



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

Enclosure

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RESPONSE TO NRC BULLETIN 88-05

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

1.0 INTRODUCTION

NRC Bulletin 88-05 and Supplements 1 and 2 require holders of construction permits or holders of less-than-full-power operating licenses to submit information regarding materials supplied by Piping Supplies, Incorporated (PSI), Folsom, New Jersey; West Jersey Manufacturing Company (WJM), Williamstown, New Jersey; and Chews Landing Metal Manufacturers (CLM); and requested that addressees: 1) take actions to assure that materials comply with ASME Code and design specification requirements or are suitable for their intended service, or 2) replace such materials. The NRC action was precipitated by the discovery that certified material test reports (CMTRs) for material supplied by WJM, PSI, and CLM contained false information about material supplied to the nuclear industry. A number of CMTRs were apparently used to certify that commercial-grade steel meets the requirements of ASME Code Section III, Subarticle NCA-3800.

Tennessee Valley Authority (TVA) responded to Bulletin 88-05 for Watts Bar Nuclear Plant letters dated August 1, 1991, January 14, 1992, and April 21, 1992 (the last letter pertains to Unit 1 only). The responses contain information which describe the methodology used to identify, test, and evaluate the material at issue. The responses also describe the document and procurement review and testing programs.

Section 2 of this Safety Evaluation (SE) provides an overview summary of the actions taken by the applicant and the evaluation of the applicant's response by the NRC staff. Section 3 discusses the staff's evaluation of the applicant's submittal with particular emphasis on reviewing the component material properties to demonstrate suitability for service. Section 4 contains the staff's conclusions.

2.0 SUMMARY

The staff has reviewed the applicant's responses to NRC Bulletin 88-05 and Supplements 1 and 2. The responses define specific actions and reporting requirements with respect to identifying, locating and testing

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nonconforming flanges and fittings supplied by PSI/WJM/CLM, and evaluating these items' adequacy and suitability for their intended service.

The applicant's response consisted of submittals dated August 1, 1991, January 14, 1992, and April 21, 1992. The submittals described the methodology used to identify and test the nonconforming parts and contains a summary of the test results.

The applicant conducted a program to identify and locate materials supplied by PSI/WJM/CLM. This program includes an in-depth review and field inspection covering plant piping systems. In addition, the applicant also conducted reviews using data provided by suppliers and vendors. The applicant's efforts showed that approximately 1800 flanges were identified as having been supplied by WJM. No Piping Supplies Inc. (PSI) or Chew Landing (CLM) material was identified. Of the approximately 1800 WJM flanges, 35 flanges from three different heats of material were found installed in safety-related applications in Unit 1 and common (systems shared by both Units 1 and 2.) These 35 flanges were tested and none were found to be outside the acceptable hardness range of between 137 BHN and 187 BHN. The applicant also provided the results of this testing to the INPO Nuclear Network.

Based on the review of the applicant's responses, the staff finds that TVA was responsive to the action and reporting requirements of Bulletin 88-05 for Watts Bar Unit 1, and that the applicant has demonstrated all nonconforming parts as being suitable for their intended service. The staff concludes that the identification program and the results of the tests by TVA to qualify the nonconforming parts provided an adequate basis for resolving the concerns expressed in Bulletin 88-05 with respect to demonstrating adequacy for service.

3.0 DESCRIPTION AND EVALUATION OF APPLICANT'S RESPONSE

3.1 Evaluation of Applicant's Identification Efforts

The applicant conducted a comprehensive program to identify and locate materials supplied by WJM/PSI/CLM. In order to identify WJM/PSI/CLM material, the applicant reviewed contracts, contract submittals, and other purchasing and shipment records for material supplied by any of the three identified vendors. As a result of the records review, the applicant determined receipt of approximately 1800 WJM flanges from two piping suppliers (Capitol and Dravo.) Of these, 35 flanges from three different heats of material were found installed in Unit 1 (and common) safety-related applications. The remaining WJM flanges have either been installed in Unit 1 nonsafety-related applications, installed in Unit 2, or were surplus material not installed. No PSI or CLM material was identified, and no other material types, other than flanges, were identified that were available for construction or modification use. The 35 flanges installed in Unit 1 (and common) safety-related applications were traced to specific component-unique identification numbers, weld data drawings and weld identifiers for each flange.

Based on the review of the submittals, the staff finds that the applicant conducted a thorough and comprehensive search to identify and locate nonconforming flanges and fittings supplied by PSI/WJM/CLM in response to the requirements of Bulletin 88-05, original issue and Supplements 1 and 2. The staff also finds that the applicant was responsive to the action and reporting requirements of Bulletin 88-05 and Supplements 1 and 2 and that there is reasonable assurance that all nonconforming flanges and fittings have been identified. The staff concludes that the applicant's identification efforts provide an adequate basis to resolve the nonconforming material identification concerns described in Bulletin 88-05, and are acceptable.

3.2 Description of Applicant's Test Program

The applicant tested the 35 flanges installed in safety-related service to determine material hardness using an Equotip hardness tester. The Equotip hardness measurements were converted to Brinell hardness numbers (BHN) using an acceptable correlation. The acceptance criteria for SA-105 material established the range of Brinell hardness number from 137 to 187. The results of these tests indicate that the hardness of these flanges are within this hardness range.

At the request of the NRC, additional chemical analyses were provided for the heats of material for the 35 flanges installed in safety-related service. The staff had requested that the chemistry of any flange not meeting the required hardness range be determined and that a statistically valid sampling plan (such as Mil-STD-105D, Table I and IIa) also be performed to determine that the chemistries of all the suspect parts conform to SA-105 requirements including each heat representing installed material. However, since none of the 35 installed flanges were found outside the acceptable hardness range (137-187 BHN), and since there were only 35 items, the staff agreed that it was acceptable to test the chemistry of one flange from each of the three heats of installed material.

The results of the chemical analyses of the three samples are within the specified SA-105 chemistry range. Further, there are no anomalies in the hardness data to indicate that the installed flanges would not be adequately represented by these three samples. Therefore, these tests indicated that all the installed flanges are within the specified SA-105 chemistry range. Based on the above described material property and chemical testing performed by the applicant, the staff concludes that the components in question are acceptable for their intended use.

4.0 Conclusions

Based on review of the submittals, the staff finds that TVA conducted an adequate material property analysis of the Watts Bar Unit 1 (and common) nonconforming flanges using acceptable and conservative methods and evaluation criteria. The staff also finds that the applicant was responsive to the action and reporting requirements of Bulletin 88-05, Supplements 1 and 2, and that the applicant has qualified all nonconforming parts as being suitable for

the intended service. The staff does not consider the nonconforming parts to be ASME Code material. The use of this material is an acceptable alternative in accordance with 10 CFR 50.55a(a)(3)(ii) because full compliance with all specified requirements would result in hardship or unusual difficulties without a compensatory increase in the level of quality or safety.

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Dated: June 11, 1992