WCC cable installation phase 1

- Execution of works
- Major issues and lessons
- Next steps

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Status of integration studies – Global view
Execution of works – from 3D integration to reality
Execution of works – what went well and what went wrong

• **Resources**
  • Only 3 out 5 people of Flohe could access CERN
  • Back up solution fund with the contribution of SM18 MSC team – Thanks!
  • Manpower for the installation of the 1300 mm² has not been sufficient for a smooth and effortless installation

• **Working Environment**
  • Successful VIC with contractor on Monday morning -> Green light to proceed with installation
  • Common agreement on how to deal with the crane lockout worked well
  • Punctual stoppage of works according to the progress of tests on bench A1 duly managed
Issues & lessons learned – cable trays # 1

• Issue
  • Fixing of the 5 cables tray have been fund insufficient to hold the weight of the WCC. In particular the four with a cross-section of 1300mm².
  • Most of the supports collapsed under the weight creating also a risk for the personnel accessing the scaffolding!
  • Installation of WCC has been stopped when all cables where already in place

• Solution
  • EN-EL intervention to replace the weak supporting systems by a more robust solution
  • Most of the WCC had to be removed from the cables trays. No impact on the positioning of cables on the top frame and inside the CDB

• Outcome
  • The repair took a full day with up to 7 intervening people from EN-EL contractor
  • WP16 is seeking to receive the EN-EL calculation note initially requested on 12th February 2022
  • WP16 will open a non conformity to trace and document this issue that can affect also HL-LHC
Issues & lessons learned – cable trays # 1

**Issues**
- Extremities of the cable trays are not sufficiently stable and with the weight if the WCC transversal beams are bent
- Structural stability of the cable tray is affected in particular the one 500mm² width
- WCC are punctually compressed over the transversal beams. This can potentially harm the WCC hose

**Solutions**
- Supporting plates have been designed to guide the output of the cables from the cables trays
- Urgently implemented on 29th – 30th of November by WP16

**Outcome**
- EN-EL has to review the way of supporting the WCC when going out from a cable tray
- Another point that EN-EL has to confirm is why the transversal beams of the two type of cables trays have different dimensions.
- WP16 will open a non conformity to trace and document this issue that can affect also HL-LHC
Issues & lessons learned – water connections and joints

• Issues
  • After WCC installation CV verified the possible s of installation the water connections and pipes to the WCC logs on the CDB side.
  • They claimed that not enough space is available for installing the rotating joints and the flexible tube.
  • Additionally CV requested to remove the four lowest 500mm² WCC extremities from the final position in order to install the inox to copper joint.

• Solutions
  • The required WCC will have to be handled out of the CDB
  • Two WCC lugs will have to be reoriented on the CBD side. Not initially planned and need to dismantle definitive crimping.

• Outcome
  • Requested implementation of WCC joint would have avoided to go back moving WCC on CDB side.
  • On site visit done and points to be retained before second phase are under discussion.
Next steps

• Expected sequence
  • WCC supports installation - ongoing
  • Installation of DC grounding along cable trays – December 2022
  • Removal of scaffolding – December 2022
  • Installation of PC racks, 2, 14 and 18 kA according to availability – From January 2023
  • Preliminary positioning of WCC on PC side – From January 2023
  • Copper plates design and installation on PC side – February 2023
  • Measurements and manufacturing of CV joints – February 2023
  • Installation of current transformers – March 2023
  • Installation of CV circuitry – April 2023
  • Alignment and SAT of WCC lugs – April 2023.

A big thanks to Sebastien that replaced me on the steering the WCC installation over three challenging days and to all participants that contributed to make this important step in the assembly of IT String successful.