

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

September 16, 1996

NRC INFORMATION NOTICE 92-68, SUPPLEMENT 1: POTENTIALLY SUBSTANDARD SLIP-ON,
WELDING NECK, AND BLIND FLANGES

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 supplement to alert addressees to problems with potentially substandard stainless steel butt weld fittings and flanges from Taiwan and to advise licensees of plant events that involved carbon steel flanges from the People's Republic of China. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice supplement are not NRC requirements; therefore, no specific action or written response is required.

Background

The NRC issued Information Notice (IN) 92-68, "Potentially Substandard Slip-On, Welding Neck, and Blind Flanges," on September 10, 1992, to alert addressees to problems with potentially substandard carbon steel slip-on, welding neck, and blind flanges. The National Board of Boiler and Pressure Vessel Inspectors had discussed with the NRC the board investigation of problems associated with flanges that originated from the People's Republic of China. Specifically, the suspect flanges marked "China" were sold to U.S. suppliers through several trading companies and contained cracks, inclusions, and slugged weld repairs and were constructed from two pieces of material.

The suspect flanges were marked as forgings that complied with the requirements of American Society for Testing and Materials (ASTM) Standard A-105, "Specification for Forgings, Carbon Steel, for Piping Components," and American National Standards Institute (ANSI) Standard B16.5, "Dimensional Standards for Steel Pipe Flanges and Flanged Fittings." However, the suspect flanges were manufactured with ring inserts welded to the inside diameter of the flange and the outer surfaces were machined. Consequently, neither the welding nor the two-piece construction would be detected during a visual inspection. Other flanges were found with slugged weld repairs to the flange hub, and still others failed to meet the material specification requirements for thermal treatment, mechanical properties, or chemistry.

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Description of Circumstances

Stainless Steel Butt Weld Fittings and Flanges

As a result of issuing IN 92-68, the NRC received information that the U.S. Federal Trade Commission was investigating potentially substandard stainless steel butt weld fittings and flanges imported from Taiwan. The information suggested that two Taiwan manufacturers (Tru-Flow and Tung Teng) had sold U.S. suppliers potentially substandard stainless steel butt weld fittings and flanges and that potentially substandard stainless steel fittings and flanges can be sold to U.S. suppliers by other foreign manufacturers.

Specifically, stainless steel stub-end butt weld fittings, marked in conformance with ASTM Standard A-403, "Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings," and ANSI Standard B16.9, "Factory-Made Wrought Steel Butt-Welding Fittings," with the manufacturer name, pipe size and schedule, A403 WP 316L-W, heat number, Type A, and Taiwan, failed to conform to applicable standards. The fitting manufacturer had fabricated the suspect stub-end fittings by welding the flange or lap to starting pipe material.

A cross-sectioned stub end examined by the NRC was marked, "Tru-Flow, 1 1/2-inch schedule 40s, A403 WP 316L-W, HT:15425 Type A, Taiwan." ASTM A-403 specification Class WP-W fittings shall meet the requirements of ANSI B16.9 and shall have all welds made by the fitting manufacturer and all pipe welds made with the addition of filler metal radiographically examined throughout the entire length. However, a visual inspection of the cross-sectioned stub end showed that the welds attaching the flange or lap to the pipe did not fully penetrate the weld joint.

Additionally, the NRC was given documentation of an independent inspection of six stub ends also manufactured by Tru-Flow and marked "2-inch schedule 10s, A403 WP 316L-W, HT:20327 Type A, Taiwan." Independent radiographic examination of the fitting manufacturer weld of the flange or lap to the starting pipe showed that the welds on all six stub ends examined lacked full penetration welds. A visual inspection would not be able to detect the welding deficiencies. Additionally, although all six fittings had the same material heat number, a reported chemical analysis showed that two heats of material were supplied and that the flange or lap was yet another heat of material.

Carbon Steel Flanges

IN 92-68 stated that the National Board of Boiler and Pressure Vessel Inspectors had received numerous reports of flanges marked "China" that contained cracks, inclusions, and slugged weld repairs and were constructed from two pieces of material. When IN 92-68 was issued, the NRC did not have evidence that any suspect flanges from China had been installed in U.S. nuclear power plants. However, after the IN was issued, two instances of these suspect flanges at licensee facilities have been reported.

In November 1992, the licensee for Seabrook Station reported finding flanges in a safety system (six 4-inch nominal welding neck flanges installed in the control room ventilation system) that could be part of the potentially substandard group identified in the IN. These flanges were stamped with the word "China." The flanges had been procured as nonsafety-related items.

The licensee performed in situ evaluations of the flanges installed at the Seabrook Station to assess their quality, integrity, and capability to perform their safety function in a ventilation system. The licensee determined that the "China" flanges were acceptable for this particular installation. The licensee identified and inspected about 20 "China" flanges installed in non-safety systems, but found no additional suspect flanges in safety systems.

In February 1993, the licensee for Browns Ferry rejected piping assemblies at receipt inspection because they contained flanges stamped with the word "China." Specifically, the piping assemblies contained 30-, 24-, 20-, 16-, and 12-inch nominal diameter, 150-lb. pressure-class, schedule 40, slip-on "China" flanges. The assemblies were procured by the licensee as safety-related items from Press Mechanical (Cicero, Illinois) for a filter assembly for the control room emergency ventilation system. Press Mechanical procured the flanges as safety-related items from Albany Steel & Brass (Chicago, Illinois), who procured them from Weld Bend (Argo, Illinois). The flanges were supplied to Press Mechanical with Weld Bend material certificates that did not indicate the original source of manufacture as China. However, the flanges were all marked "China."

The National Board of Boiler and Pressure Vessel Inspectors reported that an 18-inch nominal diameter, 150-lb. pressure-class "China" flange also supplied by Weld Bend (for use not related to the nuclear industry) had cracked (inside diameter to outside diameter) beneath the raised face flange area (gasket surface). The 18-inch nominal diameter flange was reported as originating from heat 6F03F0; which is the same heat number reported for the 24-inch nominal diameter flanges supplied to Press Mechanical by Weld Bend for the Browns Ferry piping. Press Mechanical testing of selected China flanges, including the 24-inch nominal diameter ones, did not identify any deviations from the specifications.

Discussion

The Federal Trade Commission advised the NRC that it had not made a final disposition of its investigation of the potentially substandard stainless steel butt weld fittings and flanges that had originated in Taiwan, and that they referred the matter to the Occupational Safety and Health Administration to alert users to the risks associated with these potentially substandard fittings and flanges.

The NRC does not have evidence that any of these suspect stainless steel butt weld fittings and flanges from Taiwan had been installed in U.S. nuclear power plants. However, identified problems are described above for information.

With regard to China flanges, the U.S. Customs Service reported that it had not received any additional complaints or further information and, therefore, closed its case.

A potentially substandard fitting or flange could pass among multiple distributors before reaching the end-user facility. A nuclear power plant licensee could buy a commercial grade fitting or flange from a distributor to dedicate the component for safety-related use, or safety-related components or subassemblies that contain fittings and flanges could be supplied by licensee-approved manufactures or fabricators. Procedures to trace procured equipment and material to the original manufacturer or mill is an important prerequisite to inspecting and testing during the dedication process. It is possible for a licensee to install potentially substandard or defective equipment or material if it does not adequately verify that the product can be traced to the original manufacturer. Properly implemented, NRC-required quality assurance programs should prevent licensees from installing substandard fittings and flanges in safety systems.

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.



Thomas T. Martin, Director
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Office of Nuclear Reactor Regulation

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Attachment: List of Recently Issued NRC Information Notices

Attachment filed in jacket

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
96-51	Residual Contamination Remaining in Krypton-85 Handling System After Venting	09/11/96	All material licensees
96-50	Problems with Levering-In Devices in Westinghouse Circuit Breakers	09/04/96	All holders of OLs and CPs for nuclear power plants
96-49	Thermally Induced pressurization of of Nuclear Power facility Piping	08/20/96	All holders of OLs or CPs for nuclear power reactors
96-48	Motor-Operated Valve Performance Issues	08/21/96	All holders of OLs or CPs for nuclear power reactors
96-47	Recordkeeping, Decommissioning Notifications for Disposals of Radioactive Waste by Land Burial Authorized Under Former 10 CFR 20.304, 20.302, and Current 20.2002	08/19/96	All U.S. Nuclear Regulatory Commission licensees
96-46	Zinc Plating of Hardened Metal Parts and Removal of Protective Coatings in Refurbished Circuit Breakers	08/12/96	All holders of OLs or CPs for nuclear power reactors
96-45	Potential Common-Mode Post-Accident Failure of Containment Coolers	8/12/96	All holders of OLs or CPs for nuclear power reactors
96-44	Failure of Reactor Trip Breaker from Cracking of Phenolic Material in secondary contact assembly	8/05/96	All holders of OLs or CPs for nuclear power reactors

OL = Operating License
 CP = Construction Permit

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original signed by
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Attachment: List of Recently Issued NRC Information Notices

DOCUMENT NAME: 92-68SP1.IN
Tech Editor reviewed 7/1/96
Reviewed by FTC, Customs, National Board of Boiler and Pressure Vessel Inspectors -
8/15/96
Reviewed by International Programs - 8/22/96

*SEE PREVIOUS CONCURRENCES

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DOCUMENT NAME: G:\JRT\FLANGE.INA

Tech Editor reviewed 7/1/96

Reviewed by FTC, Customs, National Board of Boiler and Pressure Vessel Inspectors - 8/15/96

Reviewed by International Programs - 8/22/96

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 Tech Editor reviewed 7/1/96

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