



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARKET A ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303



Gentlemen:

The enclosed information notice provides early notification of an event that may have significance. Accordingly, you should review the information notice for possible applicability to your facility.

A specific action or response is requested at this time; however, contingent upon the results of further staff evaluation, a bulletin or a circular recommending or requesting specific licensee actions may be issued. If you have questions regarding this matter, please contact this office.

Sincerely,


James P. O'Reilly
Director

Enclosures:

1. IE Information Notice No. 81-25
2. List of Recently Issued IE Information Notices

IESI
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FOR ADCK 0500250
Q FOR

August 24, 1981

AddressesIn Reference To

- | | |
|--|--|
| 1. Alabama Power Company
Attn: R. P. McDonald
Vice President-Nuclear Generation
Post Office Box 2641
Birmingham, AL 35291 | 50-348 Farley Unit 1
50-364 Farley Unit 2 |
| 2. Carolina Power and Light Company
Attn: J. A. Jones
Senior Executive Vice President
and Chief Operating Officer
411 Fayetteville Street
Raleigh, NC 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 |
| 3. Duke Power Company
Attn: L. C. Dail, Vice President
Design Engineering
P. O. Box 33189
Charlotte, NC 28242 | 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 |
| 4. Duke Power Company
Attn: W. O. Parker, Jr.
Vice President, Steam Production
P. O. Box 2178
Charlotte, NC 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
50-413 Catawba Unit 1
50-414 Catawba Unit 2 |
| 5. Florida Power and Light Company
Attn: R. E. Uhrig, Vice President
Advanced Systems and Technology
P. O. Box 529100
Miami, FL 33152 | 50-335 St. Lucie Unit 1
50-389 St. Lucie Unit 2
50-250 Turkey Point Unit 3
50-251 Turkey Point Unit 4 |
| 6. Florida Power Corporation
Attn: J. A. Hancock, Assistant
Vice President Nuclear Operations
P. O. Box 14042, Mail Stop C-4
St. Petersburg, FL 33733 | 50-302 Crystal River Unit 3 |

Addresses

In Reference To

- | | |
|---|--|
| 7. Georgia Power Company
Attn: J. H. Miller, Jr.
Executive Vice President
270 Peachtree Street
Atlanta, GA 30303 | 50-321 Hatch Unit 1
50-366 Hatch Unit 2
50-424 Vogtle Unit 1
50-425 Vogtle Unit 2 |
| 8. Mississippi Power and Light Company
Attn: N. L. Stampley
Vice President of Production
P. O. Box 1640
Jackson, MS 39205 | 50-416 Grand Gulf Unit 1
50-417 Grand Gulf Unit 2 |
| 9. Offshore Power Systems
Attn: A. R. Collier, President
P. O. Box 8000
Jacksonville, FL 32211 | 50-437 FNP 1-8 |
| 10. South Carolina Electric and Gas Company
Attn: T. C. Nichols, Jr., Vice President
Power Production and System
Operations
P. O. Box 764
Columbia, SC 29218 | 50-395 Summer Unit 1 |
| 11. Tennessee Valley Authority
Attn: H. G. Parris
Manager of Power
500A Chestnut Street Tower II
Chattanooga, TN 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 |
| 12. Virginia Electric and Power Company
Attn: R. H. Leasburg
Vice President Nuclear Operations
P. O. Box 26666
Richmond, VA 23261 | 50-338 North Anna Unit 1
50-339 North Anna Unit 2
50-404 North Anna Unit 3
50-280 Surry Unit 1
50-281 Surry Unit 2 |

Addresses

In Reference To

13. Institute of Nuclear Power Operation
Attn: R. W. Pack
Lakeside Complex
1820 Waterplace
Atlanta, GA 30339
14. Southern Company Services, Inc.
ATTN: O. Batum, Manager
Nuclear Safety & Licensing
Department
P. O. Box 2625
Birmingham, AL 35202
15. Department of Energy
Clinch River Breeder Reactor
Plant Project Office
ATTN: Chief, Quality Improvement
P. O. Box U
Oak Ridge, TN 37830
16. EDS, Nuclear, Inc.
ATTN: E. H. Verdery
330 Technology Park/Atlanta
Norcross, GA 30092

SSINS No.: 6635
Accession No.:
8103300410
IN 81-25

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555
August 24, 1981

IE INFORMATION NOTICE NO. 81-25: OPEN EQUALIZING VALVE OF DIFFERENTIAL PRESSURE TRANSMITTER CAUSES REACTOR SCRAM AND LOSS OF REDUNDANT SAFETY SIGNALS

Description of Circumstances:

On March 13, 1981, the Tennessee Valley Authority reported to the NRC that a scram occurred at the Browns Ferry Unit 2 facility as a result of an open equalizing valve used with the lower wide-range Yarway water level transmitter. Equalizing valves, which are closed during normal plant operation, are used to conduct instrument calibrations and to prevent over-ranging the transmitter during instrument isolation valve manipulations. With the plant operating at normal full recirculation flow conditions, there is no clear indication that this equalizing valve is open. However, once recirculation flow is decreased, the reference leg will drain, causing erroneous delta pressure (dp) input signals to other transmitters connected to the same reference water column. This affects a large number of safety and control systems that use water level as an input. A review of the event showed that under reduced flow conditions the false high water level signals led to loss of redundancy in the logic for initiating safety functions, as well as initiation of a turbine trip which caused the reactor to scram.

Safety system dp transmitters that could be affected by the drained reference leg provided water level input signals to the logic circuits for the following functions: primary containment isolation, low water level scram protection, automatic depressurization system confirmatory low water level, and high water level trip signal for high-pressure coolant injection and reactor core isolation cooling. In addition, a large number of control functions can be affected, either directly or indirectly, by the drained reference leg.

Under normal operating conditions with full recirculation flow, the operator would be unaware of the abnormal position of the equalizing valve because the lower wide-range Yarway transmitter, which was bypassed by the open equalizing valve and the affected safety system transmitters, would continue to provide signals to the control room instrumentation that appear normal. The lower wide-range Yarway transmitter is designed to provide accurate water level signals only for accident conditions when there is no jet pump flow. With full recirculation flow, this transmitter reads full scale (high water level) whether or not the equalizer valve is open because the variable leg is connected near the high-pressure outlet section of the jet pump. Under these conditions, the common reference leg for the safety system dp transmitters identified above will not drain. Therefore, even if the equalizing valve is open, these transmitters also provide normal signals when there is full recirculation flow.

During the event at Browns Ferry Unit 2 on March 13, 1981, the abnormal condition became apparent to the operator when the recirculation flow rate was being reduced as part of a planned reactor shutdown. Reactor power had been reduced from 100% to 54% over the previous 45 minutes. As the recirculation flow was reduced, the pressure across the jet pump diffuser changed so that at lower flow rates the driving force across the equalizing valve reversed, causing the reference leg to have a higher relative pressure. Higher pressure on the reference leg, coupled with an open equalizing valve, caused the water in the reference leg to drain into the variable leg water column. This caused all level transmitters connected to the affected reference leg to indicate higher-than-actual water level. The false indication of high water level caused the feedwater control valve to close and caused a turbine trip. The turbine trip caused the reactor to scram.

It is unknown when the lower wide-range transmitter equalizing valve was opened. However, thirty-six hours prior to the scram, a surveillance test was performed on the unit.

Similar problems have occurred previously and, in July 1980, the nuclear steam system supplier (NSSS) prepared an information letter that delineates similar safety concerns with respect to the control of differential pressure transmitter equalizing valves. This information letter provides recommendations to alleviate the chronic problem of open equalizing valves. An extract of the NSSS recommended actions is attached for information.

This information notice is provided as notification of a possible significant matter. It is expected that recipients will review the information for applicability to their facilities. No specific action or response to this information is required at this time. If you have questions regarding this matter, please contact the Director of the appropriate NRC Regional Office.

Attachments:

1. Extract from NSSS Information Letter
2. Recently issued IE Information Notices

EXTRACT FROM NSSS INFORMATION LETTER

The NSSS recommends that licensees consider for implementation the following various means for controlling critical dp sensor instrumentation equalizing valves:

1. Installed dp instrumentation equalizing valves may be removed and the low and high side pipe stubs capped (see note below). Such removal will prevent equalizing valving errors and also prevent sensor errors due to installed, leaky equalizing valves. This is, however, not feasible where valve block assemblies are in use.
2. Installed dp instrumentation equalizing valves may be closed in a positive manner by permanently locking the valves in the closed position or by closing the valves and removing the valve wheels and extended portions of the valve stems, etc.

NOTE: For Items 1 and 2 above any function of the equalizing valves can be performed by equalizing valves mounted on calibration systems or devices which are disconnected for normal operation.

3. Root, vent, drain and equalizing valve handles may be painted different colors, and the color included in calibration and line up verification checks.
4. After normal checklists are complete, an independent supervisory check may be performed and then valves may be wire and lead sealed in position.
5. Procedures may include a supervisory comparison of the dp instrument reading taken just prior to surveillance testing/calibration and just after signoff and channel restoration. The final reading should only differ from the initial reading due to calibration or a change in plant operating conditions.
6. A periodic check may be made of dp instrumentation to detect warm instrument lines (for instruments connected to systems at high temperatures). A warm instrument line would indicate significant leakage or an open equalizing valve.

Attachment
IN 81-25
August 24, 1981

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
81-24	Auxiliary Feed Pump Turbine Bearing Failures	8/5/81	All power reactor facilities with an OL or CP
81-23	Fuel Assembly Damaged due to Improper Positioning of Handling Equipment	8/4/81	All power reactor facilities with an OL or CP
81-22	Section 235 and 236 Amendments to the Atomic Energy Act of 1954	7/31/81	All power research reactor, fuel fabrication and reprocessing, and spent fuel storage licensees and applicants
81-21	Potential Loss of Direct Access to Ultimate Heat Sink	7/21/81	All power reactor facilities with an OL or CP
81-20	Test Failures of Electrical Penetration Assemblies	7/13/81	All power reactor facilities with an OL or CP
81-19	Lost Parts in Primary Coolant System	7/6/81	All power reactor facilities with an OL or CP
81-18	Excessive Radiation Exposures to the Fingers of Three Individuals Incurred During Cleaning and Wipe Testing of Radioactive Sealed Sources at a Sealed-Source Manufacturing Facility	6/23/81	Specified licensees holding byproduct licenses
81-16	Control Rod Drive System Malfunctions	4/23/81	All BWR facilities with an OL or CP

OL = Operating Licenses
CP = Construction Permits