

MEETING MINUTES

Location: Zoom
Date: 24 Feb 2021
Time: 11am EDT
Indico event: <https://indico.cern.ch/category/8972/>
Attendees: Eric, Jamie, Jean, Zenghai, Suba, Paolo, Manuele, Naeem, Silvia, Leonardo
Minute taker: Silvia
Reviewed: N/A

SCOPE OF THE MEETING

Weekly HL-LHC RFD HOM couplers follow-up meetings.

NEXT MEETING

3 March 2021.

AGENDA

- Jamie: Qualification tests of HOM couplers fabricated by CERN for RFD SPS cavity using test box.
- Zenghai: 25-50 Ohm adaptor.

DISCUSSION POINTS

- Jamie discusses that all S21 curves for 3 HOM couplers tested in the same test box coincide. However, there is a discrepancy between expected and measured, specially at high frequencies. Peak around 1.6 GHz seems damped. Two of the HOM's that need to be monitored during HOM qualification tests (see EDMS 2488213) fall into this region of the spectrum. Jamie is investigating possible causes. Metrology of the fabricated parts does not find any significant discrepancy between fabricated parts and drawings. Error from adaptor does not explain discrepancy neither. Jamie continues to investigate the origin of the discrepancy. Assembly of parts may be the culprit.
→ ACTION / NEXT STEPS [Eric, Jamie]: Build second test box. Compare test boxes.
- Zenghai presented AUP's 25-50 Ohm adaptor, which might be easier to fabricate than CERN's adaptor as it used off-the-shelf feedthrough from Kyocera and is 2 cm shorter than CERN's adaptor.
- CERN will send a HOM coupler to FNAL to compare results with test box.
- AUP will fab adaptor and test box next. CERN is now busy and cannot fab adaptor earlier than AUP.
→ ACTION [Zenghai, Jamie]: Zenghai will send S21 of his adaptor to Jamie for Jamie to plot the S21 of both CERN's adaptor and AUP's adaptor.

ACTION ITEMS

Action	Responsible	Status	Update
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0	Upload slides to Indico	All	Applies always	
1	Share metrology of PU and VHOM with AUP	Eric	Pending (Dec. 1, 2020)	
2	Share CERN MIP for VHOM and PU with Naeem	Eric	Pending (Nov. 23, 2020)	
3	Provide sacrificial feedthroughs for transport evaluation.	Eric	Pending (Oct. 16, 2019)	Eric will provide 2-3 sacrificial feedthroughs by beginning of next year to FNAL. On-going. Currently qualifying thickness of inner tube (Feb. 18, 2020).
4	Add accelerometer in the shock tests.	Eric	Pending (Oct. 16, 2019)	Eric inquired about accelerometer type/brand for shock test.
5	Which g force do the RF ancillaries need to survive in the shock test?	Kurt, Ofelia, Mikael	Pending (Oct. 22, 2019)	Parallel effort at FNAL (structural analysis – prelim shows 5g is ok) and tests with feedthroughs from CERN
7	Share drawings of gaskets with AUP	Eric, Nuria	Pending (Jan 20, 2021)	
8	Share 25 Ohm connector design with AUP	Eric	Pending (Feb 3, 2021)	
9	Develop mechanical design of AUP adapter	AUP	Pending (Feb 3, 2021)	
10	Launch fab of second test box at CERN	Eric	Pending (Feb 24, 2021)	
11	Plot S21 curves for both CERN and AUP adaptors	Zenghai, Jamie	Pending (Feb 24, 2021)	
	Send ceramics to Naeem	Eric	Closed	Arrived.
	Check NA configuration to measure directly at 25 Ohm, incl. calibration requirements for 25 Ohm option.	Eric, Jamie	Closed	Email Nov. 12 2019. See also meeting on Oct. 20, 2020.
	Share tooling drawings with Naeem	Eric	Closed	
	Send 3D mech design of RF ancillaries to Suba, Naeem, others and upload in EDMS	Eric	Closed	
	Upload STP of 3D vacuum model in EDMS 2366191 v2. Ensure that	Jamie	Closed	Files in DocDB now also in EDMS 2366191 v2 Zenghai provided links to 3D vacuum model STP file, step-by-step procedure

	parameterization for RFD RF ancillaries is in the same EDMS doc.			for building up vacuum model, and impedance table by email on April 21, 2020.
	Share with Jean the brazing procedure for feedthroughs with titanium flange	Eric	Closed	
	Calculate conversion of 10W power leakage from fundamental mode through HOM filters to the unit (dB) which is more useful in warm qualification of HOM filters.	Zenghai	Closed	
	Confirm brazing materials to Naeem and verify materials list.	Eric	Closed	
	Assembly procedures should include control step to verify 0.1 mm gap between port flange and feedthrough flange	Eric	Closed	See meeting Sep. 1, 2020.
	Add EDMS No. of HOM drawings to EDMS 2363558 (summary of models and studies reference)	Silvia	Closed	Drawings listed in the ICD.
	Generate summary drawing with RF ancillaries dimensions	Eric	Pending (Apr. 07, 2020)	Not needed anymore.
	Provide markup with corrected numbers	Naeem	Closed	On June 2, 2020, Naeem showed different dimensions for HHOM wall thickness between CERN and AUP drawings.
	Confirm material used for flanges of each RFD RF ancillary	Eric	Closed	Now in the drawings. Check in the drawings.
	Review dimension difference for HHOM wall	Eric	Closed	

	thickness between CERN and AUP drawings			
	Upload heat load breakdown for RF ancillaries and tolerance study to EDMS. Add reference to summary of engineering and multi-physics studies (EDMS 2363558)	Zenghai	Closed, see FDR	
	Upload materials to past meetings in the Indico website: https://indico.cern.ch/category/8972/	Zenghai	Closed (May 01, 2020)	
	Send LARP test box model to Eric	Suba	Closed (Apr. 21, 2020)	https://indico.cern.ch/event/891360/
	Send EDMS Doc. No. to Eric with summary of engineering studies for the RFD crab cavity	Silvia	Closed (Apr. 21, 2020)	https://edms.cern.ch/document/2363558/0.2
	Share link to trim tuning procedure for RFD.	Alex	Closed (Oct. 23, 2019)	Email Oct. 23, 2019
	Check RFD RF ancillaries drawings	Zenghai/Suba /Paolo/Naee m	Closed (Nov. 26, 2019)	Propagating new design modifications from Zenghai
	Provide thermal simulations for VHOM and temperature distribution around the flange connection.	Eric, Ofelia	Closed (Jan. 28, 2020)	Uploaded in Indico 7 Jan. 2020: https://indico.cern.ch/event/891345/
	Ask accelerator model number	Leonardo	Closed (Oct. 22, 2019)	Email Oct. 22, 2019
	Check calculations for transport of HOM couplers.	Eric, Ofelia	Closed (Nov. 12, 2019)	Plastic deformation from transport of RFD HHOM coupler is negligible.
	Confirm that the HHOM helium jacket gets sufficient cooling through single inlet (in the past there was inlet and outlet for active cooling): LHCACFH0169	Eric, Ofelia	Closed (Nov. 26, 2019)	Discussion during meeting at CERN (week of Nov. 20).

	Add guiding pin to flange in LHCACFH0164	Eric	Closed (Nov. 12 2019)	No good for cleaning room
	Create Indico event for these meetings	Eric	Closed (18 Feb 2020)	https://indico.cern.ch/category/8972/
	Inform Suba about drawings that were corrected on Feb. 3, 2020.	Eric	Closed (email, Feb. 20, 2020)	https://edms.cern.ch/ui/#!/master/navigator/document?D:100502025:100502025:subDocs
	Share FDR agenda with CERN	Leonardo	Closed (Mar. 31, 2020)	https://indico.fnal.gov/event/23353/ (link for the dry-run agenda, which mirrors the actual agenda for the FDR – note that the dates are for the dry-run)