CRYOGENIC TANK TECHNOLOGY PROGRAM (CTTP)

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CRYOGENIC TANK TECHNOLOGY PROGRAM (CTTP)

OBJECTIVES

• DETERMINE FEASIBILITY AND COST EFFECTIVENESS OF NEAR NET SHAPE HARDWARE
• DEMONSTRATE NEAR NET SHAPE PROCESSES BY FABRICATING LARGE SCALE-FLIGHT QUALITY HARDWARE
• ADVANCE STATE OF CURRENT WELD PROCESSING TECHNOLOGIES FOR ALUMINUM LITHIUM ALLOYS
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- NEAR NET SHAPE TECHNOLOGIES
  - EXTRUDED BARREL PANELS
  - ROLL FORGED Y-RING ADAPTERS
  - ONE PIECE SPIN FORMED DOMES

- OTHER TECHNOLOGIES
  - LOW PROFILE, NON-TANGENT NET SHAPE SPIN FORMED BULKHEADS
  - FRICTION STIR WELDING
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PROGRAM STATUS

- ADAPTERS, BARREL PANELS, AND DOMES HAVE BEEN COMPLETED
- FRICTION STIR WELD TOOLING IN PLACE ON CIRCUMFERENTIAL TOOL
- BARREL PANEL WELDS COMPLETED
- EXCESSIVE POROSITY IN BARREL TO ADAPTER WELDMENTS PLACED TANK FABRICATION ON HOLD
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CONCLUSIONS

- NEAR NET SHAPE HARDWARE CAN BE COST EFFECTIVE FOR HIGHER PRODUCTION RATE CRYOTANK HARDWARE
- LARGE SCALE-FLIGHT QUALITY HARDWARE CAN BE MANUFACTURED USING NEAR NET SHAPE PROCESSES
- FRICTION STIR WELDING SUCCESSFULLY DEMONSTRATED