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

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U.S. NUCLEAR REGULATORY COMMISSION

Gentlemen:

The enclosed information notice provides early notification of an event that may have safety significance. It is expected that recipients will review the information notice for possible applicability to their facilities.

If you have any questions regarding this matter, please contact this office.

Sincerely,

James P. O'Reilly
Regional Administrator

Enclosures:
1. IE Information Notice No. 81-35
2. List of Recently Issued
   IE Information Notices

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Distribution for IE Information Notice 81-35 (INFORMATION)

December 2, 1981

Addresses	In 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.: 6835
Accession No.:
8107230041
IN 81-35

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

December 2, 1981

IE INFORMATION NOTICE NO. 81-35: CHECK VALVE FAILURES

Description of Circumstances:

After undertaking a program at Three Mile Island Nuclear Station Unit 1 (TMI-1) to follow the recommendations in IE Circular 78-15, "Tilting Disk Check Valves Fail to Close With Gravity in Vertical Position," Metropolitan Edison Company (Met-Ed) reported (LER 80-003/01T and supplement) loose valve internals in the high-pressure injection pump discharge check valves. The valves are Crane three-inch 1500# tilting disk check valves. The initial cause of the loose valve internals was traced to the corrosion of the seat holddown devices of the valves.

As a result of these findings, Met-Ed developed and implemented a continuing inspection program for TMI-1. A design study of the tilting disk check valves was also conducted. Further inspection led to the discovery that some valves could not prevent back flow due to the failure of the hinge pin and seat ring retention devices.

A hinge pin was found to have fallen off, and tack welds on the hinge pin retaining screws were either cracked, weak, or nonexistent. In the seat ring retention device, one lock plate assembly was missing and the seat ring retention device became loose because washers were not installed.

Met-Ed also found many fabrication inconsistencies that may have initiated and/or contributed to these failures. These inconsistencies ranged from the use of materials, other than those specified in procurement documents, to poor workmanship, particularly in the case of welds. For instance, where tack welds were called for on the hinge pin retaining screws, the screws were peened. There were also instances where flat washers were installed in the valves instead of spring washers, and nickel-plated carbon steel washers were used when precipitation hardened stainless steel washers were specified.

Additional problems with disk retaining pins in Crane check valves were reported by Florida Power Company (LERs 80-017/03L-0 and 80-021/03L-0) at Crystal River Unit 3 and by Virginia Electric and Power Company (LER 80-023/01T-0) at Surry Unit 1.

The failure of the hinge lugs on a Mission Manufacturing Company check valve at Fort Calhoun Station was reported by Omaha Public Power District (LER 78-036/03L-0). The failure of the hinge lugs allowed the disk plate to migrate to the steam generator. No damage was observed in the steam generator when the disk plate was removed. The valve is a Mission Type 3"-C308, Style "B" Duo Check, Series 900 check valve.

The discovery of internal damage to two Anchor Darling check valves at Arkansas Nuclear One Unit 2 was reported by Arkansas Power and Light Company (LER 81-034/99X-0). When the first valve was opened to repair a leak, it was discovered that the disk pin was broken from the disk and the disk pin, pin nut, and washer were missing. The equivalent valve in the redundant train was then opened and a disk pin nut and washer were found missing. Both failures were attributed to the valve being manufactured with wire used as the locking device rather than the pin shown on the design drawing. Both valves are Anchor Darling four-inch swing check valves, drawing number 3102-3.

Thus, the check valve failures can be attributed to two main causes: (1) poor retaining device design, and (2) poor quality control on the assembly of the valve internals.

Similar problems with check valves from another manufacturer are described in IE Information Notices No. 80-41, "Failure of Swing Check Valve in the Decay Heat Removal System at Davis-Besse Unit No. 1," and 81-30, "Velan Swing Check Valves."

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

Attachment:
Recently issued IE Information Notices

Attachment
IN 81-35
December 2, 1981

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
81-34	Accidental Actuation of Prompt Public Notification System	11/16/81	All power reactor facilities with an OL or CP
81-33	Locking Devices Inadequately Installed on Main Steam Isolation Valves	11/9/81	All power reactor facilities with an OL or CP
81-32	Transfer and/or Disposal of Spent Generators	10/23/81	All medical licensees
81-31	Failure of Safety Injection Valves to Operate Against Differential Pressure	10/8/81	All power reactor facilities with an OL or CP
81-30	Velan Swing Check Valves	9/28/81	All power reactor facilities with an OL or CP
81-29	Equipment Qualification Testing Experience	9/23/81	All power reactor facilities with an OL or CP
81-28	Failure of Rockwell-Edward Main Steam Isolation Valves	9/3/81	All power reactor facilities with an OL or CP
81-27	Flammable Gas Mixtures in the Waste Gas Decay Tanks in PWR Plants	9/3/81	All power reactor facilities with an OL or CP
81-26	Compilation of Health Physics Related Information Items	9/3/81	All power reactor facilities with an OL or CP
81-25	Open Equalizing Valve of Differential Pressure Transmitter Causes Reactor Scram and Loss of Redundant Safety Signals	8/21/81	All power reactor facilities with an OL or CP

OL = Operating License
CP = Construction Permit

Review of finalized documentation revealed that of approximately 3,701 welds whose material thickness is 1/4" through 1", delta ferrite hold points were assigned to 535 welds. Of these, 469 welds were documented correctly, 54 have missing information, 12 had a delta ferrite value of less than 3FN.

These 12 welds were rechecked and delta ferrite values were 3FN or greater. The documentation for these welds has been corrected. The 54 hold points with missing information were marked not applicable because Process Specification 5.M.2.1(a) requires a sample of 250 welds be checked for this thickness range when the total number of welds is in the range from 3,500 to 10,000. We have checked 231 welds above this requirement.

Corrective Steps Taken to Avoid Further Noncompliance

To avoid the possibility of further insufficient document review before finalization, the Welding Engineering Unit is complying with revision 1 of Addendum 2 of WBN QCI 1.8. This revision provides for the development of a document review checklist by which all future and past submissions to the Quality Control and Records Unit will be given a detailed screening for accuracy and completeness.

Date of Full Compliance

TVA was in full compliance on September 11, 1981.