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

June 24, 1988

NRC BULLETIN NO. 88-08, SUPPLEMENT 1: THERMAL STRESSES IN PIPING CONNECTED TO REACTOR COOLANT SYSTEMS

Addressees:

All holders of operating licenses or construction permits for light-water-cooled nuclear power reactors.

Purpose:

The purpose of this supplement is to 1) provide preliminary information to addressees about an event at Tihange 1 that appears to be similar to the Farley 2 event and 2) emphasize the need for sufficient examinations of unisolable piping connected to the reactor coolant system (RCS) to assure that there are no rejectable crack or flaw indications. No new requirements are included in this supplement.

Description of Circumstances:

Tihange 1 is an 870 MWe, Westinghouse-type, 3-loop, pressurized-water reactor located at Tihange, Belgium. On June 18, 1988, while the reactor was operating, a sudden leak occurred in a short, unisolable section of emergency core cooling system (ECCS) piping that is connected to the hot leg of loop 1 of the RCS. The operator noted increases in radioactivity and moisture within containment and a decrease of water level in the volume control tank. The leak rate was 6 gpm, and the source of leakage was a crack extending through the wall of the piping. The location of the crack and its orientation are shown in Figure 1.

The crack, which is in the base metal of the elbow wall and not in the weld or heat-affected zone, is 3.5 inches long on the inside surface of the elbow and 1.6 inches long on the outside surface. A crack indication also exists in the spool connecting the elbow to the nozzle in the RCS hot leg. That indication is in the heat-affected zone at the weld connecting the spool to the elbow. The indication is circumferential, extends 3.9 inches on the inner surface of the spool, and is 100 mils deep. Two smaller indications exist in the vicinity of the weld connecting the elbow to the check valve.

Farley 2 experienced one crack in a short, unisolable section of ECCS piping connected to an RCS cold leg as described in Information Notice 88-01, "Safety Injection Pipe Failure," and Bulletin 88-08. That crack, which leaked at 0.7 gpm or less, was in the heat-affected zone of the upstream elbow weld. The crack developed slowly rather than suddenly as at Tihange 1.

Actions Requested:

Although the actions requested in NRC Bulletin 88-08 are unchanged, it should be noted that examinations of high stress locations would include the base metal, as appropriate.

Reporting Requirements:

The reporting requirements set forth in NRC Bulletin 88-08 remain unchanged.

If you have any questions regarding this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate NRC regional office.

Charles E. Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: Roger W. Woodruff, NRR
(301) 492-1180

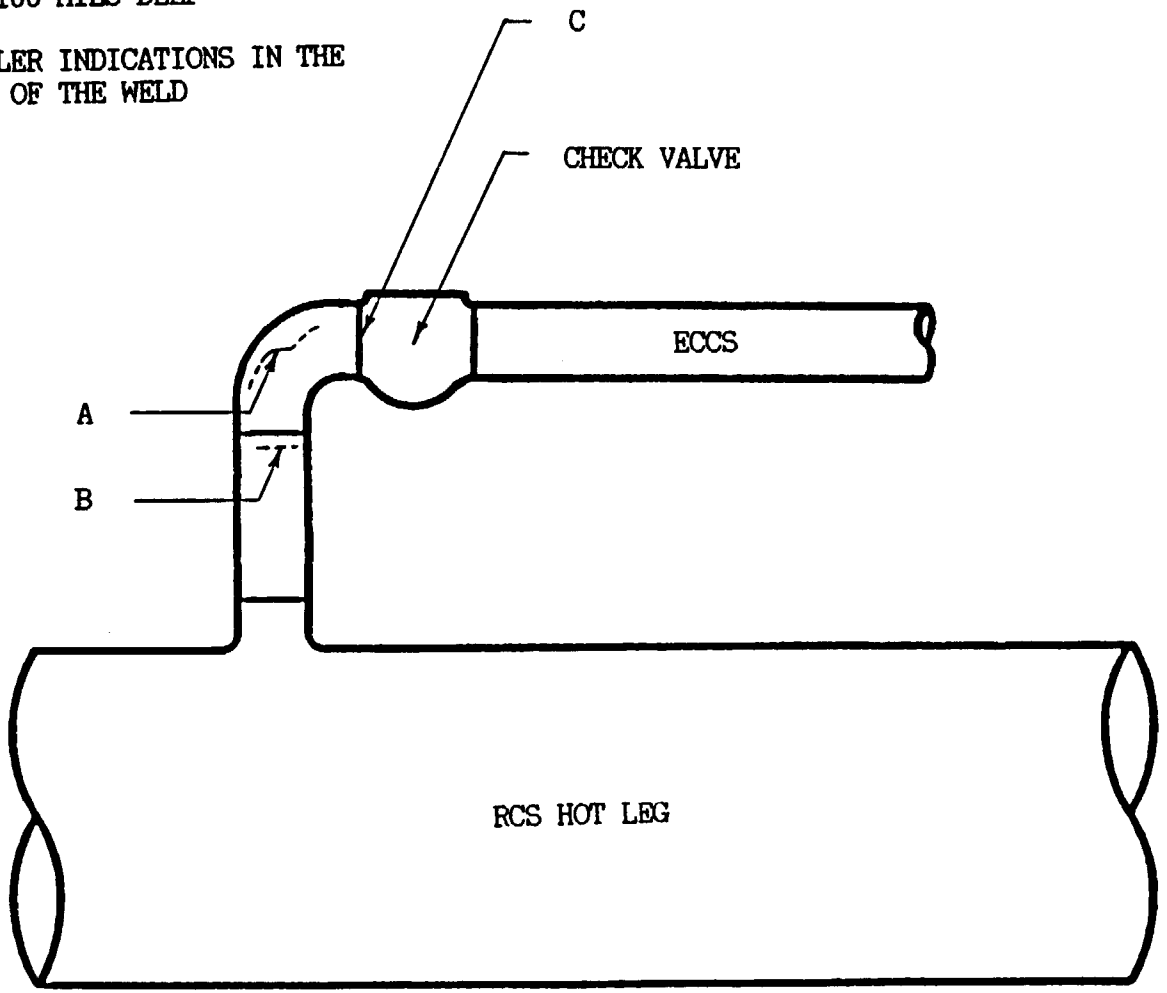
Pao Kuo, NRR
(301) 492-0907

Attachments:
1. Figure 1 - Tihange 1 Piping
2. List of Recently Issued NRC Bulletins

A - THROUGH-WALL CRACK, 3.5 INCHES LONG INSIDE, 1.6 INCHES LONG OUTSIDE

B - CRACK INDICATION, 3.9 INCHES LONG INSIDE, 100 MILS DEEP

C - TWO SMALLER INDICATIONS IN THE VICINITY OF THE WELD



TIHANGE 1 PIPING

FIGURE 1

Attachment 2
NRCB 88-08, Supplement 1
June 24, 1988

LIST OF RECENTLY ISSUED
NRC BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
88-08	Thermal Stresses in Piping Connected to Reactor Coolant Systems	6/22/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-05, Supplement 1	Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-07	Power Oscillations in Boiling Water Reactors (BWRs)	6/15/88	All holders of OLs or CPs for BWRs.
88-06	Actions to be Taken for the Transportation of Model No. Spec 2-T Radiographic Exposure Device	6/14/88	All NRC licensees authorized to manufacture, distribute, or operate radiographic exposure devices or source changers.
87-02, Supplement 2	Fastener Testing to Determine Conformance with Applicable Material Specifications	6/10/88	All holders of OLs or CPs for nuclear power reactors.
88-05	Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey	5/6/88	All holders of OLs or CPs for nuclear power reactors.
88-04	Potential Safety-Related Pump Loss	5/5/88	All holders of OLs or CPs for nuclear power reactors.
85-03, Supplement 1	Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings	4/27/88	All holders of OLs or CPs for BWRs.

OL = Operating License
CP = Construction Permit

Actions Requested:

Although the actions requested in NRC Bulletin 88-08 are unchanged, it should be noted that examinations of high stress locations would include the base metal, as appropriate.

Reporting Requirements:

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2. List of Recently Issued NRC Bulletins

*SEE PREVIOUS PAGE FOR CONCURRENCE

Indicates Shao reconcurrence in in revision

*EAB:DOEA	*EAB:DOEA	*C:EAB:DOEA	*D:DEST	D:DOEA	*GPA:IP
RWWoodruff	DFischer	WDLanning	LShao	CERossi	HJFaulkner
6/24/88	6/24/88	6/24/88	6/24/88	6/24/88	6/24/88

Actions Requested:

For any unisolable sections of piping connected to the RCS that may have been subjected to excessive thermal stresses, Action Item 2 in Bulletin 88-08 requests that addressees examine nondestructively the welds, heat-affected zones and high stress locations, including geometric discontinuities, in that piping to provide assurance that there are no existing flaws. Although the cause of the event at Tihange 1 has not been determined, addressees should assure their examinations adequately evaluate all sections of piping that are susceptible to the phenomena observed at Farley 2 including the base metal as appropriate.

Reporting Requirements:

The reporting requirements set forth in NRC Bulletin 88-08 remain unchanged.

If you have any questions regarding this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate NRC regional office.

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