

Date	Topics
2/22/2007	Discussed "Talking Points" entitled "Duane Arnold Plant NRC Conference Call, 2/22/07" attached
2/23/2007	<p>Discussed "Talking Points" consisting of DRAFT letter NG-07-0176 dated February 21, 2007.</p> <p>Discussions focused on how differences in sensitivity of previous detection methods versus current methods could affect the perceived speed of crack growth (that is, better detection methods reveal cracks that could not be detected earlier with the procedures then in use, which would increase the perceived speed of the crack enlargement).</p> <p>The draft version of NG-07-0176 was finalized, dated February 24, 2007, and submitted as the request for relief.</p>
2/27/2007	<p>A Request for Information (RAI) dated February 26, 2007, 4:05 PM (RAI from M Mitchell to K Feintuch - attached) resulted in RAI Response letter NG-07-0188 dated February 26, 2007. the information in this Response constituted the "Talking Points" for the February 27, 2007 Conference Call.</p> <p>Discussions of the content of the February 26, 2007 Response led to a Request for Additional information. The RAI Response letter NG-07-0191, dated February 28, 2007 contained the requested information.</p>
3/6/2007	Matthew Mitchell, Branch Chief, Vessels and Internals Integrity Branch (CVIB) and Patrick Milano, Acting Branch Chief, Plant Licensing Branch LPL3-1 granted a relief pursuant to 10CFR50.55a(a)(3)(i) using the Temporary Verbal Relief process, as described in NRR Office Instruction LIC-102 "Relief Request Reviews" Section 4.2.C. The relief authorization was based on the February 24, 2007 application letter (ML070660482), as supplemented by additional information in letters dated February 26, 2007 (ML070660463) and February 28, 2007 (ML070660587). The docketed information is sufficient for the NRC staff to write its safety evaluation.
6/14/2007	Letter granting the relief, corresponding to the temporary verbal relief of March 6, 2007, for TAC No. MD4466, was issued on June 12, 2007, as ML071110007.

Name	Affiliation	Conference Call 02/22/2007	Conference Call 02/23/2007	Conference Call 02/27/2007	Conference Call 03/06/2007
Dyle, R	BWRVIP	X	X		
Mullens	BWRVIP	X	X		
Bjorseth, J	Duane Arnold Energy Center	X	X		
Blair, D	Duane Arnold Energy Center	X	X		
Browning, A	Duane Arnold Energy Center				X
Byrne, T	Duane Arnold Energy Center				
Catron, S	Duane Arnold Energy Center	X	X	X	
Curtland, S	Duane Arnold Energy Center	X	X		
Dohmen, F	Duane Arnold Energy Center		X		
Doubet, S	Duane Arnold Energy Center		X		
Haller, S	Duane Arnold Energy Center	X	X	X	X
Klotz, B	Duane Arnold Energy Center	X	X		
Kuehl, J	Duane Arnold Energy Center				
Lingenfelter, M	Duane Arnold Energy Center				
Murrell, B	Duane Arnold Energy Center				
Park, G	Duane Arnold Energy Center	X	X	X	X
Presler, S	Duane Arnold Energy Center				
Van Middlesworth	Duane Arnold Energy Center	X	X	X	
Shelby, C	EPRI		X		
Bruster, L	FPL	X	X		
Collard, S	FPL	X	X		
Danek, J	FPL	X	X		
Garcia, J	FPL	X	X		
Gil, R	FPL	X	X	X	X
Kundalkar, R	FPL	X	X		
Nowakowski	FPL		X	X	
Skiba, T	FPL			X	
Stall, A	FPL	X	X		
Tomaszewski, D	FPL	X	X	X	X
Vandevender, R	FPL			X	
Fertel, M	NEI		X		
Marion, A	NEI	X	X		X
Andruszkiewicz, E	USNRC			X	X
Baker, R	USNRC		X	X	
Bateman, W	USNRC	X	X		
Boland, A	USNRC		X		
Burgess, B	USNRC	X	X		
Caldwell, J	USNRC		X		
Cullen, B	USNRC	X	X		
Dyer, J	USNRC		X		
Evans, M	USNRC		X		
Feintuch, K	USNRC	X	X	X	
Grobe, J	USNRC	X	X		
Hardies, R	USNRC	X	X		
Hills, D	USNRC	X	X		X
Holmberg, M	USNRC	X	X		
Honcharik, J	USNRC		X		
Milano, P	USNRC				X
Mitchell, M	USNRC	X	X	X	X

Name	Affiliation	Conference Call 02/22/2007	Conference Call 02/23/2007	Conference Call 02/27/2007	Conference Call 03/06/2007
Orlikowski, R	USNRC	X	X		
Raghavan, L	USNRC	X			
Shaw	USNRC	X			
Sheldon, S	USNRC	X	X		
Tapp, J	USNRC	X	X		
Tsao, J	USNRC			X	

Duane Arnold Plant/NRC Conference Call, 2/22/07

1. Inspection Scope:

The DAEC inspection schedule for recirculation piping nozzle to safe end welds is in conformance with both ASME Sect. XI and VIP-75 for both frequency and extent.

2. Nozzle Configuration:

The approximately 13.12 inch outside diameter (OD) by 11.00 inch inside diameter (ID) safe-end to nozzle weld is Alloy 82 and connects the Alloy 600 SB-166 safe-end to the SA-508 Class 2 low alloy steel nozzle, buttered with Alloy 182. A portion of the original Alloy 82/182 safe-end to nozzle weld remains on the nozzle side as a result of installing a modified safe-end with an integrally attached thermal sleeve prior to going into service. There are 8 recirculation nozzles with this configuration. Additionally, there are 2 approximately 8 inch core spray nozzles that have thermal sleeves.

3. Results of Inspections

Method-

Manually encoded Phased array. Equipment, personnel, and procedure have been qualified in accordance with ASME Section XI, Appendix VIII.

Recirculation riser nozzle-to-safe-end weld RRF-F002 (N2F).

- Planar flaw wholly contained in weld and butter
- Circumferential
- Located at the weld to butter interface
- Reported length is ~61 degrees
- Reported depth 0.59" of 1.1" thickness (55.6%)
- Remaining ligament to the outside surface 0.47"
- Data being independently reviewed by EPRI

Recirculation riser nozzle-to-safe-end weld RRC-F002 (N2C)

- Examined as part of the 1<sup>st</sup> expansion sample
- Circumferential
- Reported length ~104 degrees
- Reported depth ~0.94" of 1.1" thickness (~85%)
- Final sizing will likely change
- Data being independently reviewed by EPRI

#### 4. Previous Inspection results

RRF-F002 (N2F).

- 2005 Data
  - Currently with EPRI for review
- 1999 Data
  - Data was compromised due to weld crown, however there is some evidence present in data that the flaw was present in 1999
    - No sizing possible due to data quality
- 1996 Data
  - Data compromised due to weld crown cannot pick out evidence of flaw
    - Data worse than 1999
    - Could have been there, could not see it

RRC-F002 (N2C)

- Previously examined in 1999
  - Data currently in review

#### 5. Safety Significance

Using the source equations in the AME Code, Section XI (IWB-3640.) It can be shown that for a 100 degree long flaw, through-wall, acceptable since it results in a safety factor of at least 2.77. The flaw observed, while being of significant depth and length, falls within reasonable proximity to the BWR field history

#### 6. Industry experience

As mentioned above, these flaws fall within BWR experiences. IGSCC is a well documented industry phenomenon.

#### 7. FPLE Plans

- Continue with determination of expanded sample to meet BWRVIP-75 and ASME Section XI
- Continue with review and characterization of acquired UT data
- Complete and submit Relief Request to implement overlay repair of the 2 welds
- Implement overlay repair
- Develop root cause evaluation and long-term actions

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**From:** Matthew Mitchell  
**To:** Karl Feintuch  
**Date:** Mon, Feb 26, 2007 4:05 PM  
**Subject:** Request for Additional Information - Duane Arnold Weld Overlay RR (TAC No. MD4466)

Karl,

Please find enclosed the staff's RAI on the subject submittal. A formal memorandum will follow.

Matt Mitchell, Chief  
NRR/DCI/CVIB

**CC:** Edward Andruszkiewicz; John Tsao

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Attachment to email from Matthew Mitchell to Karl Feintuch dated February 26, 2007,  
4:05 pm

OFFICE OF NUCLEAR REACTOR REGULATION  
REQUEST FOR ADDITIONAL INFORMATION  
DUANE ARNOLD FPL ENERGY RELIEF REQUEST  
DOCKET NO. 50-331

The Nuclear Regulatory Commission staff has reviewed the request by FPL Energy Duane Arnold, requesting deviation from American Society for Mechanical Engineer (ASME) Code Cases N-504-2 and N-638-1; and has determined that additional information is necessary to complete the review of their request for relief. Based on the staff's review, please provide a response which addresses the following RAI questions.

1. How has the licensee addressed the rapid cooling rates which are possible from water-backed welding on the SA-508 Class 2 base metal? Has a mockup or procedure qualification record (PQR) of a water-backed weld overlay been performed? What overlay thickness was used on the mockup or PQR? What is the thickness of the nozzle under the weld overlay? Has any testing (metallurgical, destructive, non-destructive, etc.) been performed on any weld overlays fabricated on water-backed SA-508 Class 2 base metal?
2. What is the maximum area of the P-3 material that will be welded on? This should be stated in the relief request. The relief request mentions 500 sq. in., but not as the maximum area that is to be welded on during this specific repair.
3. How often will contact pyrometers be used to measure weld preheat and interpass temperatures? Every pass? Every layer? Once during welding?
4. On page 12 of 14, under "Exception to Code Case N-638-1, Paragraph 4.0(b)," how far will the surface examination be continued past the toe of the weld overlay on the SA-508 Class 2 base metal?
5. On page 12 of 14, under "Exception to Code Case N-638-1, Paragraph 4.0(b)," will the ultrasonic examination extend up to the very edge of the overlay?
6. On Page 12 of 14, under "Exception to Code Case N-638-1 Paragraph 4.0(b), the licensee states that "...Any laminar flaws in the weld overlay will be evaluated in accordance with ASME Section XI Non-mandatory Appendix Q, Paragraph Q-4100, except, as allowed by IWB-3132.2, any flaws that exceed the acceptance standards of Table IWB-3410-1 are acceptable for continued service, without repair, if an analytical evaluation, performed in accordance with IWB-3600, meets the acceptance criteria of IWB-3600."

The staff does not agree with the licensee's exception to Appendix Q, Paragraph Q-4100. Paragraph Q-4100(1) does not allow laminar flaws to be accepted by IWB-3600. In addition, Code Case N-504-2, Paragraph (i) does not allow flaw acceptance by IWB-3600 for the preservice examination. The NRC staff's position is that any flaw detected in the weld overlay during the preservice examination that does not satisfy the acceptance standards of Table IWB-3514-2 must to be removed or repaired. Therefore, the licensee should modify its relief request to be consistent with the NRC staff's position or provide a detailed, technical basis to support its exception to paragraph

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Q-4100 of Appendix Q of the ASME Code, Section XI.

7. Clarify whether the weld overlay will be applied multiple times to a specific weld.