NSS & Project Update

Reflectometry STAP – September 2023

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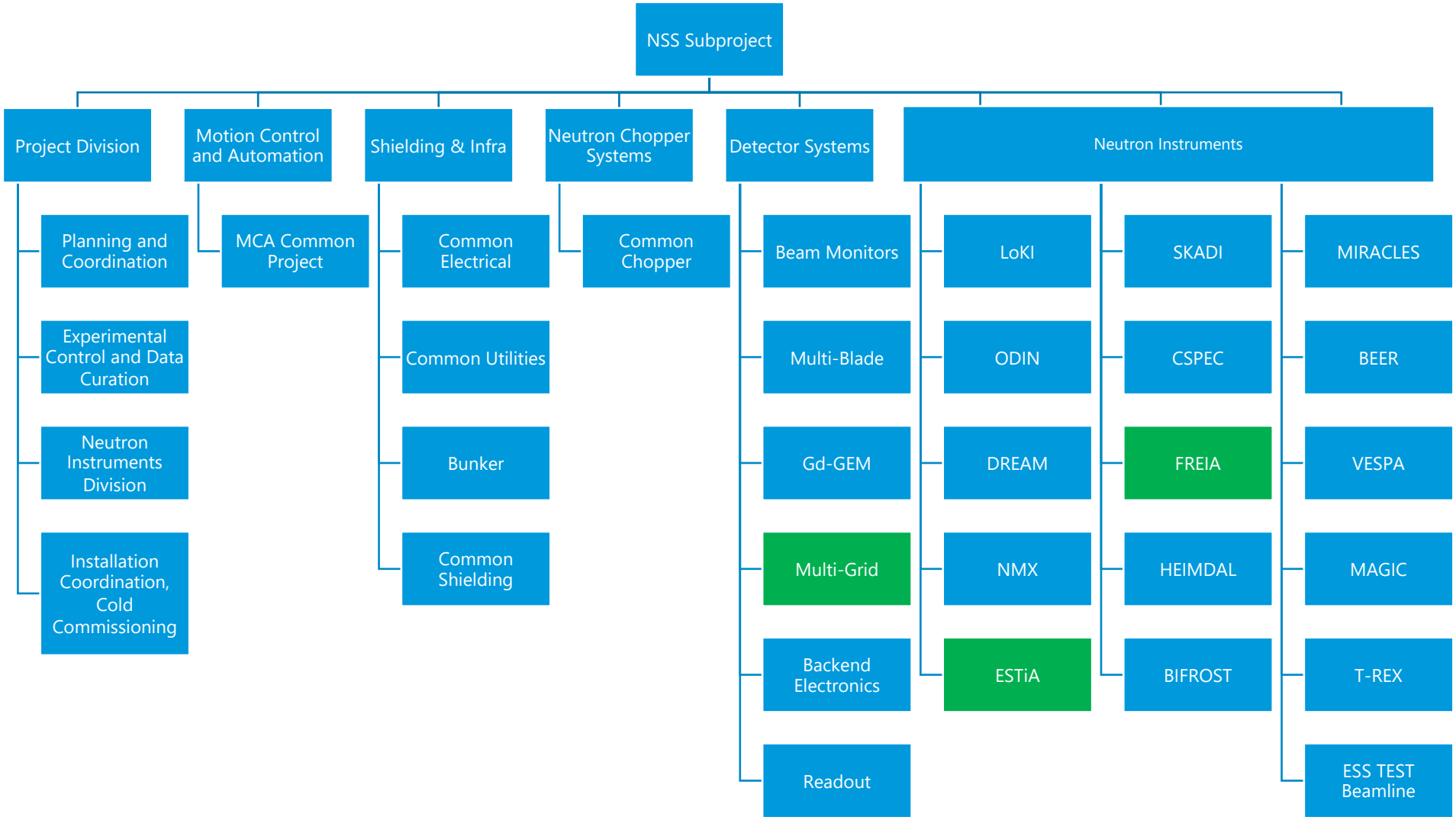
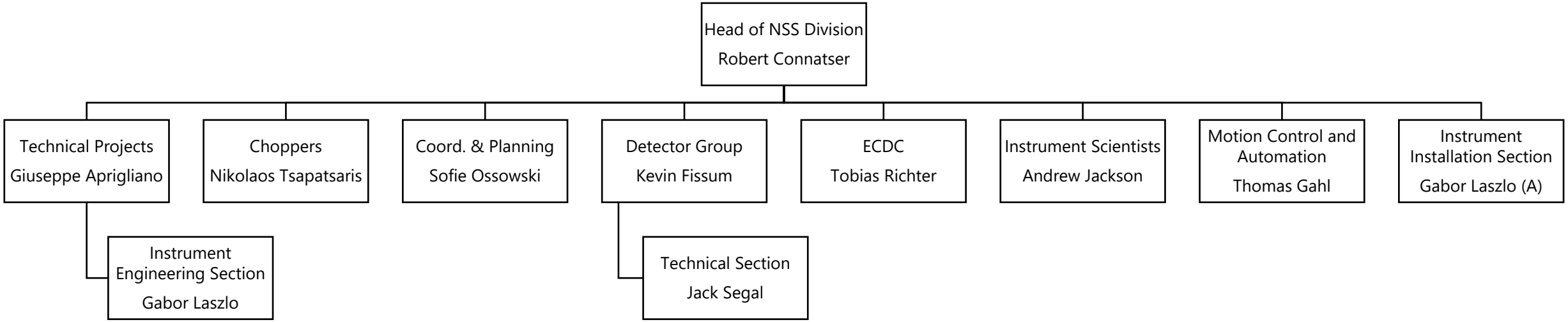
GROUP LEADER INSTRUMENT SCIENTISTS
ACTING HEAD NEUTRON INSTRUMENTS DIVISION

WBS Structure

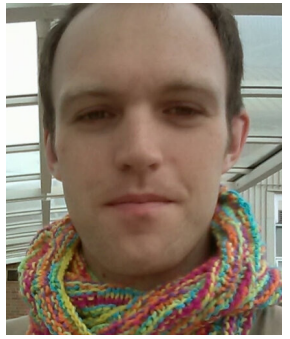


NSS Organization



Giuseppe Aprigliano
Group Leader for Technical Projects
Formerly Lead Engineer for NMX and ESS Lead Integration Engineer

Annika Stellhorn
Instrument Scientist for SKADI
Polarised SANS, GISANS and Reflectometry
Formerly Postdoc at LU



Jos Cooper
Instrument Scientist for Estia
Formerly ISIS IS on Offspec and Data Scientist

General Update

Installation & Production

- LoKI – continued progress on shielding, cave, electrical installation, detector delivery
- ODIN – Cave installation continued, preparation for electrical installation
- DREAM – Electrical installation, chopper installations, shielding installation
- ESTIA – Cave, SELENE guide system testing, chopper pit installation
- BIFROST – Pulse Shaping Chopper Disc testing failure, back up plans on going; housing and base assembled
- TEST Beamline – Bunker wall insert installation, Cave SAT, hutch installation
- NMX – Beam transporting system installed, shutter and Beam geometry conditioning system ready for installation
- Choppers – procurement for BEER and HEIMDAL discs
- CUP – Bunker cooling installation started
- Raised floors supporting electrical racks (Choppers, Beam Monitors, & more!) started

General Update

Planning & Quality

- Established a “Quality Gate” to prior to the Installation Readiness Review
  - Support from Quality Organization and internal expert
- Planning for “Common MCA” project offers for instrument teams
- Outline of Costs and Schedule for VESPA instrument assembled, recruitment of Instrument Scientist and engineer started
- Agreement with Executive Board to increase the scope of the CSPEC detector complement, Detector Group and Instrument team are developing the necessary contracts and change requests
- Evaluation of status of NMX instrument – decision to move into tranche 1 (more on later slide)

General Update

Ramping staff up – additional staff on site

New CEP team members: Two Aveva E3 CAD engineers, one electrical designer

New Detector Group members: Technical Section Leader, 4 additional detector scientists (2 for non-ESS detectors, 1 for Beam Monitors, 1 for MultiGrid)

New MCA engineer, technician, and 2 ePLAN draftspersons for MCA and Choppers

New Instrument staff: ESTIA scientist, CSPEC CAD engineer, SKADI scientist

New Electrical Engineer supporting Choppers

Two new quality staff (QCD), 1 technical writer for licensing and other documentation

FREIA Instrument Scientist (Tom Arnold) moved to Sweden from UK

General Update

Ramping staff up – more staff coming

Agreement with partner FZJ to bring on term engineering positions to support instrument integration and design, recruitments started

Agreement to bring on five Instrument Associates to work with Tranche 1 instruments, recruitments started – will extend to 6 to include Estia

Installation Section – identified preferred candidate for Section Leader, first Installation Package Leader started

Detector Group – continued ramp up planned (5 more positions)

Additional integration engineer, systems engineer, electrical engineer, and technical writers to support instrument teams

Detector Group and Deliveries Update

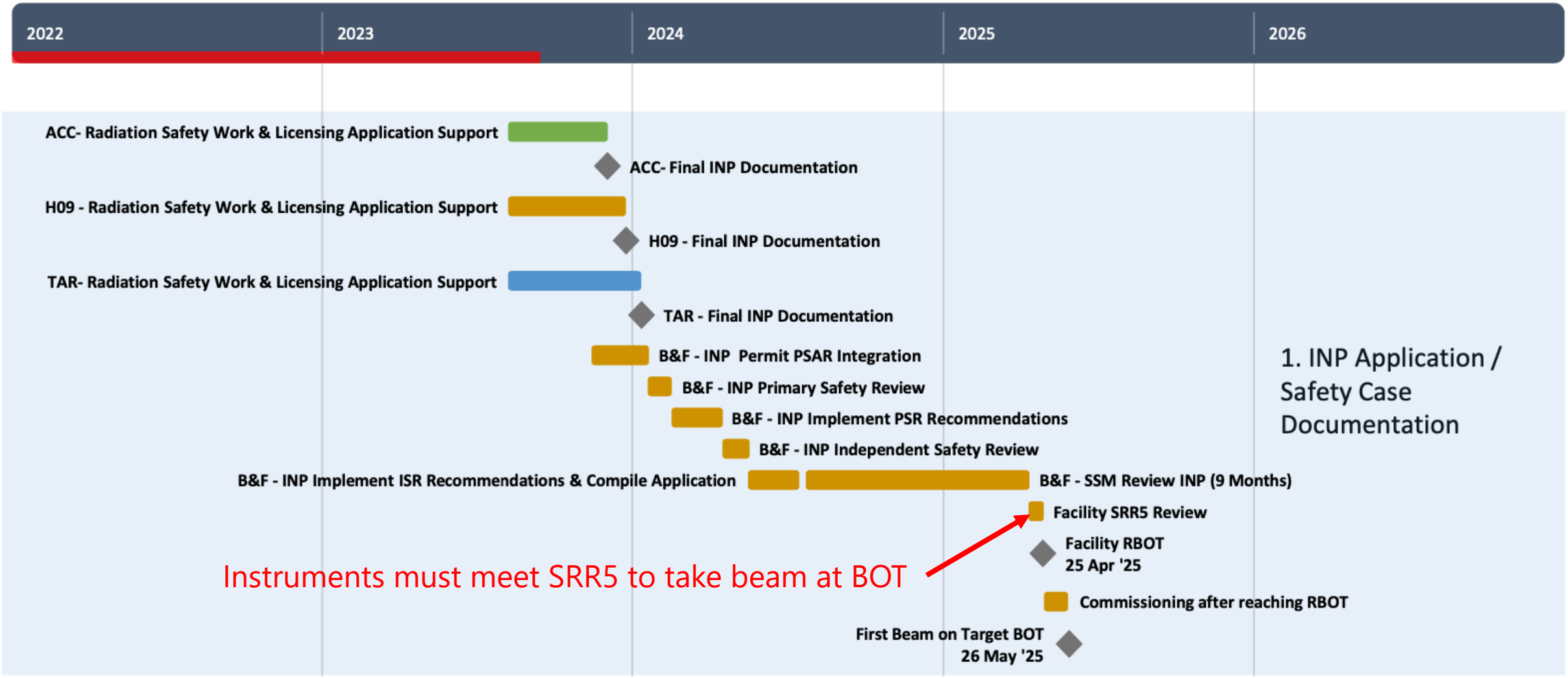
- Training of personnel on and testing of MAGIC Detector at Utgard
- Design of electrical racks and UPS completed, order being placed
- Multi-Blade detector CDR started
- Completed Multi-Blade detector with data chain to be installed at AMOR/PSI in November
  - 1 to 1 device as to be used on the Test Beamline
- Beam Monitor testing held at PSI
- DREAM initial detector delivery planned in October
- TREX MultiGrid workshop held to define path forward
- NMX in beam tests at BNR (Hungary) in September
- BIFROST detector FAT last week, with large DetG presence

ISSUES

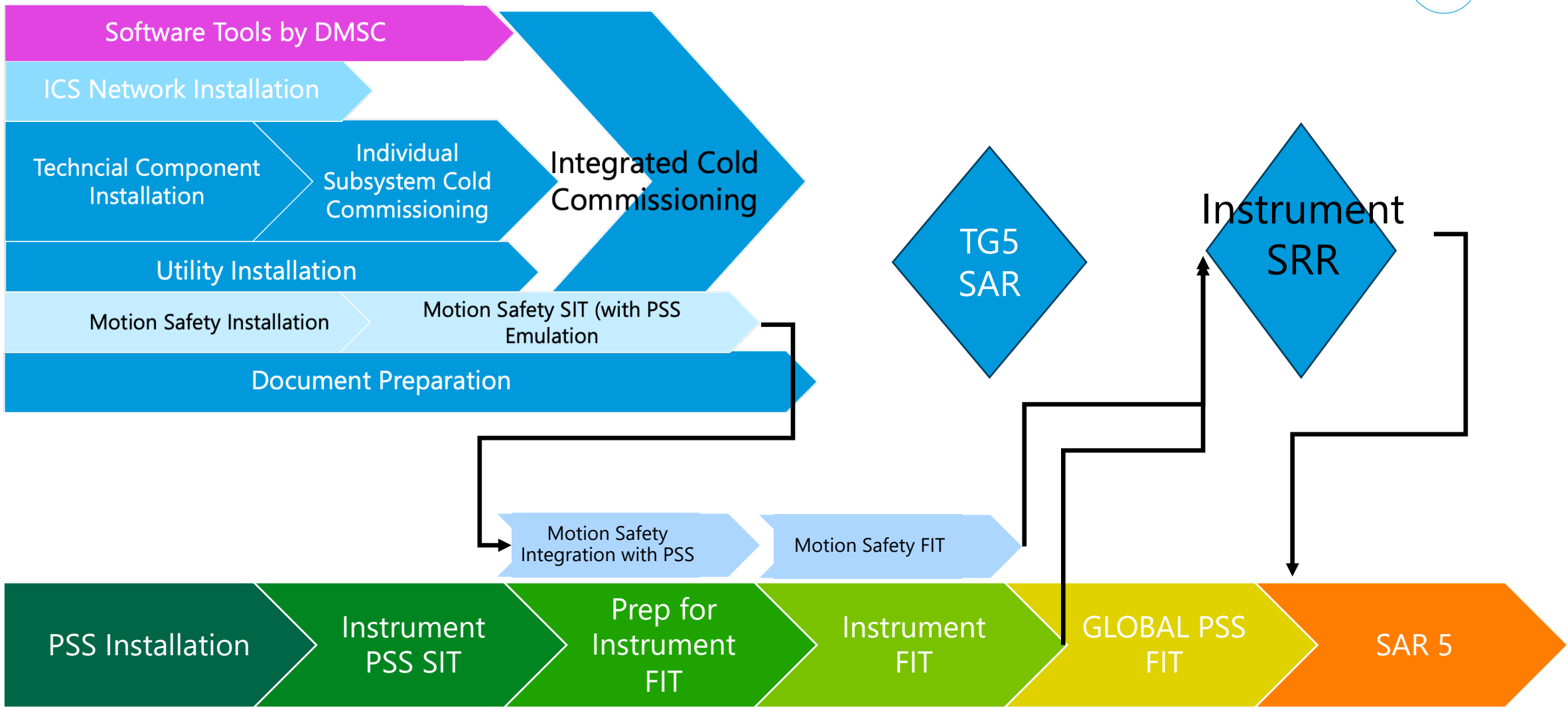
- Loss of personnel on Estia (Lead Engineer) – working with PSI to solve
- FREIA staffing levels - move of Lead Engineer away from ISIS (still within STFC) - seeking engineering support at ESS
- Loss of personnel in ECDC and DMSC due to DMSC office move – including Reflectometry IDS
- Electrical Design of Partner Detector cabling – gap found for cable wiring, using NSS/CEP Resources at partner costs to complete
- Bunker Cranes – taken out of service in July – will affect installations
- Bunker coating quality issues
- Fire safety in bunker – effect on materials for shutters (FREIA)
- Fire safety in caves – analysis per instrument to be done to determine sprinkler needs
- LoKI – ISIS MCA team lost staff; supporting partner with NSS/MCA resources
- MAGIC – candidate for local engineer position withdrew, restarting process
- Informed of loss of rented detector space in 2025; planning with ESS on how to replace has begun.
- BIFROST – Pulse Shaping Chopper Disc testing failure, back up plans on going; housing and base assembled
- Getting instruments through the cold commissioning process will require plenty of coordination both inside and outside NSS, and there are likely to be plenty of opportunities to learn lessons.

Critical Path

Top Critical Path – 0 days float

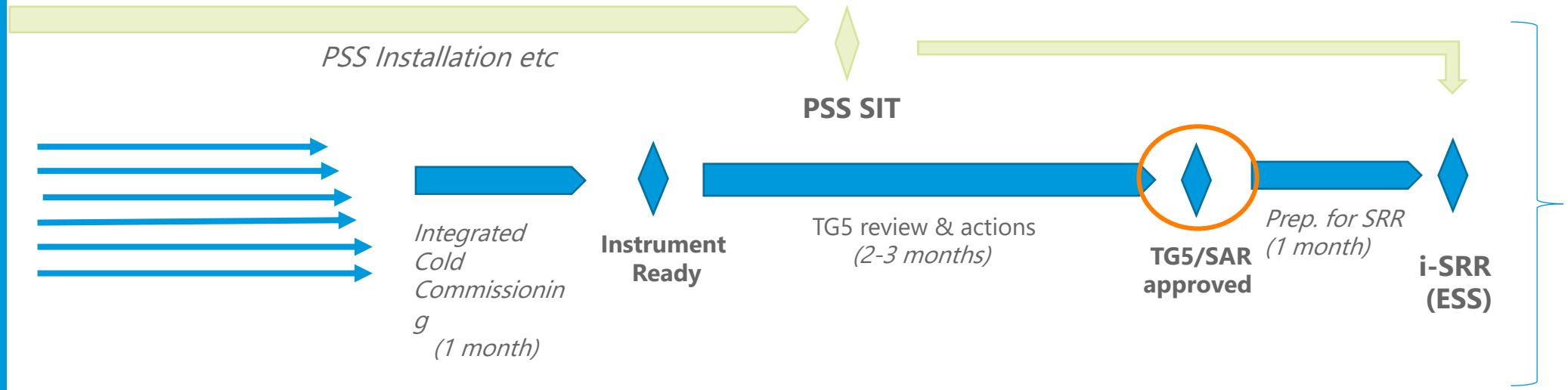


Road to Hot Commissioning



Transition from TG5 to Operations

For all Tranche 1 Instruments we have the current set up in P6;



NEW logic

SRR stays, *but TG5/SAR shifts to the right due ot all integration, documentation etc of FULL scope*

What is the SAR?

System Acceptance Review (SAR) has two main purposes:

- Examine the final technical installation in view of establishing if the installed system has been sufficiently and appropriately tested to be ready for commissioning with beam, i.e. confirm that
  - Verification activities (inspections, demonstrations, analyses and testing) have demonstrated fulfilment of all requirements and are complete and documented
- Examine preparedness for commissioning with beam from safety, planning and technical points of view (e.g. ensure that the product, required equipment for Hot Commissioning, support personnel, and Hot Commissioning procedures are ready)

What is the SRR?

Safety Readiness Review

The purpose of the SRR Procedure is to review the readiness to safely commission and operate any system

The scope is safety, both occupational health and safety, safety related to ionising radiation and effects on the environment where applicable.

The SRR is a procedure by which hardware, personnel and procedures associated with commissioning and operation of the system are verified.

The SRR is an independent review of the safety aspects, performed after a Test Readiness Review (TRR) or a System Acceptance Review (SAR) depending on whether proton beam is involved in commissioning, or not.

Instruments at BOT

GOAL: maximize scientific output as quickly as possible

Given the organizational goal and with the support of the Directors, NSS is going to replan the completion of particular pieces of scope for some instruments in order to ensure that we maximize the number of instruments that are able of accepting neutrons at BOT.

1. Estia now unlikely to meet readiness for BOT – moved to Tranche 2 for planning purposes
2. NMX – this instrument's full scope is three detectors on robots. Full integration of the motion of the robots with the detectors in place will likely take some time. At low power, though, it would be sufficient for NMX to start with at least one stationary detector.
3. TBL – defer completion of pulse shape diffraction test rig, only necessary at stable, higher beam power
4. BIFROST PSC carbon fiber disc – replace with an aluminum disc if necessary

   200k€ CR used to mitigate this issue
5. The ODIN T0 chopper – install at a later date if necessary