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

Weekly Status Report 05/21/03 thru 06/04/03

Project Management

- Attached with this update are the Preliminary Manufacturing Plan, the Preliminary Inspection Plan and the Preliminary Quality Plan. These are preliminary (work in process) until we receive the final design. Please call with any questions about this format we use. In our system the Mfg plan drives the quality plan and the inspection plan. The three are completely integrated. We will be glad to explain any aspect of the information.

Process Engineering

- The manufacturing / quality planning for the prototype vacuum vessel is 90% complete. We need the final geometry prior to procuring the vessel wall plate and die material (lead time is a concern), and we're finalizing fixturing / gauging plans.
- Our local vacuum testing supplier is currently researching the vacuum requirements to assist with finalizing our vacuum test plan.
- We are currently researching the solution anneal cycle that the formed panels will receive. If Princeton has a preference, please let us know. Otherwise, we will go with our experience, our material supplier's advice and the heat treat supplier's expert advice. We recommend the weldment not be annealed and our material supplier metallurgist concurs with our thoughts that it's not necessary for structural integrity.
- We are continuing to design / critique the forming dies. With growing concerns that we're using outdated geometry.
- We are continuing to develop and design a build fixture that will accommodate the PVVS as well as the VVSA (still in the concept / planning stage). The plan is to minimize the modifications required to produce the VVSA on the same fixture (some modifications will be inevitable). The same goes for the profile inspection / trim templates we are designing for the formed panels. We will manufacture 5 full size gages in use in conjunction with a mylar trim template to achieve the prototype height requirement.
- We are procuring material price / delivery for the VVSA.
- We do not plan to install the internal stiffeners as we discussed in the kickoff meeting at Princeton.

PVVS Fabrication

- The port extension tube is on order.
- The conflat flange and related hardware have already arrived with a material certification (304L).
- The hardware (bolts, nuts, o-rings, copper seals) did not come with material certifications. They are Varian catalog items with no material certificate available (C of C only). With other lab projects the C of C was used in place of material certifications. Will this be O.K.?

Quality Control

- Continuing with the integration of the Quality Plan into the Manufacturing Plan.

Questions and Answers

This is more of a statement than a question because we believe we understand the conflict. In order to match the datums of the complete assembly file to the prototype file a shift of the geometry in the assembly file for 1/2 of one period was required. The shift was in the X-axis 15.7892 inches in the positive direction. With this shift the ports and skin geometry matched. It is curious however, that the origin of the complete assembly file is different than that of the prototype file.

Pictures None at this time.

Prepared By: Mike Manuel
June 4, 2003