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

November 23, 1983

IE INFORMATION NOTICE NO. 83-80: USE OF SPECIALIZED "STIFF" PIPE CLAMPS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or construction permit (CP), nuclear steam system suppliers, and architect-engineers.

Purpose:

This information notice is provided as a notification of a potential significant problem in the use of specialized "stiff" pipe clamps. These pipe clamps may result in significant localized stresses in the piping. It is expected that recipients will review the information for applicability to their facilities. No specific action or response is required.

Description of Circumstances:

As a result of a staff evaluation of allegations concerning Class 1 piping design deficiencies, it has become apparent that certain loadings induced by specialized "stiff" pipe clamps can result in significant localized stresses in the piping that should be considered in the piping design. These "stiff" pipe clamps have been developed by several pipe clamp vendors to meet some recent design specification requirements that the clamps be designed to provide total system stiffness compatible with the shock suppressor stiffness. In developing these stiff pipe clamps, clamp vendors have incorporated several innovative design concepts that can detract from the piping integrity when they are not properly considered by piping designers:

1. Several types of "stiff" clamps require, during clamp installation, a preloading of the clamp U-bolts or straps to achieve the desired stiffness properties and to prevent the clamp from lifting off the piping during design load application. The bolt preload value is determined analytically by the clamp vendors and its magnitude can be extremely large. Typically, the clamp vendors qualify only the clamp stresses and do not test or evaluate the effect of the preload on the piping stresses. Some clamp vendors specify the preload value in field installation procedures that are not usually reviewed by piping designers. This may result in clamp preload forces not being appropriately considered in the piping design.

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2. Certain types of "stiff" clamps provide a small contact area of the clamp onto the pipe wall, apparently to facilitate easier clamp installation and to ensure a positive controlled clamping onto the pipe. However, a condition exists for inducing significant localized stresses in the piping during design loadings.

3. Some pipe clamps are available for mounting on piping components other than straight pipe (e.g., pipe elbows). However, when attachments are placed on elbows, the Class 1 piping stress indices and flexibility factors provided in the ASME Boiler and Pressure Vessel Code are not applicable per NB-3683.2.

The above identified clamp design features represent a significant change from the design of conventional pipe clamps that have been used for years in both nuclear and nonnuclear high pressure piping application. These relatively new design features can result in localized piping stresses significantly higher than the stresses from conventional pipe clamps. Piping designers who are accustomed to neglecting these localized stresses because of the low magnitude stresses associated with conventional pipe clamps might incorrectly assume that such stresses can be neglected with these new clamps. The NRC staff does not believe that the clamp design is deficient. However, the NRC staff does believe that potential safety concerns could exist if the piping designers are not aware of the conditions under which high stress can be induced by the clamp or do not properly evaluate piping stresses for the installed condition of the clamp. The applicant/licensee (and its piping designers) should be cognizant of the effect of the clamp-induced pipe loadings. Furthermore, the applicant/licensee should be aware that post-installation control of the clamp preload may be necessary when the clamp stiffness is required to assure total piping system restraint.

The staff has identified the following vendors as the major suppliers of "stiff" clamps. Their respective stiff" pipe clamps models are also identified:

1. E-Systems, Inc. (all models)
2. Western Piping (all models)
3. ITT Grinnell (Figure 215 Stiff Clamp)
   (Figure 315 Stiff Clamp
   (Figure 214 Mini-Stiff Clamp)
   (Figure 314 Mini-Stiff Clamp)
4. Bergen-Paterson (Part 6175)
5. Paul Munroe/Remco Synkrotherm Pipe Clamp

It is suggested that holders of operating licenses or construction permits review this information for applicability at their facilities.

No written response to this information notice is required. If you need additional information about this matter, please contact the Regional Administrator of the appropriate NRC 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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Attachment:
List of Recently Issued IE Information Notices

Attachment
IN 83-80
November 23, 1983

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
83-79	Apparently Improper Use of Components in Safety-Related Systems	11/23/83	All power reactor facilities holding an OL or CP
83-78	Apparent Improper Modification of a Component Affecting Plant Safety	11/17/83	All power reactor facilities holding an OL or CP
83-77	Air/Gas Entrainment Events Resulting in System Failures	11/14/83	All power reactor facilities holding an OL or CP
83-76	Reactor Trip Breaker Malfunctions (Undervoltage Trip Devices on GE Type AK-2-25)	11/2/83	All power reactor facilities holding an OL or CP
83-75	Improper Control Rod Manipulation	11/03/83	All power reactor facilities holding an OL or CP
83-74	Rupture of Cesium-137 Source Used in Well-Logging Operations	11/03/83	All NRC licensees authorized to possess and use sealed sources containing byproduct or special nuclear material in well-logging operations.
83-73	Radiation Exposure from Gloves Contaminated with Uranium Daughter Products	10/31/83	All licensees authorized to process uranium as source material and metal producers of alloys except uranium mills, uranium fuel fabrication plants & nuclear power plants.
83-72	Environmental Qualification Testing Experience	10/2[illegible]/83	All nuclear power facilities holding an OL or CP

OL = Operating License
CP = Construction Permit