



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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October 6, 2011

MEMORANDUM TO: Jessie F. Quichocho, Acting Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

FROM: Kenneth G. O'Brien, Deputy Director /RA/
Division of Reactor Safety

SUBJECT: TASK INTERFACE AGREEMENT - EVALUATION OF
COMPLIANCE WITH CODE FOR EXAMINATION OF FLANGE
STUD HOLES ON THE REPLACEMENT VESSEL HEAD AT THE
DAVIS-BESSE NUCLEAR POWER STATION (TIA 2011-015)

This Task Interface Agreement (TIA) documents the regulatory position as determined through consultation between Region III and the Office of Nuclear Reactor Regulation (NRR) regarding the application of Construction Code (CC) requirements for the replacement reactor vessel closure head (RRVCH) at the Davis-Besse Nuclear Power Station.

Background

During the 2011 review of RRVCH fabrication records at the Davis-Besse Nuclear Power Station, the inspectors identified that surface examinations had not been performed on the accessible interior surfaces of the RRVCH flange stud holes. The inspectors identified an unresolved item related to the licensee's decision to not apply CC requirements related to surface examination of accessible internal surfaces.

The RRVCH is a single piece low-alloy steel forging meeting American Society of Mechanical Engineers (ASME) material specification SA 508, "Specification for Quenched and Tempered Vacuum-Treated Carbon and Alloy Steel Forgings for Pressure Vessels," with an ASME NPT stamp to document that this pressure boundary part was fabricated to the requirements of the 1989 Edition of the ASME Code Section III (i.e., the CC for the RRVCH). The requirements for examination of forgings are contained in the ASME Code Section III, Article NB 2540 "Examination and Repair of Forgings and Bars." Specifically, NB-2541(a) requires in part that "In addition, all external surfaces and accessible internal surfaces shall be examined by a magnetic particle [MT] method (NB 2545) or a liquid penetrant [PT] method (NB-2546)." Also, NB-4121.3 "Repetition of Surface Examinations After Machining" requires "If, during the fabrication or installation of an item, materials for pressure containing parts are machined, then the Certificate Holder shall re-examine the surface of the material in accordance with NB-2500 when: (a) the surface was required to be examined by the magnetic particle or liquid penetrant method in accordance with NB-2500; and (b) the amount of material removed from the surface exceeds the lesser of 1/8 inch or 10 percent of the minimum required thickness of the part." For the 60, 7-inch diameter stud holes drilled through the RRVCH flange, no surface examinations (e.g., MT or PT) were conducted on the interior bore surfaces of the stud holes.

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Background - Continued

The inspectors observed a licensee demonstration of the potential accessibility of the flange stud holes for MT examination. Specifically, a licensee MT qualified examiner positioned an AC yoke used for MT examinations on the interior bore surfaces of an RRVCH flange stud hole. Based on this demonstration, the inspectors estimated that it would be possible to perform an MT exam for accessible portions of the interior bore surfaces for a depth of about 2 inches from the top and bottom flange faces for each of the 60 stud holes. Because this accessible interior surface on the RRVCH forging had not been examined by MT or PT, the inspectors were concerned that the RRVCH did not meet the requirements of NB-2541(a) and NB-4121.3 discussed above.

Licensee Position

The licensee established a position that accessible interior surfaces of the RRVCH stud holes did not require a surface examination. The licensee position was based on Code Interpretation III-1-77-162 (Reference 1), which states in part, that drilled holes are not considered to be material form surfaces and the requirement for examination of holes (if any) resides in NX-4000 and NX-5000. The licensee concluded that the re-examination of machined surfaces as discussed in NB-4121.3 did not apply to the accessible interior surfaces of the flange stud holes because they were not material form surfaces.

Staff Guidance and Regulatory Evaluation

Reference 2 provides the NRC guidance on interpretations to Section III of the ASME Code. Specifically, if inspectors identify Code issues that result in a disagreement with the licensee, or if an official Code Interpretation is identified by an inspector that appears to conflict or is inconsistent with NRC requirements, the item should be sent via TIA to NRR for guidance and interpretation. Further, Reference 2 states that the ASME Code Interpretations are not incorporated into the Code of Federal Regulations; and therefore, the NRC is not bound by these interpretations. In this case, the licensee has applied wording "material form surfaces" from Reference 1 to exclude re-examination of machined surfaces formed during boring of the RRVCH flange holes. The licensee's application of this interpretation appears to conflict with the 1989 edition of the ASME Code Section III NB-4121.3 requirement to re-examine machined surfaces of pressure boundary materials.

Conclusion

The RRVCH head forging and subsequent machining operations are subject to the examination requirements of the 1989 edition of the ASME Code Section III, Article NB 2540 "Examination and Repair of Forgings and Bars," and NB-4000 "Fabrication and Installation." The process of machining the RRVCH forging to create the flange stud holes required removal of material which exceeded 1/8 inch or 10 percent of the minimum required part thickness. Therefore, the accessible internal surfaces of the flange stud holes require surface examination (MT (NB-2545) or PT (NB-2546)) in accordance with the requirements of NB-2541 and NB-4121.3.

References

1. ASME Code Interpretation III-1-77-162, dated August 23, 1977
2. NRC Inspection Manual, Part 9900 Technical Guidance - ASME Code Section III and XI, dated November 12, 1996

Docket Nos. 50-346
License Nos. NPF-3

References

1. ASME Code Interpretation III-1-77-162, dated August 23, 1977
2. NRC Inspection Manual, Part 9900 Technical Guidance - ASME Code Section III and XI, dated November 12, 1996

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