Dominion Nuclear Connecticut, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060
Web Address: www.dom.com

March 14, 2014

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No. 14-145
NLOS/WDC R0
Docket No. 50-336
License No. DPR-65

**DOMINION NUCLEAR CONNECTICUT, INC.**
**MILLSTONE POWER STATION UNIT 2**
**RESPONSE TO SECOND REQUEST FOR ADDITIONAL INFORMATION FOR ALTERNATIVE REQUEST RR-04-16 FOR THE USE OF ENCODED PHASED ARRAY ULTRASONIC EXAMINATION TECHNIQUES (PAUT) IN LIEU OF RADIOGRAPHY (TAC NO. MF2520)**

In a letter dated August 1, 2013, Dominion Nuclear Connecticut, Inc. (DNC) requested relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section III for Millstone Power Station Unit 2 (MPS2). Specifically, DNC requested approval to use encoded Phased Array Ultrasonic Examination Techniques as an alternative to radiographic examination for ASME Class 2 carbon steel circumferential pipe weld joints to satisfy nondestructive examination requirements. In a letter dated October 1, 2013, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) to DNC related to the alternative request. In letters dated November 22, 2013 and February 27, 2014, DNC responded to the RAI. On March 12, 2014, the NRC transmitted a second RAI related to the alternative request.

The attachment to this letter contains DNC's response to the RAI.

If you have any questions regarding this submittal, please contact Wanda Craft at (804) 273-4687.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering

Attachment:

1. Response to Second Request for Additional Information for Alternative Request RR-04-16 Proposed Alternative to ASME Section III

Commitments made in this letter: None

A047
NRR

cc: U.S. Nuclear Regulatory Commission
Region I
2100 Renaissance Blvd
Suite 100
King of Prussia, PA 19406-2713

James S. Kim
Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 08 C2A
11555 Rockville Pike
Rockville, MD 20852-2738

Mohan C. Thadani
Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 08 B 1
11555 Rockville Pike
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Millstone Power Station

**ATTACHMENT**

# RESPONSE TO SECOND REQUEST FOR ADDITIONAL INFORMATION FOR ALTERNATIVE REQUEST RR-04-16 PROPOSED ALTERNATIVE TO ASME SECTION III

**MILLSTONE POWER STATION UNIT 2**
**DOMINION NUCLEAR CONNECTICUT, INC.**

## Background

In a letter dated August 1, 2013, Dominion Nuclear Connecticut, Inc. (DNC) requested relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section III for Millstone Power Station Unit 2 (MPS2). Specifically, DNC requested approval to use encoded Phased Array Ultrasonic Examination Techniques (PAUT) as an alternative to radiographic examination for ASME Class 2 carbon steel circumferential pipe weld joints to satisfy nondestructive examination requirements. In a letter dated October 1, 2013, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) to DNC related to the alternative request. In letters dated November 22, 2013 and February 27, 2014, DNC responded to the RAI. On March 12, 2014, the NRC transmitted a second RAI related to the alternative request. This attachment provides DNC's response to the RAI.

## Question 1

*Describe the radiographic testing procedure used to characterize the specimens described in the letter dated February 27 in detail. Identify if the radiographic testing procedure used single or double wall viewing and how many shots and angles were taken per weld.*

## DNC Response

The radiographic examinations were performed with the examination personnel having no knowledge of the location or type of flaws implanted within the mockups. The radiographic testing procedure used to characterize the mockups consisted of ASME Section V, Article 2 radiographic examination techniques, typical of examinations performed in the plant. The examinations were performed using an Iridium 192 source with the direction of the central beam of radiation centered on the area of interest and perpendicular to the film, to the extent possible. Each weld consisted of four film views; 0 to 90 degrees, 90 to 180 degrees, 180 to 270 degrees, and 270 to 0 degrees, with adequate overlap to provide complete coverage of the entire weld length. Single wall viewing was used to interpret the film.

**Question 2**

*Did the radiographic testing procedure used to evaluate the specimens described in the letter dated February 27 meet the requirements of ASME Code Section V Article 2?*

**DNC Response**

Yes, the radiographic testing procedure used to evaluate the specimens described in the letter dated February 27 meets the requirements of ASME Code Section V, Article 2.

**Question 3**

*Provide a table describing the implanted flaws used to qualify the ultrasonic inspection procedure. Include the flaw types and dimensions. The NRC staff understands that releasing this information may compromise the blind qualification testing. If this information is proprietary include the necessary affidavit for the NRC staff to treat the information as proprietary.*

**DNC Response**

To maintain the integrity of the test qualification material, the information will be made available for NRC review.

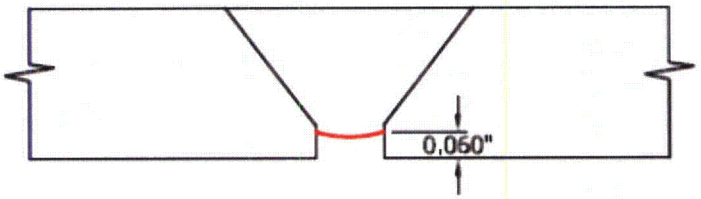
**Question 4**

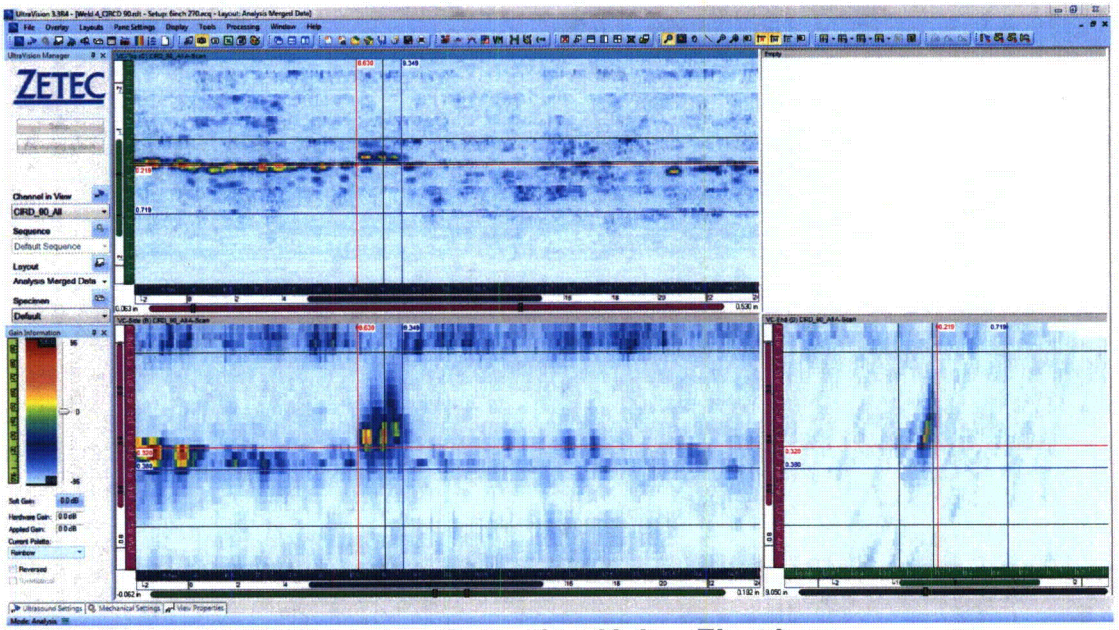
*Provide examples of successful ultrasonic detection of planar flaws in the 0.28 inch thick test blocks.*

**DNC Response**

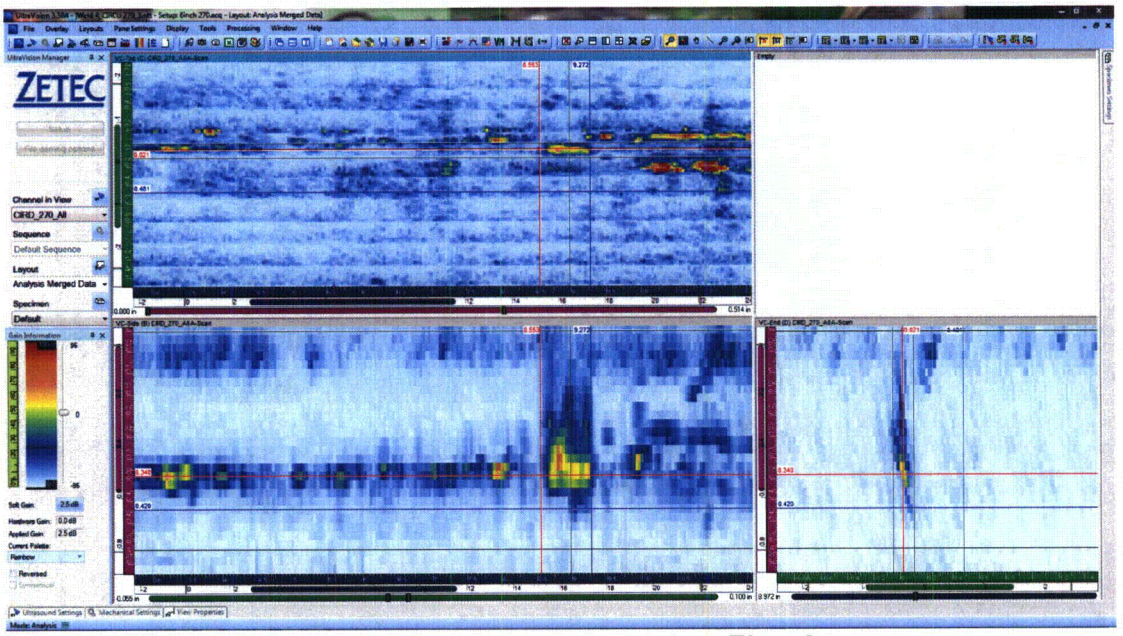
The following Figures 1 through 5 provide examples of the ultrasonic data representing successful detections and characterizations of typical fabrication flaws from the Dominion procedure qualification data. These figures provide examples of lack of fusion defects, lack of penetration defects, and cracks, which were implanted into the 6 inch diameter, 0.28 inch thick welded mockups. These mockups represent the weld configurations and welding processes to be used for the replacement welds. The flaw map for each of these examples is included in the applicable figures. The planar flaws identified in Figures 2, 3, and 4 were not detected with the radiographic examination performed.

**Figure 1**
**Weld 4 – Flaw 3, Incomplete Penetration**



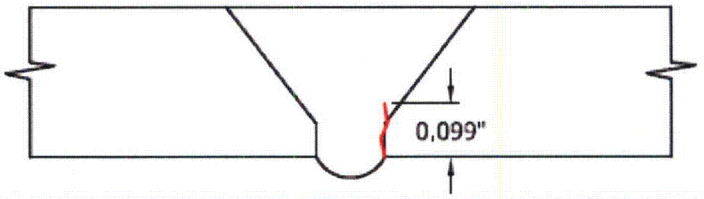



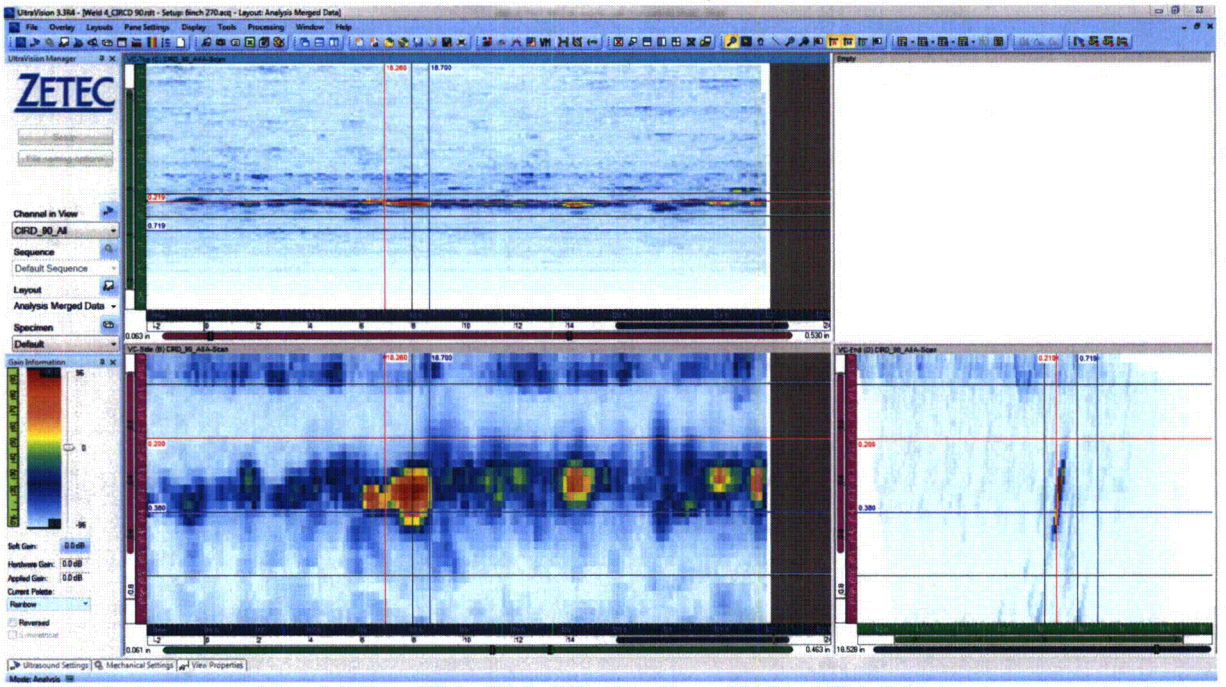

**Upstream Detection Using First Leg**



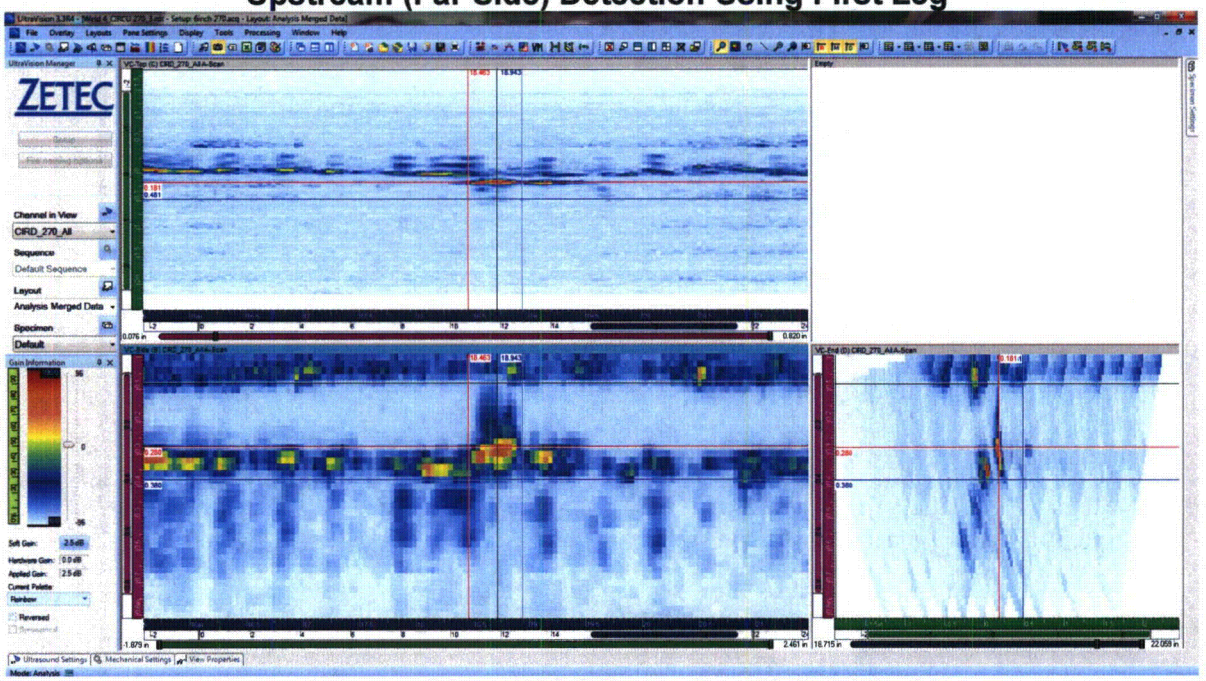

**Down Stream Detection Using First Leg**

**Figure 2**
**Weld 4 – Flaw 5, Crack**



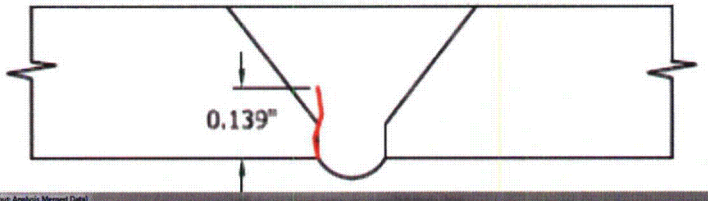



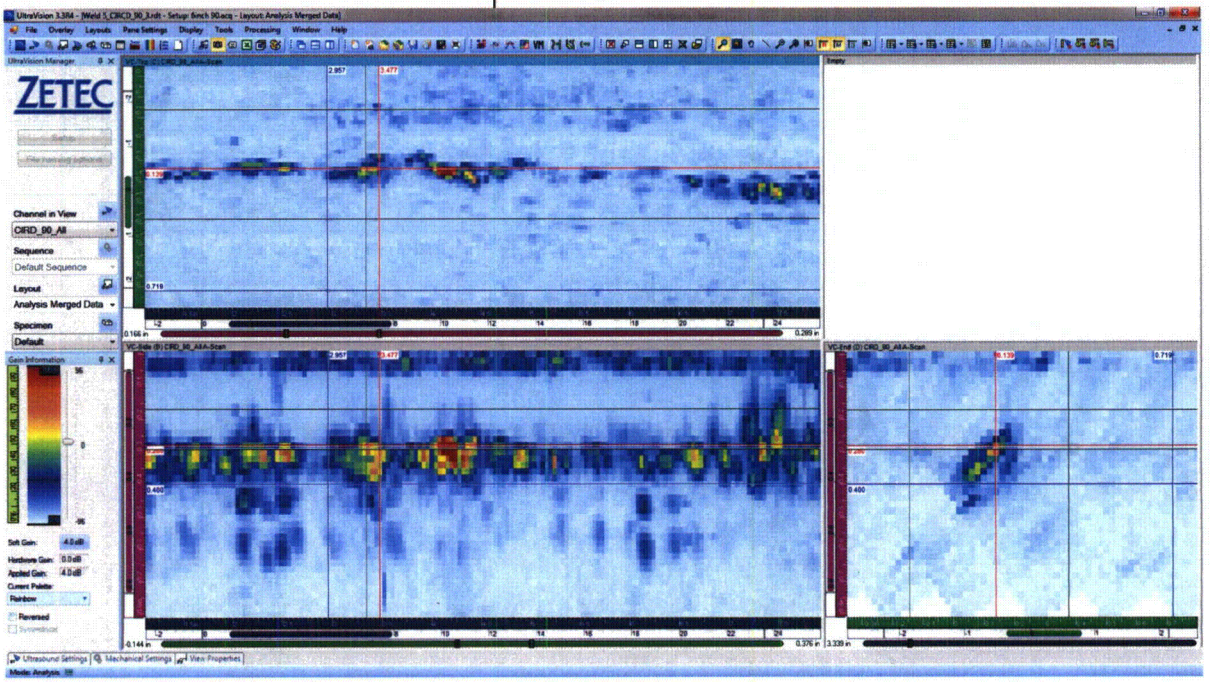

**Upstream (Far Side) Detection Using First Leg**



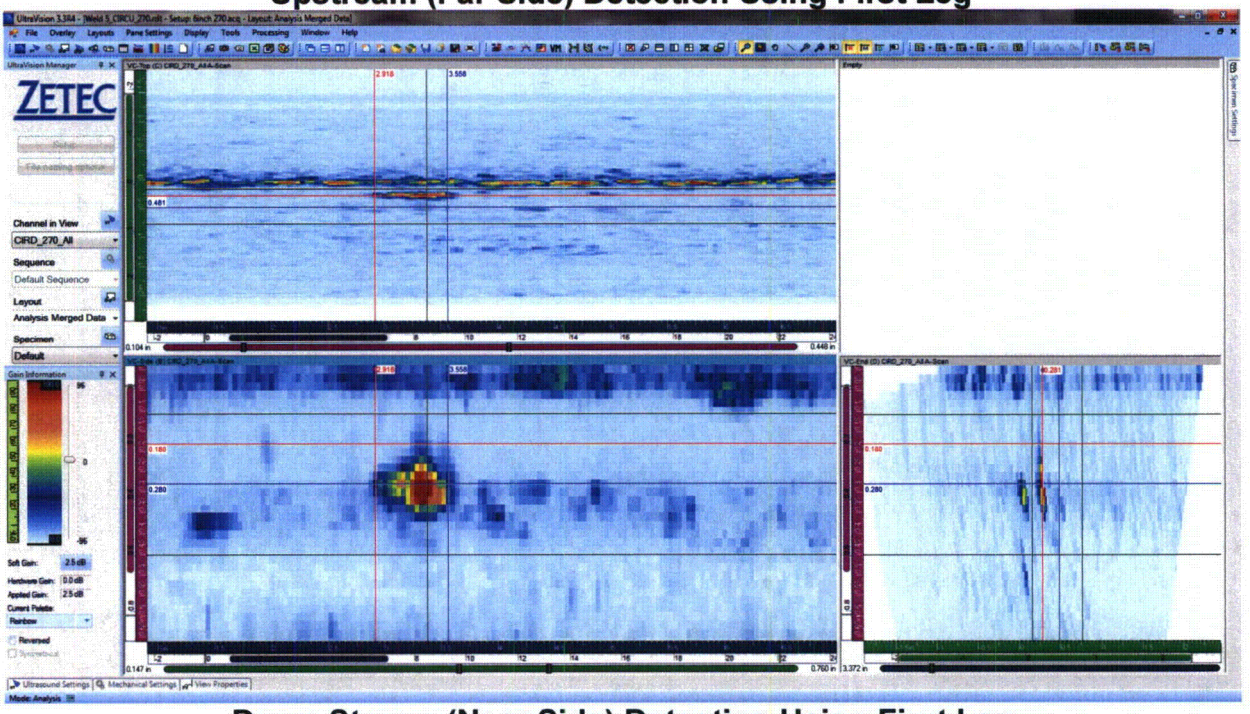

**Down Stream (Near Side) Detection Using First Leg**

**Figure 3**
**Weld 5 – Flaw 2, Crack**



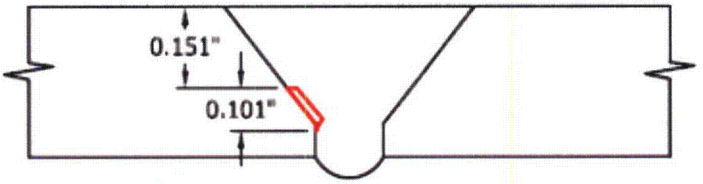



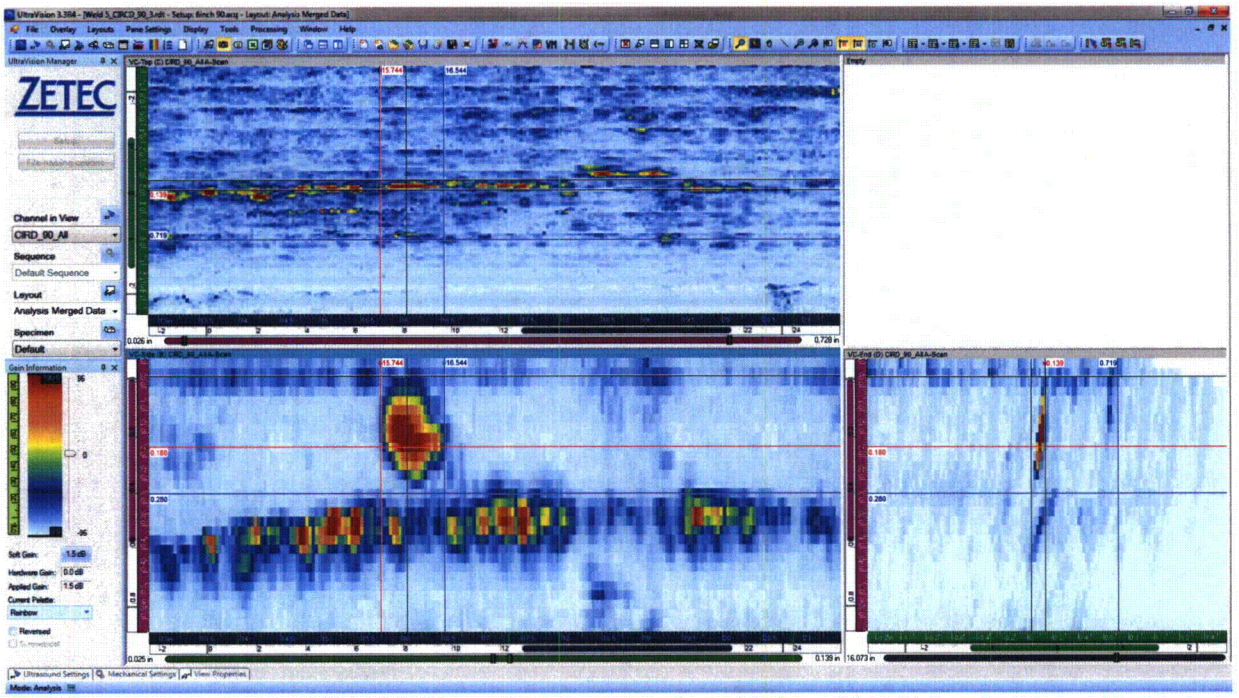

**Upstream (Far Side) Detection Using First Leg**



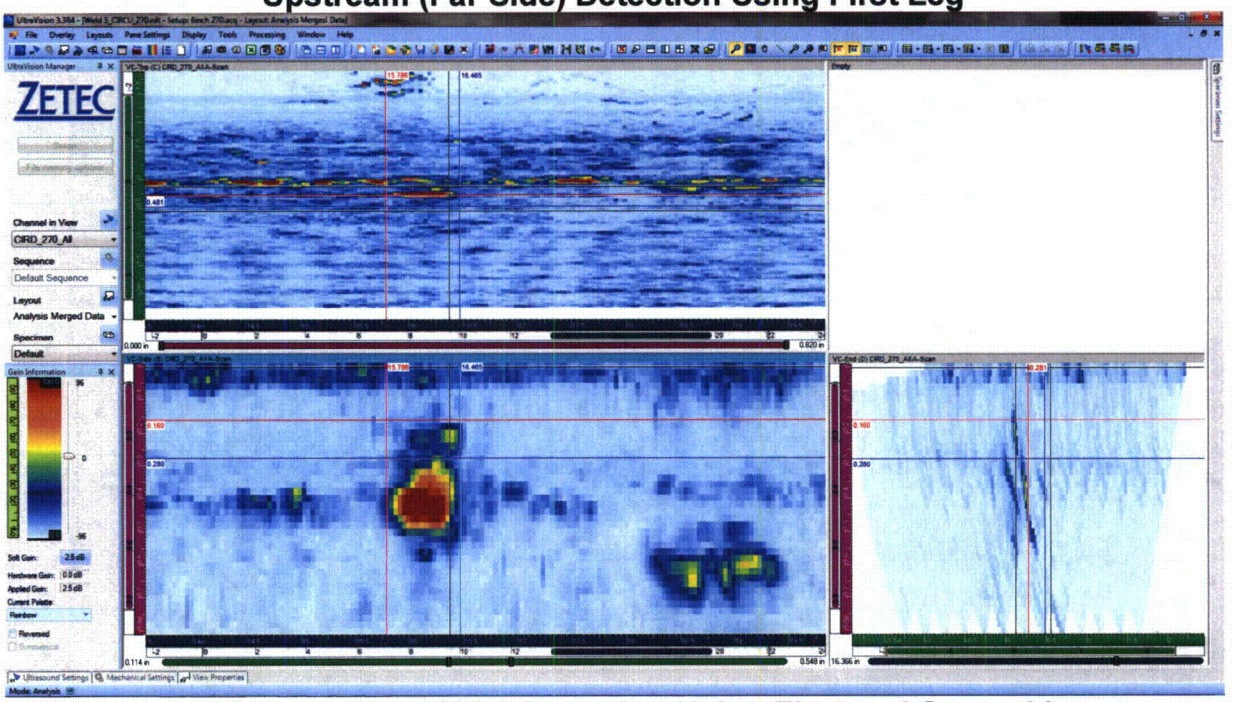

**Down Stream (Near Side) Detection Using First Leg**

**Figure 4**
**Weld 5 – Flaw 4, Lack of Fusion**



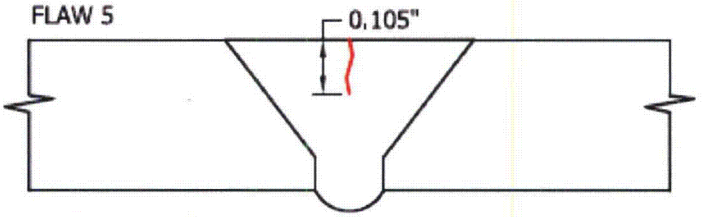



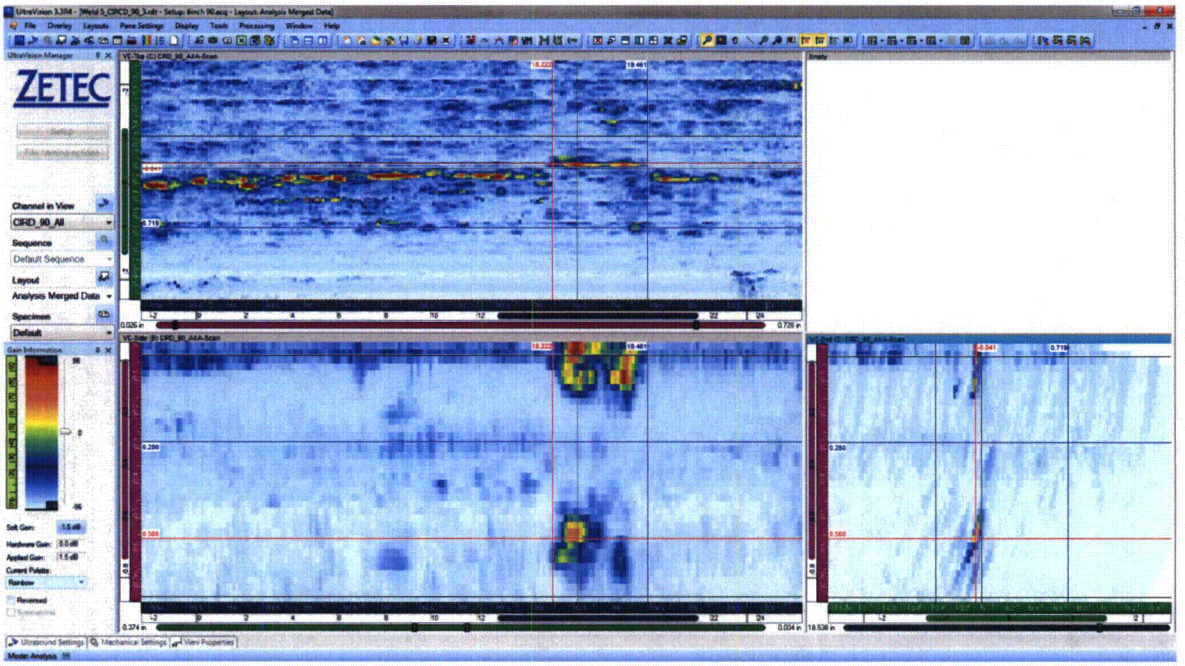

**Upstream (Far Side) Detection Using First Leg**



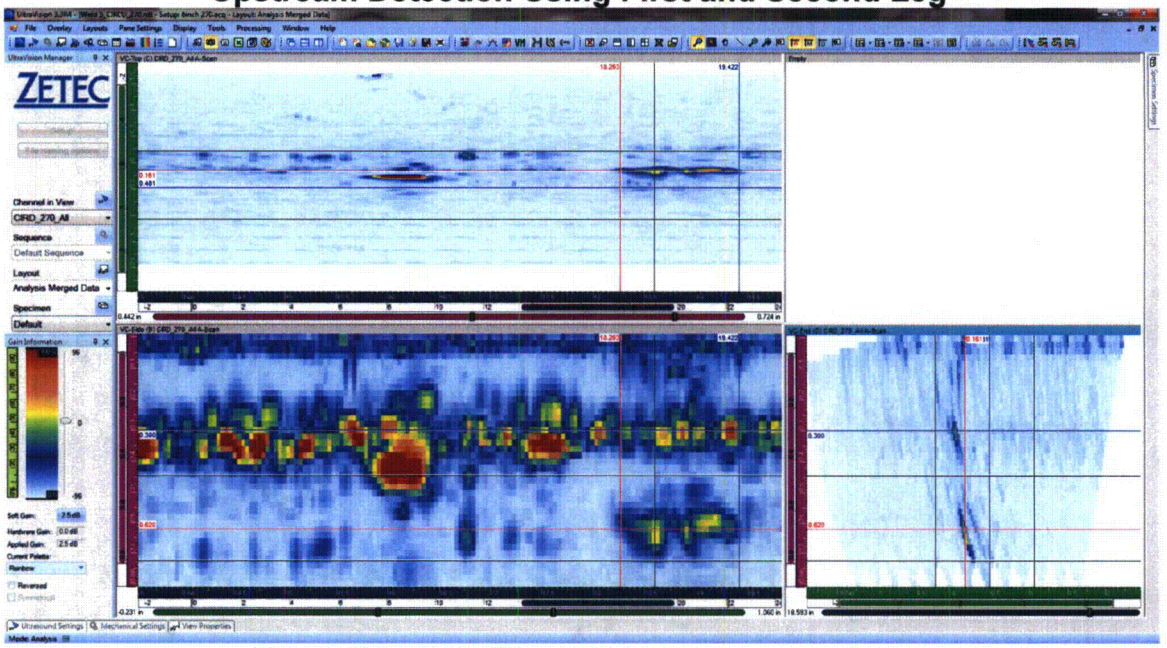

**Down Stream (Near Side) Detection Using First and Second Leg**

**Figure 5**
**Weld 5 – Flaw 5, Crack**




**Upstream Detection Using First and Second Leg**




**Down Stream Detection Using Second Leg**