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HARTSVILLE NUCLEAR PLANTS A AND B  
PHIPPS BEND NUCLEAR PLANT  
YELLOW CREEK NUCLEAR PLANT  
PIPE ELBOWS MADE OF UNSPECIFIED MATERIAL  
REPORT NO. 1 (FINAL)  
NCR's HNP-A-047, PBNP-015, AND YCNP-007

On April 25 and May 1, 1979, TVA notified NRC-OIE Region II Inspector, M. C. Hunt, that the subject NCR's for Phipps Bend and Yellow Creek Nuclear Plants, respectively, were potentially reportable. On May 24, 1979, TVA notified Inspector T. E. Burdette that the NCR for Hartsville Nuclear Plants A and B was reportable. This is the final report on the subject NCR's.

Description of Deficiency

Piping fittings made by Tube Turns Division of Chemtron Corporation (Tube Turns) and supplied to TVA by Guyon Alloys, Inc. (Guyon) were fabricated from a heat of U.S. Steel SA-234 pipe in which oil drill pipe became mixed. The oil drill pipe (API-5AC) is a high strength, brittle material containing molybdenum and approximately twice the carbon content of SA-234. The nonconforming pipe fittings are 4-inch schedule 40 elbows designated as SMLS ASME SA-234 Grade WPB material from heat lot W6719.

A total of 82 questionable fittings were shipped to Phipps Bend Nuclear Plant from Nov. 13, 1978, through Dec. 27, 1978. Seven of these fittings were shipped to Yellow Creek Nuclear Plant on March 1, 1979, from the stock of 52 received at the Hartsville Nuclear Plant on November 15, 1978.

Cause of Deficiency

U.S. Steel, Lorain Works in Lorain, Ohio, fabricated a heat of API-5AC pipe on which the heat identity number was incorrect by one digit giving it the same heat identity number of SA-234 material. U.S. Steel set the incorrectly marked material aside for remarking. However, some or all of the incorrectly marked material became mixed with the properly marked SA-234 material. All of this material was shipped to Tube Turns marked as heat lot W6719 and was fabricated into pipe fittings.

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This situation indicates that U.S. Steel had a breakdown in the identification and control of material portion of their QA program.

#### Safety Implications

One or more of the nonconforming elbows could have been used in any safety system requiring 4-inch piping had this situation remained uncorrected. The nonconforming elbows would have a higher probability of failure due to their brittleness. This failure in combination with a single active component failure could prevent a safety system from performing its intended safety function.

#### Corrective Actions

A memorandum was sent on May 11, 1979, from the Director of Engineering Design to all TVA nuclear plant construction sites requesting that they examine their records for receipt of material with heat code W6719, and if they find any to initiate a nonconformance report. To date, the following actions have been taken:

##### Hartsville Nuclear Plant

The 45 elbows of heat W6719 shipped to Hartsville excluding those shipped to Yellow Creek were identified in the receiving warehouse after notification by an April 3, 1979, telecon with Guyon. These elbows were listed on an OS or D (over, short, or defective) report, segregated, and shipped back to Tube Turns on April 12, 1979.

##### Phipps Bend Nuclear Plant

A total of 82 fittings of heat W6719 were shipped to Phipps Bend. Since three of these fittings were installed in piping assemblies in the pipe shop, U.S. Steel sent a representative to the site to check each of the fittings. On April 11, 1979, the U.S. Steel representative spark tested each of the 82 fittings onsite and found one which was made of the nonconforming material. (Note: In this spark test the spark indicates the presence of molybdenum and high carbon content, approximately 0.40 percent, in the nonconforming material and the presence of silicon and low carbon, 0.20 percent, in the SA-234 material.) The one nonconforming elbow was taken back to U.S. Steel by the representative. The other 81 elbows will be used in future piping assemblies.

##### Yellow Creek Nuclear Plant

The seven elbows of heat W6719 were identified, placed in nonconforming status, segregated, and are awaiting shipping instructions from Hartsville. These elbows will be shipped back to Tube Turns. The elbows will not be used in piping at Yellow Creek Nuclear Plant.

Means Taken to Prevent a Recurrence

Discussions have been held between representatives of TVA and representatives of Guyon, Tube Turns, and U.S. Steel since identification of the deficiency. U.S. Steel indicated they have discussed the problem in internal QA meetings emphasizing the importance of 100 percent accuracy in material identification and control. Also, U.S. Steel representatives are investigating the situation and will prepare an internal report which will contain recommendations of any possible corrective actions which could be taken in the area of material identification and control.

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