UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

August 19, 1994

NRC INFORMATION NOTICE 94-30, SUPPLEMENT 1: LEAKING SHUTDOWN COOLING ISOLATION VALVES AT COOPER NUCLEAR STATION

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) supplement to clarify the type of valve discussed in the original notice and to alert recipients to the potential that local leak rate testing of primary containment isolation valves with pressure applied in the direction opposite of the accident direction may not be conservative. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Background

The NRC issued IN 94-30, "Leaking Shutdown Cooling Isolation Valves at Cooper Nuclear Station," on April 12, 1994, to alert addressees to a precursor to an unisolable rupture of shutdown cooling piping with the potential for core damage and release of radioactive material outside the containment. In that event, after receiving a high-pressure alarm for the suction piping in the residual heat removal system, the licensee measured the leakage through the inboard isolation valve, established a bleedoff path into the pressure maintenance system and continued operations. About 10 months later, the licensee disassembled the inboard and outboard valves and found cracks in the seating surfaces of both valves.

During the preparation of IN 94-30, the staff determined that a concern may exist regarding the method used for testing of primary containment isolation valves. This concern is described below. In addition, the NRC has received information from Anchor/Darling Valve Company that the description of the valves in IN 94-30, "Anchor-Darling 20-inch nominal, double-disk, flex-wedge, gate valves," is incorrect. The correct description is, "a 20 inch, 900 class, flex wedge gate valve," manufactured by the Anchor Valve Company before the merger that formed the Anchor/Darling Valve Company. In IN 94-30, the NRC staff was concerned about the actions of the licensee after the valve leakage was identified regardless of the valve type or manufacturer.

Description of Circumstances

On May 1, 1993, after evaluating the results of local leak rate testing for several inboard primary containment isolation valves, the licensee for the Cooper Nuclear Station (Cooper) determined that the testing methodology used for Appendix J, Type C tests of certain flex-wedge gate valves could not be relied on to be equivalent to or more conservative than testing the valves in the accident direction. The Type C tests for several such valves had been performed with the pressure applied in the direction opposite to the accident direction (reverse direction). The licensee began corrective actions and notified the NRC in Licensee Event Report (LER) 93-019, dated June 1, 1993.

In LER 93-019, the licensee reported that the testing of these valves in the reverse direction was based on an incorrect interpretation of information from the valve manufacturer. In response to a question from the licensee regarding the acceptability of valve test methods, the manufacturer had indicated that testing in the reverse direction would not be expected to affect test results, but an unqualified answer could not be provided. Results of recent tests by the licensee of some of the primary containment isolation valves with pressure applied in the accident direction, indicate that testing in the reverse direction may not be equivalent to or more conservative than testing in the accident direction; therefore earlier test results may not be valid.

LER 93-019 indicated that Cooper Nuclear station has 65 inboard primary containment valves of various types and from various manufacturers. The licensee found that 24 of those valves were of concern. Of the 24 valves, 8 could be tested in the accident direction but, before the 1993 refueling outage, were not. The other 16 valves could not be tested in the accident direction nor had testing in the reverse direction been qualified to be equivalent or more conservative than testing in the accident direction. For most of these valves, the licensee qualified testing in the reverse direction to be equivalent or more conservative or modified the testing configuration to allow testing the valve in the accident direction. For the remaining valves, the licensee requested exemptions from certain Appendix J requirements to allow leak rate testing in the reverse direction.

Discussion

Appendix J to Title 10 of the Code of Federal Regulations Part 50 requires a program for leak testing the primary reactor containment and related systems and components penetrating the primary containment pressure boundary. Section III.C.1 of Appendix J specifies that, for Type C tests of valves (local leak rate tests), the pressure shall be applied in the same direction as that when the valve would be required to perform its safety function, unless it can be determined that the results from the tests for a pressure applied in a different direction will provide equivalent or more conservative results. This requirement is intended to ensure that test leak rates are representative of leak rates that would be experienced under actual accident conditions. As described above, the licensee for Cooper found that, for some of the primary containment isolation valves, testing in the reverse direction was not equivalent to or more conservative than testing in the accident direction.

Related Generic Communications

- NRC IN 86-16, "Failures to Identify Containment Leakage Due to Inadequate Local Leak Rate Testing," March 11, 1986.
- NRC IN 92-20, "Inadequate Local Leak Rate Testing," March 3, 1992.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

C I Grimes for

Brian K. Grimes, Director
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Technical contact: Jim Pulsipher, NRR
(301) 504-2811

Attachment:
List of Recently Issued NRC Information Notices

Enclosure filed in Jacket

LIST OF RECENTLY ISSUED NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
94-59	Accelerated Dealloying of Cast Aluminum-Bronze Valves Caused by Microbiologically Induced Corrosion	08/17/94	All holders of OLs or CPs for nuclear power reactors.
94-58	Reactor Coolant Pump Lube Oil Fire	08/16/94	All holders of OLs or CPs for pressurized water reactors.
94-57	Debris in Containment and the Residual Heat Removal System	08/12/94	All holders of OLs or CPs for nuclear power reactors.
94-56	Inaccuracy of Safety Valve Set Pressure Determinations Using Assist Devices	08/11/94	All holders of OLs or CPs for nuclear power reactors.
94-55	Problems with Copes-Vulcan Pressurizer Power-Operated Relief Valves	08/04/94	All holders of OLs or CPs for nuclear power reactors.
91-79, Supp. 1	Deficiencies Found in Thermo-Lag Fire Barrier Installation	08/04/94	All holders of OLs or CPs for nuclear power reactors.
94-54	Failures of General Electric Magne-Blast Circuit Breakers to Latch Closed	08/01/94	All holders of OLs or CPs for nuclear power reactors.
91-45, Supp. 1	Possible Malfunction of Westinghouse ARD, BFD, and NBFD Relays, and A200 DC and DPC 250 Magnetic Contactors	07/29/94	All holders of OLs or CPs for nuclear power reactors.
94-42, Supp. 1	Cracking in the Lower Region of the Core Shroud in Boiling-Water Reactors	07/19/94	All holders of OLs or CPs for boiling water reactors (BWRs).

OL = Operating License
CP = Construction Permit

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orig /s/'d by CIGrimes/for

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* See Previous Concurrence

OFFICE	SCSB:DSSA:NRR	SCSB:DSSA:NRR	C/SCSB:DSSA:NRR	D/DSSA:NRR
NAME	JPulsifer*	RLobel*	RBarrett*	GHolahan*
DATE	07/17/94	07/19/94	08/03/94	08/04/94

OFFICE	TECH ED	OGCB:DORS:NRR	AC/OGCB:DORS:NRR	D/DORS:NRR
NAME	RSanders*	JBirmingham*	ELDoolittle*	BKGrimes
DATE	06/14/94	08/03/94	08/04/94	08/16/94

OFFICIAL DOCUMENT NAME: 94-30SP1.IN

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DATE	07/17/94	07/19/94	08/3/94	08/ /94

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DATE	06/17/94	06/19/94	06/ /94	06/ /94

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