

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

August 16, 1989

NRC INFORMATION NOTICE NO. 89-59: SUPPLIERS OF POTENTIALLY MISREPRESENTED FASTENERS

Addressees:

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

Purpose:

This information notice is being provided to inform addressees of the names of suppliers and/or manufacturers of suspected counterfeit fasteners that were identified as a result of information reported in response to NRC Bulletin No. 87-02, "Fastener Testing To Determine Conformance With Applicable Material Specifications," and Supplements 1 and 2 thereto. Information is also provided on a Grand Jury indictment, dated June 27, 1989, of AIRCOM Fasteners, Incorporated, for allegedly providing nonconforming and falsely identified fasteners to Comanche Peak, the Department of Defense, and other customers. 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 do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On November 6, 1987, the NRC issued Bulletin No. 87-02 to all holders of operating licenses or construction permits for nuclear power reactors in order to determine whether counterfeit fasteners were a concern in the nuclear power industry. The bulletin requested addressees to determine whether fasteners obtained for use in their facilities met the chemical and mechanical specifications stipulated in the procurement documents by sampling typical studs, bolts, cap screws, and nuts. The bulletin also required addressees to provide the names of suppliers and manufacturers of the fasteners. The NRC staff has compiled the information submitted by the addressees and determined that some fasteners supplied to the nuclear industry may have been misrepresented or counterfeit.

A summary of the fastener testing data can be found in NUREG-1349, "Compilation of Fastener Testing Data Received in Response to NRC Compliance Bulletin 87-02." The NUREG summarizes the data according to licensee, manufacturer, supplier, and fastener specification. NUREG documents can be obtained from:

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1. The Superintendent of Documents, U.S. Government Printing Office, Post Office Box 37082, Washington, D.C. 20013-7082.
2. The National Technical Information Service, Springfield, Virginia 22161.

Discussion:

Over the past several years, the presence of counterfeit fasteners has been identified throughout various industries, associations, and Federal agencies. These fasteners have been mismarked to indicate a material content and composition different from the actual bolt content.

The primary problem has been with SAE J429 Grade 8.2 fasteners that were marked and sold as Grade 8. Grade 8 refers to the highest standard strength achieved in the manufacture of bolts and hex cap screws. Grade 8 bolts are medium carbon alloy steel, quenched and tempered at a minimum temperature of 800° F. The carbon content is between 0.28 and 0.55 weight percent with no specification for boron. Grade 8 fasteners are heat treated to achieve a hardness of 33 to 39 on the Rockwell C scale. Grade 8.2 fasteners are low carbon martensite steel, fully killed, fine grain, and quenched and tempered at a minimum temperature of 650° F. Grade 8.2 bolts have a carbon content of 0.15 to 0.25 weight percent and a minimum of 0.0005 weight percent boron. Grade 8.2 fasteners are heat treated to achieve a hardness of 35 to 42 on the Rockwell C scale.

Two concerns arise with regard to the use of Grade 8.2 fasteners in Grade 8 applications. The first concern is the failure of Grade 8.2 bolts from relaxation under load at elevated temperatures. Because of the lower tempering temperature, Grade 8.2 bolts will relax at a lower temperature than Grade 8 bolts. Secondly, industry experience has shown that bolts with hardness values exceeding 39 on the Rockwell C scale are prone to embrittlement if not properly processed during manufacture. In certain applications, the use of mismarked Grade 8.2 bolts in Grade 8 applications could result in failure.

The mismarking and selling of SAE J429 Grade 5.2 as Grade 5 fasteners is similar to the Grade 8 issue. Grade 5 and Grade 5.2 fasteners are both tempered at a minimum temperature of 800° F; therefore, relaxation at elevated temperatures is not a problem for these bolts. However, the mismarking of the bolts is indicative of product substitution which may extend to other, more critical products.

The companies listed below have been identified from addressee responses as providing suspected counterfeit fasteners to the nuclear industry.

<u>Supplier Name</u>	<u>Address</u>
Bennett Bolt Works	Unknown
Bolts & Nuts, Inc.	Chattanooga, Tennessee
Glasser & Associates	El Cerrito, California
Knoxville Bolt & Screw	Knoxville, Tennessee
Metal Fastener Supply	Decatur, Alabama
Phoell Manufacturing Co.	Minneapolis, Minnesota
Service Supply Co.	Unknown
Southeastern Bolt & Screw	Chattanooga, Tennessee
Sure-Loc, Inc.	Charlotte, North Carolina
Victory Bolt, Inc.	Knoxville, Tennessee

On June 27, 1989, a Fort Worth, Texas, Grand Jury handed down an indictment of AIRCOM Fasteners, Incorporated, of Arlington, Texas, and Yamaguchi-Seisakusho Company, Limited, of Japan, for allegedly providing nonconforming and falsely identified fasteners to Comanche Peak and other customers.

The indictment further alleges that false, fictitious, and fraudulent documents were made and caused to be made at AIRCOM for delivery to the Department of Defense, Peterbilt Motors Company, and Texas Utilities at Comanche Peak Nuclear Power Plant to execute and cover up the scheme, including certificates of conformance, certified material test reports, laboratory reports, metallurgical reports, plating certificates, gage certifications, heat treat certifications, purchase orders, vendor quote sheets, correspondence, invoices, quality assurance records, and affidavits.

As a result of the above information and the indictments identifying alleged record falsification and misrepresentation, addressees may wish to review nuclear procurements from these vendors to ensure that appropriate bases exist for the use of fasteners that they may have supplied for safety-related applications or to be upgraded for use in safety-related applications. Further, it is important for addressees performing audits of fastener manufacturers and suppliers to include a review of the basis for certifications provided by vendors and the supporting tests and records of traceability. Addressees may wish to review the adequacy of previous vendor audits and their general vendor approval process in light of this information (reference Information Notice No. 88-35, "Inadequate Licensee Performed Vendor Audits").

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 NRR project manager.



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

Technical Contact: Gregory C. Cwalina, NRR
(301) 492-3221

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-58	Disablement of Turbine-Driven Auxiliary Feedwater Pump Due to Closure of One of the Parallel Steam Supply Valves	8/3/89	All holders of OLS or CPs for PWRs.
89-57	Unqualified Electrical Splices in Vendor-Supplied Environmentally Qualified Equipment	7/26/89	All holders of OLS or CPs for nuclear power reactors.
89-56	Questionable Certification of Material Supplied to the Defense Department by Nuclear Suppliers	7/20/89	All holders of OLS or CPs for nuclear power reactors.
89-45, Supp. 1	Metalclad, Low-Voltage Power Circuit Breakers Refurbished With Substandard Parts	7/6/89	All holders of OLS or CPs for nuclear power reactors.
89-55	Degradation of Containment Isolation Capability by a High-Energy Line Break	6/30/89	All holders of OLS or CPs for nuclear power reactors.
89-54	Potential Overpressurization of the Component Cooling Water System	6/23/89	All holders of OLS or CPs for nuclear power reactors.
89-53	Rupture of Extraction Steam Line on High Pressure Turbine	6/13/89	All holders of OLS or CPs for nuclear power reactors.
88-46, Supp. 3	Licensee Report of Defective Refurbished Circuit Breakers	6/8/89	All holders of OLS or CPs for nuclear power reactors.
89-52	Potential Fire Damper Operational Problems	6/8/89	All holders of OLS or CPs for nuclear power reactors.
89-51	Potential Loss of Required Shutdown Margin During Refueling Operations	5/31/89	All holders of OLS or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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IRRADIATED FUEL SECTION
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DC 20555

Project M-43

**C-E Power Systems
ATTN: A. E. Scherer, Director
Nuclear Licensing
1000 Prospect Hill Road
Windsor, CT 06095**

Project M-44

**Nuclear Packaging, Inc.
ATTN: Charles J. Temus
1010 South 336th Street
Federal Way, Washington 98003**

Project M-46

**FW Energy Applications
ATTN: Henry C. Pickering, Jr.
President & Chief Executive Officer
8 Peach Tree Hill Road
Livingston, NJ 07039**

Project M-53

**Pacific Sierra Nuclear Associates
ATTN: John V. Massey, Ph.D
General Manager
15920 Los Gatos Boulevard
Los Gatos, GA 95032**

Docket 72-1

**General Electric Company
ATTN: Mr. T. E. Ingels
Manager, Morris Operation
7555 East Collins Road
Morris, IL 60450**

Project M-34, 37, 50

General Nuclear Systems, Inc.
ATTN: Paul Highberger, Vice President
220 Stoneridge Drive
Columbia, SC 29210

Project M-39, 49

NUTECH, Inc.
Mr. William J. McConaghey
Vice President
145 Martinvale Lane
San Jose, CA 95119

Project M-40, 51
52 & 54

Nuclear Assurance Corporation
ATTN: James M. Viebrock
Senior Vice President
Engineering and Transportation
Systems
6251 Crooked Creek Road
Norcross, Georgia 30092

Project M-41

Westinghouse Electric Corporation
ATTN: Mr. William J. Johnson, Manager
Nuclear Safety Department
Box 355
Pittsburgh, PA 15230-0355

Project M-42

Transnuclear, Inc.
ATTN: Donald J. Nolan
Chief Engineer
One North Broadway
White Plains, New York 10601