SSINS No.: 6835
IN 86-09

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

February 3, 1986

IE INFORMATION NOTICE NO. 86-09: FAILURE OF CHECK AND STOP CHECK VALVES SUBJECTED TO LOW FLOW CONDITIONS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP).

Purpose:

This notice is provided to alert recipients of a potentially significant safety problem pertaining to check and stop check valves failing under low flow conditions. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Between late November 1985 and early January 1986, Florida Power and Light's Turkey Point facility experienced numerous failures of the 12 stop check valves in the steam supply system to the auxiliary feedwater pumps. The stop check valves are located upstream and downstream of a motor-operated valve (MOV) that opens when required to initiate auxiliary feedwater flow. The stop check valves are normally open and thus allow steam flow to the pumps while at the same time preventing backflow through the steam line in the event of a steam line break.

The mode of failure of the valve was degradation of the disc and disc nut assembly (see attached sketch) due to low steam flow conditions caused by slight leakage past the normally closed MOV. The low steam flow rate was not sufficient to keep the disc open and the disc assembly then vibrated and chattered causing excessive wear and damage to the valve internals, in particular, the disc assembly. In many cases (three in November and four in January), the disc guide stud had broken off from the disc. This allowed the disc to become cocked in the valve and prevented full closure (thus defeating both the check and stop features of the valve) and full opening (thus restricting steam flow). In addition, the broken disc guide stud was free to travel downstream with steam flow and could have caused damage to equipment and components in the flow path.

The licensee performed a failure analysis of the disc assembly to verify the acceptability of a higher strength material being used in a redesigned disc guide. In addition, the licensee committed to a program of regular radiographic examination of the valves on Unit 3 for the remainder of the refueling cycle. However, the licensee considers this to be an interim repair pending the completion of the study underway by its AFW Enhancement Task Force.

A related series of events was discussed in IE Information Notice 82-26, "RCIC and HPCI Turbine Exhaust Check Valve Failures." In this case the low steam flow rates were the result of testing the RCIC and HPCI turbines at less than rated load. The corrective actions consisted of changes to test procedures, changes to the exhaust system design, and changing to a different check valve style.

The information herein is being provided as an early notification of a possibly significant matter that is still under review by the NRC staff. Recipients should review the information for possible applicability to their facilities. If NRC evaluation so indicates, further licensee actions may be requested.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

Edward L. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

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(404)331-4875

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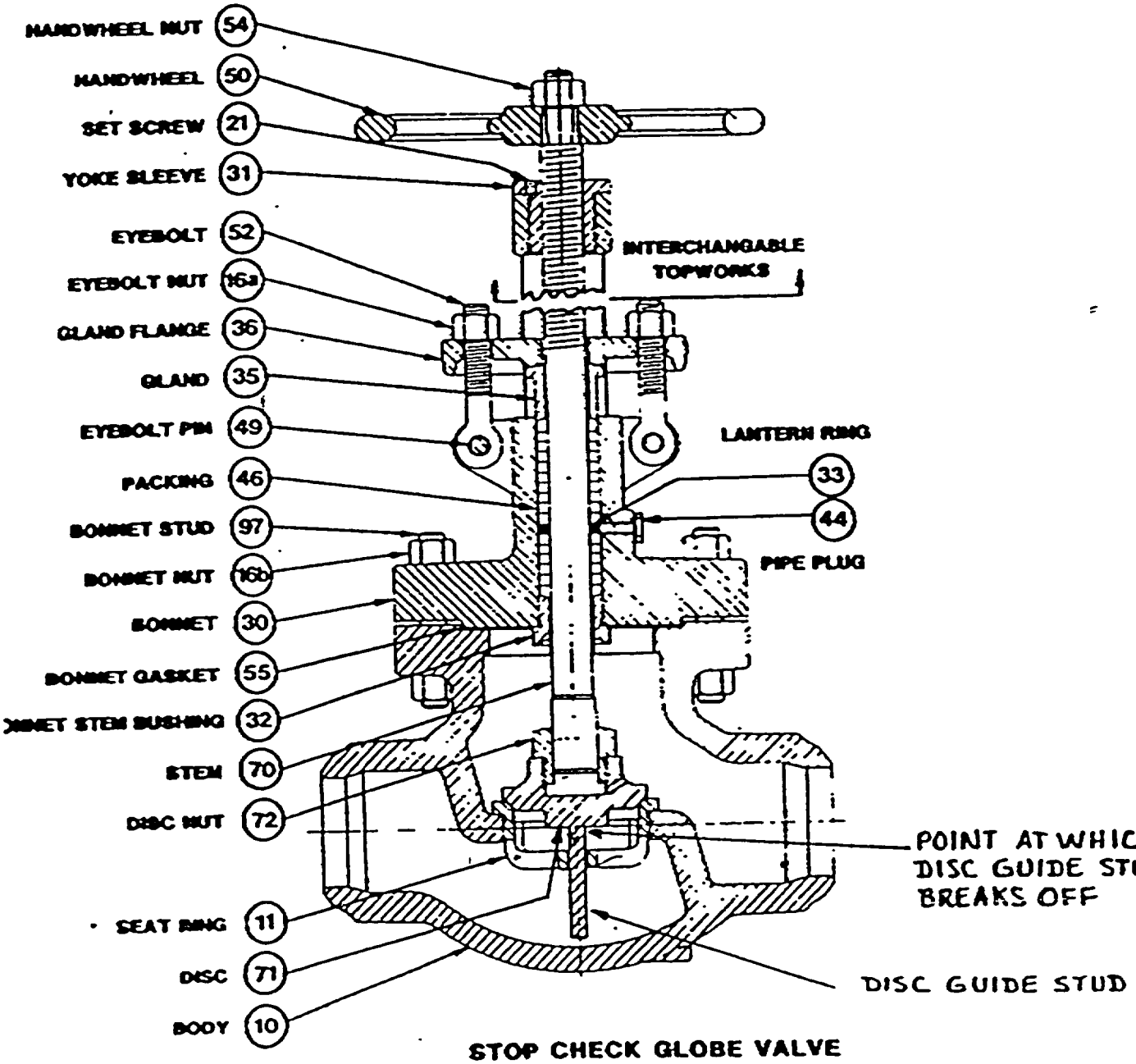
Attachments:
1. Sketch of Stop Check Globe Valve
2. List of Recently Issued IE Information Notices



STOP CHECK GLOBE VALVE

Attachment 2
IN 86-09
February 3, 1986

LIST OF RECENTLY ISSUED IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-08	Licensee Event Report (LER) Format Modification	2/3/86	All power reactor facilities holding an OL or CP
86-07	Lack Of Detailed Instruction And Inadequate Observance Of Precautions During Maintenance And Testing Of Diesel Generator Woodward Governors	2/3/86	All power reactor facilities holding an OL or CP
86-06	Failure Of Lifting Rig Attachment While Lifting The Upper Guide Structure At St. Lucie Unit 1	2/3/86	All power reactor facilities holding an OL or CP
86-05	Main Steam Safety Valve Test Failures And Ring Setting Adjustments	1/31/86	All PWR facilities holding an OL or CP
86-04	Transient Due To Loss Of Power To Integrated Control System At A Pressurized Water Reactor Designed By Babcock & Wilcox	1/31/86	All power reactor facilities holding an OL or CP
86-03	Potential Deficiencies In Environmental Qualification Of Limitorque Motor Valve Operator Wiring	1/14/86	All power reactor facilities holding an OL or CP
86-02	Failure Of Valve Operator Motor During Environmental Qualification Testing	1/6/86	All power reactor facilities holding an OL or CP
86-01	Failure Of Main Feedwater Check Valve Causes Loss Of Feedwater System Integrity And Water-Hammer Damage	1/6/86	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit