



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 1217
ATLANTA, GEORGIA 30303

Central L.C.
50-390
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NOV 22 1977

In Reply Refer To:

RII:JPO

50-438, 50-439
50-259, 50-260
50-296, 50-518
50-519, 50-520
50-521, 50-553
50-554, 50-327
50-328, 50-390
50-391, 50-566
50-567

Tennessee Valley Authority
Attn: Mr. Godwin Williams, Jr.
Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

Enclosed is IE Bulletin No. 77-06 which requires action by you with regard to your power reactor facility(ies) with an operating license.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely,

James P. O'Reilly
James P. O'Reilly
Director

Enclosures:

1. IE Bulletin No. 77-06
2. List of IE Bulletins
Issued in 1977

cc: J. E. Gilleland
Assistant Manager of Power
830 Power Building
Chattanooga, Tennessee 37401

W. W. Aydelott, Project Manager
Bellefonte Nuclear Plant
P. O. Box 2000
Hollywood, Alabama 35752

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(cc's continued)

Stan Duhan
400 Commerce Street
E4D112
Knoxville, Tennessee 37902

J. G. Dewease, Plant Superintendent
Box 2000
Decatur, Alabama 35602

R. T. Hathcote, Project Manager
Hartsville Nuclear Plant
P. O. Box 2000
Hartsville, Tennessee 37074

G. G. Stack, Project Manager
Sequoyah Nuclear Plant
P. O. Box 2000
Daisy, Tennessee 37319

J. M. Ballentine
Plant Superintendent
Sequoyah Nuclear Plant
P. O. Box 2000
Daisy, Tennessee 37319

T. B. Northern, Jr.
Project Manager
Watts Bar Nuclear Plant
P. O. Box 2000
Spring City, Tennessee 37381

Address list of utilities receiving Bulletin 77-06.

Office of Inspection and Enforcement
Bulletin 77-06

Addresses

In Reference To:

- | | |
|--|---|
| 1. Alabama Power Company
ATTN: Mr. A. R. Barton
Senior Vice President
600 N. 18th Street
Post Office Box 2641
Birmingham, Alabama 35291 | 50-348 Farley Unit 1
50-364 Farley Unit 2 |
| 2. Allied-General Nuclear Services
ATTN: Mr. Raymond C. Baxter
President
P. O. Box 847
Barnwell, South Carolina 29812 | 50-332 Barnwell Nuclear Fuel Plant |
| 3. Carolina Power and Light Company
ATTN: Mr. J. A. Jones
Executive Vice President
Engineering, Construction
and Operation
336 Fayetteville Street
Raleigh, North Carolina 27602 | 50-325 Brunswick Unit 1
50-324 Brunswick Unit 2
50-400 Harris Unit 1
50-401 Harris Unit 2
50-402 Harris Unit 3
50-403 Harris Unit 4
50-261 Robinson Unit 2 |
| 4. Duke Power Company
ATTN: Mr. W. H. Owen, Vice President
Engineering
422 South Church Street
P. O. Box 2178
Charlotte, North Carolina 28242 | 50-413 Catawba Unit 1
50-414 Catawba Unit 2
50-491 Cherokee Unit 1
50-492 Cherokee Unit 2
50-493 Cherokee Unit 3
50-488 Perkins Unit 1
50-489 Perkins Unit 2
50-490 Perkins Unit 3 |
| 5. Duke Power Company
ATTN: Mr. William O. Parker, Jr.
Vice President of Steam Production
422 South Church Street
P. O. Box 2178
Charlotte, North Carolina 28242 | 50-369 McGuire Unit 1
50-370 McGuire Unit 2
50-269 Oconee Unit 1
50-270 Oconee Unit 2
50-287 Oconee Unit 3 |
| 6. Florida Power and Light Company
ATTN: Dr. R. E. Uhrig, Vice President
of Nuclear and General
Engineering
P. O. Box 013100
9250 West Flagler Street
Miami, Florida 33101 | 50-335 St. Lucie Unit 1
50-389 St. Lucie Unit 2
50-250 Turkey Point Unit 3
50-251 Turkey Point Unit 4 |

Addresses

In Reference To:

- | | | |
|-----|---|--|
| 7. | Florida Power Corporation
ATTN: Mr. W. T. Stewart
Director of Power Production
P. O. Box 14042, Mail Stop C-4
St. Petersburg, Florida 33733 | 50-302 Crystal River Unit 3 |
| 8. | Georgia Power Company
ATTN: Mr. J. H. Miller, Jr.
Executive Vice President
270 Peachtree Street, N. W.
Atlanta, Georgia 30303 | 50-321 Hatch Unit 1
50-366 Hatch Unit 2
50-424 Vogtle Unit 1
50-425 Vogtle Unit 2 |
| 9. | Mississippi Power and Light Company
ATTN: Mr. Norris L. Stampley
Vice President of Production
P. O. Box 1640
Jackson, Mississippi 39205 | 50-416 Grand Gulf Unit 1
50-417 Grand Gulf Unit 2 |
| 10. | Offshore Power Systems
ATTN: Dr. D. H. Walker, Manager
8000 Arlington Expressway
P. O. Box 8000
Jacksonville, Florida 32211 | 50-437 FNP 1-8 |
| 11. | South Carolina Electric and Gas Company
ATTN: Mr. M. C. Johnson, Vice President
Special Services
P. O. Box 764
Columbia, South Carolina 29202 | 50-395 Summer Unit 1 |
| 12. | Tennessee Valley Authority
ATTN: Mr. Godwin Williams, Jr.
Manager of Power
830 Power Building
Chattanooga, Tennessee 37401 | 50-438 Bellefonte Unit 1
50-439 Bellefonte Unit 2
50-259 Browns Ferry Unit 1
50-260 Browns Ferry Unit 2
50-296 Browns Ferry Unit 3
50-518 Hartsville Unit 1
50-519 Hartsville Unit 2
50-520 Hartsville Unit 3
50-521 Hartsville Unit 4
50-553 Phipps Bend Unit 1
50-554 Phipps Bend Unit 2
50-327 Sequoyah Unit 1
50-328 Sequoyah Unit 2
50-390 Watts Bar Unit 1
50-391 Watts Bar Unit 2
50-566 Yellow Creek Unit 1
50-567 Yellow Creek Unit 2 |

Addressee

13. Virginia Electric and Power Company
ATTN: Mr. W. L. Proffitt
Senior Vice President
P. O. Box 26666
Richmond, Virginia 23261

In Reference To:

50-338 North Anna Unit 1
50-339 North Anna Unit 2
50-404 North Anna Unit 3
50-405 North Anna Unit 4
50-280 Surry Unit 1
50-281 Surry Unit 2

NUCLEAR REGULATORY COMMISSION
OFFICE FOR INSPECTION AND ENFORCEMENT
WASHINGTON, D. C. 20555

November 22, 1977

IE Bulletin No. 77-06

POTENTIAL PROBLEMS WITH CONTAINMENT ELECTRICAL PENETRATION ASSEMBLIES

Description of Circumstances:

On October 3, 1977, Northeast Nuclear Energy Company reported to the NRC Region I Office that two control valves installed inside containment at Millstone Unit No. 2 demonstrated abnormal operational characteristics. The licensee reported that an unexpected closure of a letdown flow stop valve occurred. While investigating this problem, the normally closed safety injection recirculation return line drain valve was found to be in the open position. Investigation of these events revealed the cause for failure to be electrical shorts between conductors within a containment low voltage penetration assembly.

The licensee subsequently determined that the wiring for both of the valves shared the same low voltage module in an electrical penetration. Electrical tests by the licensee revealed that 15 of the 85 conductors in the suspect connector module exhibited decreased insulation resistance between conductors. Based on this finding, it is believed that an electrical path between adjacent circuits in the connector module was established. This resulted in spurious operation of the valves. Similar resistance checks performed on the remaining low voltage modules within the affected penetration assembly revealed 17 additional conductors with reduced insulation resistances. All conductors with resistances less than 20 megohms were disconnected and their circuits were reconnected through spare conductors.

Examination of the three remaining low voltage penetration assemblies, identified 7 additional conductors with resistances of less than 20 megohms. Each of these circuits were also reconnected through a spare conductor.

Investigation showed that the reduced insulation resistance was probably caused by moisture accumulation within the penetration assembly together with small fissures in the epoxy seals surrounding each conductor in the module. The licensee believes that moisture penetrating these cracks reduced the insulation resistance between adjacent conductors. To prevent further degradation from moisture buildup within the penetration assemblies, the licensee re-established a dry nitrogen pressure of 24 PSIG in the penetrations.

Subsequently the licensee reported that a second event of a similar nature occurred on October 14, 1977. In this instance the sample isolation valve for the pressurizer surge line failed to close on command. Investigation into this event indicated that electrical shorts between conductors due to a moisture accumulation problem was the probable cause for valve misoperation. The shorted wires were disconnected and the valve was de-energized in the closed position.

In discussions on the issue with the licensee and the electrical penetration vendor, General Electric Company, NRC staff determined that maintenance of nitrogen pressure is essential to the integrity of both high and low voltage penetration assemblies. The General Electric Company specifies in its penetration assembly maintenance and operation manual that a 15 PSIG dry nitrogen pressure should be maintained on low voltage units while 30 PSIG should be maintained on high voltage units.

Action To Be Taken By Licensees Of All Power Reactor Facilities With An Operating License:

Containment Electrical Penetrations - For safety related systems

- 1.0 Do you have containment electrical penetrations that are of the G. E. Series 100, or are otherwise similar in that they depend upon an epoxy sealant and a dry nitrogen pressure environment to ensure that the electrical and pressure characteristics are maintained so as to ensure the functional capability as required by the plant's safety analysis report; namely, (1) to ensure adequate functioning of electrical safety-related equipment and (2) to ensure containment leak tightness?
- 1.1 Have you experienced any electrical failures with this type of penetration?

- 2.0 For those penetrations referenced in Item 1 above, have you maintained the manufacturer's prescribed nitrogen pressure at all times?
- 2.1 If you have operated the penetrations without maintaining a nitrogen pressure was any degradation of insulation resistance or anomolous component operation detected?
- 2.2 If no measurements were taken during periods when nitrogen pressure was not maintained, how were you assured that the insulation resistance was not degrading or degraded?
- 2.3 How do you determine that circuit insulation resistances values are satisfactorily maintained?
- 3.0 Is there a need, as determined by either the vendor or yourself, to maintain penetrations pressurized during a LOCA?
- 3.1 What measures have you taken to ensure that penetrations of this type will perform their design function under LOCA conditions? (design reviews, analyses or tests)
- 3.2 Are the measures that provide this assurance adequate to satisfy the Commission's regulations (GDC 4, Appendix A to Part 50; QA Criteria, Appendix B to Part 50)
- 4.0 Provide your response to Items 1.0 through 3.2 above in writing within 10 days. In addition, provide an oral response by 4:00 p.m. (Local Time) November 25, 1977. Responses should be submitted to the Director of the appropriate NRC Regional Office. A copy of written responses should be forwarded to the U. S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, Division of Reactor Operations Inspection, Washington, D. C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

LISTING OF IE BULLETINS
ISSUED IN 1977

Bulletin No.	Subject	Date Issued	Issued To
77-05A	Supplement 77-05A to IE Bulletin No. 77-05 - Electrical Connector Assemblies	11/15/77	All PWR Power Reactor Facilities with an Operating License (OL) or Construction Permit (CP)
77-05	Electrical Connector Assemblies	11/8/77	All PWR Power Reactor Facilities with an Operating License (OL) or Construction Permit (CP)
77-04	Calculational Error Affecting the Design Performance of a System for Controlling pH of Containment Sump Water Following a LOCA	11/4/77	All PWR Power Reactor Facilities with an Operating License (OL) or Construction Permit (CP)
77-03	On-Line Testing of the W Solid State Protection System	9/12/77	All W Power Reactor Facilities with an Operating License (OL) or Construction Permit (CP)
77-02	Potential Failure Mechanism in Certain W AR Relays with Relays with Latch Attachments	9/12/77	All Holders of Operating Licenses (OL) or Construction Permits (CP)
77-01	Pneumatic Time Delay Set Point Drift	4/29/77	All Holders of Operating Licenses (OL) or Construction Permits (CP)