

TECHNICAL LETTER REPORT
ON THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF
FOR
ROCHESTER GAS AND ELECTRIC CORPORATION
R. E. GINNA NUCLEAR POWER PLANT
DOCKET NO. 50-244

1.0 INTRODUCTION

By letter dated December 15, 1992, the licensee, Rochester Gas and Electric Corporation (RG&E or the licensee), submitted Requests for Relief Numbers 18-1 and 18-2 requesting relief from the requirements of American Society of Mechanical Engineers Boiler and Pressure Code (ASME Code), Section XI. As the result of a February 7, 1995, conference call with RG&E, clarification regarding RG&E proposed alternative was submitted by letter dated February 16, 1995. The Idaho National Engineering Laboratory (INEL) staff has evaluated the information provided by RG&E in support of these requests for relief in the following section.

2.0 EVALUATION

The information provided by RG&E in support of the requests for relief has been evaluated and is documented below. The Code of record for the R. E. Ginna Nuclear Power Plant Third 10-year Inservice Inspection (ISI) Interval is the 1986 Edition of the ASME Code, Section XI.

- A. Request for Relief No. 18-1, Examination Categories B-B and B-D, Items B2.60, B2.80, B3.150, and B3.160, Regenerative Heat Exchanger (RHE) Welds and Nozzle Inside Radius Sections

Code Requirement: Table IWB-2500-1, Examination Category B-B, Items B2.60 and B2.80 require a 100% volumetric examination as defined by Figure IWB-2500-6 for primary side heat exchanger tubesheet-to-shell and tubesheet-to-head welds.

Examination Category B-D, Items B3.150 and B3.160 require 100% volumetric examination as defined by Figure IWB-2500-7 for full penetration welds of nozzles and nozzle inside radius sections on the primary side of Class 1 heat exchangers.

Attachment

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examinations for the welds on two of the three sections of the regenerative heat exchanger.

Licensee's Basis for Requesting Relief (as stated):

"The Regenerative Heat Exchanger (RHE) consists of three (3) identical vessels interconnected by piping. In accordance with Note 1 of Table IWB-2500-1, Category B-B, these vessels are being considered as multiple vessels performing a similar function.

This multiple stream concept when applied to the regenerative heat exchanger shall affect the following volumetric examinations:

Category B-B, Item B2.60, Tubesheet-to-Head Welds
Category B-B, Item B2.80, Tubesheet-to-Shell Welds
Category B-D, Item B3.150, Nozzle-to-Vessel Welds
Category B-D, Item B3.160, Nozzle-to-Inside Radius Welds

The regenerative heat exchanger provides a major source of radiation exposure accumulated during a normal refueling outage inservice inspection. By utilizing the multiple stream concept on the regenerative heat exchanger, a representative sample of the welds equivalent to one: (1) RHE shall be performed which will significantly reduce personnel radiation exposure. The exposure savings to ISI personnel per inspection interval would be 31.36 Man-Rem Whole Body and 108.8 Man-Rem Extremities through the reduction of sixteen examinations."

Licensee's Proposed Alternative Examination (as stated):

"Rochester Gas and Electric (RG&E) proposes to utilize the multiple stream concept when performing a volumetric examination of accessible portions of Tubesheet-to-Head welds, Tubesheet-to-Shell Welds, Nozzle-to-Vessel Welds and Nozzle Inside Radius Welds equivalent to one of the three identical sections on the Class 1 Regenerative Heat Exchanger. The associated examinations shall be performed once during the interval. In addition, RG&E proposes to perform a VT-2 visual examination on the entire regenerative heat exchanger during system leakage tests and hydrostatic pressure test in accordance with IWA-5000 and Table IWB-2500-1, as applicable."

Note: In the February 16, 1995, letter, the licensee stated that the examinations have been performed on the lower section of the three-part heat exchanger and confirmed that this section of the RHE experiences the highest temperatures and stresses.

Evaluation: The Code requires 100% volumetric examination of the subject RHE welds. The licensee has requested relief from examining two of the three sections of the RHE, and has proposed to examine the equivalent of one section as a representative sample for all three portions of the RHE. The licensee considers the RHE to be multiple

vessels, each performing a similar function, and has proposed to apply the multiple stream concept and examine the welds of only one vessel. The licensee also stated that the RHE is a significant source of radiation exposure and estimates that personnel exposure can be reduced by 31 man-rem by limiting examinations to one section of the RHE.

The INEL staff agrees that the three sections of the RHE are of similar design and function. However, because they are connected in series, each vessel is subjected to different conditions and the multiple stream concept is not applicable. Regarding the radiation hazard, the RHE is a significant source of radiation exposure, which can be substantially reduced by limiting examinations to just one section of the RHE. In the February 7, 1995, conference call, the licensee confirmed that the section selected for examination under this alternative was the one experiencing the highest temperatures and stresses (the lowermost of the three vessels). Since the vessel subjected to the most severe operating conditions had been examined, patterns of degradation that may have been present would have been detected, and reasonable assurance of the structural integrity of the RHE welds has been provided.

Considering the licensee's proposed alternative and the potential radiation exposure, it is concluded that strict compliance with the Code requirements would result in a hardship without a compensating increase in quality and safety. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

B. Request for Relief No. 18-2, Paragraph IWB-2412, Inspection Scheduling (Program B) for the Regenerative Heat Exchanger (RHE) Tubesheet-to-Head and Tubesheet-to-Shell Welds

Code Requirement: IWB-2412 requires that examinations performed during the interval be distributed among the three inspection periods such that 16-34% are completed during the first period, 50-67% completed by the end of the second period and 100% completed by the end of the third inspection period.

Licensee's Code Relief Request: The licensee requested relief from the requirements of IWB-2412 for the regenerative heat exchanger tubesheet-to-head and tubesheet-to-shell welds.

Licensee's Basis for Requesting Relief (as stated):

"Relief Request Number 18-1 provides justification for applying the multiple stream concept that would allow examination of one of the three identical sections of the Regenerative Heat Exchanger (RHE). This action will affect the percentage requirements as specified within Table IWB-2412-1 for the following Class 1 items:

Category B-B, Item B2.60, Tubesheet-to-Head Welds
Category B-B, Item B2.80, Tubesheet-to-Shell Welds

Category B-B had examinations completed in the first period of the third interval program in accordance with Table IWB-2412-1 requirements. The decrease in the required number of weld examinations, as specified within Relief Request Number 18-1 for Category B-B, and the performance of previously scheduled examinations, will cause the percentage requirements for Category B-B to be above the maximum percentages specified within Table IWB-2412-1 for the first and second periods.

Because of the excellent examination results to date, it is considered unnecessary to require ISI personnel to re-perform acceptable examinations at a later period to obtain the proper percentage requirements per Table IWB-2412-1, particularly considering the high radiation environment in this area."

Licensee's Proposed Alternative Examination (as stated):

"Rochester Gas and Electric (RG&E) proposes that code credit be given to applicable Regenerative Heat Exchanger acceptable examinations performed during the first period of the third interval. The percentage requirements specified within Table IWB-2412-1 for Category B-B, for Items B2.60 and B2.80, will therefore not apply to the Regenerative Heat Exchanger for the Third Interval Program. The applicable requirements of Table IWB-2412-1 for Category B-B will be incorporated within the Fourth Interval Program, when developed."

Note: In the February 7, 1995, conference call, the licensee confirmed that the equivalent of one vessel was examined during the first inspection period of the third 10-year ISI interval.

Evaluation: The Code requires that the examinations performed each interval be distributed equally, to the extent practical, among the three periods. During the first inspection period, the licensee stated that the equivalent of one vessel was examined. Due to radiation exposure, the licensee requested relief from examining the remaining two vessels. Because the licensee examined the vessel subjected to the most severe operating conditions, it was concluded that the licensee's alternative would provide reasonable assurance of the RHE's structural integrity, and authorization of the alternative was recommended (see Section A of this report). However, because the licensee will not be examining the other two vessels during the second and third periods, the distribution requirements of the Code would not be met unless the licensee repeats the examinations performed during the first period. Compliance with the requirements of IWB-2412 for the RHE would result in a hardship without a compensating increase in quality and safety.

The licensee's alternative for the third 10-year interval is to examine the equivalent of one vessel during the first period (which has already been completed), and perform the Code-required VT-2 visual examination for leakage during system leakage testing. Any significant patterns of degradation should have been detected by this alternative, and reasonable assurance of the structural integrity has been provided.

Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3.0 CONCLUSION

The INEL staff has reviewed RG&E submittal and concludes that, pursuant to 10 CFR 50.55a(a)(3)(ii), compliance with the requirements of the ASME Code would result in a burden without a compensating increase in quality and safety. Therefore, for Requests for Relief Nos. 18-1 and 18-2, RG&E proposed alternatives should be authorized.

Principle Contributors: B. Brown, INEL
A. Porter, INEL