

SUPPLEMENTAL INFORMATION NEEDED

RELIEF REQUEST ACCEPTANCE EVALUATION BY THE OFFICE OF NUCLEAR REACTOR

REGULATION

REQUEST FOR RELIEF FROM ASME BOILER & PRESSURE VESSEL CODE SECTION III

ENTERGY OPERATIONS INC.

RIVER BEND STATION UNIT 1

DOCKET NUMBER 50-458

1.0 INTRODUCTION

By letter dated December 22, 2011, Entergy Operations Inc. (the licensee), requested, pursuant to 10 CFR 50.55a, relief from Table ND-4622.7 of Section III of the ASME Boiler and Pressure Vessel Code (Code). The licensee's request relates to certain ASME Code Class 3 replacement valves which were installed and later determined not to be in compliance with the heat treatment requirements of Table ND-4622.7 of the Code. Through the use of ASME Code Case N-804 the licensee proposes an alternative to the heat treatment requirements of Table ND-4622.7 of Section III of the Code.

2.0 REGULATORY EVALUATION

In the present case, the licensee has requested, pursuant to 10 CFR 50.55a, relief from Table ND-4622.7 of Section III of the ASME Boiler and Pressure Vessel Code. Given that River Bend's construction permit was issued in 1977, it is not apparent to the staff that relief from the requirements of Section III of the Code may be granted under 10 CFR 50.55a. The NRC staff notes that its ability to grant relief or authorize alternatives under 10 CFR 50.55a is limited to the authority contained in 10 CFR 50.55a(a)(3) and 10 CFR 50.55a(g)(6). The NRC staff also notes that the authority contained in 10 CFR 50.55a(a)(3) is limited to issues contained in paragraphs (c) – (h) of 10 CFR 50.55a and the authority contained in 10 CFR 50.55a(g)(6) is limited to 10 CFR 50.55a(g)(4) where impracticality of performing inspections is demonstrated. For plants with construction permits issued in 1977, there is no direct link between any of these paragraphs and Section III of the Code.

Although not requested by the licensee, the staff believes that it may have regulatory authority to authorize an alternative to the Code requirements which would resolve the current issue if the licensee proposed an alternative to requirements of IWA-4221(b)(1), i.e., that, in the present case, the requirements of this section of the code need not be met. Such a proposal could be based on the fact that the requirements of IWA-4221(b)(1) are incorporated into Federal Regulation by 10 CFR 50.55a(g)(4) and that authority to authorize alternatives to the requirements of 10 CFR 50.55a(g)(4) resides in 10 CFR 50.55a(a)(3).

### 3.0 TECHNICAL EVALUATION

In order for the NRC staff to authorize a proposed alternative to IWA-4221(b)(1), the licensee must demonstrate that the proposed alternative meets one of the technical requirements contained in 10 CFR 50.55a(a)(3)(i) or (ii). These paragraphs state:

- (i) The proposed alternatives would provide an acceptable level of quality and safety; or
- (ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

In its proposal, through the use of ASME Code Case 804, the licensee has attempted to demonstrate that an alternative to the requirements of ASME Code paragraphs ND-4622.1 and ND-4622.7 and Table ND-4622.7 provides an acceptable level of quality and safety. Given that it is not clear to the staff that relief may be requested in this manner, the staff based its technical acceptance review on whether not meeting paragraph IWA-4221(b)(1) of the code by means of providing an alternate heat treatment (in this case none) meets the requirements of either 10 CFR 50.55a(a)(3)(i) or (ii). Given that CFR 50.55a(a)(3)(i) is commonly interpreted to require the alternative to meet an acceptable level of quality and safety when compared to the code requirement, the NRC staff finds no basis that the licensee's proposal meets this standard, i.e., failure to meet a code requirement can never be viewed to provide equivalent quality or safety when compared to meeting that requirement.

For the remainder of the NRC staff's technical acceptance review the staff compared the technical merits of the licensee's proposal to the technical standard contained in 10 CFR 50.55a(a)(3)(ii), i.e., a hardship without a compensating increase in quality and safety.

Given that at least some of the valves under consideration are already installed and either removing them or heat treating them in place present certain difficulties, the NRC staff accepts the concept that a hardship may exist. This determination does not extend to those valves which have not been installed.

The NRC staff did not find sufficient information in the licensee's request to permit an acceptable evaluation of the second portion of 10 CFR 50.55a(a)(3)(ii), i.e., whether following the code requirement, as written results in a "compensating increase in the level of quality and safety."

The NRC staff believes that the licensee's docketed request should, at a minimum contain:

1. Data supporting Code Case 804. At a minimum, for the full range of materials (including carbon contents), heat inputs, welding equipment, and geometries permitted for the code case, these data should include:
  - a. welding procedures
  - b. procedure qualification records

- c. metallographic analyses showing the phases present near the weld
  - d. hardness transects across welds
  - e. toughness tests
  - f. surface test results (dye penetrant) demonstrating that the root, particularly of partial penetration welds can be made without defect
2. Similar data to 1 above for similar welds made using the heat treatments currently prescribed by the code
  3. An analysis, e.g. white paper, describing the data provided in 1 and 2 and documenting that, in terms of metallographic phases, hardness measurements and toughness, the proposed heat treatment provides equivalent results when compared to the existing code requirement.
  4. Drawings for each valve under consideration demonstrating that the geometry of the weld is bounded by the geometries considered in the code case.
  5. Weld procedures, procedure qualification records and test data for each valve weld demonstrating that the welding conditions and materials are bounded by the code case data
  6. Actual materials certifications and machine settings (heat input) used for each of the welds under consideration to demonstrate that these conditions are bounded by the weld procedures used.

Alternatively, the licensee may wish to take a more limited approach to this request. If this approach is taken, data and analyses similar to those above should be provided, however, the scope may be limited to the conditions which bound the welding conditions used for the valves under consideration rather than for all conditions to which Code Case 804 may apply. Depending on the values contained in the data provided, a full comparison between the proposed heat treatment and the current code requirement may or may not be required. Destructive evaluations of some valves not currently in service and non-destructive examinations of some valves currently in service may be beneficial in demonstrating the adequacy of the proposed heat treatment for the inservice valves. A leak-before-break analysis may also be beneficial in demonstrating that catastrophic failure of the component is not expected even if a crack develops as a result of the proposed heat treatment.

#### 4.0 CONCLUSION

As set forth above, the NRC staff finds no regulatory basis by which the licensee's request, as currently stated, may be granted. The NRC staff does, however, believe that the request can be revised such that regulatory authority to grant the request will exist.

The NRC staff reviewed the technical basis for the request based on a potential revision to the request which would provide the NRC staff with regulatory authority to grant the request. The

NRC staff failed to find sufficient information in the request and in referenced documents, some of which are not, but should be, on the docket, to conclude that the proposed alternative will meet the technical requirements contained in 10 CFR 50.55a(a)(3)(ii).

While the NRC staff is not averse to the licensee supplementing the technical information contained in this request, due to the large amount of material required, the NRC on a February conference call discussed with the licensee if it maybe more prudent that this request be withdrawn and resubmitted at a future date. The licensee noted it plans to met the 14 day response date but understands that additional information maybe needed to support the RR.

## 5.0 REFERENCES

1. Entergy Operations Inc. letter RBG 47197 to NRC dated December 22, 2011, "River Bend Station, Unit 1 - Requests for Relief Request for Relief from ASME Boiler & Pressure Vessel Code Section III," Agency-wide Documents Access and Management System (ADAMS) Accession No. ML12003A196