

# HL-LHC IT String Day IV



## Report of Contributions

Contribution ID: 1

Type: **not specified**

## Feedback from the HL-LHC IT String Day III and scope of the HL-LHC IT String Day IV

*Friday 27 September 2024 08:30 (20 minutes)*

The presentation will introduce the scope and program of this fourth IT String Day, which will focus on the lessons learned from the validation of the infrastructure, warm powering system and the cryogenic distribution line, as well as the preparation of the next important phase of the cold powering system installation. We will also review the main recommendations and the status of follow-ups that emerged during the latest IT String Day in 2023.

**Author:** ZERLAUTH, Markus (CERN)

**Presenter:** ZERLAUTH, Markus (CERN)

**Session Classification:** General session

Contribution ID: 2

Type: **not specified**

## HL-LHC IT String general status, budget, schedule (2024 vs 2023) (WP16/TE-MPE)

*Friday 27 September 2024 08:55 (20 minutes)*

The presentation will provide an overview of the HL-LHC IT String baseline, reviewing aspects such as layout, schedule, budget, and potential resource conflicts specifically for the period overlapping with LS3. A brief description of the validation program and the safety strategy will be given, emphasizing their importance in ensuring a successful project. It will also offer a glimpse into the upcoming stages, with a particular focus on the most challenging tasks and activities that lie ahead. To conclude, it will present the proposed modus operandi for the operation of the HL-LHC IT String.

**Author:** BAJKO, Marta (CERN)

**Presenter:** BAJKO, Marta (CERN)

**Session Classification:** General session

Contribution ID: 3

Type: **not specified**

## HL-LHC IT String Technical Coordination & Safety (WP16/TE-MPE)

*Friday 27 September 2024 09:40 (30 minutes)*

This presentation will cover the methodology and organizational structure behind the technical coordination of the HL-LHC IT String facility. It will provide an in-depth update on the progress of on-site construction and commissioning activities. Key lessons learned from the IT String's construction and commissioning will be shared, focusing on technical challenges, schedule management, and the coordination of concurrent activities, along with relevant feedback provided to the HL-LHC project. Additionally, the safety strategy implemented during construction and commissioning will be revisited, with an overview of the safety protocols and operational procedures which are being developed and put in place.

**Author:** BOZZINI, Davide (CERN)

**Presenter:** BOZZINI, Davide (CERN)

**Session Classification:** General session

Contribution ID: 4

Type: **not specified**

## **Cryogenic cooling system (WP16/TE-CRG)**

*Friday 27 September 2024 10:40 (20 minutes)*

The presentation will address the following topics:

- Overview of cryogenic system commissioning without magnets
- Status of the cryogenic system
- Outcomes of commissioning and lessons learnt
- Upcoming activities for preparation of commissioning with magnets

**Author:** ONUFRENA, Aleksandra (CERN)

**Presenter:** ONUFRENA, Aleksandra (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities

Contribution ID: 5

Type: **not specified**

## Cold powering system (WP6A/TE-MS)

*Friday 27 September 2024 11:55 (20 minutes)*

The presentation will address the following topics:

- Performance of the Prototype Cold Powering system
- Completed installation activities and lessons learnt
- Upcoming activities and interfaces

**Author:** LECLERCQ, Yann (CERN)

**Presenter:** LECLERCQ, Yann (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities

Contribution ID: 6

Type: **not specified**

## Warm powering equipment, control cabling and other services installation (WP16/TE-MPE)

The Warm Powering equipment, which includes the Power Converters (PC), Energy Extraction systems (EE), Circuit Disconnecter Boxes (CDB), and Powering Interlock Controllers (PIC), is nearing the final stages of installation. This process also involves the setup of control cables, AC power supply, and the technical Ethernet network. The goal is to prepare for the Individual System Tests and Short Circuit Tests. This presentation will describe the installation process and share lessons learned from overcoming various challenges and issues.

**Presenter:** BLANCHARD, Sebastien (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities

Contribution ID: 7

Type: **not specified**

## Warm powering system (WP6B/SY-EPC)

*Friday 27 September 2024 11:30 (20 minutes)*

The presentation will address the following topics:

- Lessons learned from installation and commissioning.
- Upcoming activities.

**Author:** THIESEN, Hugues (CERN)

**Presenter:** THIESEN, Hugues (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities



Contribution ID: 8

Type: **not specified**

## HL-LHC IT String individual system & short circuit tests (WP16/TE-MPE)

The Individual System Tests (IST) and the Short Circuit Tests (SCT) are important intermediary steps in the Hardware Commissioning (HWC) of the HL-LHC IT String. This talk gives an overview of the different IST and SCT planned for the warm powering system, the cryogenic system, the quench detection, and protection systems and the associated procedures. Moreover, the quality control steps and quality assurance of HL-LHC IT String systems will be shown in the presentation. These steps and procedures will also be a cornerstone to prepare the work for the HL-LHC.

**Presenter:** YAMMINE, Samer (CERN)

**Session Classification:** Upcoming main activities

Contribution ID: 9

Type: **not specified**

## SC link system installation (WP6A/TE-MSc)

The IT Cold Powering System is presented with its main components. The experience acquired during the assembly of the first Cold Powering System in 2023 is presented with respect to its added value for the upcoming STRING installation. After presentation of the proposed installation sequence, the workplan and the list of tasks until readiness for installation is shown.

**Presenter:** LECLERCQ, Yann (CERN)

**Session Classification:** Upcoming main activities

Contribution ID: **10**Type: **not specified**

## Magnet Installation and Interconnections (WP3/TE-MS)

*Friday 27 September 2024 14:35 (30 minutes)*

The presentation gives a status of the cryo-magnets for the IT string and a brief sequence of the cryo-magnets installation and connection including the interlink (DCM). The results of critical steps of the magnet connection made on representative mock-up are detailed and the first intervention on the SQXL jumper for the magnet interface is also described. The specific tooling for the interconnection activities is detailed. The known non-conformities on the magnets and the mitigation plans are presented.

**Author:** LE NAOUR, Sandrine (CERN)

**Presenter:** LE NAOUR, Sandrine (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities

Contribution ID: 11

Type: **not specified**

## **Full remote alignment system (WP19/BE-GM)**

*Friday 27 September 2024 14:10 (20 minutes)*

The presentation will address the following topics:

- Status of the preparation activities.
- Plan for installation
- Preliminary tests
- Quality control checks
- Interventions and coactivities

**Presenter:** MAINAUD DURAND, Helene (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities

Contribution ID: 12

Type: **not specified**

## Controls and software status for the HL-LHC IT String (WP16/TE-MPE)

*Friday 27 September 2024 15:50 (30 minutes)*

The HL-LHC IT String facility includes accelerator systems such as power converters, quench protection, cryogenics, insulation vacuum and alignment. The applications for the system controls and for the operation of the HL-LHC IT String facility compose a three-layer architecture. The front-end layer is composed of Programmable Logic Controllers (PLC) or Front-End Computers (FEC). The systems' layer is composed of monitoring, control, and supervisory applications. The operation layer is composed of supervisory, sequencer, and magnet circuit test analysis applications. As a preparation of the HL-LHC commissioning phase, the definition of all the required software interfaces, in line with the HL-LHC era, is essential to guarantee the suitable operation of the String facility control system. The readiness status of the controls and software is reported. The Dry Run tests are essential to validate the operation applications and the complete control system before the cooling and the powering test phase of the HL-LHC IT String commissioning program.

**Author:** BLANCHARD, Sebastien (CERN)

**Presenter:** BLANCHARD, Sebastien (CERN)

**Session Classification:** Hardware Commissioning of the HL-LHC IT String

Contribution ID: 13

Type: **not specified**

## IST, SCT and Powering Test for the HWC of the HL-LHC IT String (WP16/TE-MPE)

*Friday 27 September 2024 16:25 (30 minutes)*

The powering tests for the Hardware Commissioning (HWC) of the HL-LHC IT String circuits constitute an important preparation phase for the HWC in the HL-LHC as the last part of the LS3. This talk gives an overview of the String Validation Program concentrating on the phases preparing and after the first cryogenic cool-down of the string of magnets. It shows the work done to prepare the powering tests and the acceptance criteria for the HL-LHC circuits and concluding by a brief overview of the software used for the powering tests in this HWC phase as a recap from the two previous talks during the String day III.

**Author:** YAMMINE, Samer (CERN)

**Presenter:** YAMMINE, Samer (CERN)

**Session Classification:** Hardware Commissioning of the HL-LHC IT String

Contribution ID: 14

Type: **not specified**

## **Closed session of the advisors**

*Friday 27 September 2024 16:55 (30 minutes)*

**Session Classification:** Close Out

Contribution ID: 15

Type: **not specified**

## Visit to the HL-LHC IT String

**Session Classification:** Close Out



Contribution ID: 16

Type: **not specified**

## **Status of cryomagnets for the HL-LHC IT String (WP3/TE-MS)**

**Presenter:** Dr TODESCO, Ezio (CERN)

**Session Classification:** Upcoming main activities

Contribution ID: 17

Type: **not specified**

## AccTesting for the HL-LHC IT String (WP7/TE-MPE)

The Accelerator Testing framework has been used successfully to facilitate the execution and analysis of thousands of tests during the hardware commissioning campaigns of LHC and during its operations to qualify the powering systems. The presentation covers the extensions of AccTesting and its ecosystem needed to support the commissioning of IT String facility. Describes the framework that is used for the interactive analysis of the powering tests and its readiness for IT String.

**Presenter:** MNICH, Aleksandra (CERN)

**Session Classification:** Hardware Commissioning of the HL-LHC IT String

Contribution ID: **18**

Type: **not specified**

## Vacuum system (WP16/TE-VSC)

*Friday 27 September 2024 11:05 (20 minutes)*

The presentation will address the following topics:

- Vacuum leak tests and validation programs executed.
- Lessons learned during commissioning of SQXL and Cold Powering System.
- Installation and interconnecting leak test tooling preparations.
- Upcoming activities.

**Author:** MAAN, Willemjan (CERN)

**Presenter:** MAAN, Willemjan (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities

Contribution ID: 19

Type: **not specified**

## HL-LHC IT String Quality Assurance & Control (WP16/TE-MPE)

*Friday 27 September 2024 09:20 (15 minutes)*

This presentation provides a comprehensive overview of the Quality Assurance and Control processes implemented in the HL-LHC IT String. It describes the management of non-conformities related to the test stand, adhering to the policies established by the HL-LHC Project. It explains the tracking process of the validation tests conducted during installation and commissioning of the equipment. Additionally, the presentation covers the documentation and tools (including contribution documents, planning, and EVM) used to ensure effective project management. Finally, it discusses the communication strategy employed by the WP to report project advancements to a broader audience.

**Author:** HEREDIA GARCIA, Nicolas (CERN)

**Presenter:** HEREDIA GARCIA, Nicolas (CERN)

**Session Classification:** General session

Contribution ID: 20

Type: **not specified**

## Electrical Quality Assurance for the IT String (WP7/TE-MPE)

*Friday 27 September 2024 15:10 (15 minutes)*

The presentation will address the following topics:

- Status of the collaboration, (procedures, equipment, software...)
- Feedback of the experience of ElQA in the individual magnets and ScLink
- Plan and procedures for the IT String activities

**Author:** BEDNAREK, Mateusz Jakub (CERN)

**Presenter:** BEDNAREK, Mateusz Jakub (CERN)

**Session Classification:** Status / Lessons learned / Upcoming activities