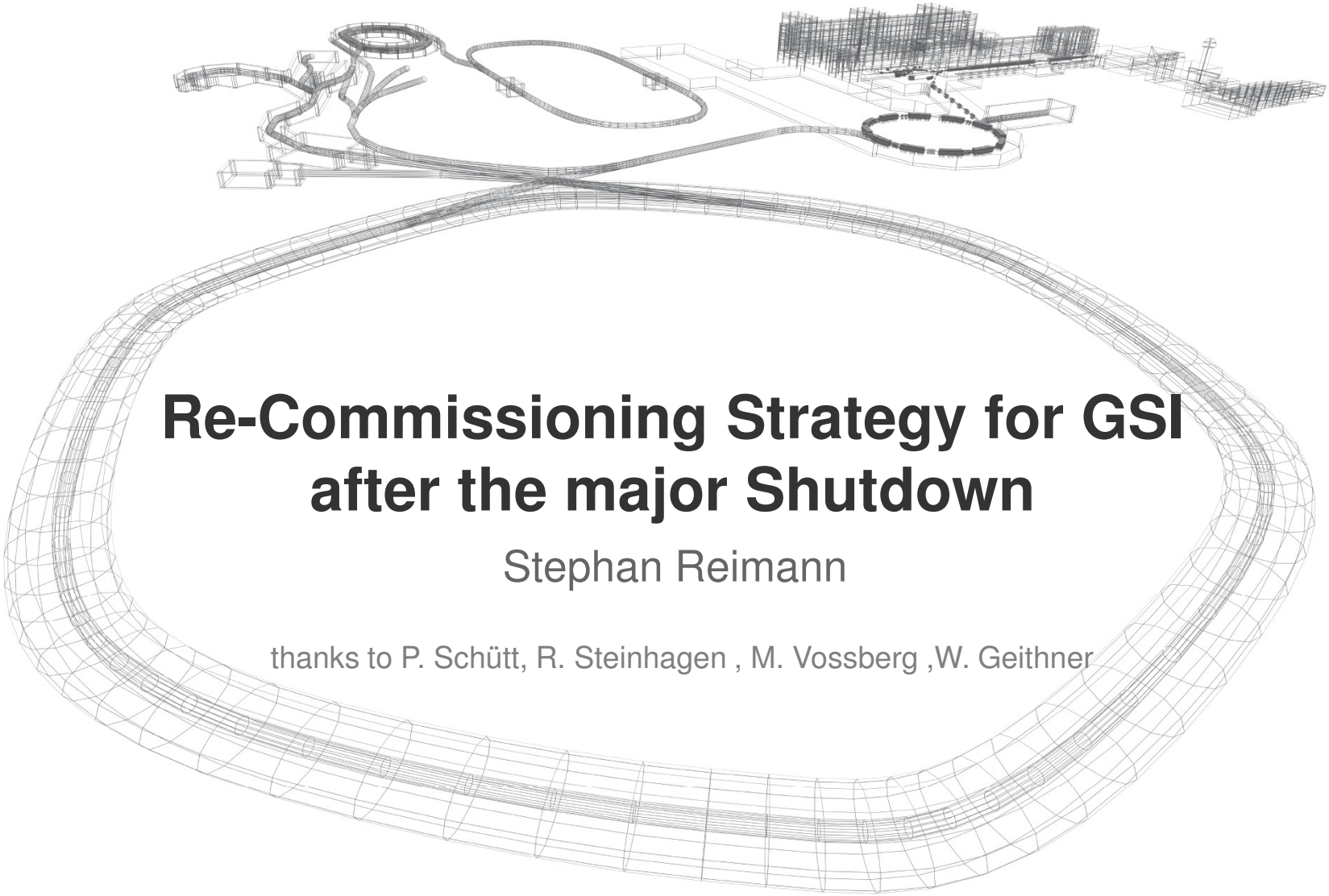


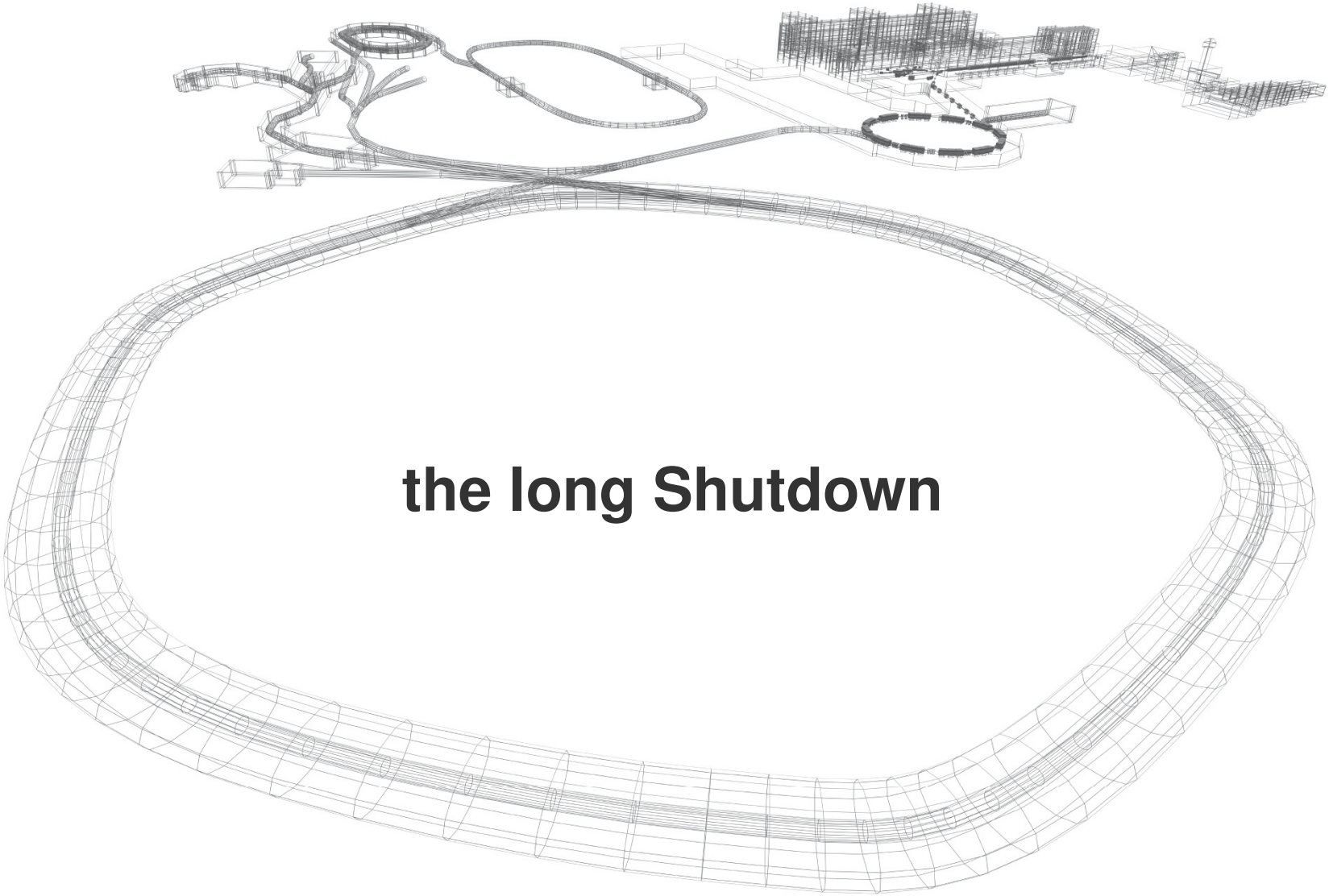
# Re-Commissioning Strategy for GSI after the major Shutdown

Stephan Reimann

thanks to P. Schütt, R. Steinhagen , M. Vossberg ,W. Geithner

# Outline

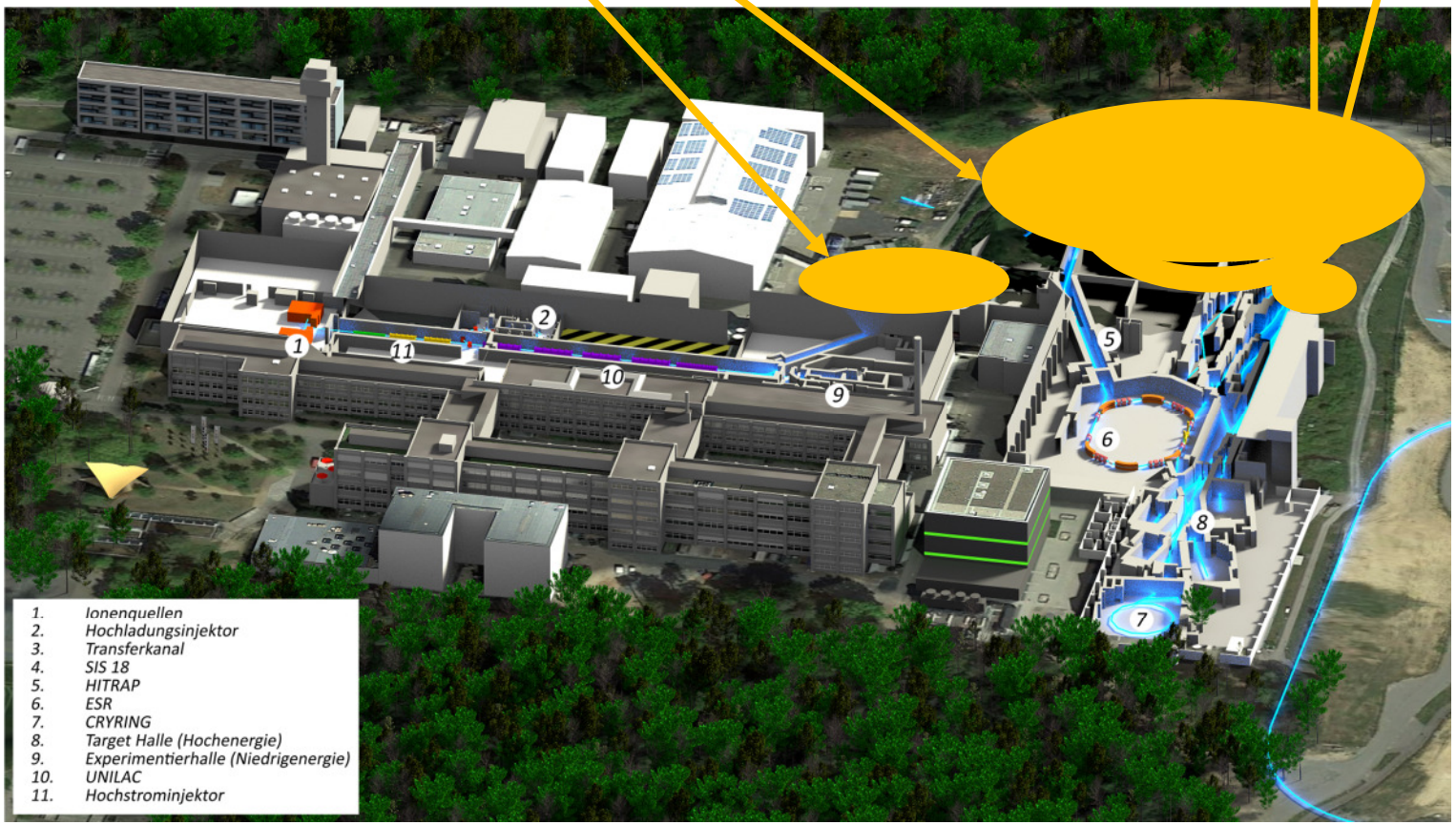
1. The long Shutdown
2. Beam Time 2018
3. Re-Commissioning



# the long Shutdown

# The long shutdown – civil construction

- Shielding SIS18
- p-Linac building
- Fire protection measures
- Connection to SIS100

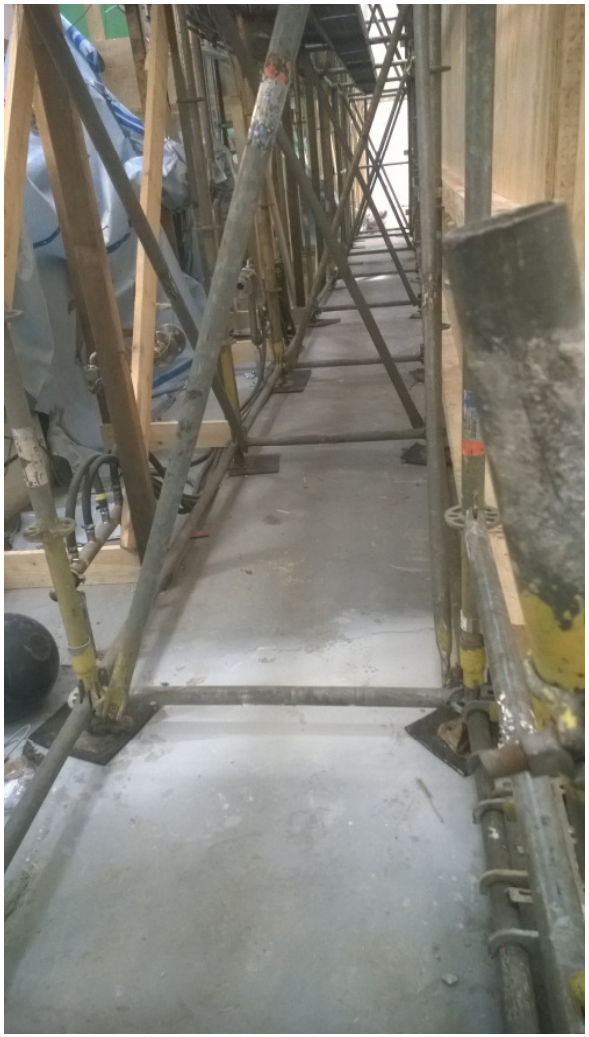



Thanks to
W. Geithner

# The long Shutdown
# Connection to SIS100

# The long shutdown
# Shielding SIS18 + preparation p-Linac

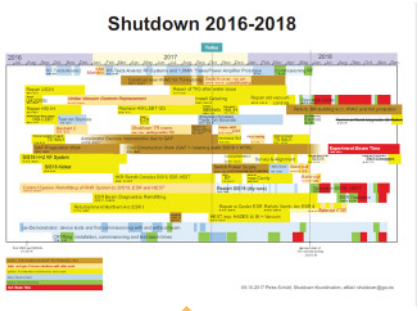
# The long Shutdown
# accelerator tunnel – foil coverage

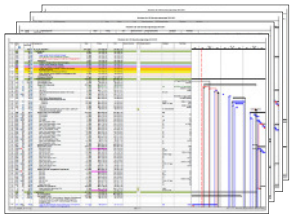


# The long shutdown – 8 projects 2017 + SIS18 upgrade program

| Project | Accelerator Section |
|---|---|
| Installation new LEBT QQ | UNILAC |
| Refurbishment Poststripper RF FOS | UNILAC |
| Upgrade Beam line SIS18 to HADES | HEST |
| Retrofitting ESR beam instrumentation | ESR |
| Commissioning Cryring | Cryring |
| Alignment SIS18/HEST/ESR/Cryring | SIS18/HEST/ESR/Cryring |
| Upgrade Main Control Room | SIS18/HEST/ESR/Cryring |
| FAIR Migration SIS18/HEST/ESR controls | SIS18/HEST/ESR |
| SIS18 upgrade | SIS18 |

# The long shutdown - schedule



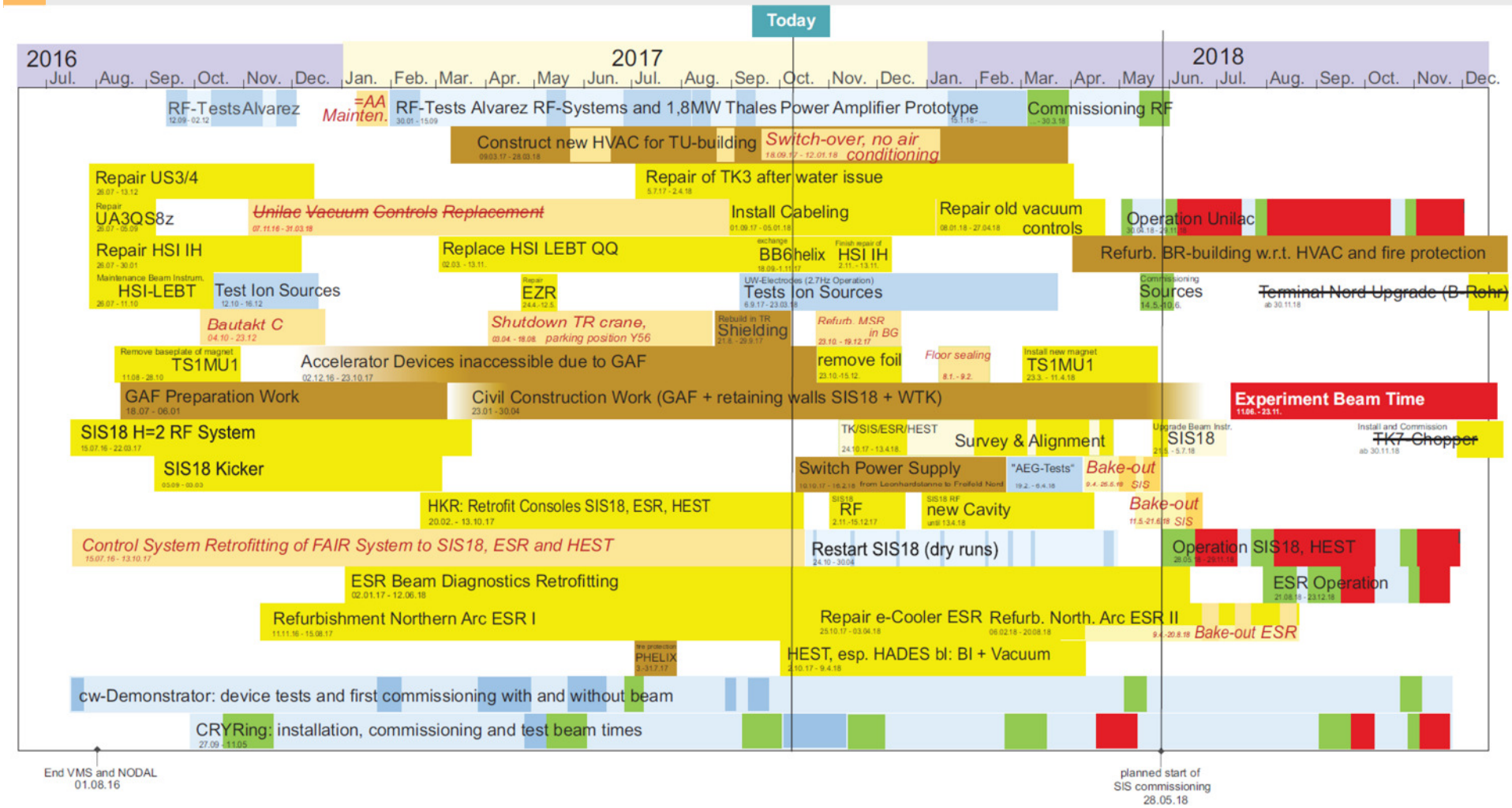



2000 tasks
15 pages

weekly shutdown meeting

8 projects + SIS18 upgrade program + GAF + standard maintenance and upgrade measures

# Overview Schedule



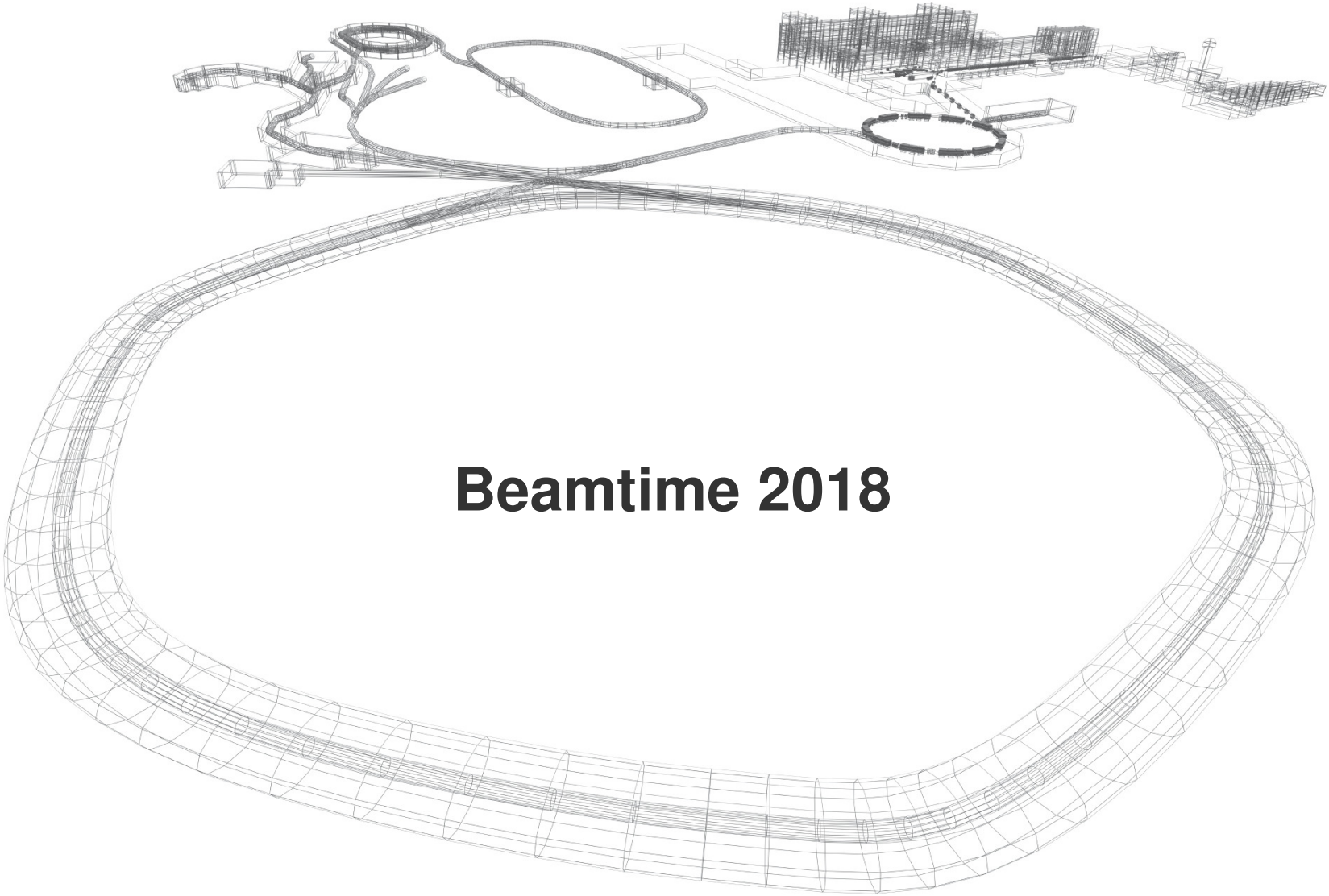

@work → operations

# Further challenges

- water accidents in connection to site construction
- hall crane issues
- FAIR-project

# After all

- Would you promise a user beam time for next year?

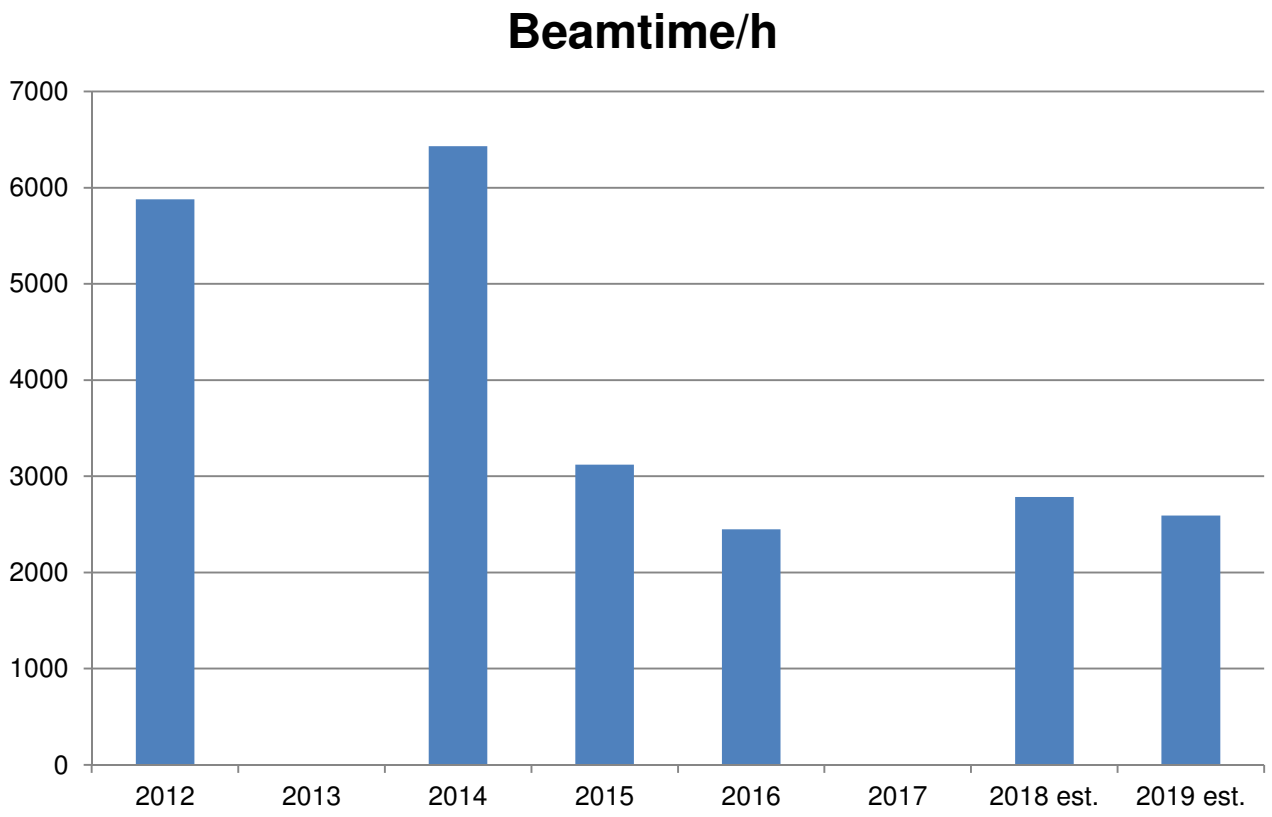


# Beamtime 2018

# Beamtime 2018


@work → operations

# comparison to the years before



# “full operation” - User Beamtime

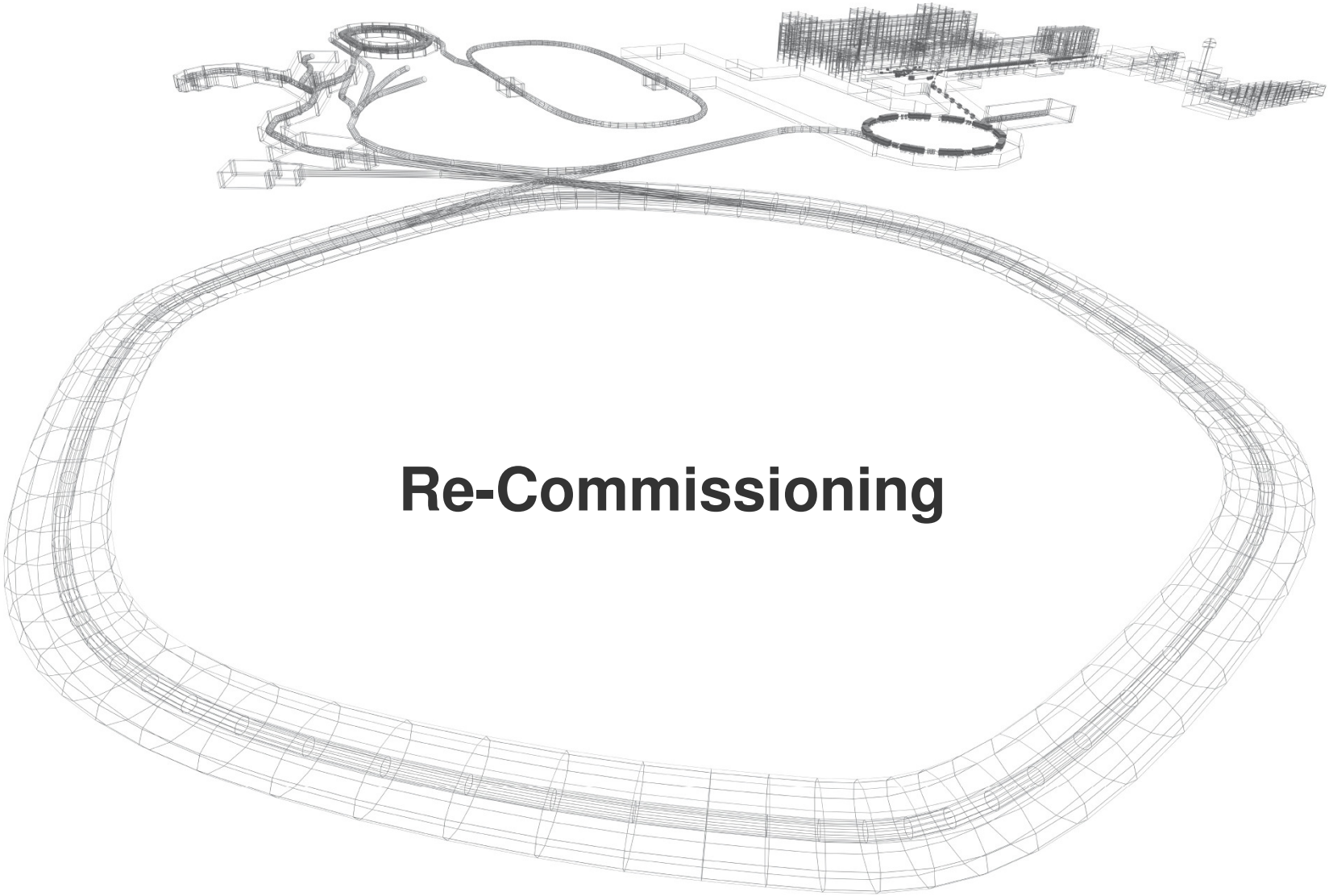
- 2784h for experiments using UNILAC-beam
- 1752h for experiments using SIS18-beam
- 120h for ESR and Cryring

accepted experiment proposals

- UNILAC: 47
- SIS18: 13
- Cryring@ESR: 1

reduced parallel operation, less flexibility, less setting changes

**nevertheless all machines have to be fully operational**



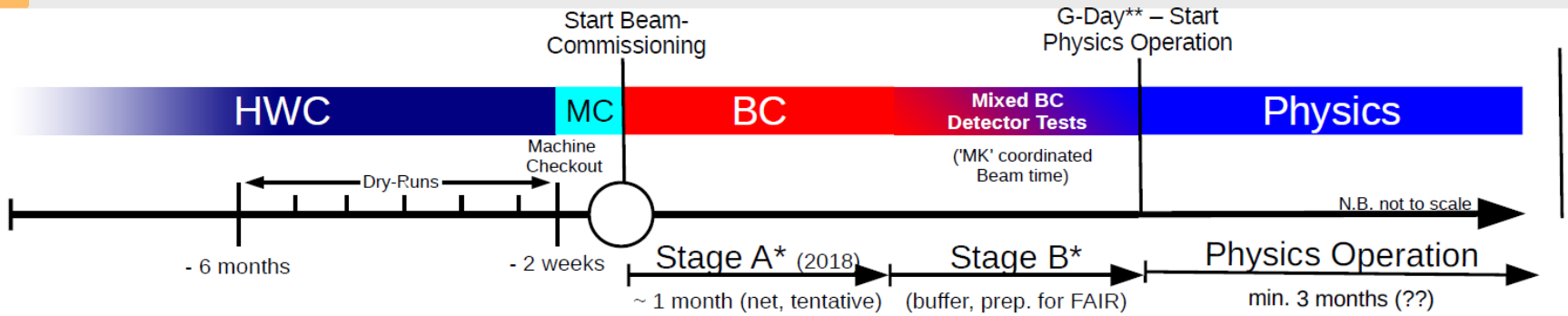
# Re-Commissioning

# Commissioning challenges

- many hardware upgrades & changes
- new control system stack for SIS18, HEST, ESR, Cryring
- new applications, tools, features
- minimize impact to FAIR project (resp. support it)
- Even without site construction and major upgrade measures, after 2 years you cannot easily switch on everything and expect it to run smoothly
- operation processes need to be practiced

→ Next year is similar to commission a new accelerator facility

# Use concept of FAIR commissioning also for the existing facilities




- **HWC (hardware commissioning)**
  → within global shutdown schedule, but planned and carried out by technical departments

- **MC (machine checkout)**
  → standard commissioning without beam, but more automation

- **BC (beam commissioning)**
  → much longer as usually in GSI history

- **Dry Runs**
  → never done at GSI before

# Re-commissioning strategy

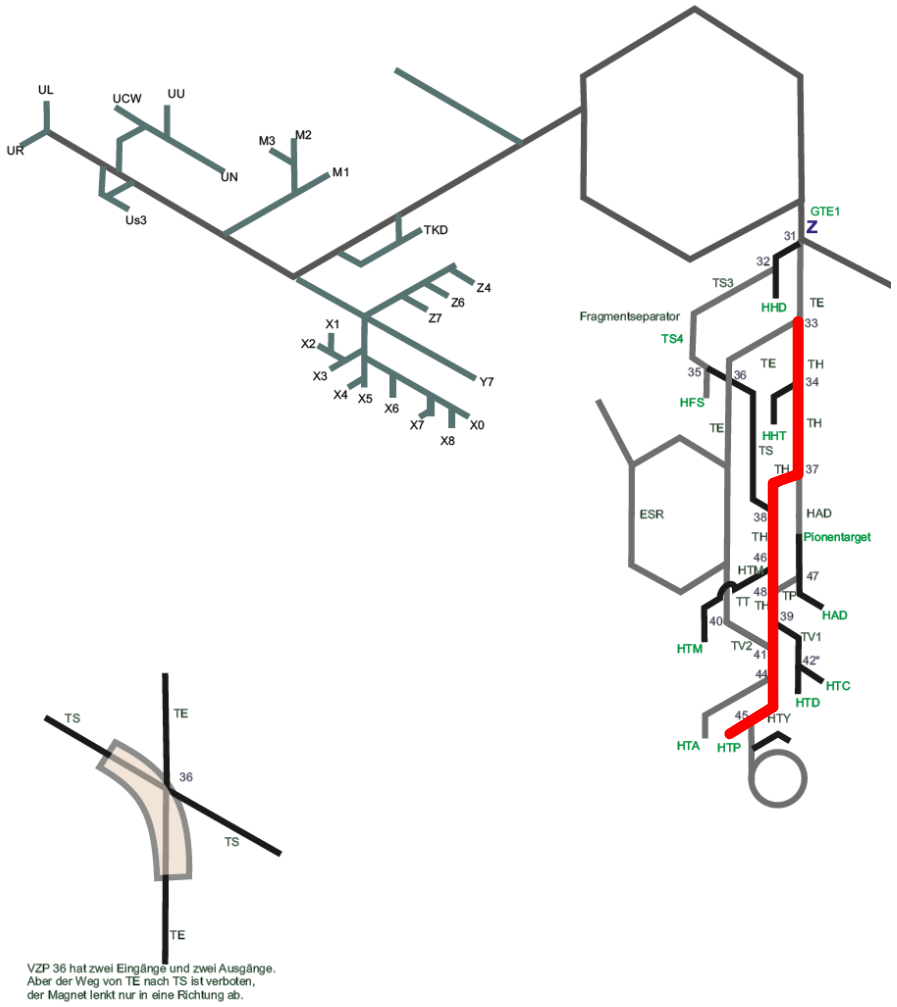
- Introduce Dry-Runs (short testing periods including vertical test + integration tests → interface tests)
- Start as early as possible (it already has begun)
- Define detailed Commissioning procedures and automatize
- Extend the time for beam-commissioning
- test only beamlines & features, that will really be used in 2018

Goal: fast, efficient, automated re-commissioning

# Dry-Runs

- 8 Dry-Runs scheduled (2-5 day length)
- #I already done
- #II+#III planned in detail
- #IV+#V planning has been started
- #VI + #VII + #VIII ...

# Dry Run I (October 2017)



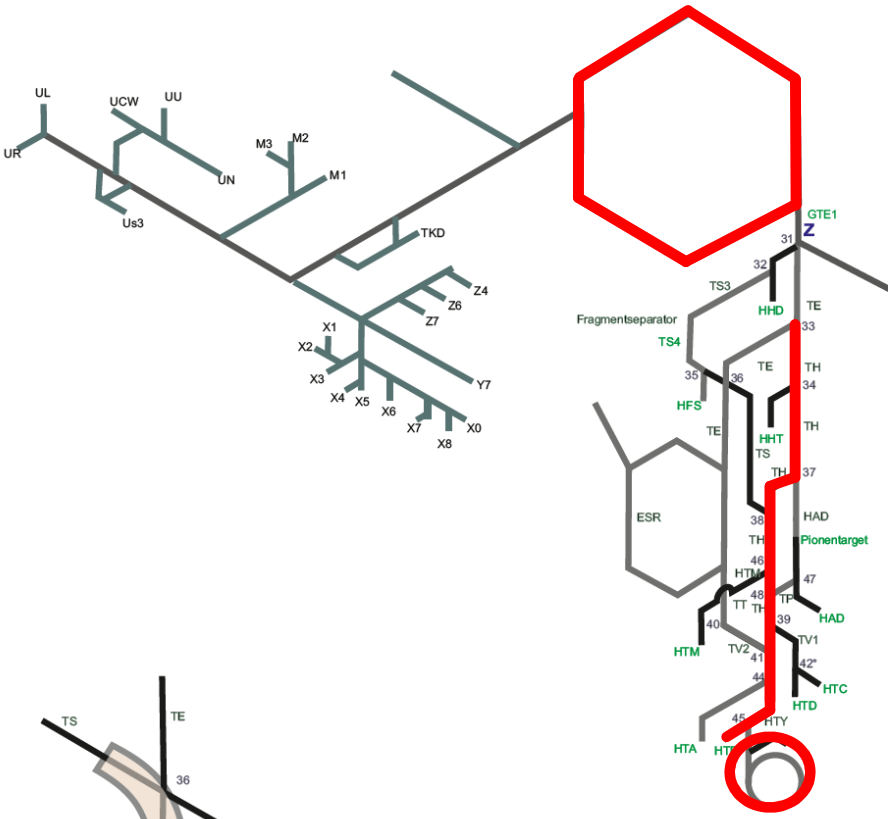


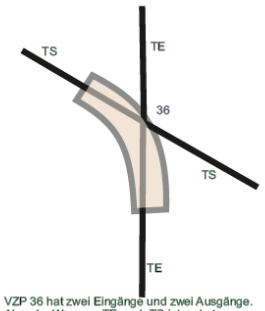


VZP 36 hat zwei Eingänge und zwei Ausgänge.
Aber der Weg von TE nach TS ist verboten,
der Magnet lenkt nur in eine Richtung ab.

- Control System Tests
- test Power Supplies of ca. 40 Magnets
- 4 Beam Instrumentation Devices
- 1 Vacuum Valve
- Applications
- Physics Model (LSA)
- Capturing and Processing Status Signals
- Control System Services
- 1st Sequencer Test

# Dry Run II (November 2017)

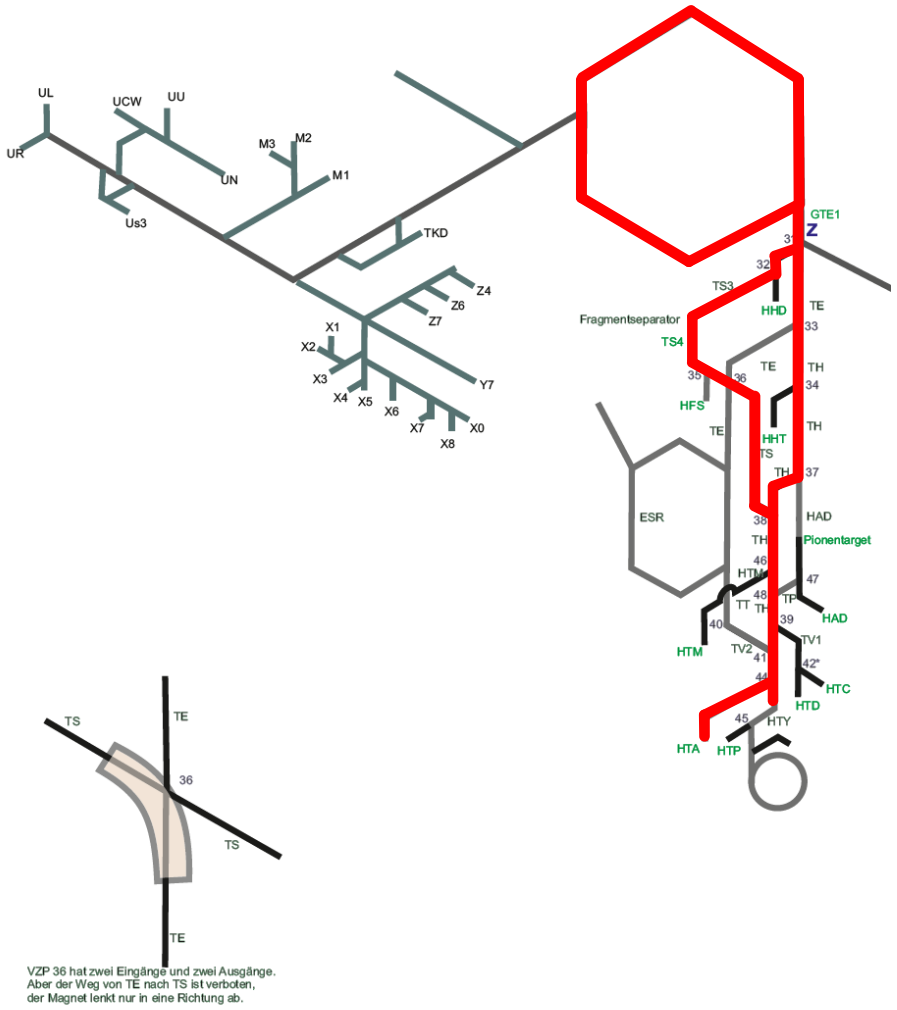



VZP 36 hat zwei Eingänge und zwei Ausgänge.
Aber der Weg von TE nach TS ist verboten,
der Magnet lenkt nur in eine Richtung ab.

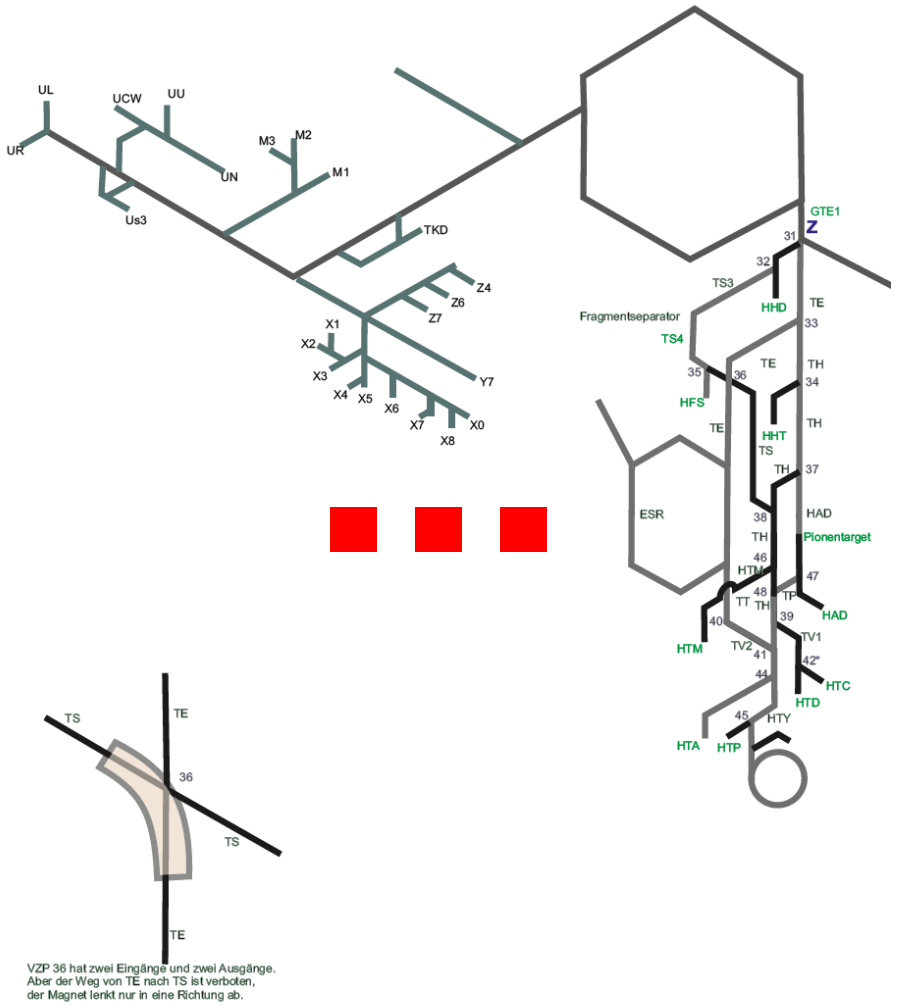
- Dry Run I + fixed bug & errors
- SIS18 AEG (no powering)
- Cryring

# Dry Run III (December 2017)




- Dry Run II + fixed bugs & errors
- 2nd beam line via FRS

# Dry Run IV + V (Jan+Feb 2018)

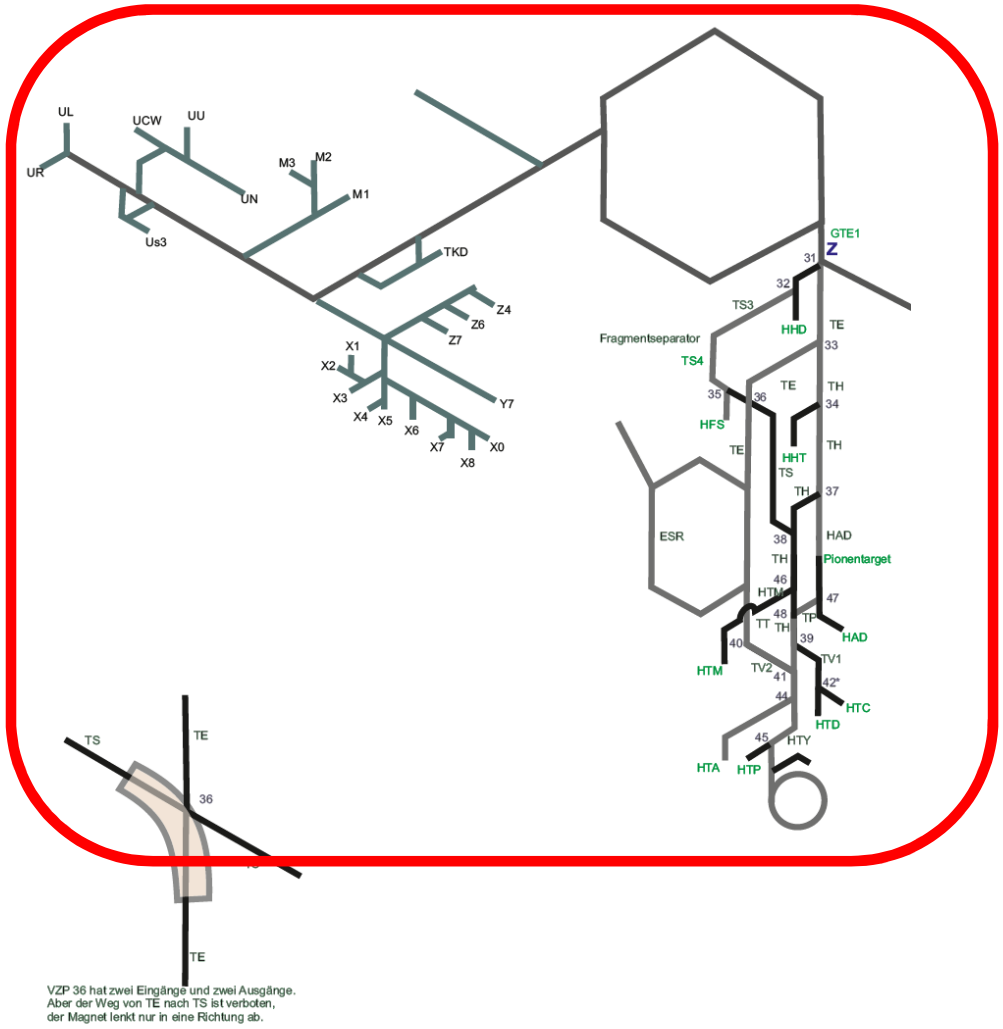



- in preparation

wish list:

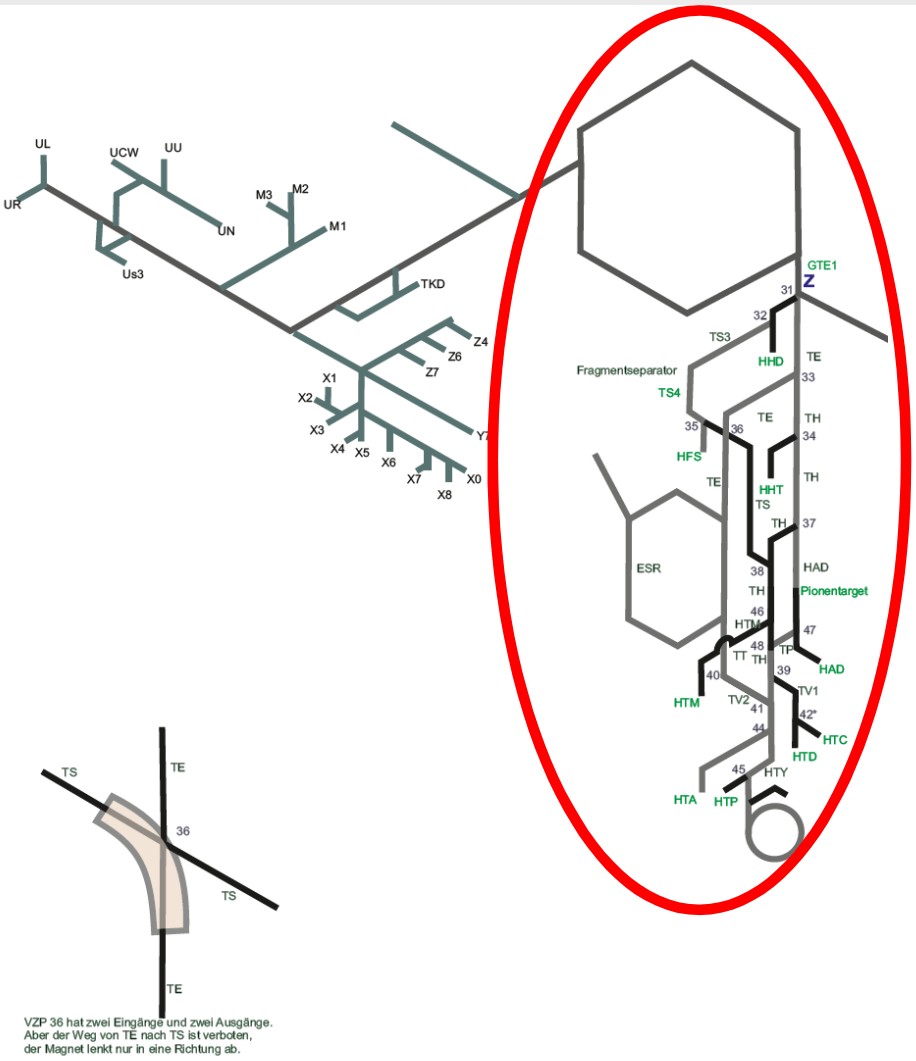
- same as Dry run III +
- HEST complete
- FRS complete
- ring HV-components
- evtl. beam transformers
- ...

# Dry Run VI+VII (March+April 2018)




- SIS18, ESR, HEST, Cryring pulsed
- experimental areas
- machine-experiment interface (beam request)
- vacuum
- ring RF
- UNILAC RF test
- UNILAC all

# Dry Run VIII (Mai 2018)



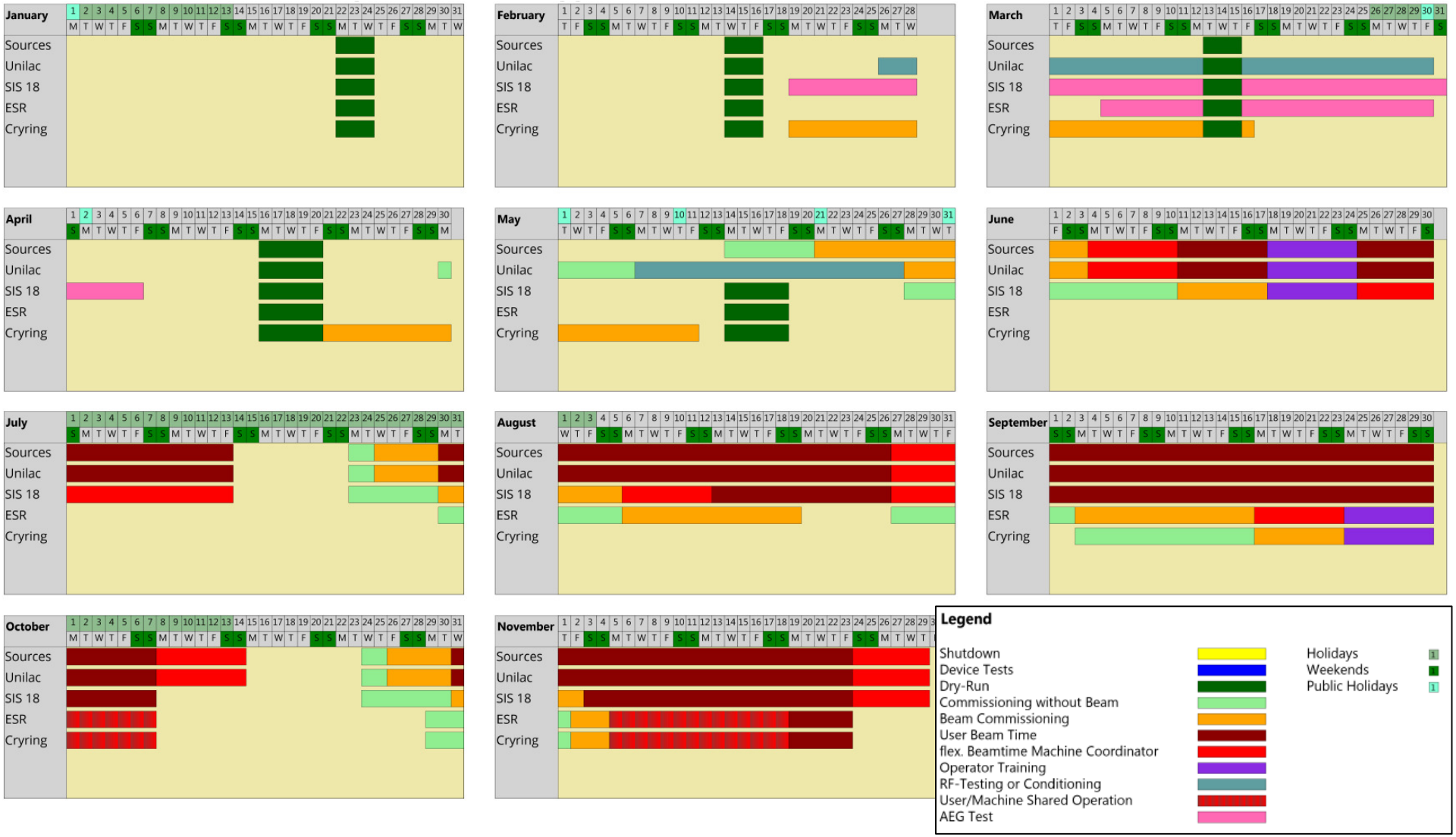




VZP 36 hat zwei Eingänge und zwei Ausgänge.
Aber der Weg von TE nach TS ist verboten,
der Magnet lenkt nur in eine Richtung ab.

- final tests SIS18 & HEST

# General Plan of Accelerator Operations 2018



# Conclusion

- It’s difficult, it’s tight, it’s challenging
- It is a lot of work for departments within project + operations division
- complex dependencies have to be watched
- honesty is very important
- planning need to be flexible, pragmatic
- fast decisions, prioritisation
- we have a plan, we are prepared

# Thank you


from gsi.de