

May 11, 2004

MEMORANDUM TO: Cathy Haney, Program Director
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

FROM: Joseph L. Birmingham, Project Manager */RA/*
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

SUBJECT: SUMMARY OF APRIL 16, 2004 MEETING WITH NUCLEAR ENERGY
INSTITUTE (NEI) AND MATERIALS RELIABILITY PROGRAM ON
BUTT WELD SAFETY ASSESSMENT

On April 16, 2004, Nuclear Regulatory Commission (NRC) staff met with representatives of the Nuclear Energy Institute, the Electrical Power Research Institute (EPRI) Materials Reliability Program (MRP) and industry in a public meeting at NRC headquarters in Rockville, Maryland. At this meeting, industry discussed its Safety Assessment for Alloy 82/182 Butt Welds including actions recently recommended by MRP for industry, results of recent field inspections, a risk analysis, current inspection capabilities, and future plans and conclusions. The meeting attendees are listed in Attachment 1. The information material presented by the MRP at the meeting is in Attachment 2 (ADAMS Accession No.ML041250009).

Industry started the meeting by discussing recent actions recommended in MRP letters 2003-039 and 2004-05. MRP 2003-039 recommended insulation removal and bare metal visual inspections within the next 2 refueling outages for all Alloy 600/82/182 pressure boundary components >350° F. MRP 2004-05 categorized the butt weld portion of the MRP 2003-039 recommendation to be "Needed" as defined by the NEI 03-08 Materials Initiative which means that the action will be implemented whenever possible but other approaches may be acceptable. Additional details regarding the MRP recommendations are in Attachment 2.

Industry then presented preliminary results of domestic and foreign field experience with these types of butt welds. Foreign experience shows a small number of cracks and very few leaks to date. Domestic experience shows no leaks detected by visual since the VC Summer event and only one weld with indications found in about 150 Ultrasonic Testing UT examinations since 2001. Field experience to date indicates that butt weld pressurized water stress corrosion cracking (PWSCC) is not widespread.

Preliminary results of industry butt weld analyses indicate that cracks will be axially oriented and limited to the width of the 82/182 weld metal. Weld repairs can impact residual stresses in that weld cracking to date has been limited to welds with repairs. Significant structural margin exists when comparing circumferential flaw size associated with maximum technical specifications leakage and leakage associated with critical flaw. Probabilistic fracture mechanics analysis shows that the risk from butt weld PWSCC is low.

Preliminary analyses of inspection capability show that inspection capability has improved. Recent In-Service-Inspection experience confirms the improvement. Challenges remain in that

field configurations for some welds differs from design drawings and the Performance Demonstration Initiative (PDI) can not be fully implemented because of nondestructive examination (NDE) capability limitations. Detection capability combined with crack growth rates may not support a 10-year interval between inspections for dissimilar metal butt welds. Industry will be incorporating the PDI results into Inspection and Examination (I&E) Guidelines. The NEI 03-08 Strategic Plan has identified the need for improved NDE capability as one of industries top priorities.

Future work includes completing draft I&E Guidelines for butt welds by end of Summer 2004. About 150 dissimilar metal 82/182 butt welds are scheduled for UT inspection in 2004-2005.

Industry summarized its conclusions as follows: No immediate safety concern, Needed Action for Visual Inspection of Alloy 82/182 butt welds issued, I&E Guidelines being developed that is expected to change the inspection intervals for some welds, and industry intends to continue working with the staff as requirements are developed.

Throughout the meeting the staff asked questions and discussed the details of the presentation with industry. The staff agreed that the meeting had been beneficial in updating the staff on the status of industry's actions and in contributing to the staff's understanding.

After responding to public questions and comments the staff adjourned the meeting.

Project No. 689

Attachments: As stated

cc: w/atts: See list

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*See previous concurrence

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DATE	05/ 05 /2004	05/ 11 /2004	05/ 11 /2004

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**List of Attendees for April 16, 2004 Meeting with
Material Reliability Program on Butt Weld Safety Assessment**

NAME	ORGANIZATION
Richard Barrett	NRC/NRR/DE
Bill Bateman	NRC/NRR/EMCB
Terence Chan	NRC/NRR/EMCB
Matthew Mitchell	NRC/NRR/EMCB
Keith Wichman	NRC/NRR/EMCB
Barry Elliott	NRC/NRR/EMCB
Simon Sheng	NRC/NRR/EMCB
Jessie Quichocho	NRC/NRR/EMCB
William Koo	NRC/NRR/EMCB
Allen Hiser	NRC/RES/MEB
Joe Birmingham	NRC/DRIP/RPRP
Alex Marion	NEI
Jim Riley	NEI
Christine King	EPRI
Larry Matthews	Southern Nuclear
Michael Robinson	Duke Power
Kazohiko Kishioka	Japan Atomic Power
Partick O'Regan	EPRI
Marcos Horrera	Structural Integrity Associates
Bob Hardies	Constellation Energy
Gery Wilkowski	Engineering Mechanics Corporation
Edwards Maneschy	Electronuclear
Tom Alley	Duke Energy
Eric Loehlein	First Energy
Dan Horner	McGraw Hill

cc: Via email (Use MS Word if available)

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Distribution: Mtg w/NEI MRP&EPRI on butt weld SA 4/16 /04
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SLong
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SCoffin
CGrimes
ESullivan (TSullivan)
RGuzman
JCollins
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