WP6a System overview & requirements

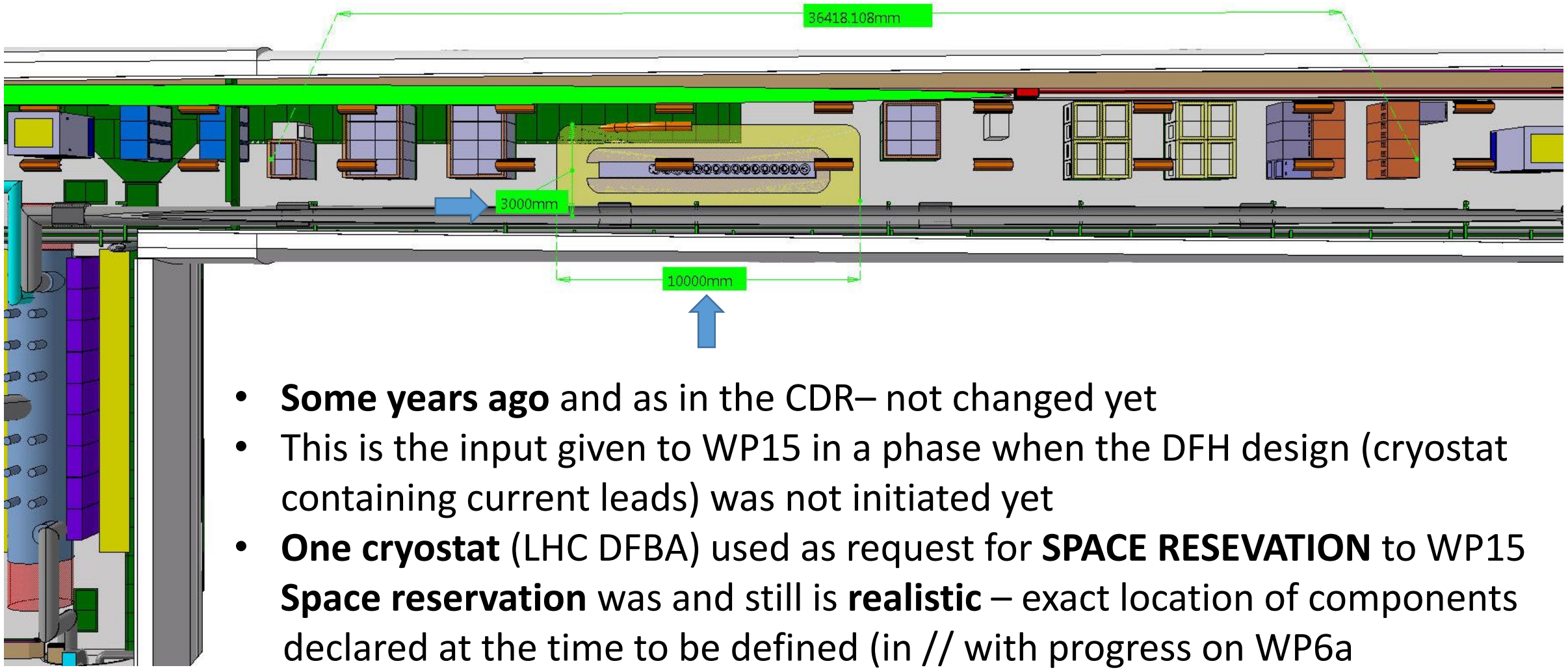
WP6a Integration Meeting, 22 Jan 2019

A. Ballarino

Scope of this (and next) Meeting(s)

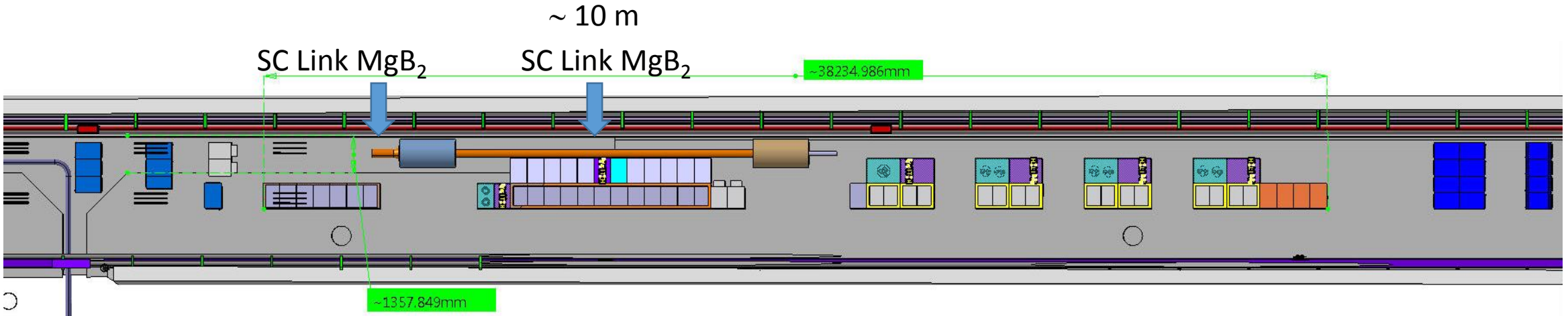
- Review requirements of WP6a (integration aspects)
- Define interfaces of WP6a to other electrical equipment (current leads to cables) – final design of series current leads in 2019
- Discuss/converge on integration of WP6a components in the tunnel (taking into account input from other systems nearby) – SC Link design being finalized, and series of cables being produced
- Discuss/collect information to be presented in a more advanced phase at the and at the MCF (in line with HL-LHC Project Structure)
- Next slides: evolution of integration studies

The baseline



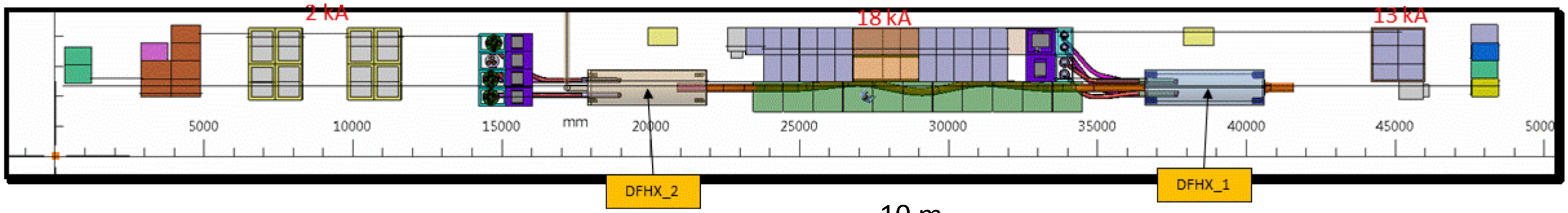
- **Some years ago** and as in the CDR– not changed yet
- This is the input given to WP15 in a phase when the DFH design (cryostat containing current leads) was not initiated yet
- **One cryostat** (LHC DFBA) used as request for **SPACE RESEVATION** to WP15
  Space reservation was and still is **realistic** – exact location of components declared at the time to be defined (in // with progress on WP6a components design)

Intermediate study



- DFH split into **two** (high current and low-current) **modules**
  This was done for easier arrangement of the splices inside the DFH, reduction of volume of the DFH and easier routing of the HTS superconducting cables connected to the current leads
- The two modules can be **attached** (very near-by) **or separated** by some additional length of SC Link
- **Boundary conditions**: high current cables spliced in the “first” DFH (where the full size SC Link terminates); length of HTS cables connected to the current leads not more than 3 m

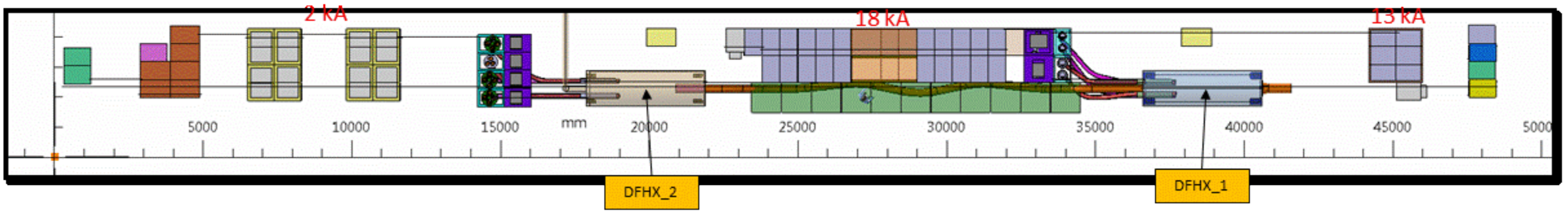
Presented at TCC in Dec 2018



~ 10 m

- **DFH 1**: four 18 kA current leads (four exits)
- **DFH2**: three up to 7 kA current leads and twelve 2 kA current leads (four exits)
- The optimum layout (wrt location of power converters) was found to be an additional length of SC Link of **~ 10 m**
- **Standardized** lead design (per current rating)
- **But**: Trim 7 kA leads far away from MQXF 18 kA leads

WP6a layout – January 2019



- **DFH 1**: four 18 kA current leads and three 7 kA current leads (5 exits)
- **DFH2**: twelve 2 kA current leads (3 exits)
- Optimum (wrt location of power converters) SC Link to be iterated
- Not yet discussed layout of **RT cables** corresponding to this configuration (with and/or without disconnections)
- To be observed: limitations on **forces on current leads terminals** (needed flexible connections) and **heat input** (specification document of Jerome Fleiter)