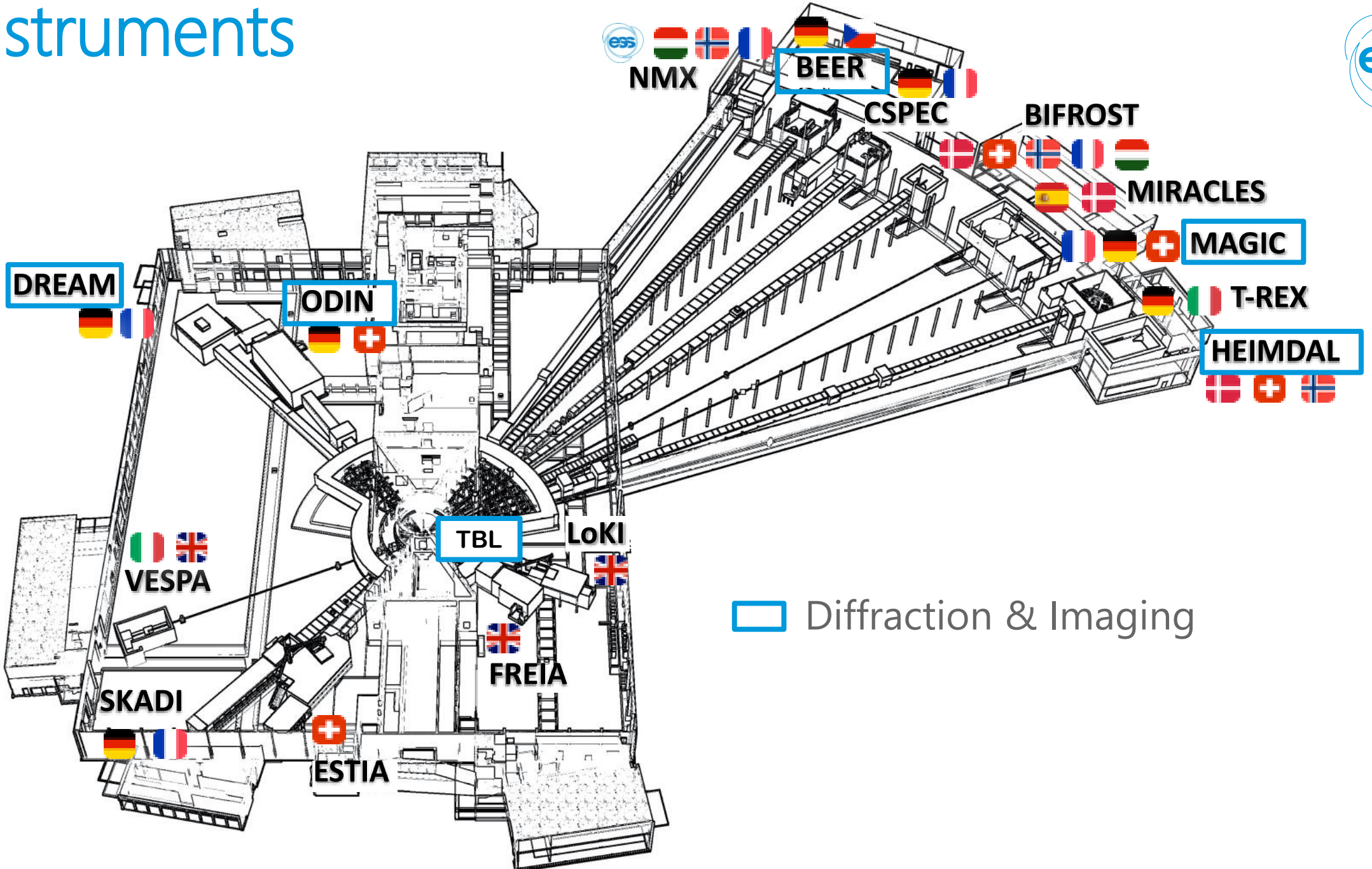
System Acceptance & Instrument Safety Readiness Reviews for ODIN

Mikhail Feygenson[1,2]

[1] Head of Diffraction and Imaging Division, European Spallation Source

[2] Adjunct Associate Professor, Department of Materials Science and Engineering, Uppsala University

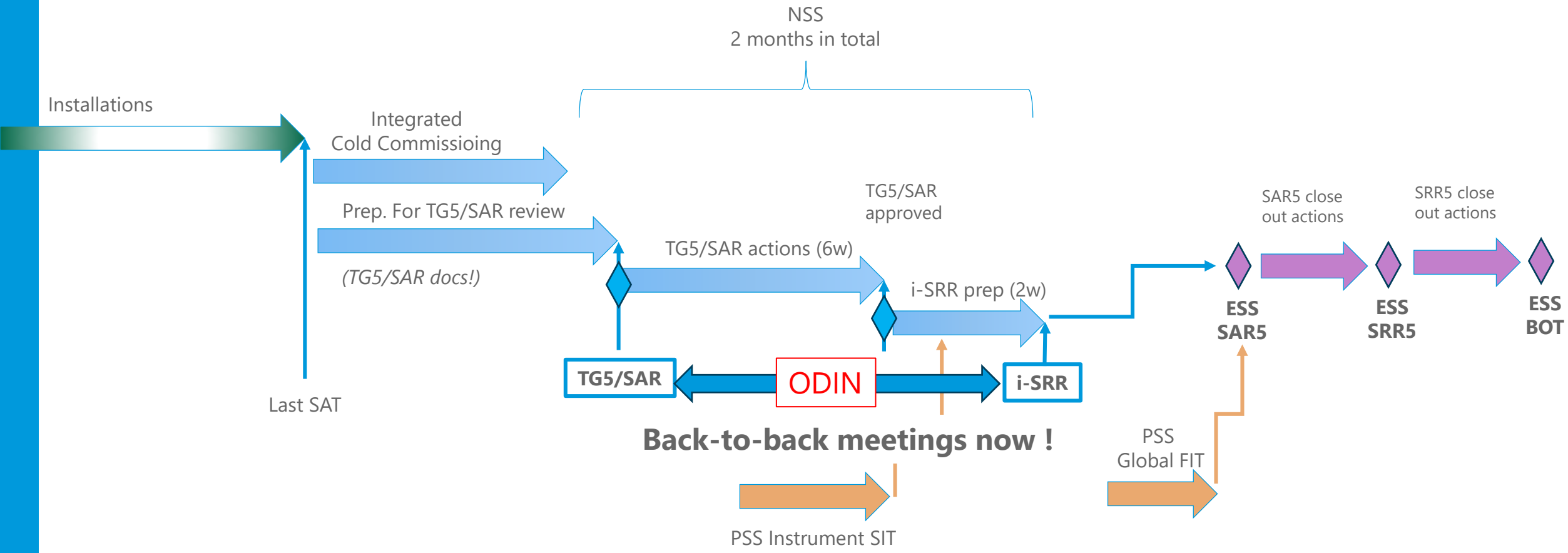
Instruments



Two reviews in one day

- **System Acceptance Review (SAR):** Are all components installed properly?
  Is the instrument ready for Hot Commissioning?

- **Instrument Safety Readiness Review (iSRR):** Safety of operations & readiness of team



Credit: Sofie Ossowski

Basic pillars for iSRR

System of interest → Hazard identification → Implemented safety measures

Short summary of the ODIN based on the previous SAR

Comprehensive Radiation Safety Assessment

- ESS-5692487 only a template
- ESS-5693466, Ch. 6
  → ESS-2972939 rev 14 section 5.2 & 6.2

ODIN Instrument Hazard Analysis (conventional and radiological)

Safety measures (Engineered)

Shielding & Activation

- Shielding
- Personnel Safety System
- REMS
- Fire protection
- ATEX zones for explosive atmospheres
- Controlled ventilation
- Safety valves for pressurised equipment
- ODH detection
- Etc.

Safety measures (Administrative)

- Roles & Responsibilities
- Training
- Operation & Safety procedures
- Etc.

Roles (some examples)

- MCR Shift leader / Operator
- Beam Commissioning Coordinator
- Instrument team
- Occupational Health & Safety
- Radiation Protection
- Electrical Operation Leader, ESL, etc

In addition

- System specific commissioning plan
- Verification *reports* **without** beam (instrument cold commissioning)
- Verification *plans* **with** beam (instrument hot commissioning) together with specifications of which 'safety requirements' that are / will be verified.

Procedures (some examples)

- ESS Local rules for safety
- Procedure for work orders
- Rules for interlocks
- Emergency procedures
- Establishment of Safe State

- Radiation Protection = protecting people from radiation
- Radiation Safety = controlling the source of radiation

Credit: Thomas Hansson

Charge for SAR

1. Validate that all system components, as defined by the Instrument FBS, are present and installed. This ensures that all project scopes have been delivered.

2. Validate that all system documentation has been delivered and is in CHESS.

3. Validate that all technical documentation has been delivered, stored in CHESS, and is appropriately linked to the FBS structure.

4. Review the integrated cold commissioning report and ensure that it represents a sufficient test of the instrument systems, showing that all requirements that are testable during cold commissioning have been addressed.

5. Confirm that the performed testing has verified performance against the requirements that are testable during the cold commissioning.

6. Review the operating processes of the instrument and Hot Commissioning plan.

7. Review the list of non-conformities and their actual or proposed resolution and determine if they are appropriate.

8. Prepare a review report

Charge for iSRR

1. Are the safety systems of the instrument installed and operational?
2. Are the safety systems of the instrument adequately documented?
3. Is all the shielding on the instrument installed and correctly configured?
4. Are the safety systems of the instrument ready for hot commissioning and operations?
5. Are the necessary operations procedures in place?
6. Complete iSRR/SAR report

Remarks

1. It is the first combined SAR & iSRR meeting
2. One report with with SAR & iSRR findings
3. Helpful pre-SAR meetings before with technical groups
4. Lessons learned from TBL, BiFROST and LoKI were considered
5. First (and only) dedicated imaging beamline
6. Welcome our on-kind partners

Rules

1. Only reviewers & observers are allowed to ask questions during the meeting
2. Mute yourself on Zoom
3. All others are welcome to ask questions during coffee breaks/lunch
4. Any feedback is welcome after the meeting