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 AUTH.NAME AUTHOR AFFILIATION
 UHRIG,R.E. Florida Power & Light Co.
 RECIP.NAME RECIPIENT AFFILIATION

MA/1

SUBJECT: Final deficiency rept re cracked & broken electrical penetration connections. Caused by poor assembly techniques. Supplier will develop repair procedures & repair & replace fractured ring tongue connectors.

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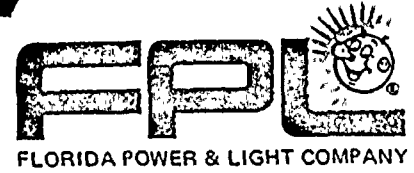
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USNRC REGION II
ATLANTA, GEORGIA



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August 6, 1980
L-80-258

Mr. James P. O'Reilly, Director, Region II
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Re: RII:JPO
50-389

Deficiencies in Electrical Penetration Connections

On July 8, 1980, Florida Power & Light Company notified the NRC Office of Inspection and Enforcement of the discovery of cracked and broken electrical connections in two electrical penetrations. Pursuant to 10 CFR 50.55(e) requirements, a final report is attached.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/TCG/ra
Attachment

cc: Director of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555
(w/attachment)

Harold F. Reis, Esquire

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Final Deficiency Report

Deficiencies in Electrical Penetration Connections

Name of Station:	St. Lucie Plant - Unit 2
Owner:	Florida Power & Light Company
Architect/Engineer:	Ebasco Services, Incorporated
Date of Deficiency:	May 30, 1980
NRC Notification:	July 8, 1980
Final Report Filed:	August 6, 1980

I. Summary

Due to a discovered broken terminal lug on electrical penetration C-3, a full inspection was conducted on all electrical penetrations containing terminal boards. As a result, a total of 23 electrical connectors were found to be fractured, 22 in electrical penetration C-3 and 1 in C-7.

Per the requirements of 10 CFR 50.55(e), the event was deemed reportable and per telecon, FP&L (W Hayward) notified the NRC (R McFarland) on July 8, 1980. This final report is being submitted to advise the NRC of the description of the deficiency and the corrective actions that will be taken.

II. Description

A one-hundred percent inspection of all electrical penetrations (total of 20) containing terminal boards was conducted on May 15 through May 22 1980, by site QA personnel after a cracked terminal lug was encountered on electrical penetration C-3. Site personnel discovered several fractured "ring tongue connectors" which connect the electrical penetration conductors to the terminal boards located on the termination assembly. A fracture was defined as ranging from an obvious break in the tin plating in the "stress area" between the ring and shank (portion where conductor is crimped in) of the connector, to a complete break and separation of the shank from the ring. As a result of the inspection (11,940 connectors), 22 fractured ring tongue connectors were noted on electrical penetration C-3 and 1 fractured connector on C-7. A letter was issued to Conax Corporation, the supplier of the electrical penetrations, advising them of the situation.

The defects of ring tongue connectors were limited to electrical penetrations C-3 and C-7, both of which had conductor feedthru modules added at the Conax factory during June 1979. At that time, five additional 12/C #8 AWG feedthrus terminated with terminal blocks were installed. To add the extra feedthrus, the original and new conductors had to be moved extensively.

Conax responded on June 5, 1980 and stated that it was evident that an anomalous event or series of events can be assigned to the assembly techniques used in the addition of the conductor feedthru modules. The additional feedthru modules were added to assembly C-3 first, and the assembly methods subsequently improved and refined for accomplishing similar work on unit C-7. The inflexibility of the #8 AWG solid conductor presented a problem in making the feedthru additions.

Further it is significant to note that the terminal block mounting structure (squirrel cage assembly) used for the St. Lucie penetrations has a square crosssection, rather than the round crosssection used on all other Conax penetrations with the terminal block mounting structure integrated to the penetration. The square structure has the disadvantage of limiting access to the feedthru ports, thus further inhibiting the addition or substitution of conductor feedthru modules.

III. Corrective Action

Conax has advised us that they are currently developing repair procedures and will forward the repair procedures and hardware to the site as soon as they become available. Conax Corporation will repair and replace, as necessary, those 23 fractured ring tongue connectors. A Corrective Actions Report will be subsequently prepared and will be available for your review at the site.

IV. Safety Implications

The electrical penetration deficiencies, found in construction, could possibly have adversely affected the safety of operations of the plant during its 40 year life, if it were to have remained uncorrected, since these particular electrical penetrations contain safety related cables. The deficiencies in the construction of these electrical penetrations will require repair to establish the adequacy of these components to perform their intended safety function.

V. Conclusion

The deficiencies found in ring tongue connectors in electrical penetrations C-3 and C-7 will be corrected by Conax Corporation according to developed procedures.

