, "Small Bore Piping and Pipe Support", Revision 0, dated April 11, 1979, stated in part, that "Edison approves all design documentation generated for the construction of small bore piping. . .", but in reality only the hanger isometric drawings and analytical isometric sketches were being reviewed by DECO design engineers. There was no formal system to ensure these drawings and

sketches were evaluated by the responsible personnel. The restraint installation detail drawings and calculation had not been reviewed by DECO engineers.

- d. **The DI Construction Procedure AP-IV-05, Revision 0, stated in part, that "The function of the Small Bore work group is to produce and revise drawings for the construction of 2" and under piping and pipe supports." DCR No. 5B-0315A extended the "2" and under" limit to a "4" and under" limit. In discussions with the DECO engineer, it was determined that the Small Bore work group can only handle the 4" and under piping with the less severe design conditions. However, the specific conditions were not specified in any document.**
- e. Since the DI Small Bore work group is a part of the design engineering function, personnel qualification, certification, indoctrination, and training requirements should be established by the DECO Design Engineering Department. In addition, the implementation of such requirements should be enforcement by the DECO Design and QA Departments. These requirements were not visible during the inspection.

The apparent inadequate provisions for the control of small bore piping suspension design is considered to be in noncompliance with 10 CFR 50, Appendix B, Criterion III, and Enrico Fermi 2 FSAR, Section A17.1.3 requirements. (341/80-02-01)

2. Observation of Work

The inspector observed a number of seismic restraint and support installations on the small bore pipe systems and had the following findings:

a. P50-7606-G09 for 2" Diameter Pipe

The single shear lug design observed in use was not specified in a DECO or DI specification.

b. P50-3307-G05 for 3" Diameter Pipe

The structural frame work design based on the Kleinlogec method was not specified in a DECO or DI specification.

c. P50-3309-G26 for 3" Diameter Pipe

Selection of the clamp type 707-C was a mistake, in that: (1) the design load exceeded the clamp capacity and (2) the clamp is for mechanical snubbers; however, in this instance it was used on a rigid restraint. Furthermore, it was installed with a "drive fit" pin connection that was determined to be unacceptable by DECO design engineer.

d. P50-7507-G15, P50-3309-G21, and Several Other Restraints in This and Other Systems

Four generic problems were observed:

- (1) On the P50 2" Noninterruptable Air System some of the 2-1/2" stainless steel sleeves installed between the 2" lines and the U-clamps were deformed due to excessive bolt torquing on the clamps. The intended one-directional restraint had now become a three-directional restraint, and additional stress could be induced into the process pipe.
- (2) Gaps as much as 1/4" were measured between the 2 1/2" sleeve and the 2" stainless steel pipe. This was outside the tolerance of $1/16" \pm 1/32"$ permitted by DECO design documents.
- (3) A Request for Clarification of Information (RCI) No. P-0042 initiated by DI QC on April 19, 1979, requested gap tolerance requirements between the 2" pipe and the 2 1/2" sleeve. Three deficiencies were identified by the inspector.
 - (a) The tolerance was provided by the DI field engineer on April 23, 1979, who had not been delegated the design responsibility.
 - (b) The tolerance given, i.e., $1/16" \pm 1/16"$, was not in compliance with the DECO design requirements of $1/16" \pm 1/32"$.
 - (c) The actual gaps between the 2" schedule 40 stainless steel pipe O.D. and the 2 1/2" schedule 40 stainless steel pipe I.D. was measured to be approximately 1/4" and could vary up to 12.5% according to the manufacturer's specification.
- (4) The design gap between two sets of shear lugs installed on each side of a pipe restraint structure was 1/16" or a total gap of 1/8". This was not in compliance with the DECO design documents that specified a total of $1/16" \pm 1/32"$ allowable gap. Gaps observed at one installation exceeded 1/8" or 1/4" total for that particular restraint.

These identified deficiencies substantiate the conclusions described in Paragraph 1 above.

3. Design Documentation Review

In addition to the findings stated in Paragraphs 1 and 2 above, the following problems were identified:

- a. DECO Project Procedures Manual Section 3.6.1.1 "Design Change Request (DCR) Daniel/Subcontractors" states where Type I (safety related) change is involved, approval is required by:
 - . Edison Project Engineering Group Supervisor (if necessary as determined by the Edison Field Project Engineer).
 - . Edison Assistant Project Engineer (if necessary as determined by the Edison Field Project Engineer).

The inspector stated that provisions should be established to assure that significant DCR's, such as changes affecting specification and engineering acceptance criteria, will be dispositioned by the design engineering department. However, the inspector concurred with the licensee that routine DCR's involving piping configuration and location changes and specification and drawing clarification could be handled by the Edison Field Project Engineer, who reports directly to the DECO Design Engineering Department. This is an unresolved item. (341/80-02-02)

- b. In his review of design documentation the inspector noted the following:
 - (1) Fifty-three outstanding DCN's and 11 outstanding DCR's had not been incorporated into the DECO Specification 3071-31, "Pipe Erection", Revision B, dated April, 1979.
 - (2) Eight outstanding DCR's had not been incorporated into DI drawing P50-7503-1, Revision A, dated July 7, 1978.

The actual number of DCN's and DCR's written for the above documents were more than stated since some of the DCN's and DCR's changed and cancelled others. The licensee stated that they recognized the problem and was in the process of improving the timeliness of updating the specifications and drawings. This is an unresolved item. (341/80-02-03)

- c. The licensee provided the inspector a copy of DECO Specification 3071-525 "Nuclear Class 2 and 2 Small Piping and Instrument and Control Piping and Tubing", Addendum A, dated October, 1977. This specification included the Sargent & Lundy Report SL-3159, "Small Piping Design Standard, Enrico Fermi Atomic Power Plant - Unit 2", Revision 1, dated July 29, 1977. The inspector stated that he will review the document and discuss his findings with the licensee during a subsequent inspection.

Attachment: Exhibit A

November 28, 1979

Mr. Harold Thornberg
Division of Reactor Construction
Nuclear Regulatory Commission
4350 East-West Highway
Bethesda, Maryland

Dear Mr. Thornberg:

During our research for the 20/20 segment, "Nuclear Construction", we have found the following:

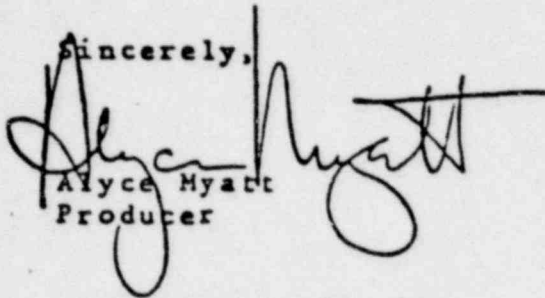
1. A fundamental lack of qualifications in the on site design engineering groups at the Fermi II plant particularly in the pipe support area. This includes doctored resumes, an apparent nepotistic situation and a general lack of experience amongst designers, checkers and supervisors.
2. The use of a contract engineering firm, QUAN-TECH, to supply "qualified" personnel. Quan-tech has a poor reputation in the field and has admitted to a failure to adequately check the backgrounds of employees.
3. A nationwide problem with engineering personnel who are recent immigrants or resident aliens who have great difficulty executing their work due to language and communication problems. This has been reported to us by engineers who have worked at numerous sites around the United States.
4. Fear amongst workers and engineers on site to raise questions about the quality of work and procedures due to retaliation by employers.
5. Specific information concerning a variety of welds and general welding conditions (cleanliness, etc.) at the Fermi II plant, e.g. the doctoring of stainless steel welds in the control cable pipes and supports, Field Weld #8. etc.
6. The use of under and unqualified personnel at Duke Power's Charlotte, North Carolina facilities in the pipe support and seismic stress design engineering areas as well as allegedly substandard engineers supplied by still another agency, NUCLEAR POWER SERVICES.
7. The lack of any set standards in the industry for design engineers and the qualifications for these positions.

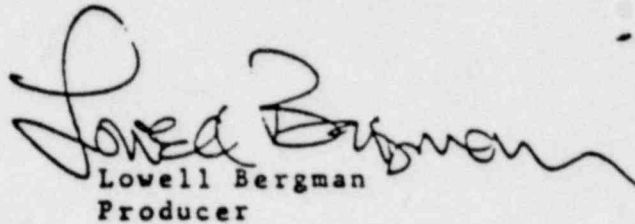
The above information has been accumulated by checking resumes we had

Mr. Harold Thornberg
November 28, 1979
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in our possession, interviews with engineers, construction workers
and individuals working or affiliated with contract engineering
agencies.

We appreciate your cooperation in investigating these matters.

Sincerely,

Alyce Myatt
Producer


Lowell Bergman
Producer

cc: James G. Keppler