Weekly Reporting SNS PPU

WBS P.02.03 Cryomodule Integration (JLab Scope)

September 24, 2021

**Issues:**

Impact of COVID-19 - JLab status changed to MEDCON-4 on 7-JUN-2021. Staff who can effectively work remotely will continue to do so. JLab is evaluating circumstances that would cause a change in MEDCON status.

**Accomplishments this week:**

Management:

* PPU activities are continuing onsite, with testing of production cavities, continuing with spaceframe/thermal shield (CM-01), continuing cold mass assembly (CM-02) and receipt inspection of components.
* Off-site work efforts continue, focused on completion of original procurement activities, continuing procurements for 8th CM and production activities.
* Evaluating impacts of COVID-19 on overall project schedule and developing mitigations.
* Rate of cavity testing is slower than needed to maintain schedule, and attributed to process investigations on tanked cavities. Continuing to evaluate changes in approach. Identified a second tanked cavity test stand that has been modified for tanked cavity testing.
* Confirmed travel arrangements for visit to end can vendor in late September (9/27-28).
* Participated in DOE IPR.
* Prepared for visit from Howell and Mammosser next week.

Engineering & Design:

* Sustaining engineering activities are continuing in order to revise drawing packages based on feedback during the procurement phase.

Procurement:

* 6 active procurement awards; 86 completed (arrived at JLab).
* RFI-018 on end can critical dimensions is fully signed off. Vendor sent updated delivery schedule for rework and remaining end cans.
* Supply End Cans (SECs):
	+ SEC 01 & 02 are at the vendor. Bellows ETA next week. SEC 01 & 02 estimate to ship to JLAB on 11/12 and 11/30, respectively.
	+ SEC 03 is at JLAB was prepared for a longer duration cold shock, which happened on Friday 9/17. Results were acceptable. Unit acceptable for first CM.
	+ SEC 04-06 are at the vendor. Vendor started dimensional inspections per RFI-018 drawings. Results will be shared with JLAB for review and approval.
	+ SEC 07 in fabrication and will be used as a test piece to try weld shrinkage control methods to apply on SECs. Expect to ship around 11/5.
* Return End Cans (RECs):
	+ REC 01 is in the process of return to vendor for rework.
	+ REC 02 is at JLAB. Pressure test & leak check done. Dimensional inspection finished. Fit-up test completed. Unit acceptable for first CM.
	+ REC 03 is at the vendor. It is used as a test piece to try dimensional control methods for RECs. Expect to ship around 10/25.
	+ REC 04 near completion. Waiting for confirmation of dimension control methods.
	+ REC 05 - 07 are at various stages of fabrication.
	+ A summary of anticipated end can deliveries in October and November:
		- REC 03 - 10/25
		- SEC 07 - 11/5
		- SEC 01 - 11/12
		- REC 04 - 11/29
		- SEC 02 - 11/30
* Vacuum Vessels:
	+ Vessel #5 has been hydrostatically pressure/leak tested and vacuum leak tested. The third party dimensional inspection will take place on 9/20/2021. Vessel is scheduled to ship 9/24/2021.
	+ Vessel #6 is in stage 1 welding of the nozzles, flanges, etc. It will go into stage 1 machining operations next week. Scheduled to ship to JLAB on 10/29/2021.
	+ Vessel #7 is in stage 1 welding, following behind vessel #6 production. Scheduled to ship to JLAB on 11/19/2021.
	+ Vessel #8’s long lead material has arrived at the vendor. These materials include the flange and nozzle forgings and ¼” shell material.

Production:

* Cavity Status:
	+ PPU-32 cavity as received from vendor failed VTRF qualification test with high Field emission
	+ PPU-08 tanked cavity was re-tested after the beam line flange rework (cavity leaked during CM2 assembly). Cavity didn't meet field emission specification for string assembly.
	+ Cavity PPU-20 underwent 120 C bake in preparation for next week RF test.
	+ PPU-12, tanked cavity is being re-process with HPR for next week RF test.
* Cavity String Status:
	+ Two cavities qualified for PPU03 string.
* Cryomodule Status:
* PPU01 Alignment near completion, verifying tolerances
* PPU02 Cold mass piping I.P.
* PPU 21L (with LL) Welding HV I.P
* SEC-03 cold shock test completed
* REC-02 VV fit up complete, no cold shock required based on assessment of clearance between vacuum jacket and shield.
* Finishing touches on final assembly to be folded in after final PFMEA meeting next week.
* FPCs:
	+ 6 more couplers will be delivered in the week of 20 Sep.

Project Management:

* Provided August EV data to ORNL
* Issued monthly cost reports to project team
* Started variance analysis
* Prepared data for JLab Director’s Review planned for 9-21-21

Quality Assurance:

* We now have process steps and corresponding potential failure modes for CM Final Assembly taken extracted from the draft traveler. Next steps in the PFMEA will involve analysis of the failure modes for causal mechanisms, risk ratings, and risk mitigation, where warranted.
* Monitoring of NCRs and Work Control documents continues. JLab QA presentation made in the DOE/SC Status Review – positive response from the review team.

Project Photos: