
Customer: PRINCETON PLASMA PHYSICS LAB

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Part: SE120-002 / PPPL NCSX VVSA

Drawing ID: SE120-005 Revision: 0
Links: 1-Type:W: 65678/1.0 Sub: 0 Op: 10

Customer P.O.: S005243-F/Ln:1
Serial No./Qty: QTY - 3

Reported By: DOUG MCCORKLE
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Problem: REFERENCE DRAWING SE121-014, SHEET 1, ZONE F-6.
WELD SYMBOL REQUIRES THE ARROW SIDE (OUTSIDE OF THE PART) TO BE SKIP WELDED (1/8"
FILLET, 1/2" X 90 DEGREES).
THE ENTIRE OUTSIDE SURFACE WAS WELDED CONTINUOUSLY.

Proposed Disposition:

CUSTOMER DISPOSITION REQUIRED.

Number of additional pages: _____

Customer Disposition: Use As Is Rework Repair Scrap Replace

Technical Contact Approval: _____

Title: _____ **Date:** _____

Buyer Approval: _____

Title: _____ **Date:** _____

Major Tool Implemented By: _____

Title: _____ **Date:** _____

Root Cause 1: 802-MANAGEMENT DECISION

Resource: SILVER TEAM, ENGINEERING Equipment:

Description: AS REQUESTED BY MTM, BASED ON EARLY WELD DISTORTION RISK MITIGATION EVALUATIONS, THE WELD JOINT CONFIGURATION FOR ALL PRIMARY VESSEL PORT ATTACHMENT WELDS WAS CHANGED FROM WELDING THE ENTIRE JOINT FROM THE OUTSIDE, TO BORING THE HOLE IN THE VESSEL LARGE ENOUGH TO SLIDE THE TUBE THROUGH TO THE INTERIOR SIDE OF THE VESSEL AND WELD THE JOINT FROM THE INSIDE OF THE VESSEL. THE ORIGINAL CONFIGURATION WAS A FULL PENETRATION WELD WITH A CONTINUOUS FILLET. THE SPACER SUB-ASSY WAS APPARENTLY OMITTED FROM THE DESIGN CHANGE AND IS UNIQUE.

WELDING A FULL PENETRATION GROOVE TO ENSURE FULL DEPTH EFFECTIVE THROAT, IT IS NECESSARY TO BACK-GRIND THE OUTSIDE TO SOUND MATERIAL AND FILL THE REMAINDER OF THE JOINT FROM THE OUTSIDE. WHEN ONE MEMBER EXTENDS BEYOND THE FACE (THE TUBE PROTRUDES OUTWARD), THE OUTSIDE OF THE FULL PENETRATION WELD IS IN THE CONFIGURATION OF A FILLET (PERPENDICULAR), THE BACK GRINDING PROCESS INHERENTLY REMOVES SOME MATERIAL FROM BOTH MATING DETAILS (IN THIS CASE, THE VESSEL WALL AND

PORT TUBE). MERELY FILLING THE GROOVE TO OBTAIN 3/8" EFFECTIVE THROAT WOULD LEAVE THE SIDEWALL OF THE TUBE UNDER CUT. NOT BACK GRINDING THE OUTSIDE WOULD LIKELY RESULT IN A PARTIAL PENETRATION GROOVE WELD (OR AT LEAST INTERMITTENTLY PARTIAL PENETRATION. THIS CONDITION INCREASES WHEN THE WELD POSITION CHANGES (E.G. HIGHLY SHAPED PROFILE). BY NECESSITY ADDITIONAL WELDING WAS PERFORMED TO FILL THE GROUND AREA ON THE OUTSIDE OF THE TUBE. THIS CREATED A CONTINUOUS FILLET AROUND THE ENTIRE TUBE. THIS WELD COULD HAVE BEEN GROUND OUT LEAVING THE FOUR 1/2" LONG AREAS WHICH WOULD CONFORM TO THE DRAWING, BUT MTM CHOSE TO LEAVE THE ENTIRE CIRCUMFERENTIAL WELD. THE ORIGINAL WELD SYMBOL WAS THE BASIS FOR THIS DECISION.

Corr Actn: 1:

Action: 01/18/06 By: 775-D.MCCORKLE

Description: NONE REQUIRED. EARLIER CUSTOMER NOTIFICATION / CLARIFICATION WOULD BE BENEFICIAL IN FUTURE CIRCUMSTANCES.

Nonconformance Report: Major Tool NC19081

This is for SE121-014 Spacer

Problem:

Reference drawing se121-014, sheet 1, zone f-6. Weld symbol requires the arrow side (outside of the part) to be skip welded (1/8" fillet, 1/2" x 90 degrees). The entire outside surface was welded continuously.

Description:

MTM determined that: "Welding a full penetration groove to ensure full depth effective throat, it is necessary to back-grind the outside to sound material and fill the remainder of the joint from the outside. When one member extends beyond the face (the tube protrudes outward), the outside of the full penetration weld is in the configuration of a fillet (perpendicular), the back grinding process inherently removes some material from both mating details (in this case, the vessel wall and port tube). Merely filling the groove to obtain 3/8" effective throat would leave the sidewall of the tube under cut. Not back grinding the outside would likely result in a partial penetration groove weld (or at least intermittently partial penetration. This condition increases when the weld position changes (e.g. highly shaped profile). By necessity additional welding was performed to fill the ground area on the outside of the tube. This created a continuous fillet around the entire tube. This weld could have been ground out leaving the four 1/2" long areas which would conform to the drawing, but MTM chose to leave the entire circumferential weld. The original weld symbol was the basis for this decision."

Project Disposition:

For this spacer weld, Use as is.

For the corrective action, consistent with MTM's stated, "IN FUTURE CIRCUMSTANCES, EARLIER CUSTOMER NOTIFICATION / CLARIFICATION WOULD BE BENEFICIAL", PPPL asks MTM to acknowledge that any proposed deviation from PPPL requirements must be formally requested in writing and approved by PPPL prior to implementation.

Approvals:

Procurement Technical Representative

Responsible Line Manager:

Project Quality Assurance: