Vogtle PEmails

From: Hoellman, Jordan
Sent: Tuesday, April 12, 2016 8:00 AM
To: Vogtle PEmails
Subject: 4/14/16 Public Meeting slides - NDE for Welds Joining Couplers to SS and CS Embedment Plates
Attachments: 2016-04-14 NDE for Welds Joining Couplers to Stainless and Carbon Steel Embedment Plates - Public Meeting slides.pdf

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Hearing Identifier: Vogtle_COL_Docs_Public
Email Number: 24

Mail Envelope Properties (b2af2c2fc1d64bd188804f4a7e3c378b)

Subject: 4/14/16 Public Meeting slides - NDE for Welds Joining Couplers to SS and CS Embedment Plates
Sent Date: 4/12/2016 8:00:28 AM
Received Date: 4/12/2016 8:00:29 AM
From: Hoellman, Jordan

Created By: Jordan.Hoellman2@nrc.gov

Recipients:
"Vogtle PEmails" <Vogtle.PEmails@nrc.gov>
Tracking Status: None

Post Office: HQPWMSMRS03.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	229	4/12/2016 8:00:29 AM
2016-04-14 NDE for Welds Joining Couplers to Stainless and Carbon Steel Embedment Plates - Public Meeting slides.pdf	206117	

Options
Priority: Standard
Return Notification: No
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Sensitivity: Normal
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ENCLOSURE 6

APP-GW-GLY-096, Rev. 0, "NDE for Welds Joining Couplers to Stainless and Carbon Steel Embedment Plates (Public Meeting)"

NDE for Welds Joining Couplers to Stainless and Carbon Steel Embedment Plates

(Public Meeting)

April 14, 2016

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Meeting Purpose and Agenda

Meeting Purpose

- Discuss the proposed resolution paths for nondestructive examination (NDE) code nonconformance regarding carbon steel (CS) and stainless steel (SS) embedment plates with weldable coupler populations at Vogtle and V.C. Summer (VCS)
- Receive and address Staff feedback

Agenda

- Background
- Problem Statement & Proposed Resolution Paths
  - Vogtle Carbon Steel Couplers
  - VCS Carbon Steel Couplers
  - Vogtle/VCS Stainless Steel Couplers

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Background Information

- Weldable couplers are utilized in the AP1000 design where reinforcing bars are attached to structural steel
- The coupler is connected by a weld to the structural steel
  - The coupler is welded via a PJP J-Groove with fillet reinforcement
- Per UFSAR subsection 3.8.4.5, “Structural Criteria,” the analysis and design of concrete and structural steel conform to ACI 349-01 and AISC N690-1994.

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AISC N690-94 Q1.26 Nondestructive Examination Requirements

Q1.26.2 MINIMUM EXAMINATION OF WELDS

All welds shall be visually examined in accordance with Section Q 1.26.1.5 for 100 percent of their length.

Q1.26.2.2 PARTIAL-PENETRATION WELDS

Partial-penetration welds shall be 10 percent inspected by magnetic particle examination or liquid penetrant examination. The examination may be 10 percent of each weld or 100 percent of one weld in ten.

Q1.26.2.3 WELD SAMPLES

If a weld inspected in Section Q1.26.2.1 or Q1.26.2.2 does not meet the acceptance criteria given in Section Q1.26.1, a second 10 percent sample shall be taken. The second sample should include any weld immediately adjacent to the first sample, to determine the extent of the defect found in the first sample. If this sample does not meet the acceptance criteria, all welds represented by the samples should be inspected.

Q1.26.3 REPAIR AND REEXAMINATION

All unacceptable welds shall be repaired using an Owner approved repair procedure. After repairs have been made, the repaired weld shall be 100 percent examined with the same method that disclosed the original defect(s).

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All welds shall be visually examined.
PJP welds shall be 10% MT or PT examined.

Summary - Problem Statement & Proposed Resolution

Problem Statement:

- Contrary to AISC N690-1994, Q1.26 MT/PT examination requirements, populations of CS and SS embedment plates with weldable couplers were installed at Vogtle and VCS without this requisite NDE having been performed

Proposed Resolution Paths:

- NDE code nonconformance is addressed via three independent LARs:
  1. LAR-134 for CS weld population at Vogtle
  2. LAR-140 for CS weld population at VCS
  3. LAR-129 for SS weld population at Vogtle & VCS
- The three LARs address similar NDE code nonconformance issues, but LAR technical evaluations vary based on gathered data
- As the work related to these LARs is currently ongoing, the data presented in later slides is subject to change pending LAR finalization

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Proposed resolution paths presented in more detail on following slides

LAR-134 Approach (Vogtle Carbon Steel)

- Licensing Basis Change
  - LAR to demonstrate that the coupler welds are suitable for performing their intended design function
- The evidence of suitability to perform intended design function will be demonstrated by a combination of:
  1. VT successfully performed on original weld population
  2. Static testing performed on original weld population
  3. MT successfully performed
     - Recognizing that the MT sample population was not completely representative of the installed welds

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LAR-140 Approach (VC Summer Carbon Steel)

- Licensing Basis Change
  - LAR to demonstrate that the coupler welds are suitable for performing their intended design function
- The evidence of suitability to perform intended design function will be demonstrated by a combination of:
  1. VT successfully performed on original weld population
  2. Static Testing performed on Vogtle original weld population
     - Vogtle static testing results utilized due to differences in site test configurations. Use of Vogtle test results is justified due to overlap between Vogtle & VCS Load VT timelines
  3. MT successfully performed
     - Recognizing that the MT sample population was not completely representative of the installed welds

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LAR-129 Approach (Vogtle & VCS Stainless Steel)

- Licensing Basis Change
  - LAR to demonstrate that the coupler welds are suitable for performing their intended design function
- The evidence of suitability to perform intended design function will be demonstrated by a combination of:
  1. VT successfully performed on original weld population
  2. Static (Tensile) testing method developed and performed on uninstalled couplers from original population
     - Tensile testing to demonstrate that the strength of the welds meets or exceeds the design strength
     - Test samples include an array of couplers with PT indications after conditioning, couplers with indications but with no conditioning, and couplers distributed amongst fabrication loads for Vogtle and VCS

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Summary

- NDE code nonconformance is addressed via three LARs:
  1. LAR-134 for CS weld population at Vogtle
  2. LAR-140 for CS weld population at VCS
  3. LAR-129 for SS weld population at Vogtle & VCS
- Each of the three LARs intend to demonstrate that while not in conformance with AISC N690-1994 requirements for NDE, the coupler welds are suitable for performing their intended design function

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Questions & Discussion