

**National Compact Stellarator Experiment (NCSX) SubC# S-04344-F
Vacuum Vessel Manufacturing Development and Prototype Fabrication**

Weekly Status Report 02/16/04 thru 02/20/04

Project Management

Process Engineering

- We have been “streamlining” the MIT this week. Now that the welding process development has been refined to a high level of confidence, the routing is being restructured to remove what is now known to be superfluous welding operation sequences that were based on our original estimated number of inter-pass welds. The trimming / fitting responsibility of the 1-2 and 3-4 weld seams has also been changed from a CNC machining center back to the Fabrication Department (as it was originally planned (prior to the last release meeting)). Once our Fabricators and Manufacturing Management gained confidence from the success of the individual sub-set weld seams, they agreed it would be more practical to trim and fit the final two weld seams in their area.
- The Quality Plan has been streamlined along with the MIT. With the reduction of interim inspections, there will be a reduction in redundant quality documents.
- The primary purpose of the changes was to remove unnecessary in-process profile inspections between each inter-pass weld. We now only foresee the need to inspect the profile at tack weld, after the interior is complete, and after the exterior is complete. (final profile inspections remain unchanged)
- The datum targets (monuments) have been designed and produced. We will be applying three monuments equally spaced (approximate), flush to the top surface of the part. These monuments have provisions for the insertion of a standard 1/2” tooling ball. Orientation / coordinates for MTM final inspection, and PPPL receiving inspection will be provided prior to removing the part from the build fixture.

PVVS Fabrication

- The final two structural weld seams have been trimmed, tacked, and inspected. It went very well!!! These joints are currently being welded. We have learned that our fixture design does not facilitate access to do the welding as well as we would like (particularly for these two weld joints). This concern will be compounded on the production vessel. The complex shape of the part does not facilitate “easy access”. Production fixture (concept) design changes are being evaluated. Assigning one right handed, and one left handed Fabricator to the task alleviates the difficulty.

Quality Control

- The in-process profile inspection / point data evaluation process has been refined to a high level of confidence along with the welding development.
- There is a MTM non-conformance in process regarding the marks on the x-ray film discovered by Frank Malinowski during the most recent PPPL visit (N/C 15103). It is currently being evaluated for corrective action. The document will be presented to Princeton for final approval after our (or our supplier's) corrective action is completed. This was one of two concerns raised by Frank while analyzing the film. After further review, we found the density of the film (outside the overlapping area) to be within tolerance. There is no plan to create a non-conformance report for this item.

Photographs

