

Minute of "RPC cables chat"

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To: Anton Dimitrov; Salvatore Buontempo; Ian Crotty; Ivan Iliyanov Mihaylov; Cristina Penades Huesca; David Michael Morse; Gabriella Pugliese; Paola Tropea

Cc: Michele Bianco

Attachments: RE1_Cables_Cost.xls (220 KB)

Dear All,

here below the minute of our chat on the RPC cables, held last Thursday 10th.

I profit to integrate them with the offline (via mail) discussion continued after the meeting with Anton and Ian to better estimate the cost of the RE1 cables, this allowed me to prepare the attached excel table which update the table in slide 6 presented by Anton.

This work need a follow up, after internal RPC discussion, indeed during the meeting the possibility to profit of the LS3 interventions to replace the actual HV cables and HV connectors with more robust and reliable cables/connectors have been highlighted and supported by the RPC expert, but this require more discussions in the project.

I'll add this minute and the table to the agenda of the meeting.

Regards

Michele

Minutes of the "Discussion on YE1 RPC services" held on Feb 10th, 2022

Participants: A. Dimitrov, I. Crotty, G. Pugliese, I. Mihaylov, C. Penades, M. Bianco

-) C. Penades, presented brief summary of the expected services decommissioning, the space needed for the new services (in particular piping on the periphery) and reported, thanks to some old pictures on the slacks currently sitting both on RE1/3-ME1/3 and the slack of RPC cables on top of X2 and X4 racks. From the pictures is not 100% clear to the RPC expert if the cables under ME1/3-RE-1/3 chambers is fully related to CSC or is a mixture of CSC-RPC cables, May feedback could be provided by A. Kurenkov. Cristina reported about the decommissioning cables, it was confirmed that the RE1.1 services are still in place, both in the radial chain both on the periphery, during the LS2 only the two extremities have been cut to allow for GEM services installation. It follows that the stripping of the RE1/1 services need to be included in the decommissioning plan. To be clarified if these services seats above or below the ME1/1 services, no drawings seems to be available, to be investigated, A. Kurenkov could provide some info as CSC often works on the final part of the cable tray. Accurate cross sections of the nose cable trays showing all services, ECAL, ME1/1, RPC, HCAL, could be available with the help of S. Bally.

-) M. Bianco, asked to the expert for ranking the RPC services from the more fragile to the more robust, it revert that the Signal Cables and partially the HV cables have to be considered the most critical; the first for the difficulties in connectors assembly (40 pins IDC, the wires are pressed onto the "Y" displacing the insulation in the connector and holding the conductor by spring action), the second type for difficulties in polymerization of the connectors (a night of curing) when assembled. I. Crotty suggested and A. Dimitrov and G. Pugliese agreed that LS3 could be the occasion to replace definitively for all YE RPC chambers the three-poles connectors with coaxial Jupiter connectors, this will imply that the HV cables should be completely replaced too. This possibility was not yet considered so far for YE RPC chambers but adopted several times for RPC chambers sitting on station 2-3-4 and dismantled sometime for maintenance. LV and DCS cables looks to be more robust and in principle simpler to be reconnectorized, at least on rack side.

-) A. Dimitrov presented slides with an estimation of the cost for the gas system and summary of the possible extra cost in case RPC services (cables) will be fully replaced. For the gas system extra cost of about 500 CHF of material and 34 kCHF for manpower (based on ZEC cost) have been estimated. For the cables the summary provided estimate full services replacement for RE1 and RE2 at the cost of about 500 kCHF, where about 290 kCHF is the cost of the Signal Cables (no connectors and connectorization). Currently only the RE1 cables are under discussion this revert in a factor 2 less of costs.

Additional offline investigation made by I. Crotty estimate, for the signal cables (no connectors or connectorization) a total length of 10 km (in line with A. Dimitrov estimation), and a cost of about 7 CHF/m (from CERN store), this will lower the extra cost (only for the raw material of the cables) to about 70 kCHF.

Using the info provided by A. Dimitrov and the info passed offline by I. Crotty, the replacement of the RE1 cables would cost about 170 kCHF (see attached excel file). This estimation do not include the possibility to move fro three-poles cable to standard coaxial cable for the HV, as well as need to be revised for better estimation of connector and connectorization cost.

-) The possibility to keep the actual cables, reworking them, shortening at the correct lengths to reduce the actual slack has been discussed, this will allow to save at least the cost of the cables and connectorization on one side (about 90 kCHF from the latest estimation). Reworking the actual cables could be subject to RP restrictions. I. Crotty will contact both the cables production company both the cables services at CERN (G. Canale) to investigate the possibility to rework the actual cables and also to get a quote in case of new cables production. Still on this item the time available between the decommissioning and re-installation have to be correctly estimated in order to define the time available for the eventual cable re-working.

-) At the end of the discussion the needs of an additional meeting, this time not only with RPC but also with CSC and GEM experts, dedicated to the YE1 cooling appeared necessary, it will be scheduled in few weeks in agreement with C. Penades and the detectors TC and MuTCO.