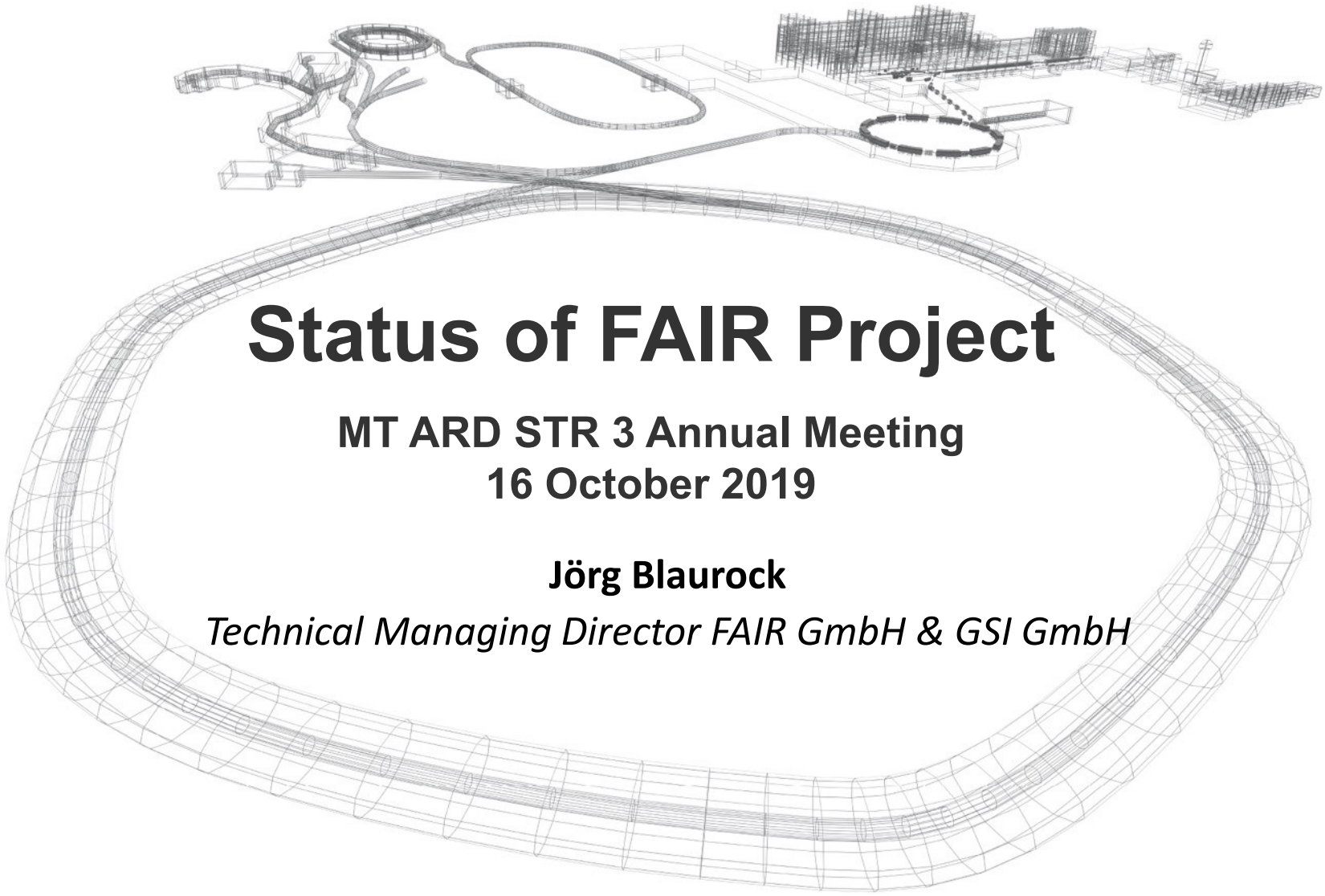


Status of FAIR Project

MT ARD STR 3 Annual Meeting
16 October 2019

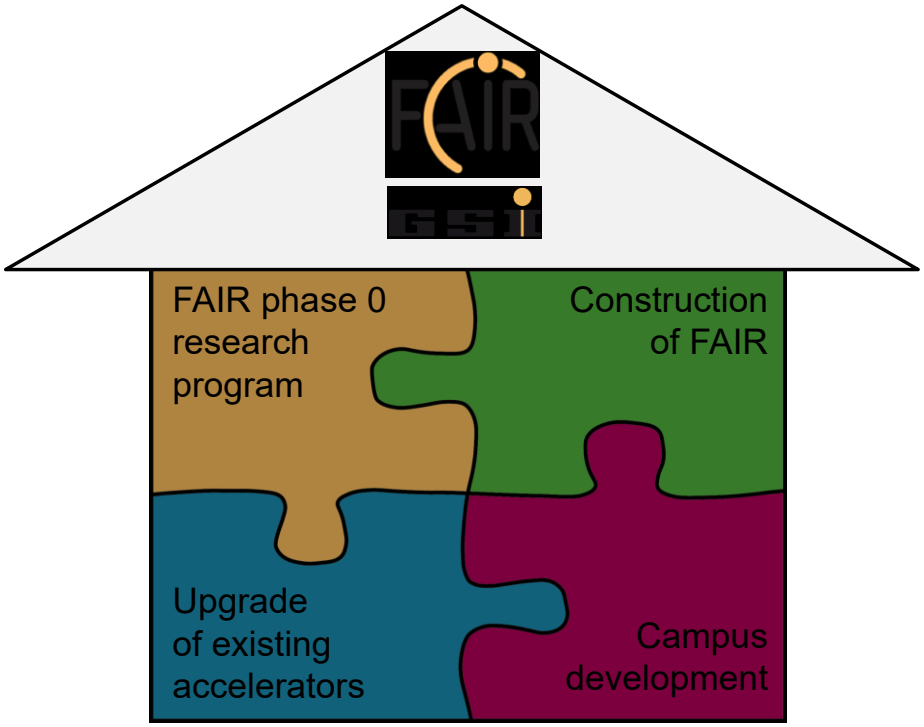
Jörg Blaurock

Technical Managing Director FAIR GmbH & GSI GmbH

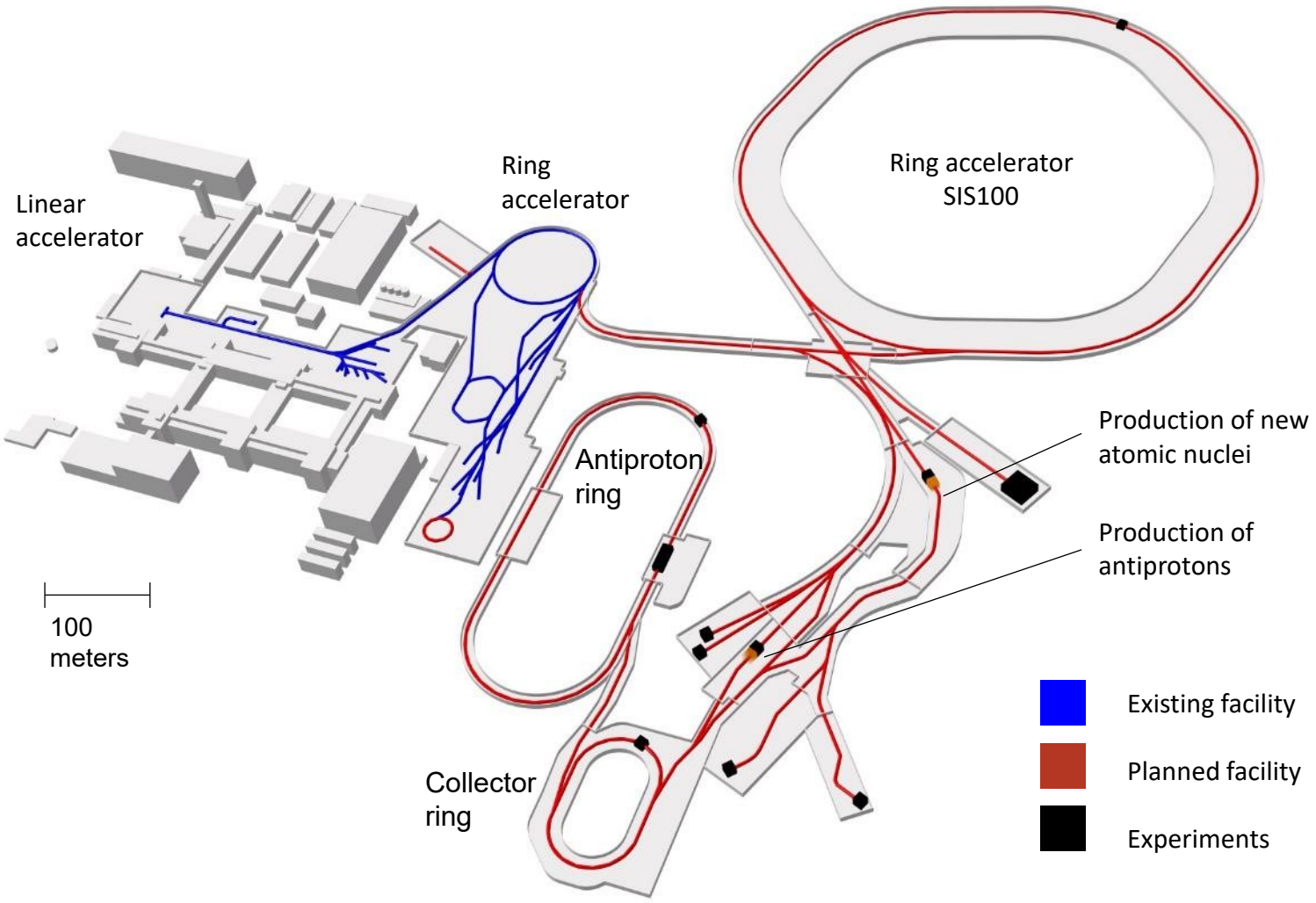
FAIR & GSI – Strategic objectives

Four strategic objectives

- Construction of FAIR
- FAIR phase 0 research program
- Upgrade of existing accelerators
- Campus development



FAIR – The Facility



Agenda

FAIR Recent Highlights

FAIR Project Progress

a. Accelerator

b. Civil Construction

c. Experiments

FAIR Recent Highlights (Part 1)

Celebration ceremony for testing of 55th SIS100 dipole magnet (50% of series) delivered by company BNG to GSI/FAIR

Ceremonial release to transport first batch of 67 pc. HEBT Power Converters from ECIL (India) to FAIR

FAIR Recent Highlights (Part 2)

In-Kind Contracts signed for

SIS100 Cryo Bypass Line and SIS100

Feedbox with WUST (Poland)

PANDA solenoid magnet:

Construction of all octants of the yoke

completed at BINP (Russia)

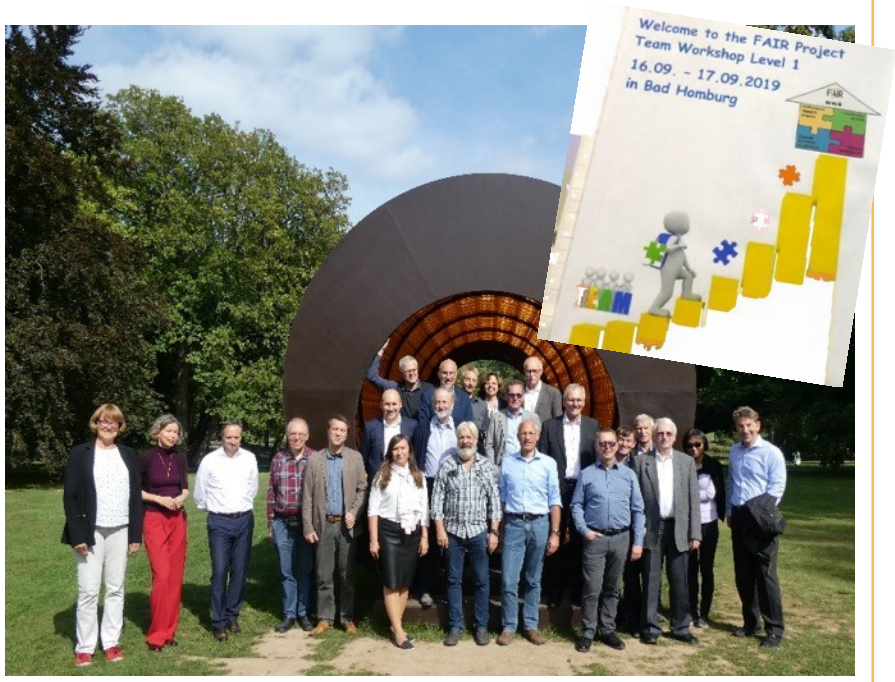
FAIR Recent Highlights (Part 3)

Tendering of further Technical Building Installation packages covering the full area AP1 started in the market

FAIR Project Level 1 Workshop on 16th & 17th Sept. 2019

Key Objective

- Focus on next key challenges / steps
- Strategy for S-FRS prioritization



Agenda

FAIR Recent Highlights

FAIR Project Progress

a. Accelerator

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c. Experiments

FAIR Project Progress – ACC
SIS100

- In-Kind Contracts signed for SIS100 Cryo Bypass Line and Feedbox with WUST (Poland)
- Production of Cryogenic Bypass Lines started
- Half of s.c. dipole series (55 pieces) manufactured and tested
- Integration of FOS quadrupole module completed
- Contract series testing of integrated modules with INFN (Salerno, Italy) signed
- Series production for thin wall dipole chambers progressing
- Production of injection septa power converters completed
- Series production of Cryo- Catchers started
- Tendering for main dipole- and quadrupole power converter ongoing

Cryo catcher Pfeiffer Vacuum

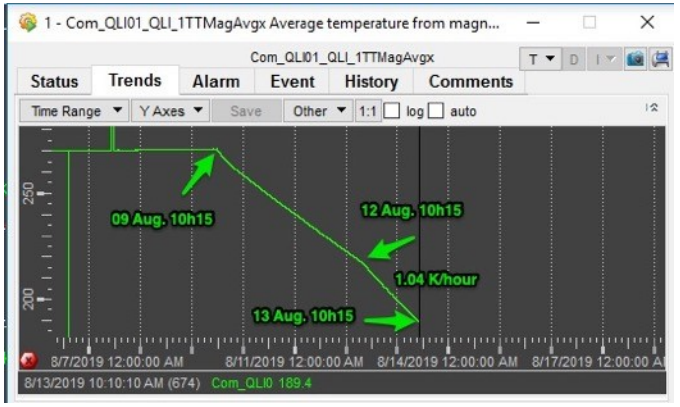
55. s.c. dipole magnets tested at STF

Integration of FOS quadrupole module

Acceleration cavities at RI

FAIR Project Progress – ACC
SuperFRS

- Test FoS sc magnets: cool down successful: magnets are under stable cold temperature, in liquid helium. Powering ongoing.
- Local cryogenics: Inkind contracts drafted and under discussion with Poland.
- Status of BINP IK-Contribution:
  - Kick off for NC dipoles in May 2019
  - Kick off for diagnostic vacuum chambers in May 2019
  - Contract for SC dipoles vacuum chambers signed (11/09/2019), kick off done.
  - NC multipoles: contract signed for R&D study prior to contract's signature, decision on IK due Nov. 2019
  - Negotiation ongoing for NC magnet chambers, other vacuum elements, and BPM detectors.
- Lateral iron shielding (relevant for shell construction): call for bids closed (20/09/2019), negotiations started
- Super-FRS Quench Detection system development will be used also at SIS100. Test system production ongoing

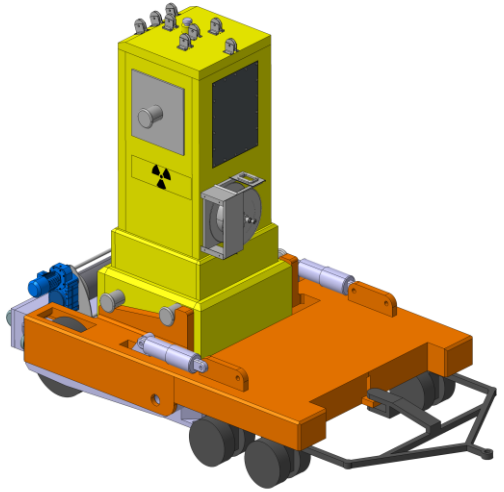


Cool down of first SC magnet at CERN

Delivery of first SC magnet at CERN

FAIR Project Progress – ACC
pLinac/ pbar Target

- Ladder-RFQ opened and machined to final geometry after first low level RF tests and succeeding simulations. Tuning continuing
- After successful copper plating tests for first CCH cavity preparation of copper plating with drift tube dummy
- Specification for pbar shielding flask for exchange of highly radioactive targets released



FAIR Project Progress – ACC
Collector Ring

- Series production of RF – debunchers has been finished. SAT of 2nd System under preparation
- Series production of Power Amplifiers (PA) for Stochastic Cooling is ongoing. 1st batch (8 from 34 pieces has been delivered)
- 8 CDRs and 2 FDRs have been accepted from BINP
- Production of FoS CR dipole magnet started
- 3rd BINP - FAIR Workshop will take place covering all aspects of all subprojects in Novosibirsk from 24th – 29th November 2019

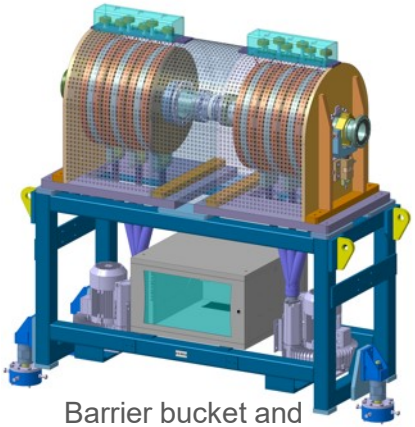
RF-debuncher

Power amplifiers for Stochastic Cooling

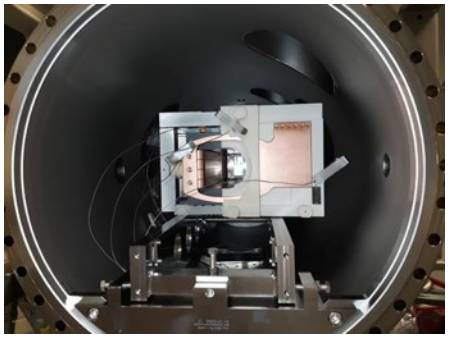
FAIR Project Progress – ACC
HESR

- All Dipoles are in Jülich. 39 (of 46) are delivered to FAIR
- All 84 Quadrupoles are in Jülich
- Romania: 31 (of 66) Sextupoles, 26 (of 53) steerers, 20 (of 87) power converters for these magnets are in Jülich
- Most other power converters are in Jülich
- RF cavity production has started
- Injection kickers in production
- 6 (of 7) Stochastic cooling tanks produced, beam position monitor and ion clearing chamber productions released

Sextupole & steerer power converters



Barrier bucket and acceleration cavity



Injection kicker assembly

Stoch. cool. kicker with girder

FAIR Project Progress – ACC
COMMONS

- Delivery of first batch (67 pcs.) of HEBT Quadrupole Power Converters from ECIL (India)
- 7 further Dipole magnets delivered from NIIEFA (total delivery 33 out of 51 to be delivered in total)
- First Prototype of Diagnostic Vac. Chamber (Indian In-Kind Contribution) delivered to GSI
- New Test facility for BPM Data Acquisition for software development of Slovenian In-Kind partner Cosylab @GSI

Agenda

FAIR Recent Highlights

FAIR Project Progress

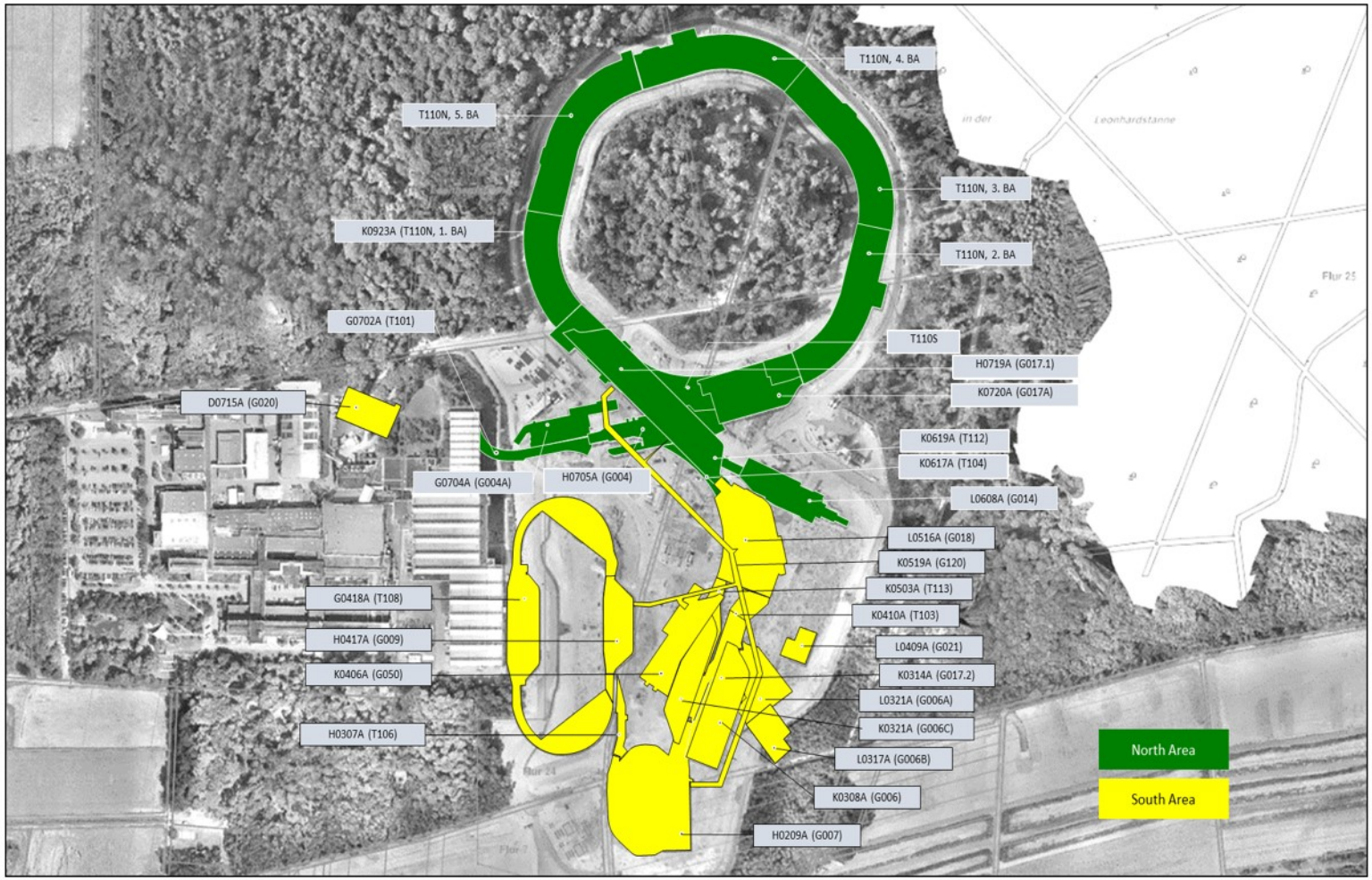
a. Accelerator

b. Civil Construction

c. Experiments

FAIR Project Progress - Civil Construction

FAIR Site & Buildings

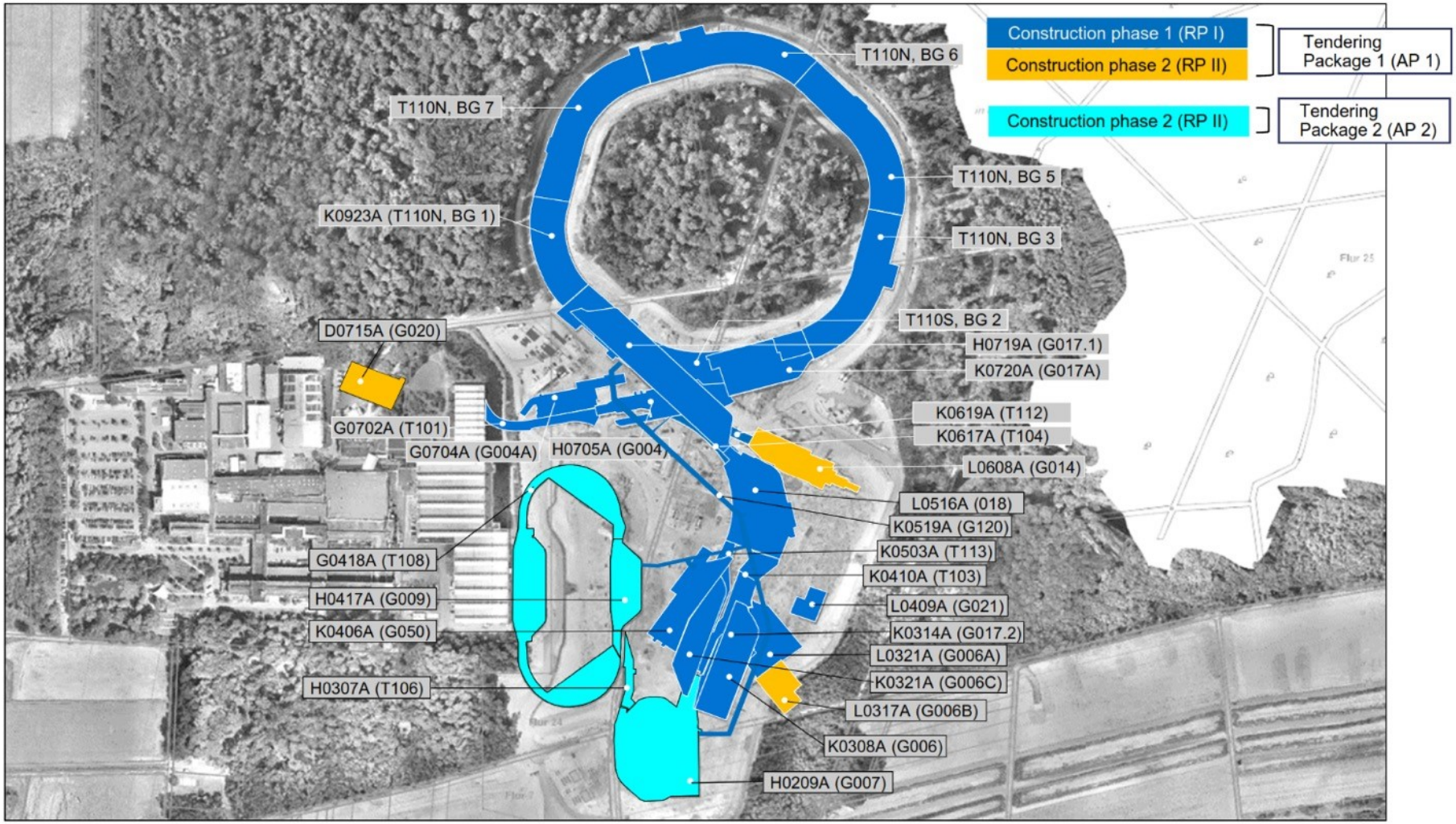


FAIR Project Progress - Civil Construction
FSB Procurement & Contracting

Pos.	Awarding Item	Company	Status	Contract Award Date
VE 300-025	Excavation Building Area „North“	ABN consortium	awarded	26.05.2017
VE 300-026	Building Shell Construction Area „North“	PORR	awarded	29.01.2018
VE 300-027	Site Logistics and Temporary Services	ZÜBLIN	awarded	19.03.2018
VE 300-028a	Elevators	TAG	awarded	09.04.2018
VE 300-029	Site Power Supply and Site Security	GAT	awarded	29.01.2018
VE 300-031	Building Shell Construction Area „South“	-	Under negotiation	forecast Dec. 2019
VE 400-008	Special Cranes	Rudolf Fritz	awarded	24.06.2019
VE 400-009	Normal Cranes	AXXIA	awarded	27.08.2019

FAIR Project Progress - Civil Construction
FSB Procurement & Contracting

Contracting strategy for Technical building Installations (Mechanical & Electrical & Process (MEP))



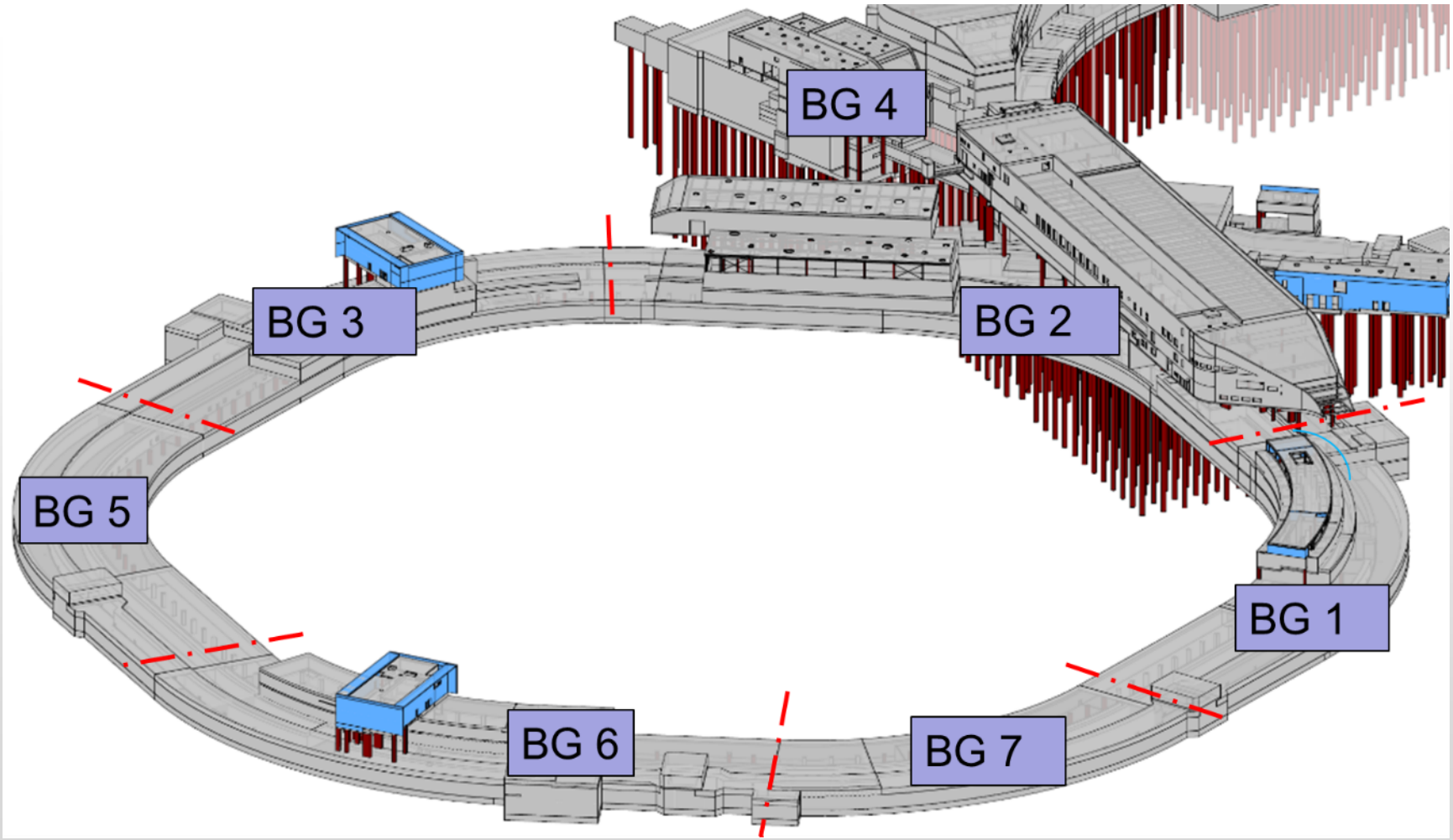
FAIR Project Progress - Civil Construction
FSB Procurement & Contracting

Mechanical & Electrical & Process (MEP) Awarding Package AP1

Pos.	Awarding Item	Specifications	Status	Planned Contract award date
VE 400-001	Ventilation	Ventilation	published on 26.09.2018	forecast Q1 / 2020
VE 400-003	Sanitary / Technical Gases	Water and Wastewater, Compressed Air	published on 25.09.2018	forecast Q1 / 2020
VE 400-005	Heating/ Cooling	Heating and Cooling, Chilling Process	published on 10.10.2018	forecast Q2 / 2020
VE 400-0021	Electrotechnical	Mainpower supply	published on 29.07.2019	forecast Q2 / 2020
VE 400-0022	Electrotechnical	Power distributions (north 1)	published on 29.07.2019	forecast Q2 / 2020
VE 400-0023	Electrotechnical	Power distributions (north 2+south)	publishing 28.10.2019	forecast Q3 / 2020
VE 400-0024	Electrotechnical	VE 400-0024: machines cables (user cables)	publishing 18.10.2019	forecast Q3 / 2020
VE 400-027	Safety and Security Systems	Fire Detection System, BOS- Radio, Access Control / Door Controls	published on 14.03.2019	forecast Q2 / 2020
VE 400-004	Firefighting Systems	Firefighting Systems, High Pressure Water-mist Systems	published on 22.10.2018	forecast Q1 / 2020
VE 400-006	Building & Process Automation Systems	Automation Systems, Control panels, Operation Facilities, various Building Automation Systems	published on 30.07.2019	forecast Q2 / 2020

FAIR Project Progress
Civil Construction

Overview of Excavation Pits area north



FAIR Project Progress
Civil Construction

Area North: Pit 1 (BG1) Pit 2 (BG2)

Construction work in pit 1 (BG1)
Tunnel SIS100

- concrete works for ground slabs completed.
- concrete works for walls and columns in level U30 completed.
- concrete works for ceilings in level U30 completed.
- sealing and backfill works in progress.

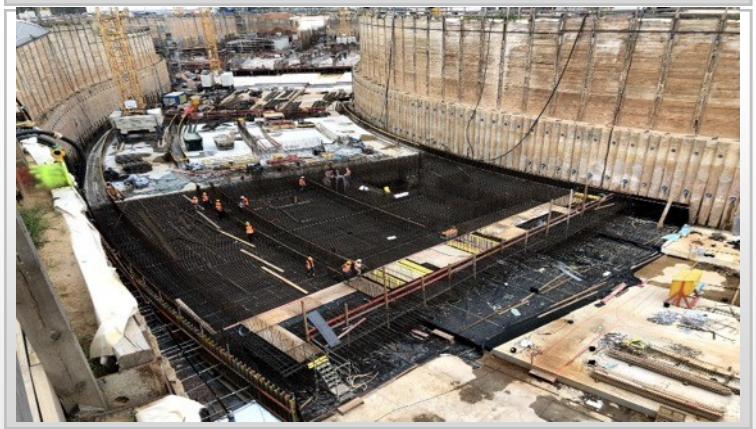
Construction work in pit 2 (BG2)
Tunnel SIS100 & Transfer Building G004

- concrete works for ground slabs completed.
- concrete works for walls and columns in level U30 completed.
- concrete works for ceilings in level U30 completed.
- sealing and backfill works in progress.

FAIR Project Progress
Civil Construction

Area North: Pit 3 - 6 (BG3 – BG6) work is ongoing

Excavation work @ pit 3 (BG3)



Excavation work @ pit 4 (BG4)

Excavation work @ pit 5 (BG5)

Excavation work @ pit 6 (BG6)

Civil Construction – Next Steps

- Continuation of civil detailed design process
- Continuation of civil works in area north
- Award of civil works construction area south in Dec. 2019
- Continue tender process for technical building installation packages (MEP) targeting at contract award mid 2020

Agenda

FAIR Recent Highlights

FAIR Project Progress

a. Accelerator

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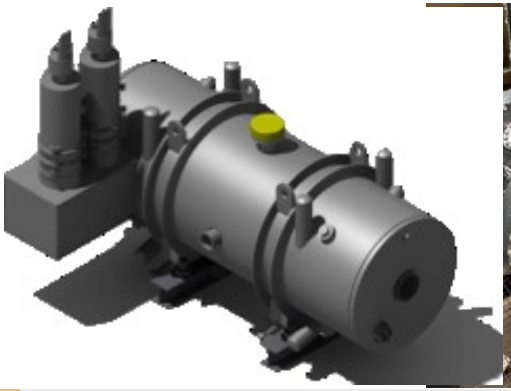
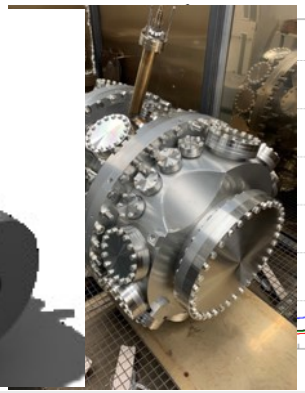
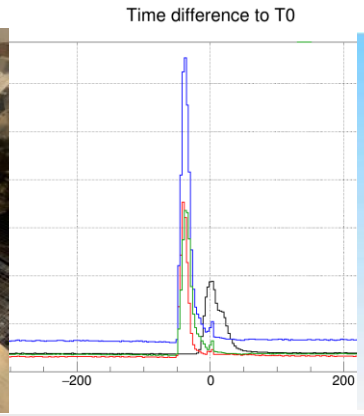
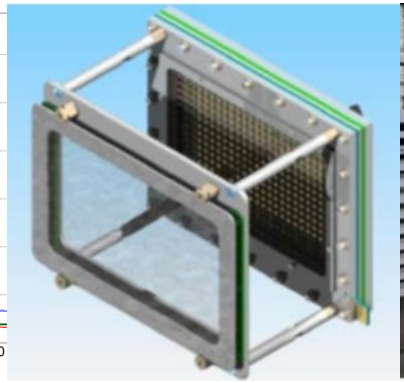
FAIR Project Progress – Experiments

Main Achievements

- Final Design Reviews for two large systems of APPA HED@FAIR and SPARC were successfully completed, construction of components progressing. For SPARC the CARME construction is very advanced.
- The CBM collaborations has successfully demonstrated the viability of its future data acquisition concept through the analysis of data taken with the mini-CBM setup in the FAIR Phase-0 beam time.
- The NUSTAR collaboration has concluded the technical design of several components and submitted TDRs for evaluation by the ECE.
- For PANDA, the construction of all octants of the yoke of the large solenoid magnet was completed at the manufacturing company in Russia and the tender for the Barrel DIRC quartz bars was successfully concluded.




Thank you for your attention !