

# **Status of FAIR Project**

**- NUSTAR Collaboration Meeting 2019 -**

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*Site Manager FAIR GmbH & GSI GmbH*

*27. February 2019*

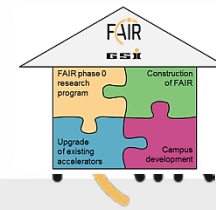
## FAIR Highlights

### FAIR Progress Status by Subproject

- a. Accelerator
- b. Civil Construction

### FAIR Next Steps

# FAIR Highlights (Part 1)

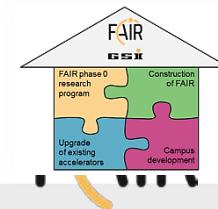


Start of concrete pouring in pit 1 of SIS 100 Tunnel on 2nd August 2018





# FAIR Highlights (Part 2)



The CR rest contract between BINP and FAIR has been signed on 26th June 2018

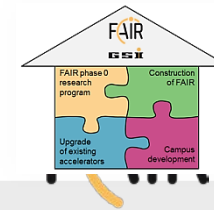


Eugene Levichev, Ursula Weyrich, Jörg Blaurock, Ivan Koop

Testing facility for Super-FRS Magnets at CERN ready for use



# FAIR Highlights (Part 3)



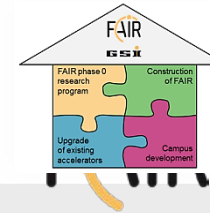
## FAIR Project Level 1 Workshop on 20th & 21st Sept. 2018

Key Objective : -> Roadmap to Project Review April 2019 and  
-> Re-baselining of overall project time schedule

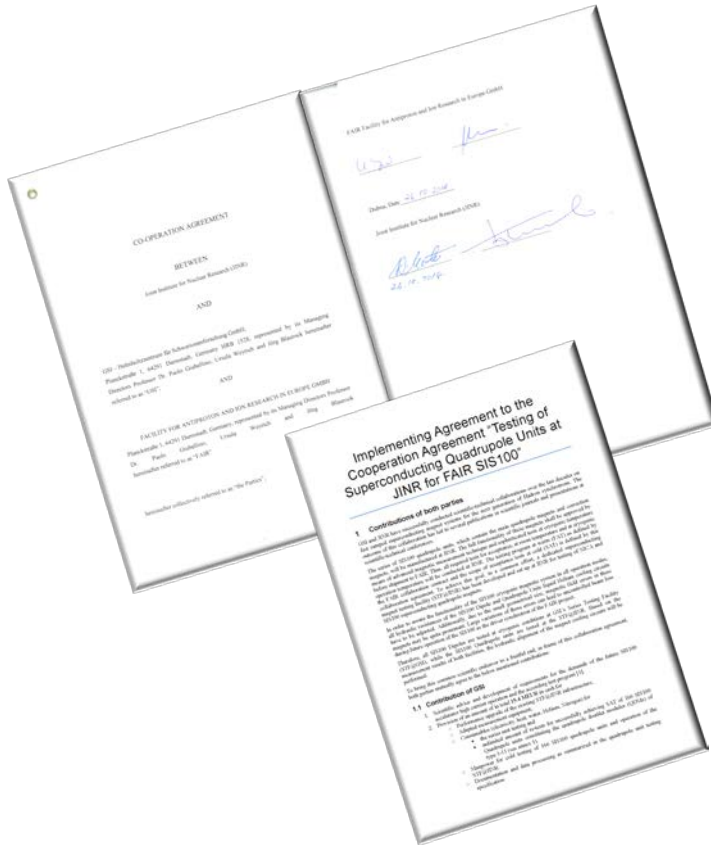




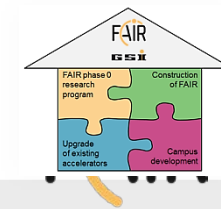
# FAIR Highlights (Part 4)



## Contract for Testing of SIS100 Quadrupole Units signed with JINR on 26th Oct. 2018



# Agenda



FAIR Highlights

FAIR Progress Status by Subproject

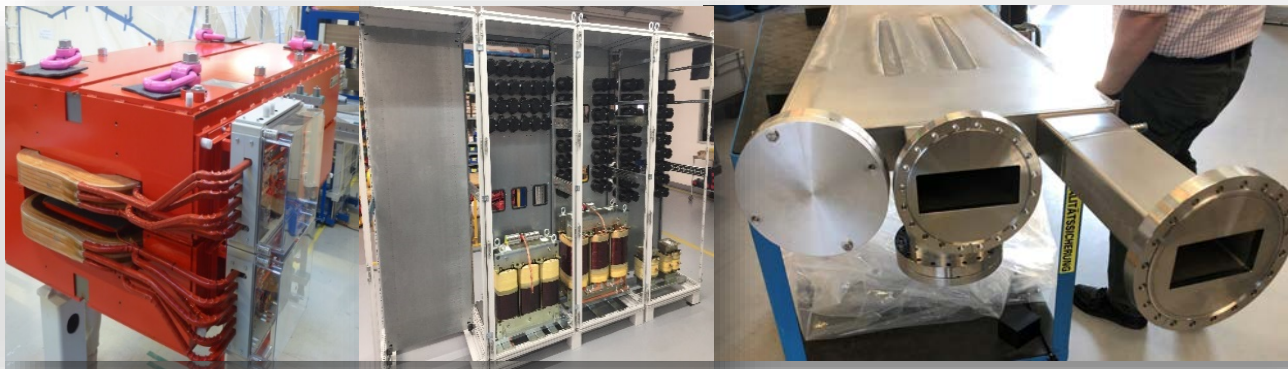
a. **Accelerator**

b. Civil Construction

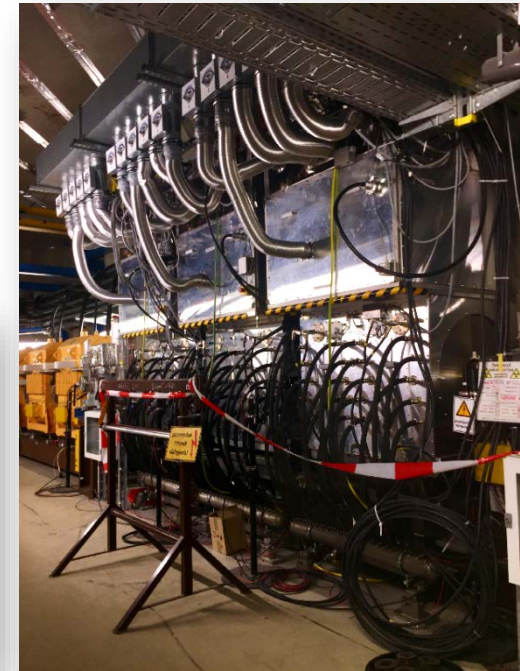
FAIR Next Steps

## SIS18: Re-commissioning with beam

- Re-commissioning of SIS18 with beam took place in May 2018
- FAIR control systems standards for SIS18 is now available with new hard- and software and the new LSA set-value generation
- Three new MA acceleration cavities installed and commissioned with beam
- Concrete and ground works of GAF project completed



Bipolar dipole magnet, power converter and chamber for the connection of beam transport line to SIS100 ready for installation



New acceleration cavities



# FAIR Project Progress – ACC



## SIS100

- 36 sc dipole modules manufactured at BNG and 22 shipped to GSI and tested
- Series production released for thin wall dipole chambers with LHe cooling
- Quadrupole (QP) modules:
  - Contract for integration and manufacturing signed with BNG
  - FOS quadrupole units shipped from JINR to BNG for integration into FOS module
  - Contract for series testing of quadrupole units at JINR signed on 26th of October 2018
  - Quadrupole module testing INFN, Salerno (Italy) - agreement under finalisation
- FOS acceleration cavity accepted after extensive SAT test at GSI
- 8 (of 9) bunch compression cavities manufactured at Aurion
- Contract for electrostatic extraction septum signed and manufacturing started
- Production of injection septa and injection kicker system running
- Series production of cryo-catchers launched
- Series production of cryo-adsorption pumps running



sc dipole modules in GSI storage area



QP Unit @ BNG



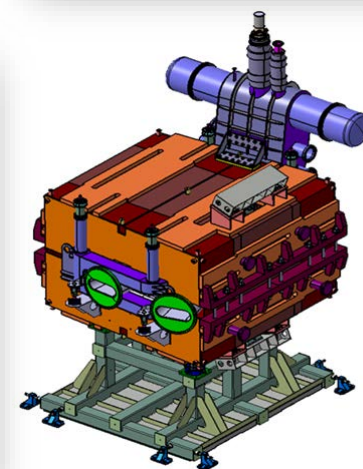
Resonance sextupole magnets

# FAIR Project Progress – ACC



## Super- FRS

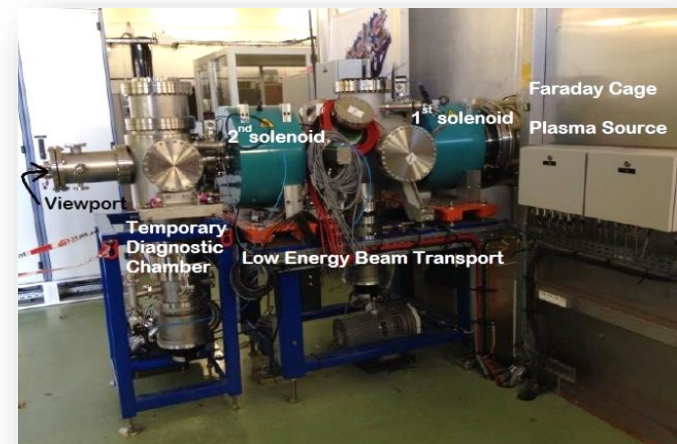
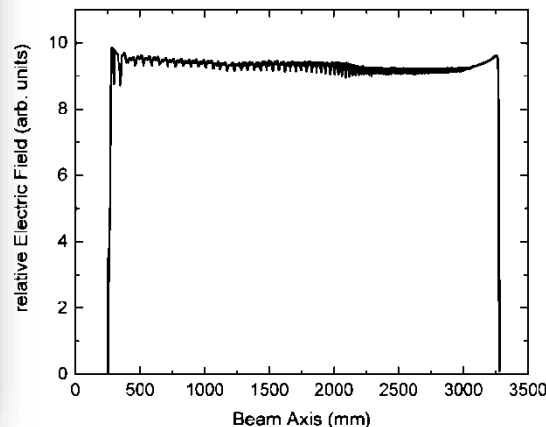
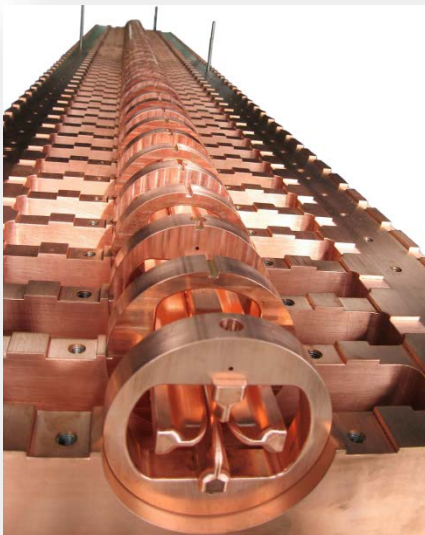
- Production of FoS sc short multiplets running, delivery to CERN for testing expected in February 2019
- Production of FoS sc long multiplet started
- Testing Facility for sc magnets at CERN is ready for use
- Design verification phase of sc standard dipole running
- Design phase of sc branching dipole finalized
- Design phase of PC prototype finalized
- 1<sup>st</sup> version quench detection electronics developed
- Various IKC for detector systems drafted (beam profiler, tracking detectors, scintillators, drives, etc.) and in negotiation with in-kind partners
- Production of slit systems running



# FAIR Project Progress – ACC

## pLinac/ pbar Target

- Commissioning of ion source at CEA in progress
- First low level RF test for ladder-RFQ performed. Excellent agreement with theoretical predictions (see flatness plot)
- Seven klystrons on site. SAT progressing.
- Experiment at CERN's HiRadMat facility to test pbar targets successfully done. Data analysis in progress





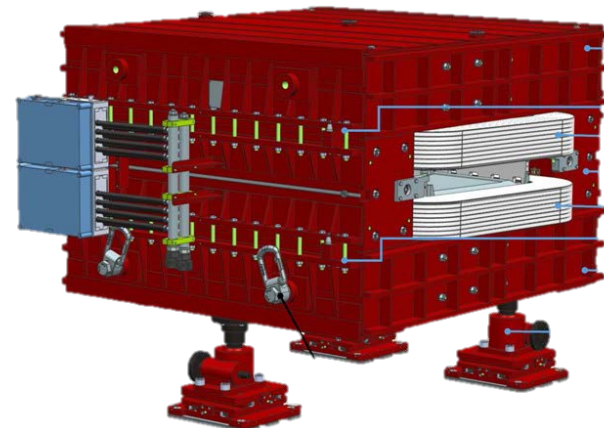
## Collector Ring

- 90 % of CR specifications has been released
- The series production of RF – debunchers is ongoing
- CR Rest Contract with BINP (Russia) has been signed in June 2018
- Power amplifier prototype for Stochastic Cooling system has been produced and SAT successfully tested
- 1st BINP - FAIR Coordination Workshop performed on 5th - 9th November 2018 in Novosibirsk covering all aspects of the collaboration between FAIR and BINP for all subprojects

FoS RF-debuncher



CR dipole design



# FAIR Project Progress – ACC



## HESR

- All Dipoles are produced, in Jülich and 65% are delivered to FAIR
- Quadrupoles (QP) are all produced in Jülich
- Two assembly lines for the quadrupole groups in the arcs are in preparation
- Sextupoles, steerers and their power converters are in production (Romania), magnets arriving continuously in Jülich
- Nearly all other power converters are produced, in Jülich.
- RF equipment is in mechanical design
- Stochastic cooling equipment, Beam diagnostics and Injection kickers are in production



# FAIR Project Progress – ACC



## Commons

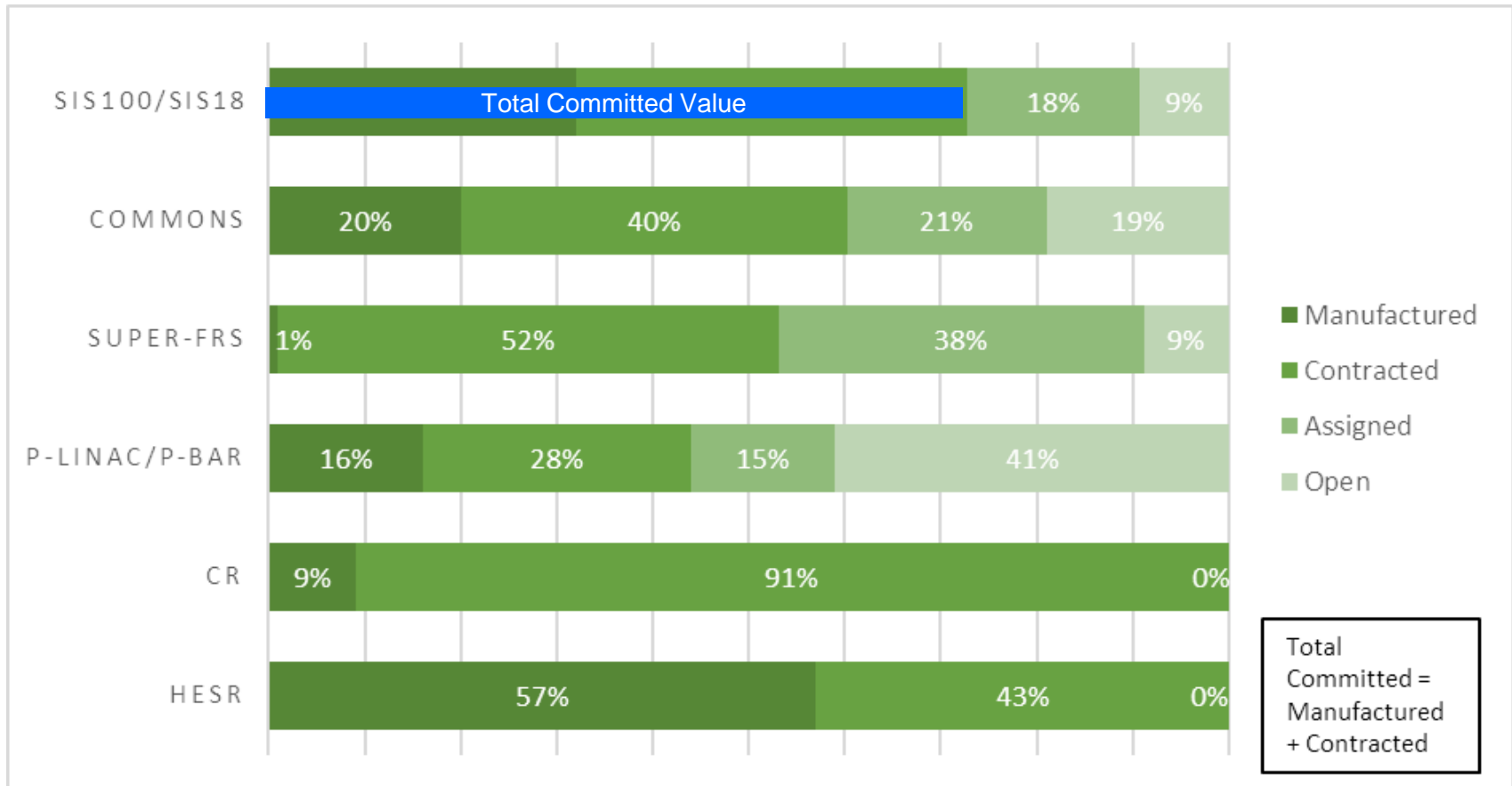
- All 51 HEBT vacuum chambers of batch 1 delivered (BINP, Russia)
- 21 of 51 HEBT Dipoles from serial production delivered (Efremov)
- Delivery of 1st 6 series Power Converter from India, (ECIL, India)
- GSI control room refurbished with new prototype FAIR consoles and fixed displays, 1<sup>st</sup> basic and generic set of control room applications developed
- Transformer station south started operation, now supplying FAIR construction site FAIR with electrical energy
- Cable data base set-up finalized with all cable parameters required for a reliable cost estimation and execution of cable related tasks for the project





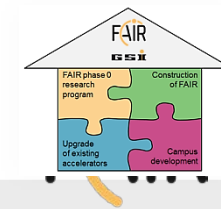
# Manufacturing Progress per Subproject

based on Costbook @2005 with Data Date: 31.08.2018



- Substantial commitment and manufacturing progress in all areas of the accelerator

# Agenda



FAIR Highlights

FAIR Progress Status by Subproject

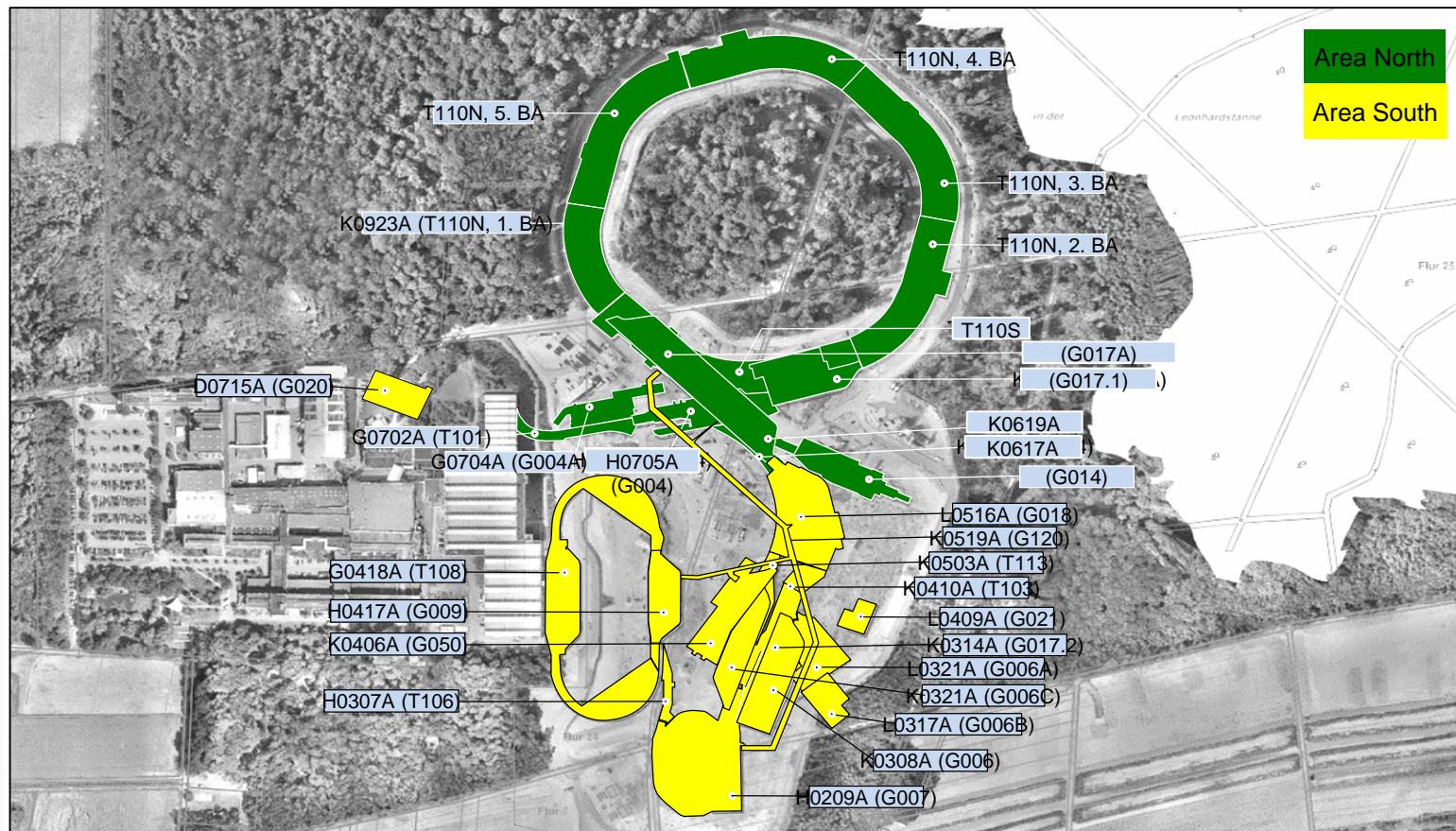
a. Accelerator

**b. Civil Construction**

FAIR Next Steps

# FAIR Project Progress – Civil Construction

## FAIR Site & Buildings





# FAIR Project Progress



Drone Video – December 2018



Dateiname: 2018-12\_FAIR Drone film EN.mp4

# FAIR Project Progress – Civil Construction



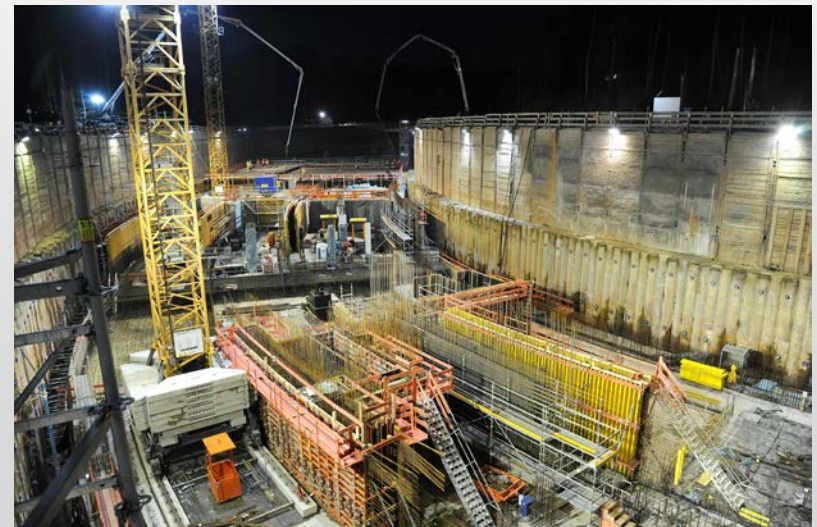
## Excavation and Concrete Pouring in area north



## Preparation of ceiling slab for first tunnel sections



## Excavation pit 1 – Tunnel section.



## Excavation Transfer Building and CBM Cave





# FAIR Project Progress – Civil Construction



Construction site infrastructure installed by company PORR



# FAIR Project Progress – Civil Construction

## - Status Procurement and 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“	-	published on 04.09.2018	
VE 300-028b	Special Cranes	-	published on 04.09.2018	
VE 300-028c	Normal Cranes	-	published on 04.09.2018	

# FAIR Project Progress – Civil Construction

## - Status Procurement and Contracting

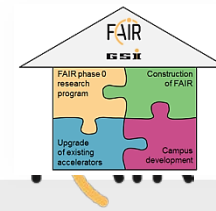


### Technical building installations (Mechanical & Electrical & Process Automation) Package 1

Pos.	Awarding Item	Specifications	Status	Planned Contract award date
VE 400-001	Ventilation	Ventilation	published on 26.09.2018	Q4 2019
VE 400-003	Sanitary / Technical Gases	Water and Wastewater, Compressed Air	published on 25.09.2018	Q4 2019
VE 400-005	Heating / Cooling	Heating and Cooling, Chilling Process	published on 10.10.2018	Q4 2019
VE 400-002	Electrotechnical Facilities	High-voltage, Telecommunication and IT, Data System, Ducts and Tracks, Building & Process Automation Systems	published on 28.09.2018	Q4 2019
VE 400-007	Safety and Security Systems	Fire Detection System, BOS-Radio, Access Control / Door Controls	published on 08.10.2018	Q4 2019
VE 400-004	Firefighting Systems	Firefighting Systems, High Pressure Water-mist Systems	published on 22.10.2018	Q4 2019
VE 400-006	Building & Process Automation Systems	Automation Systems, Control panels, Operation Facilities, divers Building Automation Systems	Not yet published	Q2 2020



# Agenda



## FAIR Highlights

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## FAIR Next Steps

# Summary of next project steps



- Continue civil construction works area north
- Submission of 1<sup>st</sup> tenders for civil works construction of area south in Q1 2019
- Submission of 1<sup>st</sup> tenders for Technical buildings installation in Q1 2019
- Continue tendering and award of accelerator components as per priorities
- Continue follow-up of series production of accelerator components and execution of related FAT and SAT to ensure quality
- Continue specific testing of accelerator components as planned
- Re-baselining overall project time schedule completion in Q1 2019
- Execute International Project Review until April 2019

# FAIR : Facility for Antiproton and Ion Research



Thank you !

