| NCSX RFD Part I | **Number:** **RFD-12-017** | **RFD Description:** **Port Attachment Weld Deviation Request** |
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| **Initiator: Doug McCorkle** | **Organization: Major Tool & Machine, Inc.** |
|---|---|

**List of Impacted Documents:** ***(Specification, MIT/QA Plan, SOW, drawing, etc.)***
**NCSX-CSPEC-121-02-06; SE120-004;**

**Cost Impact:** ***(If none, so state): NONE***

**Schedule Impact:** ***(If none, so state): NONE***

**Quality Impact:** ***(If none, so state) : Q*****uality improvement and improved welding distortion control.**

**State Requirement Deviation is Requested For*****: (Specification, MIT/QA Plan, SOW, drawing, etc.):*** **Ref: Drawing SE120-004, Sht 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, & 19. The drawing weld symbol for joining the port extension to the vessel.**

**Full Description of the Deviation Requested:**

**Background: NCR 19464 (attached) identified that MTM had used a different method for welding the port extensions to the vessel for VVSA segments #1 and #2. As indicated in the NCR, rather than following the design on the respective drawings, MTM elected to utilize and alternate methods by:**

- **Round ports - cutting the hole in the vessel to the o.d. size of the tube and welding full penetration from the vessel interior (ground flush) with a continuous fillet weld around the tube exterior.**
- **Ports 4, 12, NB - welded the exterior fillet as a continuous fillet opposed to the specified intermittent weld.**
- **Clevis bosses - added a 3/16 fillet to the exterior side of the joint.**

**The attached sketch visually provides the type of welding performed by MTM.**

**MTM justified this deviation from design by claiming that their alternate methods resulted in an improvement in quality and provided better welding distortion control.**

**Deviation Requested: Permit this alternate welding method for VVSA Segment #3.**

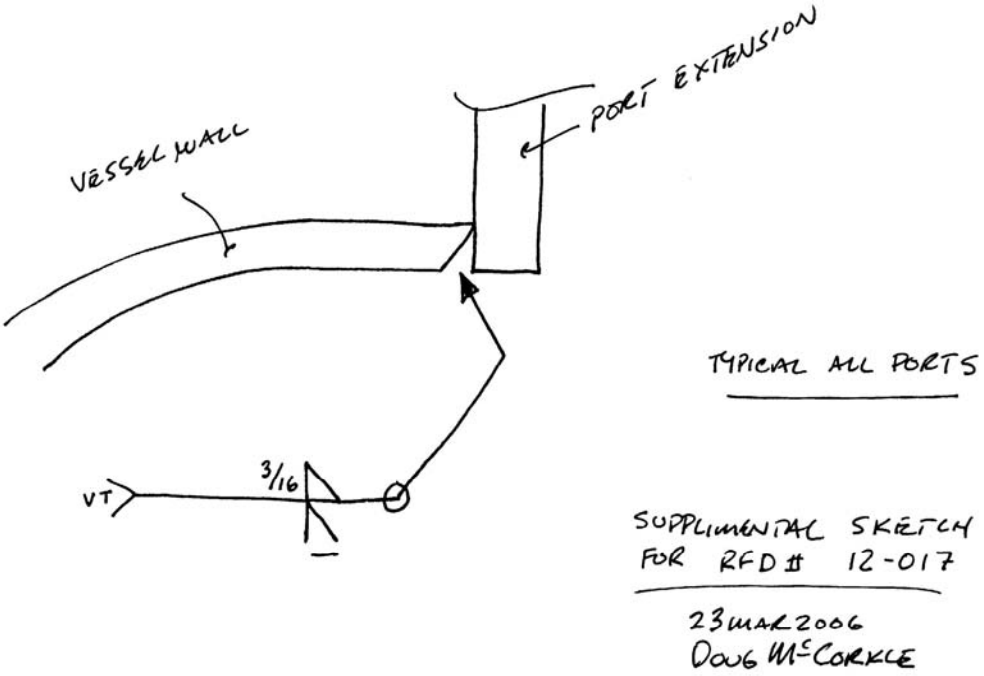
**Attachments:**

**(1) Sketch of MTM Weld Concept**
**(2) Copy of NCR 19464**

**Initiator Signature: Mike Viola Date: March 23, 2006**

**Sketch of MTM Weld Concept**

This sketch better defines the weld prep for the joint that attach the port stubs to the vessel wall on the first two units. The majority of the joint is filled in from the inside vessel surface, then we grind the outside (root side) until all irregularities are removed, and apply a fill pass and a cover pass (which creates the 3/16 fillet) on the exterior side.



**Customer: PRINCETON PLASMA PHYSICS LAB**
Contact: LARRY SUTTON
E-Mail: S-04286-F
Telephone: 609-243-2441
Fax: 609-243-2021

**Part: /**
Drawing ID: Revision:
Links: 1-Type:W: 65678/1.0 Sub: 0 Op: 10
2-Type:W: 65678/2.0 Sub: 0 Op: 10
Customer P.O.: S005243-F/Ln:1
Serial No./Qty: 2 PARTS (SN 1&2)

Reported By: DOUG MCCORKLE
E-Mail: dMcCorkle@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: Ref: Drawing SE120-004, Sht 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, & 19. The drawing weld symbol for joining the port extension to the vessel.
All round ports: Current design requires the tube to be butted to the exterior surface of the vessel wall, prepped to the outside of the tube, and welded 100% with no backing weld or interior weld, with a continuous fillet around the exterior. The following was actually done: The hole was cut to the o.d. size of the tube and welding full penetration from the vessel interior (ground flush) with a continuous fillet weld around the tube exterior. The majority of the joint is filled from the interior, and the exterior is back ground and filled in for 100% penetration. A 3/16" continuous fillet is applied to the exterior of the joint for strength and to properly blend the two surfaces together.

Ports 4, 12, NB: Current design offers two welding options. MTM chose the optional method. The exterior fillet wasd welded as a continuous fillet opposed to the specified intermittent weld.

Clevis bosses: Added a 3/16 fillet to the exterior side of the joint.

**Proposed Disposition:**
SUBMITTING TO PPPL FOR APPROVAL

Number of additional pages: _____

**Customer Disposition:** **[x ] Use As Is** **[ ] Rework** **[ ] Repair** **[ ] Scrap** **[ ] Replace**

**Technical Contact Approval:** Mike Viola **Title:** _____ **Date:** _____

**Buyer Approval:** Brad Nelson **Title:** _____ **Date:** _____

**Major Tool Implemented By:** _____ **Title:** _____ **Date:** _____

**Root Cause 1: 806-PROCEDURE NONCOMPLIANCE**
Resource: FAB MEDIUM SOUTH Equipment:
Description: Manufacturing personnel welded ports to the vessels with a continuous full penetration weld in opposition to the

drawing which called for an interrupted weld. Manufacturing personnel did this in concert with Engineering personnel under the misguided perception that Engineering was working with the customer to change the drawing to the weld seam design that they were welding the vessel to. Manufacturing personnel failed to initiate an N/C in compliance with QA-SOP-01.

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**Corr Actn: 1:** Action: 04/06/06 By: 890-M.VISLAY

Description: I have communicated to all weld shop T.L.'s via an e-mail sent on 4-4-06 to follow QA-SOP-01. We can not work to verbal instructions when deviating from a customer drawing. If the drawing hasn't been changed upon request, an NC must be generated and dispositioned "continue" prior to working on the part.

Verify Notes: Participated in the discussion. And received a copy of the e-mail.

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**Root Cause 2: 806-PROCEDURE NONCOMPLIANCE**

Resource: SILVER TEAM, ENGINEERING Equipment:

Description: Manufacturing personnel welded ports to the vessels with a continuous full penetration weld in opposition to the drawing which called for an interrupted weld. Manufacturing personnel did this in concert with Engineering personnel under the misguided perception that Engineering was working with the customer to change the drawing to the weld seam design that they were welding the vessel to. Engineering personnel failed to ensure that an N/C was initiated in compliance with QA-SOP-01.

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**Corr Actn: 2:** Action: 04/06/06 By: 927-M.MANUEL

Description: The engineer on the PPPL vessel project will be instructed on the right action to follow per the MTM QA-SOP-01. The fact that the customer knew of the deviation and engineering was planning to document the change doesn't change the fact that our processes did not follow the customer requirements.

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**Root Cause 3: 806-PROCEDURE NONCOMPLIANCE**

Resource: CWI Equipment:

Description: Manufacturing personnel welded ports to the vessels with a continuous full penetration weld in opposition to the drawing which called for an interrupted weld. Manufacturing personnel did this in concert with Engineering personnel under the misguided perception that Engineering was working with the customer to change the drawing to the weld seam design that they were welding the vessel to. The CWI inspector noted the variance to the drawing but did not initiate an N/C under the misguided perception that Engineering had an imminent drawing change coming throught he customer.

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**Corr Actn: 3:** Action: By: 596-D.KNAUB

Description: CWI personnel have been instructed on their failure to follow correct procedure and have been re-instructed in the tenets of QA-SOP-01.

Verify Notes: Issue was discussed with V.P. of Quality.

| NCSX RFD Part II | Number: RFD-12-017 | RFD Description: Port Attachment Weld Deviation Reques |
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| RLM: Brad Nelson | Organization: ORNL |
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**Impact on Interfaces with Other WBS Elements/Items:** ***(If none, so state): NONE***

**RLM Recommendation:**

☒ **Approve** ☐ **Do Not Approve**

**Additional remarks:**

**Approved for use on the VVSA Segment #3. Drawings will not be revised to reflect revised welding method – however a note will be placed on the drawings to note this change.**

**MTM NCR caused when MTM manufacturing and engineering personnel assumed that PPPL was advised of the change prior to the non-conforming action. This has been thoroughly discussed with MTM management and engineering and manufacturing personnel as indicated in the three (3) corrective actions included with the NCR. This is acceptable to PPPL.**

**Does this Change Impact Material Already Procured or Parts/Assemblies Already Assembled/Manufactured using this Material:** ☐ **Yes** ☒ **No**

**If "Yes", what is the recommended disposition of this material/part/assembly?**

**RLM Signature:** Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.04.21 12:20:29 -04'00'

**Project Disposition:**

☒ **Approved. No ECP required. ECN will be prepared to note this NCR on the impacted drawings.**

Bob Simmons

Digitally signed by Bob Simmons
DN: cn=Bob Simmons, c=US
Reason: I have reviewed this document
Date: 2006.04.21 12:00:39 -04'00'

**NCSX Systems Engineering Support Manager**

☐ **Approved. ECP - assigned and processed.**

☐ **Not Approved. Reason(s) for disapproval:**