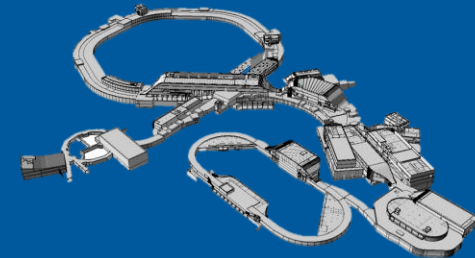


FAIR Project Team Workshop PMO - Quality Assurance and BINP

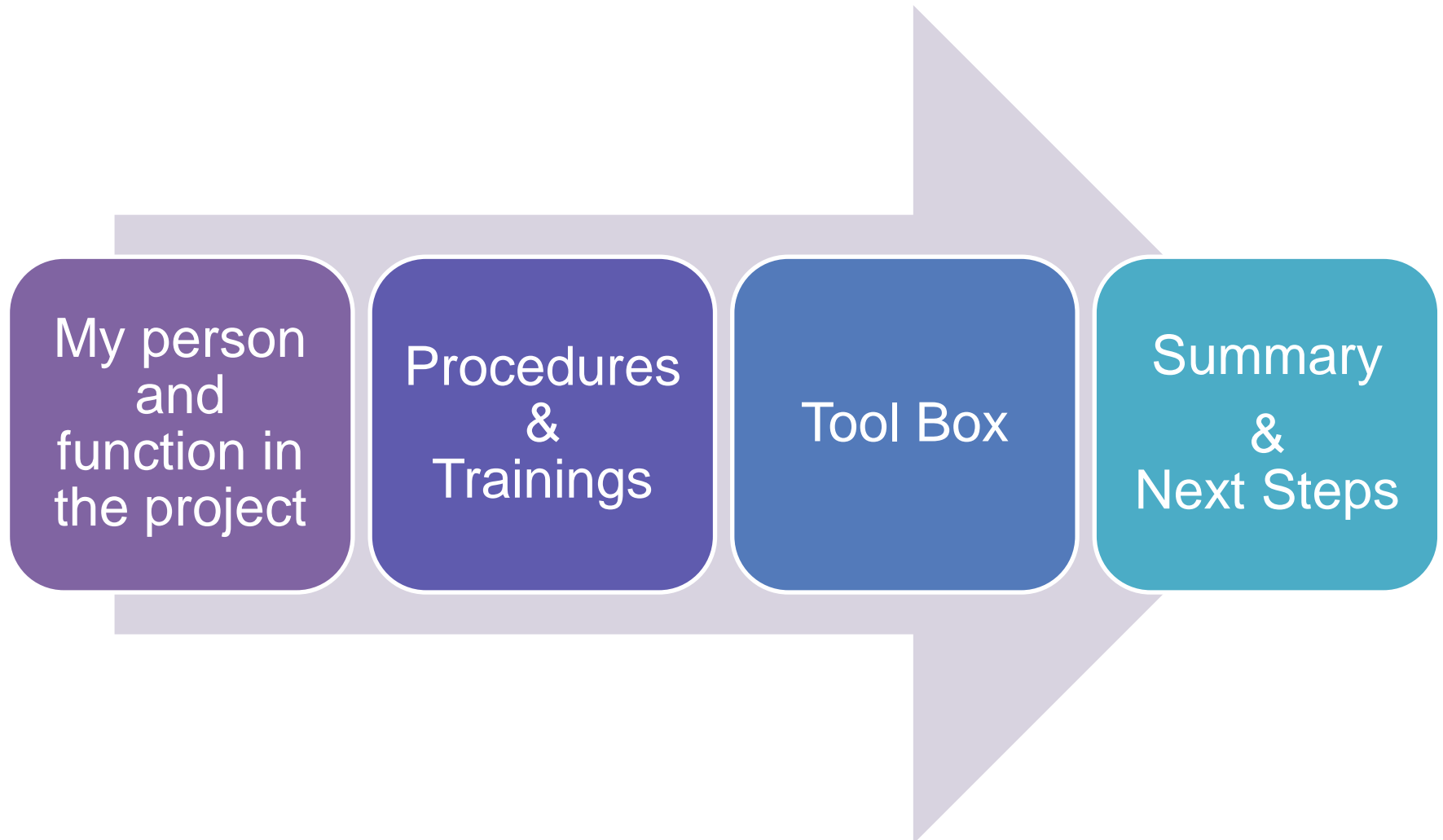


November 5th, 2018

Herbert Schwarz

20181031-3-Workshop_BINP_GSI_Quality_Assurance.pptx





My person and function in the project



● **Since 4 years as a member of the QUA department and your FAIR-PMO contact person for all CR Quality Assurance tasks**

2 years as a Work Package leader in development of medical devices

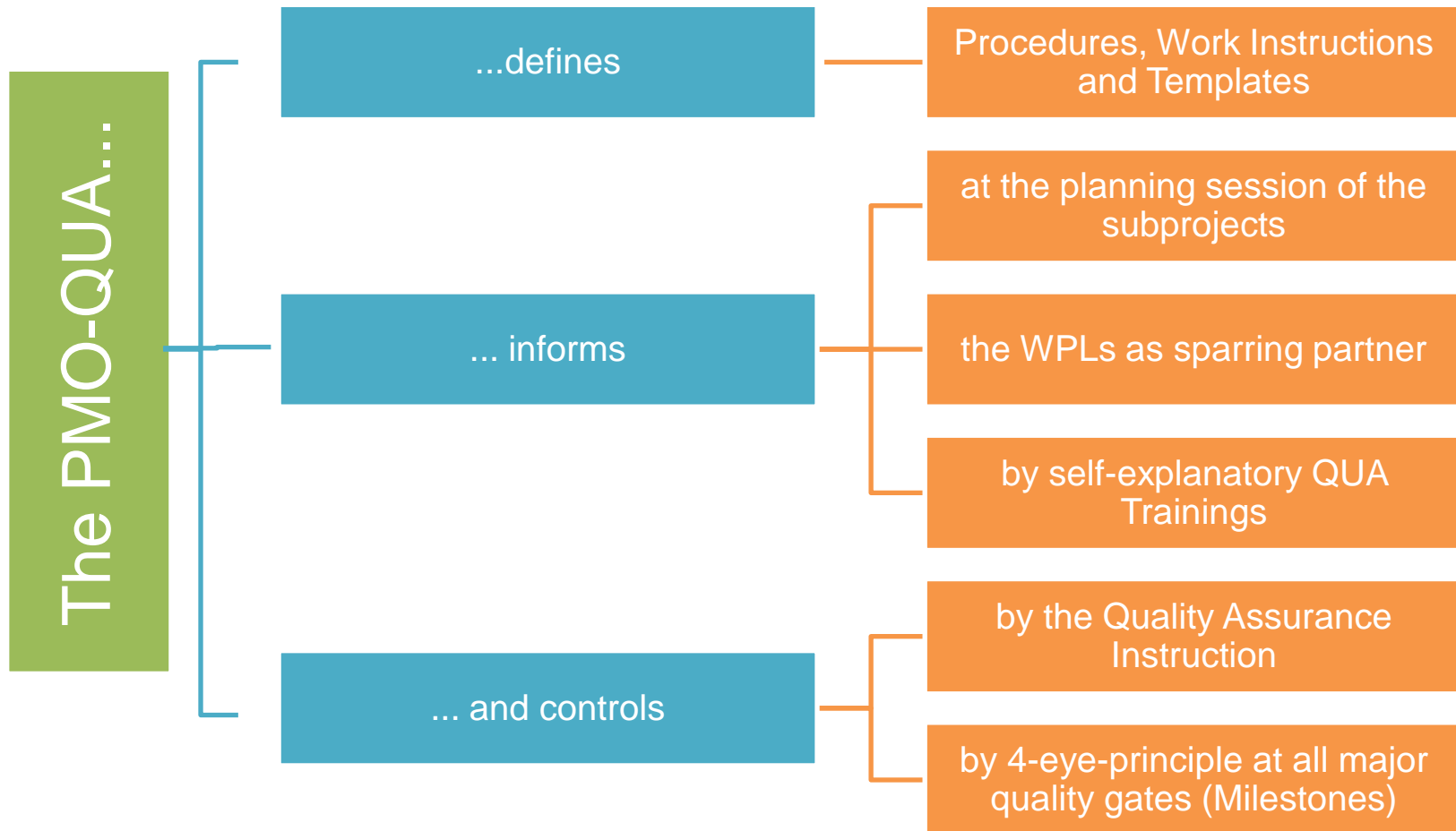
23 years as a quality engineer in the development of test tools for the production line and the last 5 years as a project audit engineer

4 years as a Service Engineer



Herbert Schwarz
H.Schwarz@gsi.de

Introduction



Conclusion: Aim of Quality Assurance is to save time and costs.

Lessons Learned

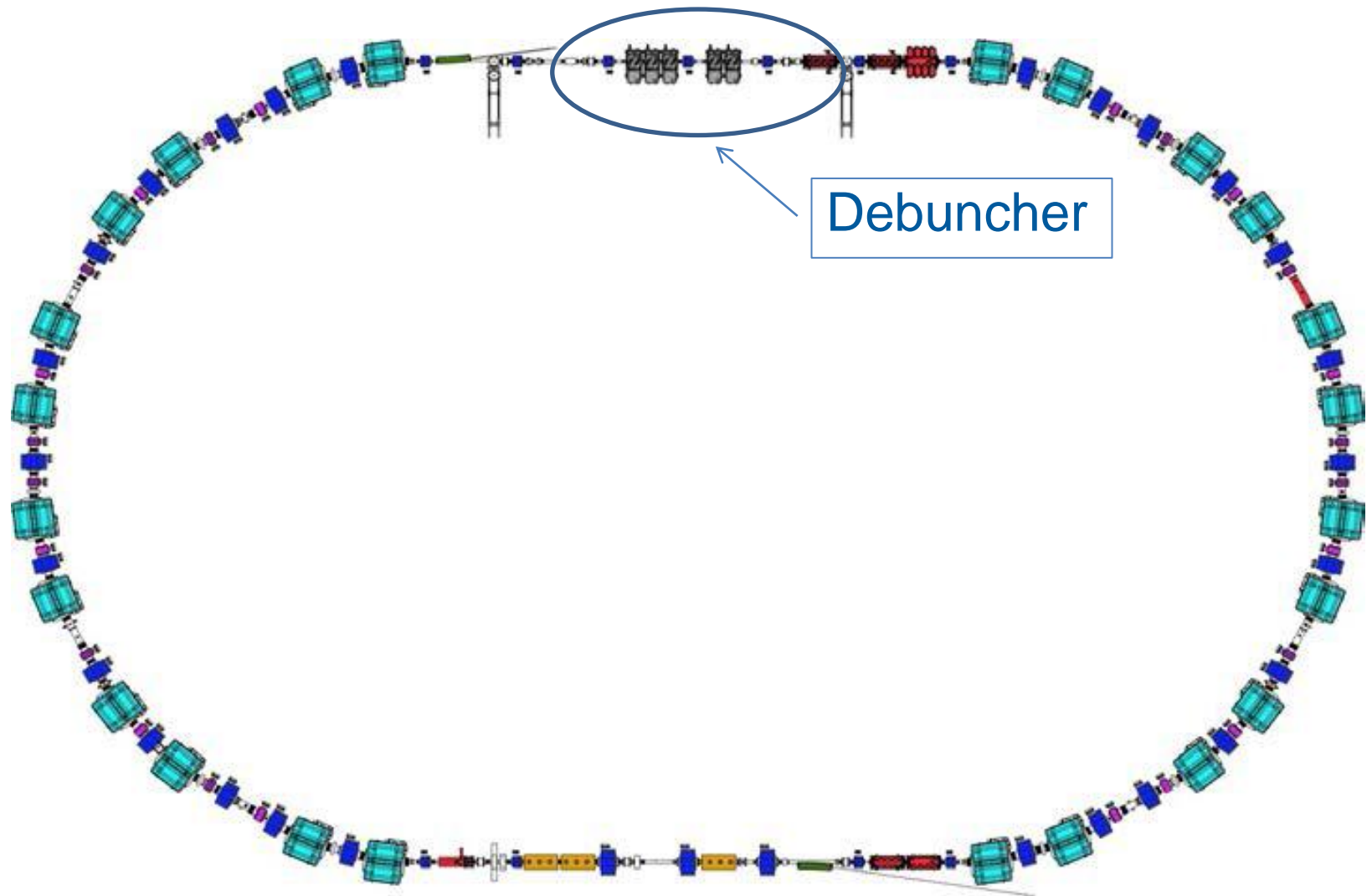
- Quality assurance is not an additional hurdle.
 - *Most quality related activities are straightforward project activities.*
- The specifications and contract terms are the base of nearly most quality assurance related measures.
 - *Clear and stringent formulations are needed.*
 - *Any shortcuts will lead to (massive) additional efforts at a later stage.*

Lessons Learned

- Difficulties and deviations from the specification are usual.
→ *Dealing with Non-Conformities is an inherent topic of quality assurance.*
- Verbal agreements work until something goes wrong.
→ *Compliance with the specified processes, procedures and templates is essential for a successful project completion.*
- Solution based flexibility is necessary.
→ *But large-scale project involving many stakeholders requires compliance with processes, therefore quality assurance sometimes needs to be some kind of formal.*

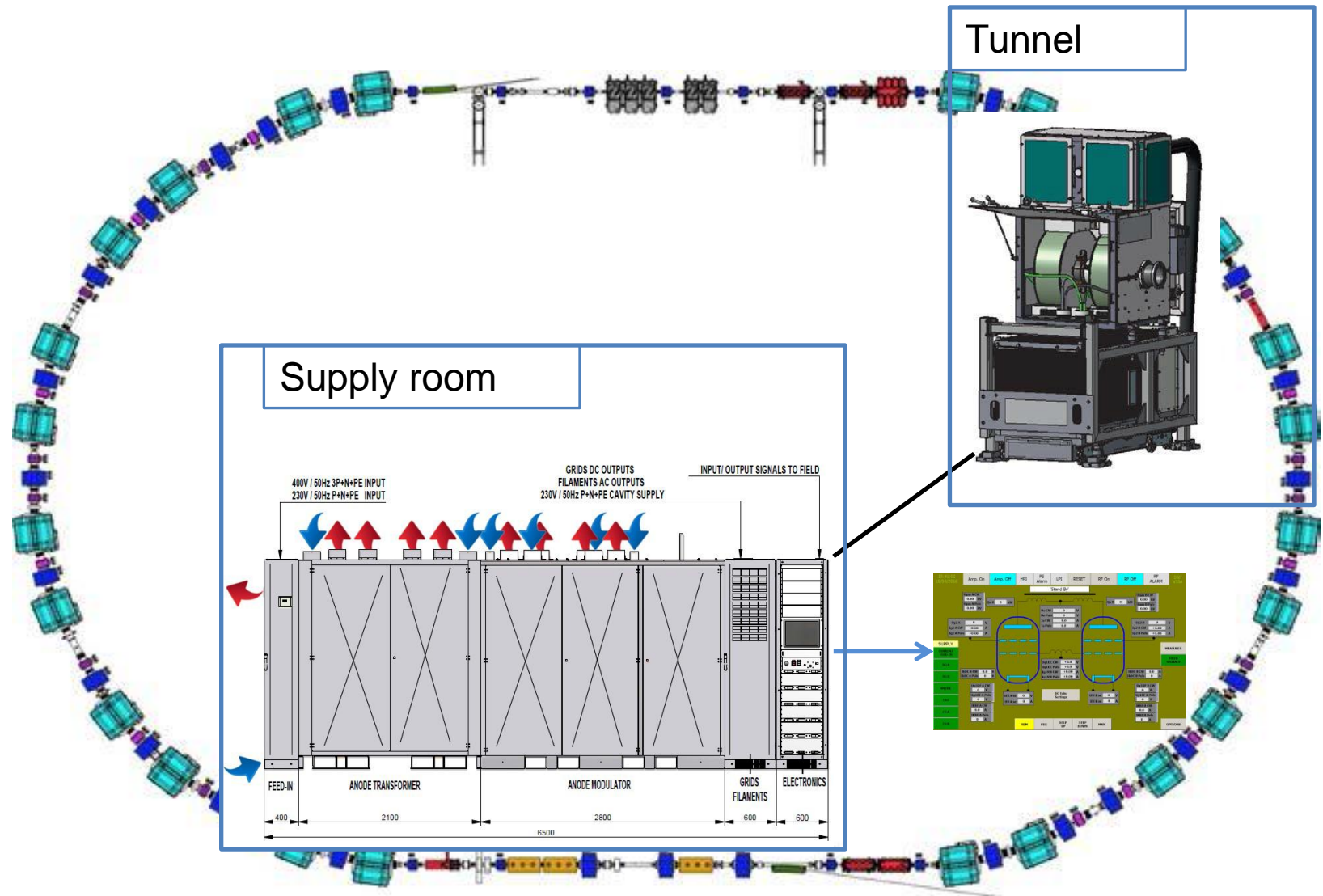
Lessons Learned by CR example

... the Debuncher requirements for the interfaces, tests and inspections



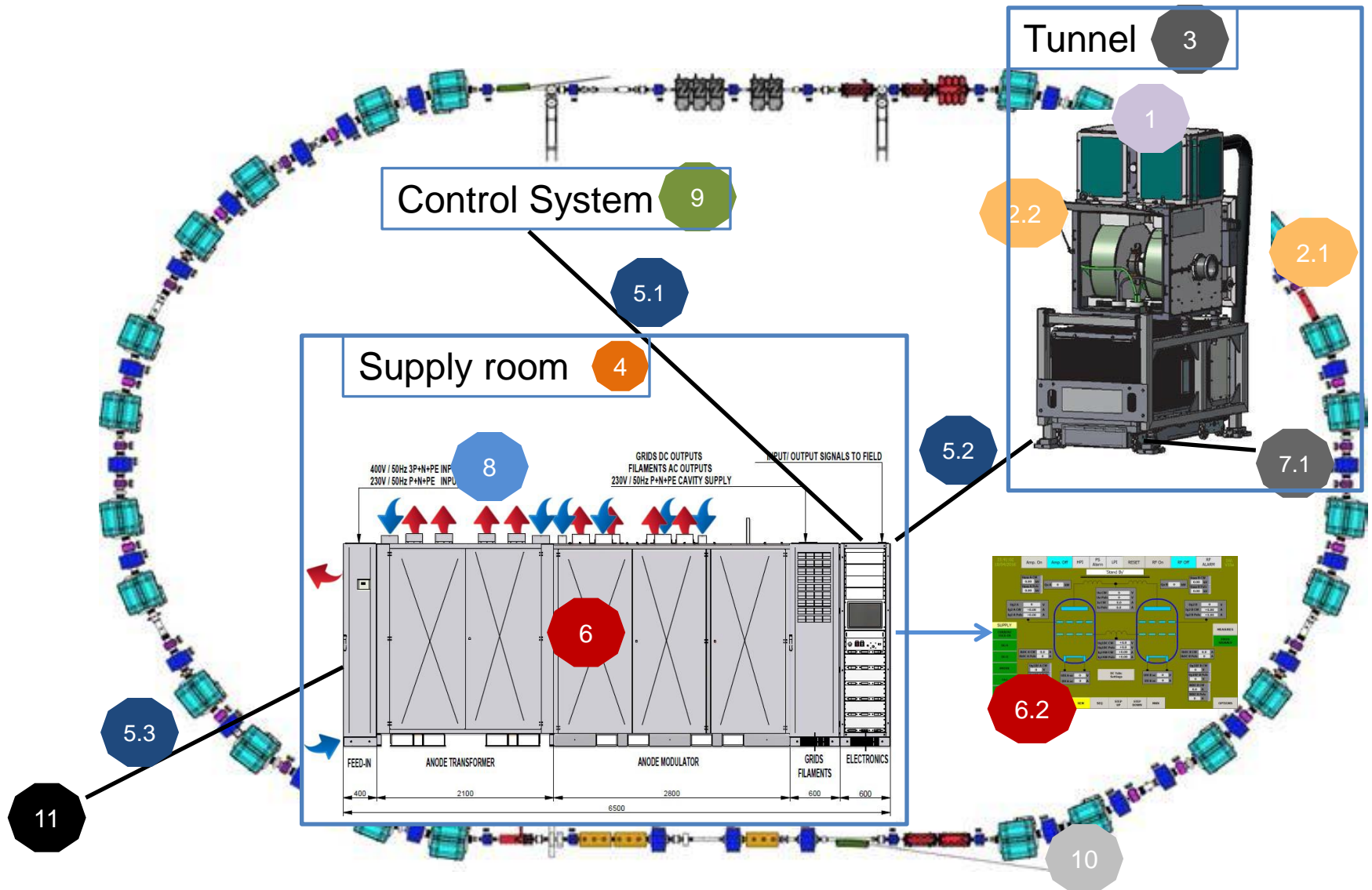
Lessons Learned by CR example

... the Debuncher requirements for the interfaces, tests and inspections



Lessons Learned by CR example

... the Debuncher requirements for the interfaces, tests and inspections

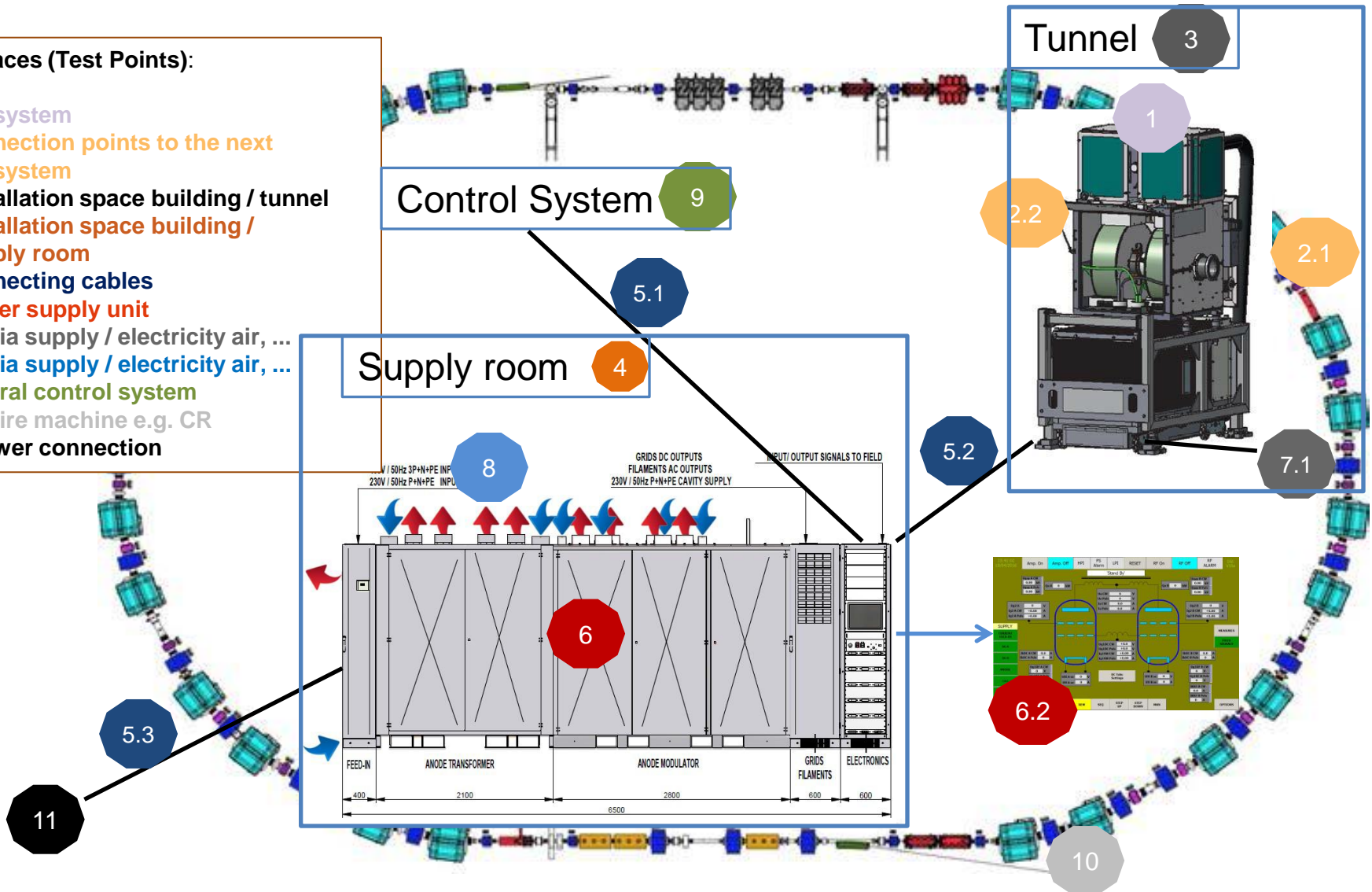


Lessons Learned by CR example

... the Debuncher requirements for the interfaces, tests and inspections

Interfaces (Test Points):

- 1 subsystem
- 2 connection points to the next subsystem
- 3 installation space building / tunnel
- 4 installation space building / supply room
- 5 connecting cables
- 6 power supply unit
- 7 media supply / electricity air, ...
- 8 media supply / electricity air, ...
- 9 central control system
- 10 entire machine e.g. CR
- 11 power connection



Lessons Learned by CR example

... the Debuncher requirements for the interfaces, tests and inspections

- The CR Debuncher is one example for teamwork during the design phases M6 and M7.
→ *The WPL presents his or contract partners work in a design meeting and finalizes his/their design documents with this step.*

Overview of the participating departments in this case:

- - Control Systems (ACO) / - Commons (COM) / - Transport & Installation (TRI)
- Engineering (ENG) / - Mechanical Integration (MIN)
- Vacuum Systems (VAC) / - Accelerator Radiation Protection (SRP) /
- Safety Officer /
- Quality Assurance (QuA)

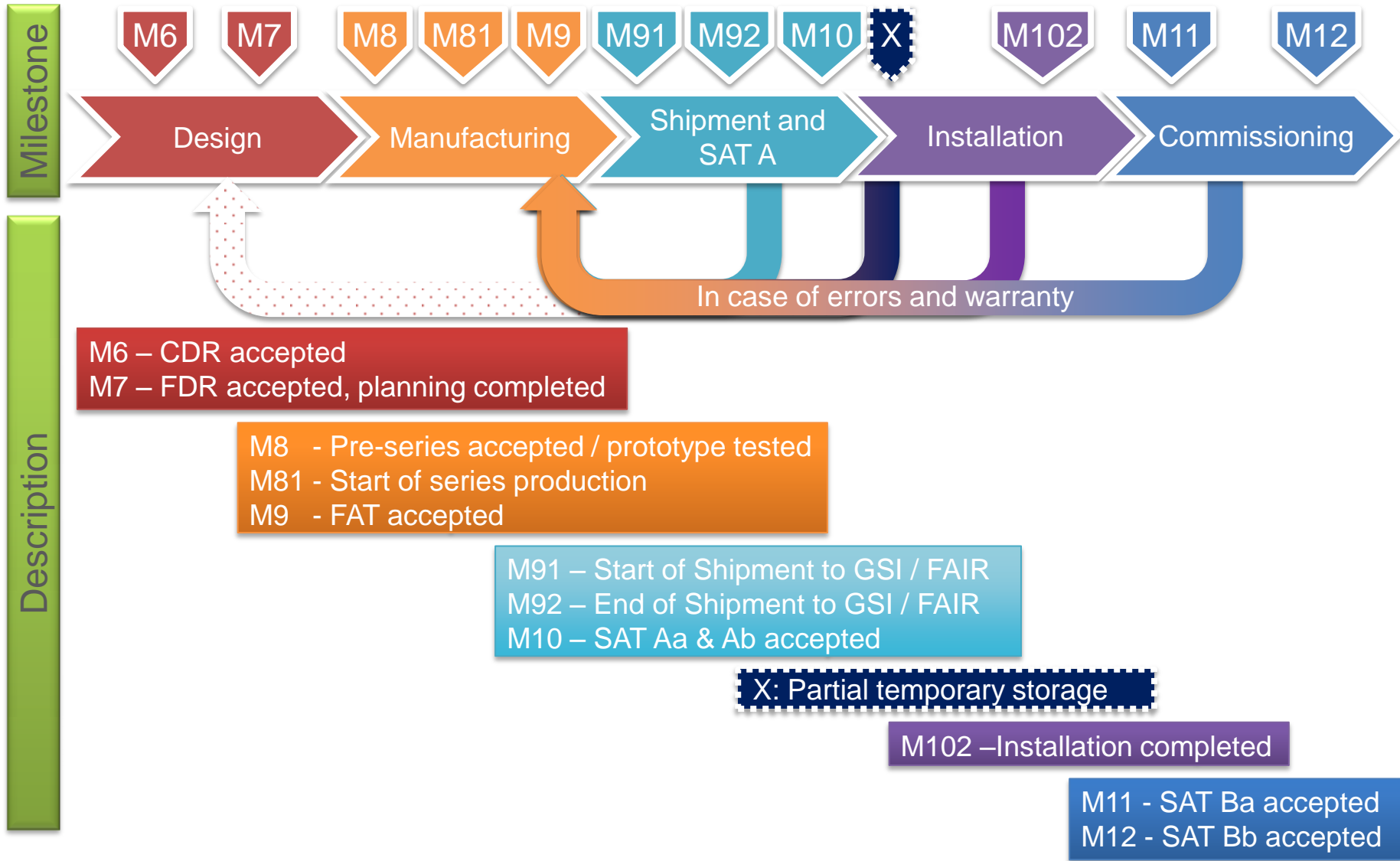
Conclusion:

Define your interface partner.

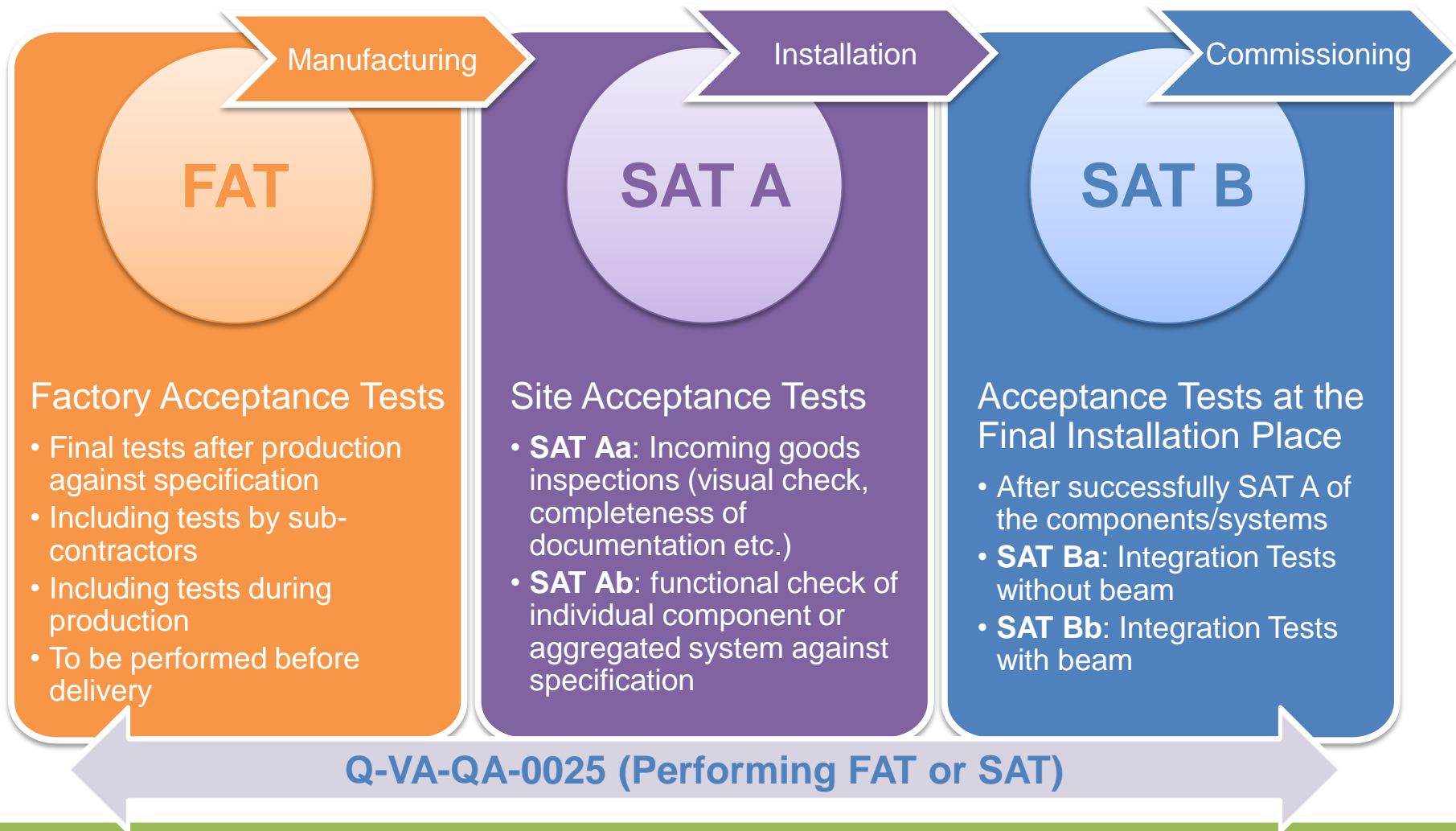
Teamwork saves time and costs.

Milestones & Descriptions

Underlying rules and processes are valid for all FAIR Suppliers.

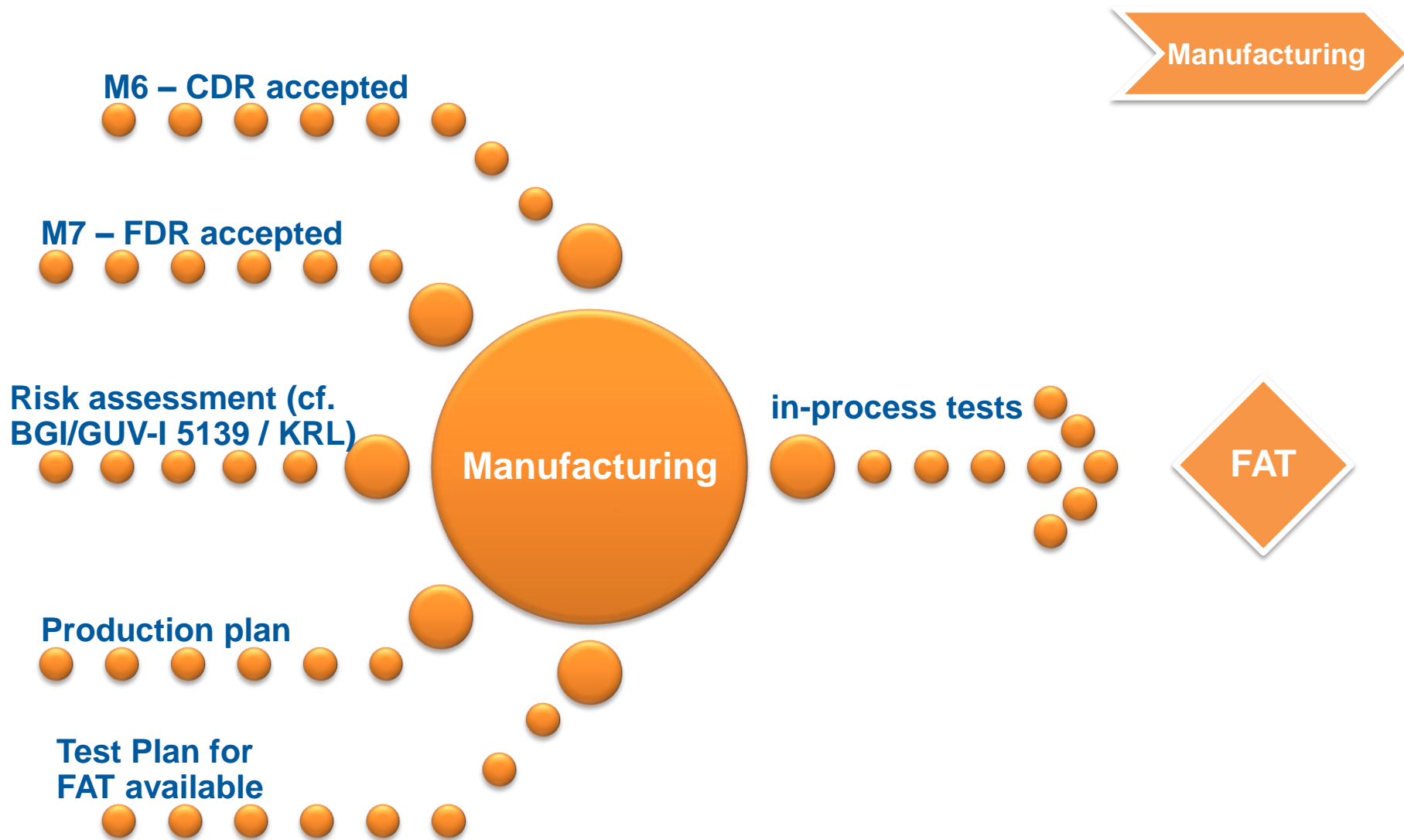


FAT / SAT Overview

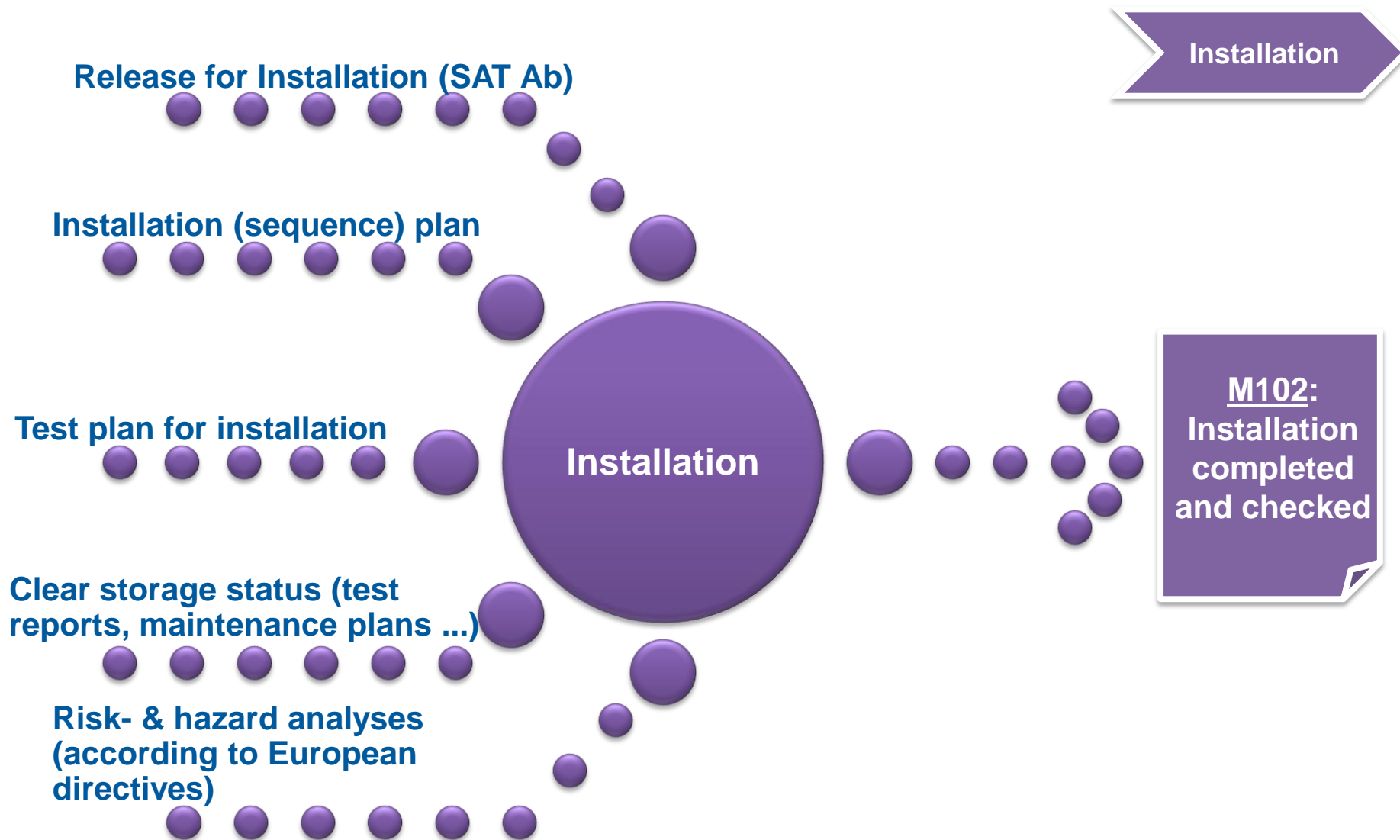


All components that will be productively used must pass through all acceptance tests
→ Prototypes for evaluation purposes are not relevant from quality assurance perspective

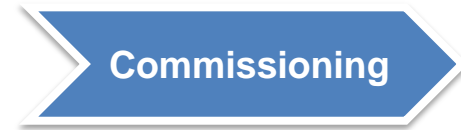
Preconditions for Manufacturing



Preconditions for Installation



Preconditions for Commissioning



M102: Assembly in tunnel finished (and checked)

Commissioning sequence plan

SAT BA and SAT Bb test plan

Risk assessment (hazards) for components, systems and the entire FAIR system

...to be continued...



Post-conditions:
SAT Bb report approved & released

All NCR must be closed.

Summary: Manufacturing, Installation & Commissioning

- From quality assurance perspective, the acceptance tests for the **milestones M9 (FAT) to M12 (SAT Bb)** **build the foundation** for the manufacturing, installation and commissioning.
- The **test plans** must be prepared in advance and agreed by QUA.
- Acceptance records are to be created and **stored in EDMS** together with the accompanying documents.
- **Quality deviations** (non-conformities) must be documented and followed up until clarification.

Tool Box Procedures (VA)

These rules and processes are valid for all FAIR Suppliers.

Particularly relevant for milestone	Procedure/ Template	Description	Link to EDMS
M6, M7	Q-VA-QA-0006	Design Reviews	edms.cern.ch/document/1514206
M10, M11, M12	Q-VA-QA-0022	Management of Test Equipment	edms.cern.ch/document/1730749
M9, M10, M11, M12	Q-VA-QA-0025	FAT or SAT	edms.cern.ch/document/1514174
M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12	F-VA-QUA-en-0030 (formerly Q-VA-QA-0030)	Dealing with Non-Conformities	edms.cern.ch/document/1503121
M8, M9, M10, M11, M12	F-VA-QUA-en-0031	Capability of Measuring Equipment	edms.cern.ch/document/1830692

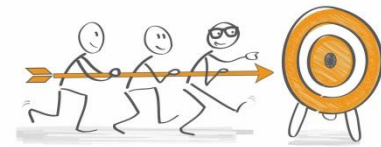
Tool Box Templates

Particularly relevant for milestone	Procedure/ Template	Description	Link to EDMS
M6, M7, M8, M9, M10, M11, M12	Q-FO-QA-0002	Template for an Acceptance Record	edms.cern.ch/document/1458121/
M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12	F-FO-QUA-bl-0003	Template for a Non-Conformity Report	edms.cern.ch/document/1503137
M10, M11, M12	F-FO-QUA-bl-0004	Template for Stoppage Card	edms.cern.ch/document/1503140
M9, M10, M11, M12	Q-FO-QA-0006	Template for a Test Record	edms.cern.ch/document/1517696
M6, M7, M8, M9, M10	F-FO-QUA-bl-0007	Template for an Inspection Plan	edms.cern.ch/document/1810648
M6, M7, M8, M9, M10	Q-FO-QM-0010	Template for a Test Instruction	edms.cern.ch/document/1512546
M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12	F-FO-QUA-en-0012	Template for Meeting Minutes	edms.cern.ch/document/1573659
M6, M7, M8, M9, M10	Q-FO-QA-0013	Template for Required Documents	edms.cern.ch/document/1732710

Tool Box QUA Training Modules

QUA Instruction Module
<https://instruct-guest.gsi.de>

QUA Training Modules	Link to EDMS
QUA-Training 2018-01-25 <ul style="list-style-type: none">- QUA on a page- Document Approval- Design Reviews (CDR & FDR)- Acceptance Tests (FAT, SAT A)- Dealing with Non-Conformities- Standards, Guidelines and Laws- Required Documents	edms.cern.ch/document/1867402
QUA-Training 2017-01-17 <ul style="list-style-type: none">- Capability of Measuring Systems- Schedule & Q-Plan- Shipment, Storage, Installation- Design Reviews (CDR & FDR)- Acceptance Tests (FAT, SAT A)- Management of Test Equipment	edms.cern.ch/document/1747874
QUA-Training 2016-06-24 <ul style="list-style-type: none">- QA Overview- Design Reviews- Acceptance Tests (FAT, SAT Aa & SAT Ab)- Dealing with Non-Conformities- Management of Test Equipment- Document Approval	edms.cern.ch/document/1747876



Milestones (Spec, FDR, FAT, SATs) must be taken seriously.
→ Full commitment of SPL and WPLs is mandatory!!!

Documentation is essential.
→ EDMS must be used for all required documents.

Tracking of individual components & systems is necessary.
→ PLM structures must be implemented
Product Lifecycle Management

Responsibilities must be clear.
→ Logistics, Aggregated Systems, Safety, Commissioning

No time for planning (e.g. for testing and installation)?
→ Every minute in planning saves 10 min. in execution.

Next Steps / Open Issues

1. Start the subprojects with kick-off meetings for each work package 2.5.x.
 - Define the team with name, function and mail address.
 - Create EDMS Structures based on PLM requirements. For that contact Klaus Höhne (Klaus.Hoehne@fair-center.eu)
 - Define how the team will work together.
2. Early clarification on how the risk assessments should look like
 - If necessary, consult a notified body (e.g. TÜV).
3. Keep MS Project Plan and EDMS updated.
 - If not, start to clarify the users and their access rights.



I am your FAIR-PMO contact person for all Quality Assurance tasks for CR

**Responsible
for quality**

Every employee

An aerial rendering of a large, complex industrial or university campus. The complex features numerous interconnected buildings, a central pond, and several large storage tanks. The entire facility is surrounded by a dense forest. The text "Thank You!" is overlaid in the center of the image.

Thank You!