

20 October 2004

Ms. Teresa Hubbard  
 Major Tool & Machine, Inc.  
 1458 E. 19<sup>th</sup> Street  
 Indianapolis, IN 46218

SUBJECT: Subcontract S005243-F

Dear Ms. Hubbard:

This letter is in three parts:

Part I - The following modifications to Section 2.1 Codes and Standards of NCSX Product Specification for the Vacuum Vessel System Sub-Assembly NCSX-CSPEC-121-02-02 are effective immediately and will be incorporated into the Specification the next time it is amended.

1. Following are modifications of Specification Revision numbers:

Section 2.1			
d.	ASTM B 440-00	revised to be	ASTM B 440-03
e.	ASTM B 705-00	“ “	ASTM B 705-03
f.	ASTM B 446-00	“ “	ASTM B 446-03
g.	ASTM A240-02	“ “	ASTM A 240-04A
h.	ASTM A193/A193M-01b	“ “	ASTM A193/A193M-04
i.	ASTM A 1014	“ “	ASTM A 1014-03
l.	SNT-TC-1A, 1996	“ “	ST-TC-1A 2001
m.	ASTM E 498-95	“ “	ASTM E 498-2000

2. The following tube specifications are hereby added to Section 2.1 Codes and Standards.

ASTM A 249/A 249M-04A Standard Specification for Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser Tubes.

ASTM A 213/A 213M-03 Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, Heat-Exchanger Tubes.

## Part II - Vacuum Vessel Sub-Assembly (VVSA) Drawings:

Major Tool & Machines (MTM) identification and reporting of drawing corrections required is appreciated. Other minor drawing corrections are being collected. Drawings will be updated in the near time frame. Please advise if you feel any of the drawings need expedited revision for clarification and contractual understanding.

## Part III - MTM Procedures

Following are comments of NCSX Project personnel on procedures MTM has provided for review.

1. Recommend the revision level be dropped from specification references such as in Purpose and Reference documents. They refer to Revision 1 of the Specification. Revision 2 is the current edition.
2. Should the criteria for meeting procedure requirements be listed in the procedures or are they covered individually in MTM visual Manufacturing cards? It is a bit difficult to confirm that all VVSA Specification requirements are passed onto the shop personnel.
3. PS480-Visual Weld Inspection
  - a. Paragraph 8.7 - This, and several subsequent paragraphs, are written conditionally, "When qualification of the...procedure is required..." The procedure is specific to this work and so the condition is known. NCSX-SOW-121-03-01, paragraph 4.10 requires qualified procedures. These paragraphs should invoke the requirement, rather than appearing to have limited, or only potential, applicability.
  - b. Similarly, in paragraph 8.8 the visual acuity standard should be specified.
  - c. Paragraph 9.2 - Specify when an IDC Record and when an Inspection Report are required. At minimum, there should be an Inspection Report for each final weld inspection.
  - d. Paragraph 9.2.2 should specify "for final inspections" and list all appropriate items identified in Section 4.6 of NCSX-SOW-121-03-01. Missing are "area inspected" and "equipment calibration status."

4. PS-487 - Surface Finish
  - a. Exterior finish requirement (.04") regarding pits (SOW Section 3.2.3) not mentioned. Are repairs (SOW Section 3.2.2.1) addressed?
  - b. PPPL has QAWI008, Rev. J. Is this the current revision?
  - c. Some minimal guidance as to what is acceptable (allowable deviation) and steps to take if outside of tolerance (at least a pointer to the manual) are needed.
  - d. Paragraphs 6.3 and 7.4 both provide surface finish requirements. Paragraph 7.4, if needed, should point to paragraph 6.3.
  - e. Paragraphs 7.5 and 8.2 should identify when it's required to document results. Presumably for final acceptance inspection only.

5. PS-484 - Magnetic permeability Inspection

Should include actual inspection steps such as those in MTM's PP-476 Section 4:

- 4.0 Instructions

- 4.1 Prior to taking any permeability measurements, make sure that all locations where measurements will be taken are clean and free of any oil, scale, or any other foreign matter that could effect the readings taken. If cleaning is necessary, it should be performed per the applicable section of PP475. Ensure the part being checked is isolated from ferrous materials (e.g. work tables, bracing, tools, etc.). In addition, any part or material that is suspect of holding residual magnetism must be demagnetized before taking a permeability measurement. Residual magnetism can adversely effect permeability measurements.
    - 4.2 If the panel / assembly has not already been laid out for inspection, layout according to the specified inspection drawing (via. Mfg. Routing). The layout should cover the entire part evenly, and consist of an approximate 6" grid throughout the body of the formed panels, and an approximate 1" grid near the weld seams / edges.
    - 4.3 Inspect the magnetic permeability at each inspection point following the directions given within the manufacturer's operating manual, MTM manufacturing routing, the precautions listed above, and the following:

- 4.3.1 Screw the insert reflecting the maximum allowable relative permeability into the top of the case. For example, if the area in questions cannot exceed  $1.2\mu$ , use the  $1.2\mu$  indicator.
- 4.3.1.1 Use the following criteria for insert selection:
  - 4.3.1.1.1 Overall relative magnetic permeability of Inconel 625 components:  $1.01\mu$  max.
  - 4.3.1.1.2 Overall relative magnetic permeability of 316SST components:  $1.02\mu$  max.
  - 4.3.1.1.3 Overall relative magnetic permeability in welds (and heat affected zones) joining 316 SST to Inconel 625:  $1.2\mu$  max.
- 4.3.2 Place the indicator on the piece under test with the exposed magnet making contact within the grid cell.
- 4.3.3 Smoothly lift the indicator away from the test surface, in a direction perpendicular to the test surface.
- 4.3.4 If the magnet breaks contact with the test piece before breaking contact with the indicator, the test piece has a lower relative magnetic permeability and is acceptable.
- 4.3.5 If the magnet breaks contact with the indicator before breaking contact with the test piece, the test piece has a higher relative magnetic permeability.
- 4.3.5.1 Recheck the area with successively higher value indicators until a determination can be made that the test piece permeability is greater than one indicator broke first).

6. PS-485 – Ultrasonic Thickness Inspection

Paragraph 7.2 should specify when a report is needed.

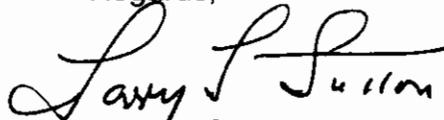
7. PS-483 – Cleanliness

- a. Paragraphs 6.1.1 and 6.10.1 invoke ASTM A380 paragraph 7.2 which lists a gross visual inspection in 7.2.1 and several more complex tests in the subsequent subparagraphs. How much of paragraph 7.2 is being invoked here?
- b. Specify when a report is needed.

Based on your Proposal and subsequent conference calls we expect to receive your updated Project schedule this week. Also, for planning purposes, when do you anticipate meeting the first performance milestone?

If there are any questions pertaining to these matters I may be contacted at (609) 243-2441, telefax (609) 243-2021 and by e-mail [lsutton@pppl.gov](mailto:lsutton@pppl.gov). Technical questions, other than for Quality Assurance, should be addressed to Mike Viola at [mviola@pppl.gov](mailto:mviola@pppl.gov). Address Quality Assurance questions to Frank Malinowski at [fmalinowski@pppl.gov](mailto:fmalinowski@pppl.gov).

Regards,



Larry L. Sutton

Senior Subcontract Administrator

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