

GENERAL  ELECTRIC

MEDIUM VOLTAGE SWITCHGEAR BUSINESS SECTION  
GENERAL ELECTRIC COMPANY • P.O. BOX 488 • BURLINGTON, IOWA 52601 • (319) 753-8400

March 9, 1983

Mr. Richard DeYoung, Director  
Office of Inspection & Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. DeYoung:

In compliance with the requirements of Part 21 of the NRC's Rules and Regulations, Reporting of Defects and Noncompliances, we are submitting the attached copy of the results of our investigation of a report of defects made under the requirements of NRC Rules and Regulations 10CFR50.55(e) on or about August 2, 1982.

10CFR50.55(e) Report Issued by Bechtel Power Corp.  
Bechtel Report No. DER 82-41

Site: Arizona Public Service Co.  
Palo Verde Nuclear Generating Site  
Units 1, 2 and 3

Construction Consultants:

Bechtel Power Corporation  
Norwalk, California 90650

Equipment Supplied:

4.16kV Switchgear Equipment, manufactured by:

General Electric Company  
Switchgear Business Department  
Burlington, Iowa 52601

If you have questions or desire additional information, please contact me.

PWD/md  
Attachment

  
P. W. Dwyer, Manager  
Development & Design Engineering

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March 9, 1983

Mr. L. R. Fickel  
GENERAL ELECTRIC COMPANY  
EUSD  
9350 E. Flair Drive  
El Monte, CA 91734

Dear Sir:

On or about October 26, 1982, you received a Deficiency Evaluation Report, DER 82-41, from the Bechtel Power Corporation alerting you to two conditions concerning control wire terminations within the 4.16kV switchgear equipment supplied by the General Electric Company, G.E. Req'n. 480-54640, Bechtel Spec. 13-EM-009.

The purpose of this letter is to document the results of our investigation into the situation reported by Bechtel/Arizona Public Service DER 82-41.

For clarification, we will separately address the two conditions stated in the report.

## CONDITION IDENTIFICATION

Item 1 "Two conductors were found pulled from the crimped area of the lug barrel. It was determined at that time that some of the lugs within the equipment area did not exhibit identifying marks which identify correct use of crimping tools and dies."

## INVESTIGATION

An investigation by General Electric's I&SE Department determined that there had been two terminals pulled away from the wire. The exact cause of this could not be determined as the terminals had already been repaired. In addition, it was determined that the identifying marks were present although difficult to see.

However, we immediately performed a 100% inspection of all crimped connections at our Burlington Manufacturing location to find out if there were any loose connections or evidence of the use of improper crimping tools. This inspection, plus subsequent inspections at the Palo Verde site performed by Bechtel, Arizona Public Service, and GE Installation and Service Engineering personnel, recorded no further examples of these reported conditions.

#### CONCLUSION

We believe the two loose terminals were an isolated incident which would normally be discovered during facility installation and check-out.

We believe a general safety hazard does not exist based on our thorough inspections of factory and field previously reported. Further corrective action is not required.

#### CONDITION IDENTIFICATION

Item 2 "The attached General Electric (GE) letter provides the criteria and corrective action for providing acceptable termination crimps in the switchgear furnished by GE under Bechtel specification 13-EM-009. A followup random inspection performed by Bechtel Construction using GE criteria in Unit 3 switchgear (7 cubicles noted below) revealed that not all lug terminations were in compliance; however, no open circuits were apparent."

#### INVESTIGATION

The internal requirement that the wire be "flush to 1/16 protruding" from the barrel was engineered to provide easy inspection. It is not a field requirement for a satisfactory joint.

We sent our I&SE engineer to inspect the reported terminals in Unit #3. Under close inspection all wires were secure although a few were back in the barrel as much as .070 to .090. None were back .125".

Further, a number of questionable terminals were returned to Burlington from Units #1 and #3. These were similar to the findings from Unit #2. All in all, more than 10,000 terminals were checked with none being found outside the limits previously discussed.

Although we believed these joints to be fully satisfactory, an additional test was run to verify that they were satisfactory to carry current. Temperature rises of the terminals for 10 and 20 amps were measured at various dimensions of the barrel to wire end up to .125" - no significant difference in heating was found. Therefore, we believe all of these joints were satisfactory for their intended purpose.

CONCLUSION

We believe that the factory internal inspection standards are too conservative to be used as a general field inspection criterion. As long as the wire is securely crimped, and not recessed more than 1/8", it is satisfactory. The evidence from extensive field inspections indicates that field terminals meet these requirements and further field inspections are not needed.

We therefore believe that a safety hazard does not exist, as even the inspection of thousands of terminals did not identify terminals beyond the 1/8" or loose.

  
P. W. Dwyer, Manager  
Development & Design Engineering

PWD/md

cc: W.G. Bingham  
Bechtel Power Corp.  
P. O. Box 60860  
Terminal Annex  
Los Angeles, CA 90060

R.F. Greene  
Plant Manager  
General Electric Company  
Burlington, IA 52601

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Mr. L. R. Fickel

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R.A. Kantmann  
General Electric Company  
Burlington, IA 52601

E. Phillipe  
General Electric Company  
EUSD  
9350 E. Flair Drive  
El Monte, CA 91734

P.S. Rinne  
General Electric Company  
A&ES  
P. O. Box 10419  
Phoenix, AZ 85064

R.L. Shaw  
General Electric Company  
EUSD  
P. O. Box 10419  
Phoenix, AZ 85064

C.G. Weymouth  
General Electric Company  
P. O. Box 10419  
Phoenix, AZ 85064