

April 5, 2011

MEMORANDUM TO: Docket File

FROM: Lynnea Wilkins, Project Manager /RA/
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 – SUMMARY OF
CONFERENCE CALL ON MARCH 30, 2011, RE: VERBAL
AUTHORIZATION OF RELIEF REQUEST RR-12 FROM CODE
CASE N-722 VISUAL EXAMINATION (VE) OF THE REACTOR
VESSEL HOT LEG NOZZLE TO SAFE END DISSIMILAR METAL
WELDS (TAC NO. ME4541)

By letter dated August 16, 2010, as supplemented by letters dated January 14 and March 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML102300679, ML110200205, and ML110670226, respectively), Omaha Public Power District (OPPD, the licensee), requested approval by the U.S. Nuclear Regulatory Commission (NRC) of Relief Request Number RR-12, "Request for Relief from Code Case N-722 Visual Examination (VE) of the Reactor Vessel Hot Leg Nozzle to Safe End Dissimilar Metal Welds," for Fort Calhoun Station, Unit 1 (FCS). Pursuant to paragraph 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR), OPPD requested NRC approval of an alternative to the visual examination requirements of American Society of Mechanical Engineers (ASME) Code, Section XI, Code Case N-722, "Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials, Section XI, Division 1."

The licensee requested relief from the 10 CFR 50.55a(g)(6)(ii)(E) requirement to perform a bare metal visual inspection of reactor pressure vessel outlet nozzle to safe end dissimilar metal welds in accordance with ASME Code Case N-722. OPPD requested this relief for the spring 2011 and fall 2012 refueling outages at FCS. The NRC staff found that analyses submitted by the licensee may not support the full 51 calendar months requested under RR-12. However, the analysis does support relief during the spring 2011 refueling outage for one operating cycle.

Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii), and is in compliance with the Code requirements. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the licensee's proposed alternative, RR-12 at FCS for the spring 2011 refueling outage, as discussed during a conference call with the licensee on March 30, 2011. A summary of the verbal authorization is enclosed.

The NRC staff will proceed with completion of the written safety evaluation for RR-12. The staff may ask additional clarification questions to complete its written safety evaluation, if necessary. The written safety evaluation should be issued within 150 days in accordance with the Office of Nuclear Reactor Regulation office instructions.

NRC Participants:

M. Markley, NRR/DORL/LPL4, Branch Chief
T. Lupold, NRR/DCI/CPNB, Branch Chief
J. Collins, NRR/DCI/CPNB, Senior Materials Engineer
B. Singal, NRR/DORL/LPL4, Project Manager
L. Wilkins, NRR/DORL/LPL4, Project Manager

Licensee Participants:

J. Herman, Division Manager – Nuclear Engineering
B. Hansher, Supervisor – Nuclear Licensing
B. Lisowyj, Project Manager – Materials
J. Brandeau, Project Manager – Nuclear Projects
M. Edwards, Nuclear Licensing Engineer

Docket No. 50-285

Enclosure:
As stated

The NRC staff will proceed with completion of the written safety evaluation for RR-12. The staff may ask additional clarification questions to complete its written safety evaluation, if necessary. The written safety evaluation should be issued within 150 days in accordance with the Office of Nuclear Reactor Regulation office instructions.

NRC Participants:

M. Markley, NRR/DORL/LPL4, Branch Chief
T. Lupold, NRR/DCI/CPNB, Branch Chief
J. Collins, NRR/DCI/CPNB, Senior Materials Engineer
B. Singal, NRR/DORL/LPL4, Project Manager
L. Wilkins, NRR/DORL/LPL4, Project Manager

Licensee Participants:

J. Herman, Division Manager – Nuclear Engineering
B. Hansher, Supervisor – Nuclear Licensing
B. Lisowyj, Project Manager – Materials
J. Brandeau, Project Manager – Nuclear Projects
M. Edwards, Nuclear Licensing Engineer

Docket No. 50-285

Enclosure:
As stated

DISTRIBUTION:

PUBLIC
LPLIV Reading
RidsAcrsAcnw_MailCTR Resource
RidsNrrDorlLpl4 Resource
RidsNrrPMFortCalhoun Resource
RidsNrrLAJBurkhardt Resource
RidsRgn4MailCenter Resource
RidsNrrDciCpn
JCollins, NRR/DCI/CPNB

ADAMS Accession No. ML110910327

***via email dated**

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/DCI/CPNB/BC	NRR/LPL4/BC	NRR/LPL4/PM
NAME	LWilkins	JBurkhardt	TLupold*	MMarkley (BSingal for)	LWilkins
DATE	4/1/11	4/1/11	3/31/11	4/1/11	4/5/11

OFFICIAL RECORD COPY

SUMMARY OF CONFERENCE CALL ON MARCH 30, 2011

VERBAL AUTHORIZATION FROM ASME CODE CASE N-722 VISUAL EXAMINATION OF
THE REACTOR VESSEL HOT LEG NOZZLE TO SAFE END DISSIMILAR METAL WELDS

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

DOCKET NO. 50-285

By letter dated August 16, 2010, as supplemented by letters dated January 14 and March 4, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML102300679, ML110200205, and ML110670226, respectively), Omaha Public Power District (OPPD, the licensee), requested relief (RR-12) from the 10 CFR 50.55a(g)(6)(ii)(E) requirement to perform a bare metal visual inspection of reactor pressure vessel outlet nozzle to safe end dissimilar metal welds in accordance with ASME Code Case N-722.

OPPD requested this relief for the spring 2011 and fall 2012 refueling outages (RFO) at Fort Calhoun Station, Unit 1 (FCS). OPPD stated that a best effort visual examination performed during each RFO coupled with favorable inspection data from the 2003, 2008, and 2009 weld examinations, use of zinc addition, and a supporting deterministic crack growth analysis would provide an acceptable level of quality and safety in lieu of the required bare metal visual examination.

The bare metal visual examination requirements for dissimilar metal butt welds provide defense-in-depth non-destructive examination. Plant-specific analysis can be used to provide a basis for inspection relief if the bare metal visual inspection presents a significant hardship on a licensee.

In 2010, the NRC and industry groups worked on the development of MRP-287, "Materials Reliability Program: Primary Water Stress Corrosion Cracking (PWSCC) Flaw Evaluation Guidance," to develop an acceptable standard methodology for deterministic flaw analysis. While the report was not complete by the time of the issuance of OPPD's relief request, OPPD did use the report to support its basis for this relief request. The staff reviewed OPPD's deterministic assessment as well as supporting inspection results, zinc mitigation and best effort visual examination alternative for authorization of RR-12.

By letter dated January 14, 2011, OPPD provided information on the hardship involved with performing the required bare metal visual examination, additional details on zinc addition, several references for the flaw evaluation, and clarification on previous examination data. As the hot-leg dissimilar metal welds are in sandboxes, the NRC staff concluded that OPPD had a sufficient basis for hardship. However, the staff found insufficient time available to evaluate the effectiveness and credit the zinc benefit for stress-corrosion cracking to support this relief request. Additionally, the staff concluded that OPPD's plant-specific stress analysis used the incorrect safe-end length in the model, which is a critical part of the flaw evaluation. The NRC

Enclosure

staff then reviewed OPPD's stress analysis without the effect of a safe end and used OPPD's methodology to develop a new flaw analysis. The staff found this analysis may not support the full 51 calendar months requested under RR-12. However, the analysis does support relief during the spring 2011 RFO for one operating cycle.

In order to validate OPPD's flaw analysis and support relief through to the spring 2014 RFO, the NRC staff would need OPPD to use the as-build dimensions, in accordance with Item 1, "Geometry and Materials," of Section 3.6, "Attributes of an Acceptable Residual Stress Analysis," of MRP-287 to develop a robust flaw analysis under RR-12. Completion of this analysis would be expected to go beyond the upcoming spring 2011 refueling outage at FCS. However, since the NRC staff's review of OPPD's current analysis shows reasonable assurance of leak tightness for the reactor pressure vessel outlet nozzle to safe end dissimilar metal welds until the fall 2012 RFO, the staff finds sufficient basis to authorize RR-12 for the spring 2011 RFO.

Therefore, given the hardship of the location of both reactor pressure vessel outlet nozzle to safe end dissimilar metal welds being in sandboxes, OPPD's best effort visual inspection during the spring 2011 RFO, and the flaw analysis performed to date, the NRC staff concludes that OPPD has provided sufficient technical basis to find that compliance with the current requirements of 10 CFR 50.55a(g)(6)(ii)(E) for a bare metal visual examination of the reactor pressure vessel outlet nozzle to safe end dissimilar metal welds at FCS during the spring 2011 RFO would cause an unnecessary hardship or unusual difficulty on the licensee without a compensating increase in the level of quality and safety.

Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii), and is in compliance with the Code's requirements. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the licensee's proposed alternative, RR-12 as supplemented by letters dated January 14 and March 4, 2011, at FCS for the spring 2011 RFO for one operating cycle.

The NRC staff asked if the licensee intended to supplement the existing application in order for the staff to complete its review. The licensee stated that it does not plan to supplement the existing application and will address the NRC staff's concerns in new application for the fall 2012 RFO.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.