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January 11, 1982

Mr. James G. Keppler
 Director, Region III
 Office of Inspection and Enforcement
 U.S. Nuclear Regulatory Commission
 199 Roosevelt Road
 Glen Ellyn, Illinois 60137



Dear Mr. Keppler,

Clinton Power Station Unit 1
 Docket No. 50-461/CPFR-137
Deficiency No. 81-06

On October 27, 1981 Illinois Power verbally notified Mr. H.M. Wescott, NRC Region III, of a potential reportable deficiency per 10CFR50.55(e) concerning cracking of certain electrical hanger fittings (E-212 and A-212) during installation. This letter is to serve as a final report for this reportable deficiency per 10CFR50.55(e)(3).

1. Statement of Reportable Deficiency

Several supplied fittings, types E-212 and A-212, used in raceway support applications, cracked or failed during installation of the fittings.

2. Investigation Results

A-212 and E-212 fittings manufactured by Marengo Manufacturing Company and Superstrut are U-shaped and manufactured from A36 and A575 material. These fittings are used in various types of raceway supports, which are utilized in wall mount applications. The suspect fittings manufactured by Marengo Manufacturing Company cracked or failed in the 90° flange angle after bolt torquing.

The suspect fittings were submitted for chemical and mechanical testing to independent test labs by the contractor and the supplier. Significant test results include:

- a) Fitting material chemical and mechanical characteristics were within specifications.

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- b) The sharp inside brake line and tight outer radius of the Marengo fitting flange angle reduces the fitting tolerance for reverse bending. In strut-to-strut applications, reverse bending is not likely to be induced because of strut flexure. In non-resilient applications, such as those used at Clinton Power Station, the fittings may be susceptible to cracking and failure because of reverse bending during installation.
- c) The Superstrut manufactured fittings with a minimum 1/8" radius brake lines and generous outside radii in the flange angle demonstrate acceptable tolerance to over bending and reverse bending.

3. Corrective Action

Prior to the completion of the evaluation and the test results of the suspect fittings the following corrective action measures were taken:

- a) Raceway support work continued using fittings with a minimum 1/8" radii brake lines and generous outside radii in the flange angles. The supports were withheld from inspection until the test results on the fittings were available and a final evaluation had been made.
- b) Fittings with sharp brake lines and less than 1/8" outside radii in the flange angle were removed from stock.

Upon evaluation of the test results the following additional corrective action measures were undertaken:

- a) Identification of the completed and in-progress raceway supports that may use Marengo manufactured A-212 and E-212 fittings.
- b) Return of the in-stock Marengo produced fittings to Superstrut in exchange for approved Superstrut produced fittings or their equal.
- c) Inspection of all possibly affected in-progress raceway supports and replacement of the suspect Marengo fittings where they were used.
- d) Inspection of all possibly affected completed raceway supports and replacement of the suspect Marengo fittings.
- e) Completion of QC Inspection of all suspect fittings that were received or produced on site to assure that each had radii brake lines and generous outside bend radii in the flange angles.

Corrective actions measures outlined above have either been accomplished or will be accomplished prior to final acceptance of affected raceway.

4. Safety Implications/Significance

The raceway systems carry nuclear-safety-related cable and could possibly interact with other nuclear safety-related items. Considering the complexity of hypothesizing the numerous combinations of potential failures, it is difficult to evaluate the hazard, if any, to public health and safety if the deficiency had gone undetected.

This letter is hereby submitted as a final report in accordance with 10CFR50.55(e), and I trust that it is sufficient for your analysis and evaluation of the deficiency and corrective action.

Sincerely,



L.J. Koch
Vice President

LJK/clh

cc: H.H. Livermore NRC Resident Inspector
Director, Office of I&E, USNRC, Washington, DC 22013
Director of Quality Assurance