

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

February 22, 1985

IE INFORMATION NOTICE NO. 85-15: NONCONFORMING STRUCTURAL STEEL FOR  
SAFETY-RELATED USE

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or construction permit (CP).

Purpose:

This information notice is provided to alert recipients of a potentially significant problem pertaining to the structural material provided by steel suppliers for safety-related use, especially plate that the steel suppliers cut into small pieces. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. 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 August 3, 1984, Illinois Power Company made notification of a potentially reportable deficiency concerning ASTM A-36 plate material. A 1/2 x 15 x 15 in. plate of steel did not behave as expected in a mechanical cutting operation. Subsequent testing of this plate showed that the physical properties (yield and tensile strength) were less than that required by the A-36 material specification. Confirmatory testing of samples from other plates having the same identification number (the material manufacturer's heat number) by a different laboratory also showed that the yield and tensile strengths were lower than required. For all the samples tested with this identification number, the lowest yield strength was 14% below the ASTM minimum and 23% below the certified material test report (CMTR). The lowest tensile strength was 24% below the ASTM minimum and 34% below the CMTR. The certified material test report, which accompanied this material, came from Phoenix Steel Corporation. The report showed that the material met the requirements of ASTM A-36 and was manufactured in 1980.

Subsequently, Phoenix Steel performed a chemical analysis of two other samples with the same identification number and concluded that this material was not made by them. Phoenix Steel makes steel from scrap and the analysis of trace chemical elements showed a purity not possible from the remelting of scrap material. Testing of an additional sample with the same identification by an independent laboratory confirmed this analysis.

The Illinois Power Company began a thorough examination program and discovered a 1/2 x 10 x 10 in. steel plate with a different identification number that also had yield and tensile strengths lower than required by the A-36 material specification. The certified material test report, which accompanied this material, came from Bethlehem Steel Corporation. The report showed that the material met the requirements of ASTM A-36 and was manufactured in the last half of 1980. Testing of an additional sample with the same identification by an independent laboratory also showed yield and tensile strengths lower than required. For all the samples tested with this identification number, the lowest yield strength was 16% below the ASTM minimum and 36% below the CMTR. The lowest tensile strength was 25% below the ASTM minimum and 45% below the CMTR.

Neither Bethlehem Steel nor Phoenix Steel sell steel cut into small pieces. In both cases, an independent supplier, Interstate Steel Supply Company of Philadelphia, Pennsylvania, provided the material to Illinois Power Company. Interstate Steel purchases plates, shapes and rectangular tubing in large quantities from steel mills and other suppliers. The material is usually resold, as is, to small users, but occasionally the material is cut into smaller sizes. Interstate Steel does not have an ASME Quality System Certificate, but does supply structural steel for safety-related use. The Clinton Power Station purchased material from Interstate Steel for safety-related pipe supports, conduit supports, beam stiffeners, and cable pan hangers.

#### Traceability of Cut Material

Until recently, Interstate Steel had a subcontractor perform all cutting of plate. A review of certified material test reports, shipping invoices and purchase orders, as well as discussions with subcontractors, indicated that traceability was not maintained when material was sent out for cutting. Interstate Steel was unable to show that the material that their vendor cut to size and shipped to Clinton was the material shown on the certified material test report.

A comparison was made between the quantities of steel listed on the certified material test report, identified by heat number, and the quantities of steel received by Illinois Power Company with the same heat number. There were several instances where the quantities of cut plate shipped by Interstate Steel exceeded the dimensional limitations of the material supplied under the same heat number by Bethlehem Steel to Interstate Steel. The disparities have not been resolved.

#### Safety-Related ASME Code Material


A review of certified material test reports, which were supplied by Interstate Steel for material delivered after April 1982 to Clinton, revealed that Interstate Steel purchased material from sources that were not approved to supply ASME material, in accordance with the requirements of Subarticle NA-3700 of Section III of the ASME Code. The testing necessary to upgrade the material, as required by Subarticle NA-3700, was not performed.

Interstate Steel maintains inventory records by size, not by heat number, and it does not retain inventory records beyond 4 years. The records do not provide positive identification of the customers for a specific manufacturer's heat number.

The Illinois Power Company is locating the material that is suspected of having lower-than-specified yield and tensile strengths and is evaluating the effect of reduced strength on safety. Further testing of material is being performed.

Interstate Steel has provided a list (Attachment 1) of the nuclear power reactor facilities to which they have supplied material. In two instances, only the name of the utility was furnished. The list does not contain information about the safety significance of the material.

No specific action or written response is required by this information notice. If you have any questions 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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Attachments:

1. List of Nuclear Power Reactor Facilities  
Receiving Material from Interstate Steel
2. List of Recently Issued IE Information Notices

LIST OF NUCLEAR POWER REACTOR FACILITIES  
RECEIVING MATERIAL FROM INTERSTATE STEEL

<u>UTILITY</u>	<u>FACILITY</u>
Carolina Power & Light Company	Shearon Harris Nuclear Power Plant
Consumers Power Company	Unknown
Duke Power Company	Unknown
Duquesne Light Company	Beaver Valley Power Station
Florida Power & Light Company	Turkey Point Plant
Georgia Power Company	Alvin W. Vogtle Nuclear Plant
GPU Nuclear	Three Mile Island - 1
GPU Nuclear	Three Mile Island - 2
Gulf States Utilities	River Bend Station
Illinois Power Company	Clinton Power Station
Long Island Lighting Company	Shoreham Nuclear Power Station
Niagara Mohawk Power Company	Nine Mile Point
Northeast Utilities	Millstone Nuclear Power Station Unit 3
Pennsylvania Power & Light Company	Susquehanna Steam Electric Station
Philadelphia Electric Company	Limerick Generating Station
Philadelphia Electric Company	Peach Bottom Atomic Power Station
Power Authority of the State of New York	Indian Point Nuclear Power Plant
Public Service Company of New Hampshire	Seabrook Station
Public Service Electric & Gas Company	Hope Creek Generating Station
Public Service Electric & Gas Company	Salem Nuclear Generating Station
Virginia Electric & Power Company	Surry Power Station

LIST OF RECENTLY ISSUED  
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-14	Failure of a Heavy Control Rod (B4C) Drive Assembly to Insert on a Trip Signal	02/22/85	All power reactor facilities holding a CP
85-13	Consequences of Using Soluble Dams	02/21/85	All power reactor facilities holding a CP
85-12	Recent Fuel Handling Events	02/11/85	All power reactor facilities holding a CP
85-11	Licensee Programs For Inspection Of Electrical Raceway And Cable Installation	2/11/85	All power reactor facilities holding a CP
85-10	Posttensioned Containment Tendon Anchor Head Failure	2/6/85	All power reactor facilities holding an OL or CP
85-09	Isolation Transfer Switches And Post-Fire Shutdown Capability	1/31/85	All power reactor facilities holding an OL or CP
85-08	Industry Experience On Certain Materials Used In Safety-Related Equipment	1/30/85	All power reactor facilities holding an OL or CP
85-07	Contaminated Radiography Source Shipments	1/29/85	All NRC licensees authorized to possess industrial radiography sources
85-06	Contamination of Breathing Air Systems	1/23/85	All power reactor facilities holding an OL or CP
85-05	Pipe Whip Restraints	1/23/85	All power reactor facilities holding an OL or CP

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OL = Operating License  
CP = Construction Permit