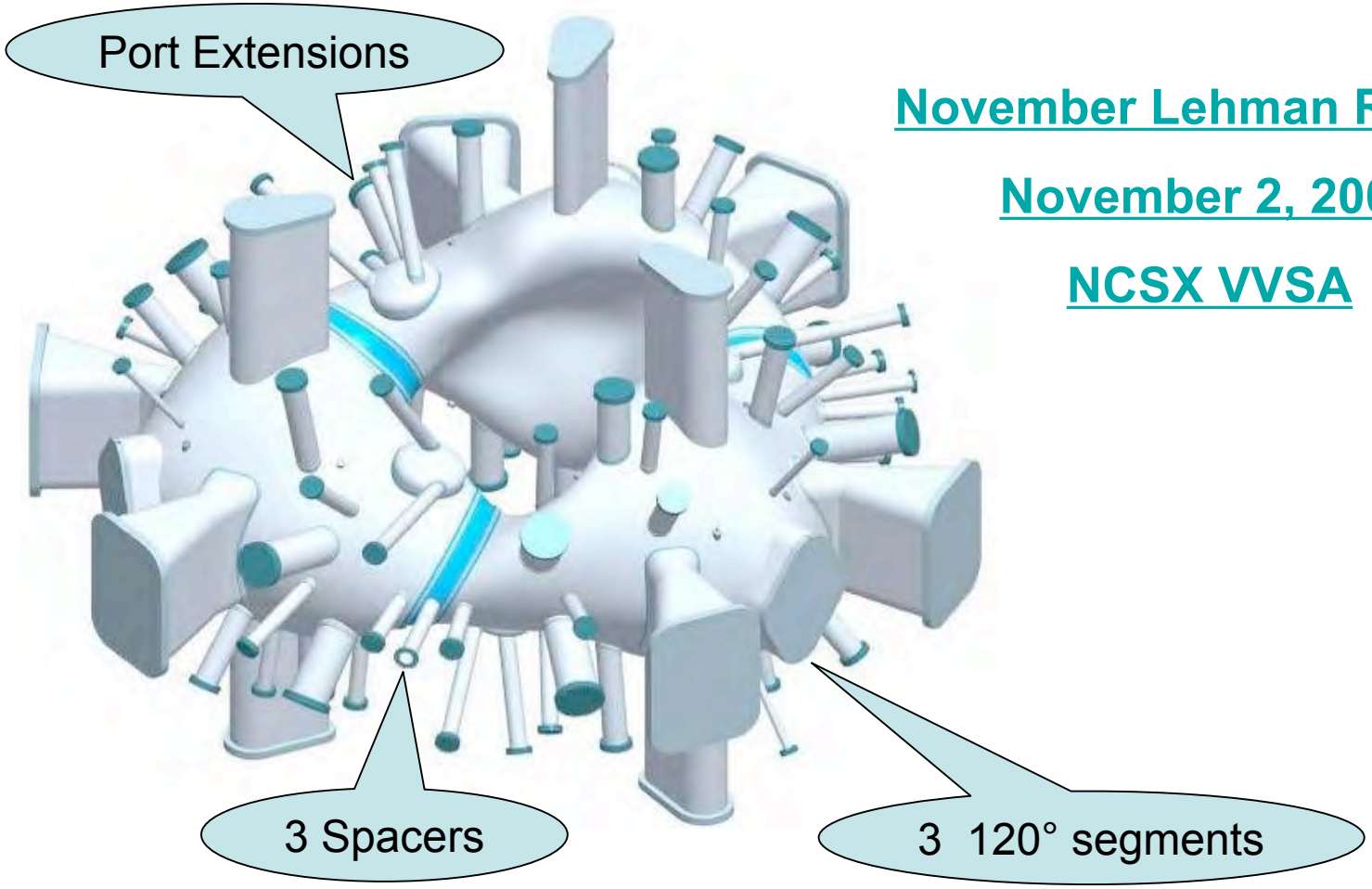
NCSX Vacuum Vessel Fabrication

Major Tool and Machine – S005243-F



November Lehman Review

November 2, 2005

NCSX VVSA

Process Summary

- ✓ Ten Kirksite die sets (20 total – upper and lower) cast and machined - complete
- ✓ Ten Panels form each 60° segment – all 60 complete
  - ✓ Press – anneal – press – local rework
- Upper and Lower 5 panel sets joined on a fixture to form ½ of a 60° segment
- Upper and lower ½ segments welded together over a collapsible welding fixture to form a 60° segment.
  - ✓ 4 of 6 60º segments complete
- 60º segments welded together on a fixture to form a 120º segment.
  - ✓ 2 of 3 120º segment shells complete
- Port holes bored and ports installed
- Leak checked and thermal cycled
- Ports cut off and shipped.
- Reassembled at PPPL after Modular Coils installed.

Contract Oversight / Risk Management

NCSX National Compact Stellarator Experiment

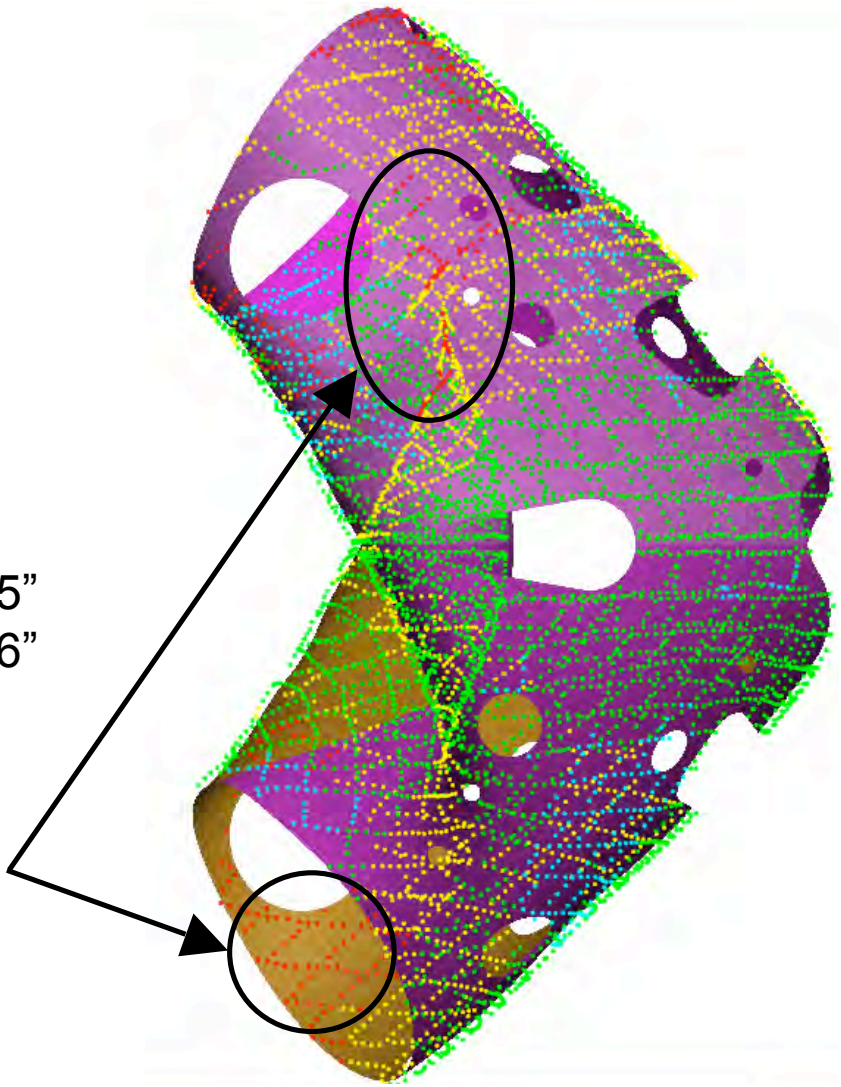
- Immediate feedback provided which can be reviewed by NCSX team.
  - DCMA, QA, and the contract technical representative are intimately involved
  - many onsite visits (DCMA, Tech rep, QA, Mod Coil team)
  - Weekly and Monthly status reports
- Alignment and distortion control are critical. Major Tool has several opportunities to make adjustments as needed
  - They have set internal tolerances more stringent than the specification to trigger concerns
  - Forming of panels, welding each 60° segment, welding of completed 120° shell welding on ports - fixturing and tailoring weld sequence
  - Many meetings between production control, QA, Weld Engineering
  - Extraordinary measures (pun intended) - metrology every step of the way
  - best fit analysis is performed using Verisurf© software

MTM is performing very well

- 4 of 6 60° segments are complete and welded into their final configuration.
- 2 120° segment shells are complete.

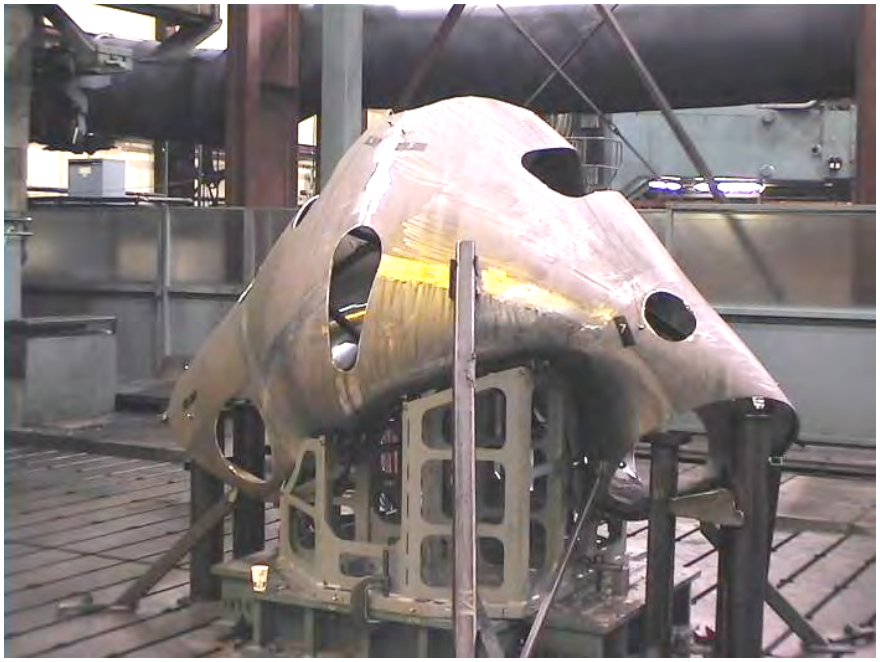
Tolerances are Acceptable

- MTM Data: 120scan30aug
- VV shell profile tolerance is 0.375” (+/-.1875”)
- 5462 Data points taken
- 356 points out of tolerance (6.5%)
  - 2 points out of tolerance > +.2”
  - 5 points out of tolerance > +.15”
  - 35 point out of tolerance > +.1”
  - 62 points out of tolerance -.01” to -.05”
  - 16 points out of tolerance -.05” to -.06”
  - 0 points out of tolerance < -.1”
- **OOT areas checked by NCSX team determined that there is no interference.**



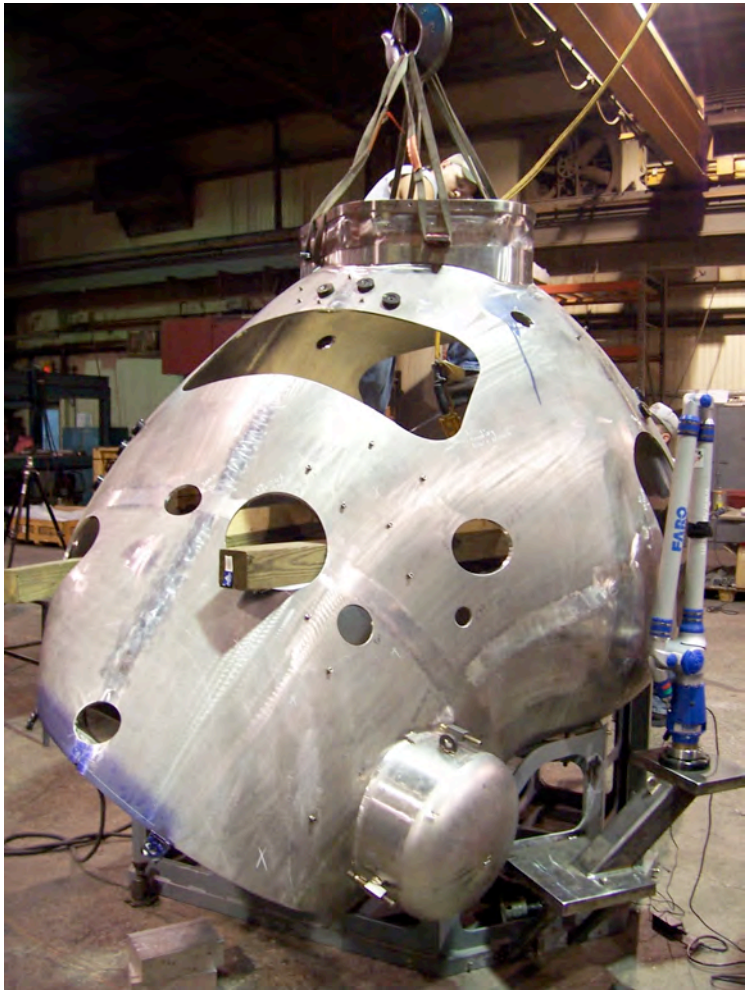
Verisurf© Scan

Ports Ports Ports



Boring Port Holes

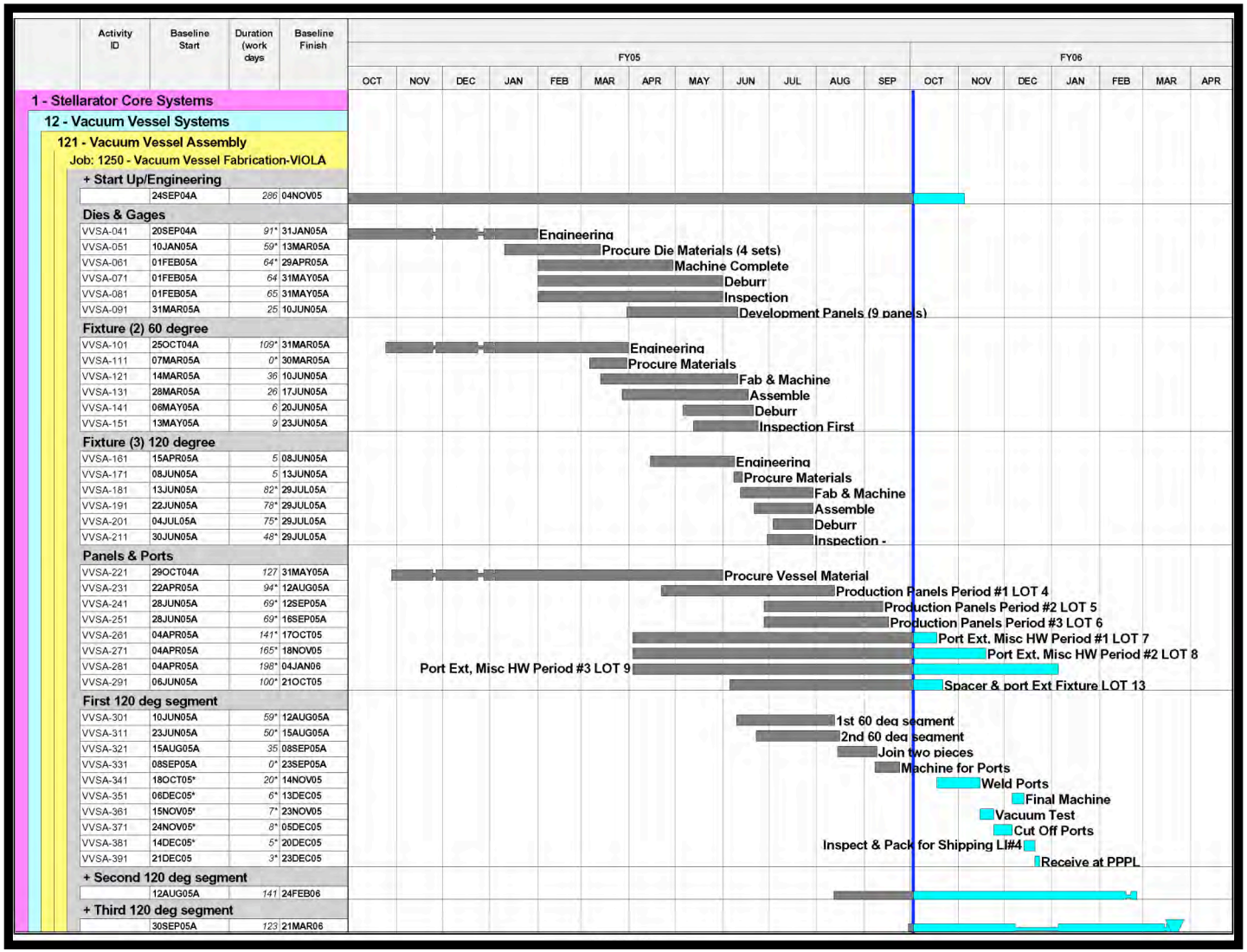
- Beginning to install ports on the first segment.



Installing Ports

Current Status

- ✓ All 60 plates are formed!
- ✓ All ports are formed!
- ✓ All flanges are welded to all ports!
- ✓ Flanges for Spacer are complete!
- ✓ All fixtures are complete!
- ✓ First two 120° segment shells are complete!
- Ports are being installed into first segment
  - welding plan carefully designed to improve OOT areas.
- Leak check
- Cut off ports



Cost and Schedule

- The current Subcontract price of $5,006,228 includes an approximate 10.3% increase in the initial Subcontract price. This increase was for material for new dies (about $431K) and about $39K for new flanges (original flanges called out in the drawings had unexpectedly high permeability).

- They have slipped about one month from the baseline due to increased time to form the panels, measure and align the 60° segments, form the 120° segment shell, and bore the port holes.
  - They have their top welders on our project which is resource limiting to increase production but assuring quality.
  - MTM has very little leak checking experience especially on such a large vessel. However, the assured weld quality mitigates the possibility of leaks.

SUMMARY

- Charge 1 (Is the project proceeding according to the August 2005 approved baseline cost and schedule?):
  - VVSA has slipped a month but well within project float tolerance
- Charge 2 (Are there credible mechanisms in place for evaluating and resolving past and future project risks, including technical issues and changes, which have or may arise?):
  - Risks are actively managed – communication and feedback is excellent
- Charge 3 (Are the project's cost and schedule estimates credible and realistic for this stage of the project? Do they include adequate cost and schedule contingency? Is the contingency based on a thorough risk based analysis?):
  - The learning curve is behind us and they are performing well.
  - MTM has not indicated to date any potential issues that could conceivably increase the cost of the contract.