



Instrument STAP Meetings October 2020

Overview

PRESENTED BY ANDREW JACKSON



Welcome!

Reminder of the Process

- We are now on a regular schedule
 - 2 STAP meetings per year, synchronized with SAC meetings
 - Reporting to SAC meeting
 - Spring:
 - Short video meeting
 - Written reports sent to SAC
 - Autumn:
 - A longer, physical (if possible), meeting
 - Held during 3 days before SAC meeting
 - All instrument STAPs meet at the same time
 - STAP chairs to attend SAC meeting and present summary
 - Written reports follow

- Format of this meeting:
 - Aim for deeper dive into each instrument than done in April
 - Based on status reports submitted in advance



Purpose & Remit of Instrument STAPs

- Scientific and Technical Advisory Panels
 - one per instrument class
- STAP: instrument advisory body
 - science case and functional requirements
 - all aspects which impact on scientific output of instrument (not just instrument project)
 - technical and project decisions
 - early science
- Advice to both NSS management and instrument teams
 - collaborative & non-adversarial setting
 - NSS management & instrument teams take advice constructively
 - allows NSS management & instrument teams to make good, informed decisions
- Each STAP meeting results in written recommendations
 - followed up in subsequent meeting(s)
 - presented at following SAC meeting
 - SAC report includes highlights of STAP reports – presented to Council



Schedule of Meetings

All times CEST

Monday 19th 09:45 – 11:00 Q&A session with Andreas, Shane & Andrew
14:45 – 16:00 Q&A session with Andreas, Shane & Andrew
Two sessions to allow STAP members from diverse timezones to join one.

Tuesday 20th 13:00 – 16:00 Joint session with DMSC STAP
<https://indico.esss.lu.se/event/1535/>

Wednesday 21st 09:00 – 12:00 NMX STAP : Zoom meeting
09:30 – 13:00 SANS STAP : <https://indico.esss.lu.se/event/1547/>
13:00 – 18:50 Spectroscopy STAP : <https://indico.esss.lu.se/event/1545/>
14:00 – 17:30 Diffraction STAP : <https://indico.esss.lu.se/event/1544/>
14:00 – 17:00 Reflectometry STAP : <https://indico.esss.lu.se/event/1548/>
14:50 – 18:00 Imaging & Engineering STAP : <https://indico.esss.lu.se/event/1546/>



Science Update

STAP meetings October 2020

PRESENTED BY ANDREAS SCHREYER, DIRECTOR FOR SCIENCE

19 OCTOBER 2020





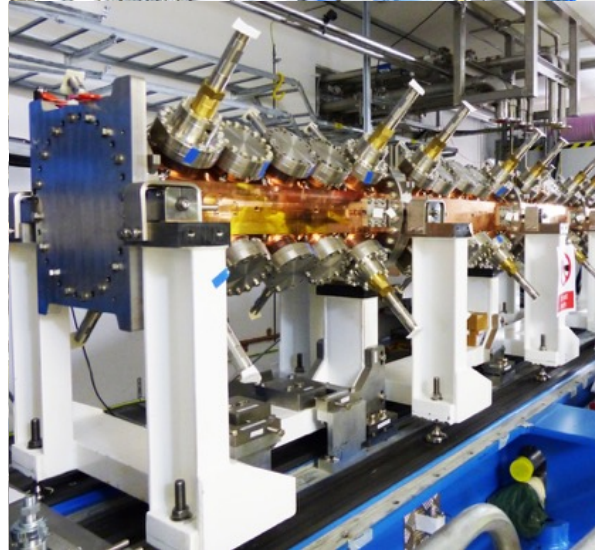
Aerial view, September 2020



Aerial view, September 2018

Accelerator today

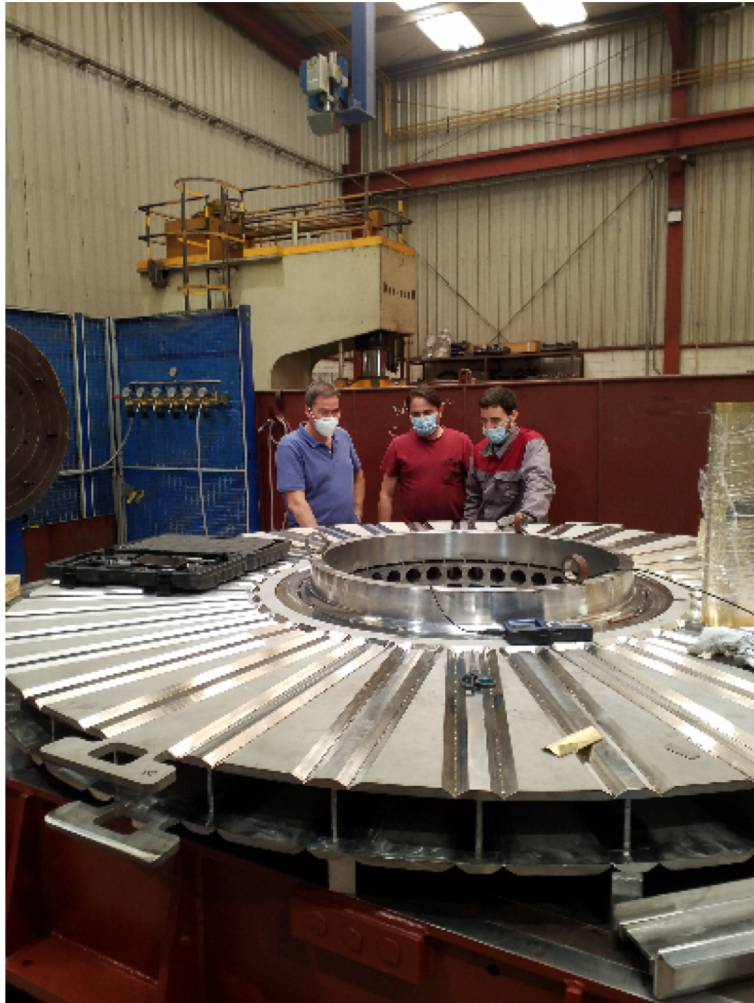
Have now installed 8km of piping, 14km of raceways and approximately 120km of cables for the accelerator. Cables for SC Linac now arriving in Lund.



Target today



Major components in manufacture, monolith vessel now due in October
(there have been some machining issues)



Target Today

The target vessel on its way to ESS - 7th → 21st October



*Photos courtesy of
Rikard Linander/ESS
Bilbao*

Instrument Halls

E01 complete. Significant progress on D01 and D03. Started the encircling "sombbrero" roof



ESS Offices and Laboratories campus



Buildings complete and fit-out underway. On schedule for occupancy in Q1 2021. Campus Transition team established, developing the overall plan for transitioning from temporary offices, workshops and labs into permanent facilities



Bi-annual ESS-ILL user meetings



#1 10-12 October 2018, Grenoble

hosted by ILL

Focus sessions

- Scientific Potential for Combined or In-Situ Neutron Spectroscopy
- Laue Diffraction for Biology
- Laue Diffraction for Materials
- Spectroscopy in Biological Systems
- Imaging



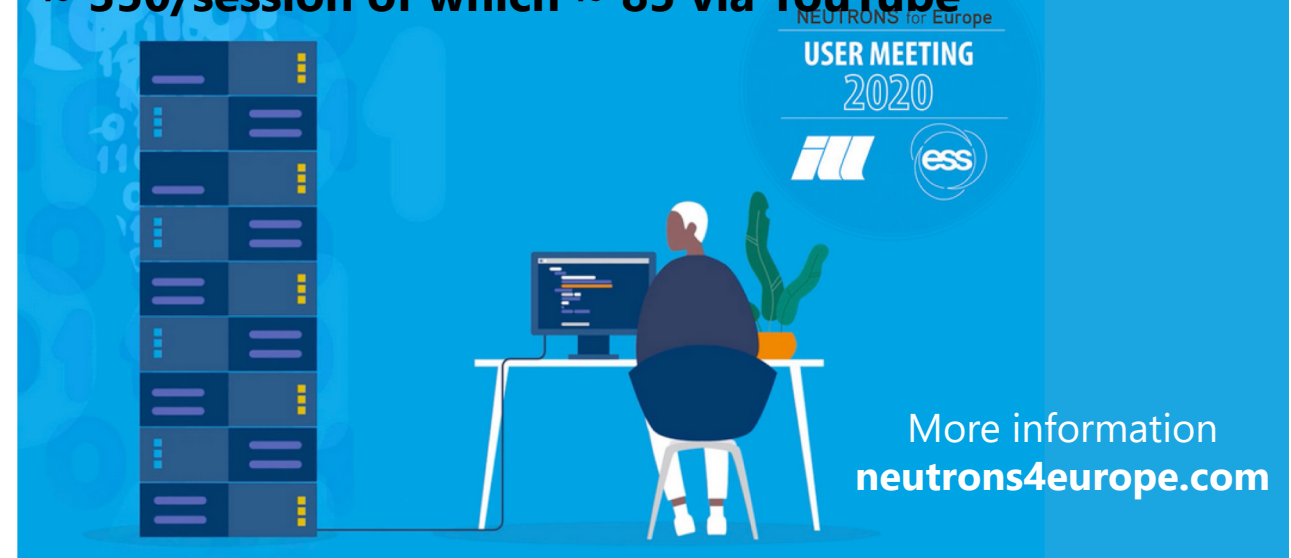
#2 23-25 September 2020, online

Jointly hosted by ESS and ILL

Topical workshops in Oct./Nov.

- ESS - ILL Topical Workshop on Fundamental and Particle Physics
- ESS - ILL Topical Workshop on Chemistry and Magnetism
- ESS - ILL Topical Workshop on Imaging, Materials and Engineering
- ESS Polarisation Workshop
- GISANS Meeting

777 registrants, 508 Zoom accounts active (not at all times)
~ 350/session of which ~ 85 via YouTube



The next physical joint user meeting will be hosted by ESS in Lund in 2022

Pandemic-related measures



Despite the many challenges, ESS has **remained open safely** and made **significant progress** on delivering the project

Since 15 March 2020:

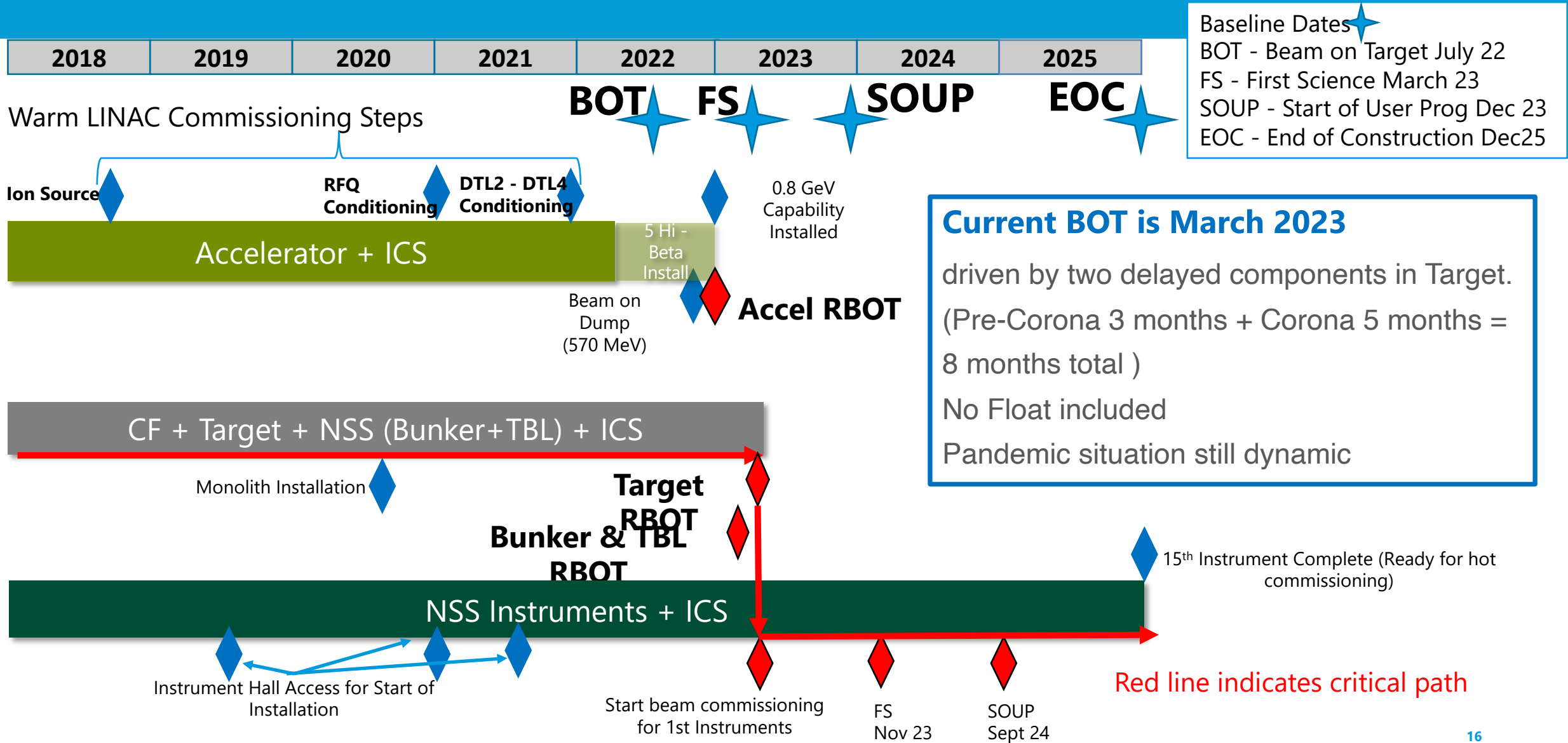
- Work from home for those who can
- Work on-site for construction and hands-on technical work (85-90% capacity)
- Work by in-kind partners resuming, including work of IK partners in Lund as travel is now possible (IFJ-PAN, INFN, CEA)
- Detailed survey of in-kind supply chain showing delays of 2-7 months

Since 1 September 2020:

- Re-populating ESS offices at roughly 50% occupancy, with appropriate distancing measures in place



Summary Schedule and Critical Path for Remaining Work



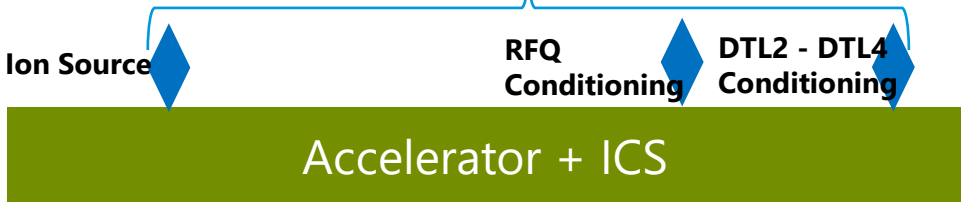
Summary Schedule and Critical Path for Remaining Work

2018	2019	2020	2021	2022	2023	2024	2025
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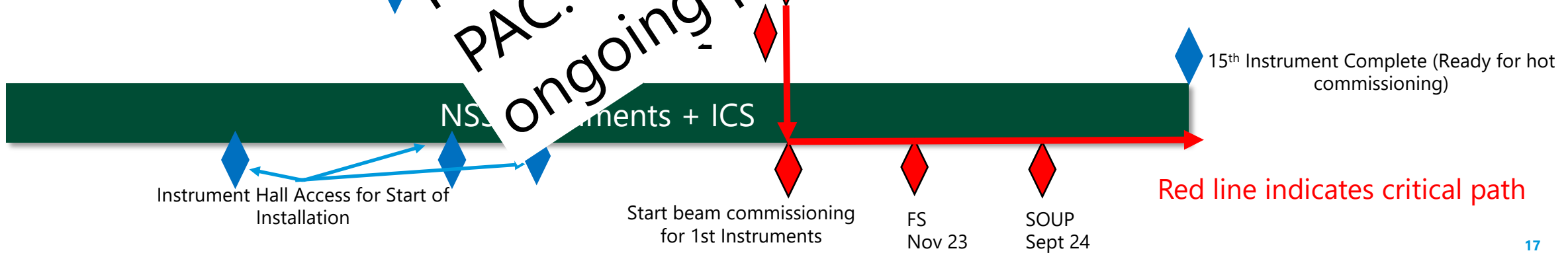
Baseline Dates

- BOT - Beam on Target July 22
- FS - First Science March 23
- SOUP - Start of User Prog Dec 23
- EOC - End of Construction Dec 25

Warm LINAC Commissioning Steps



BOT **FS** **SOUP** **EOC**



Rebaselining in 2021
 PAC: not too early due to
 ongoing pandemic

ent BOT is March 2023

by two delayed components in Target.
 Corona 3 months + Corona 5 months =
 8 months total)
 No Float included
 Pandemic situation still dynamic

Red line indicates critical path



First Science (BOT + 9 months)

SAC recommendation

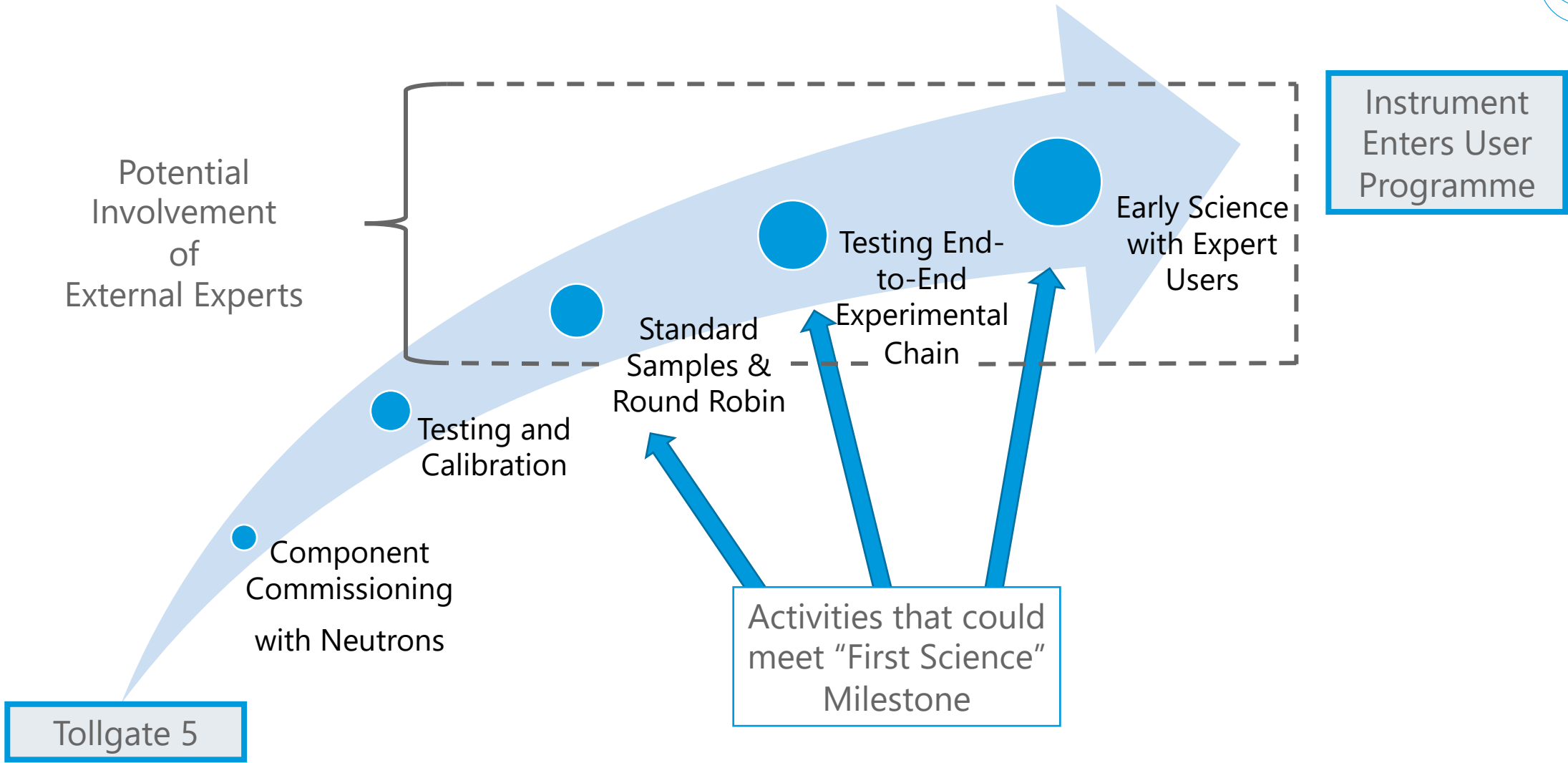
1. Establish that instruments work properly (Benchmarking)
2. Do first science experiments
 - First Science takes place during hot commissioning of the instruments **and** the source
 - Need a working neutron source, but availability can still be low
 - Managing to get a real experiment done, however scientifically straightforward, will be a major achievement!
 - With SOUP (FS + 9 months) we need an acceptable reliability
 - Is essential to not frustrate the user community

How do we plan for First Science?



- Consider all the instruments that will be in hot commissioning 9 months from BOT
- Focus currently on the first 3 – LoKI, ODIN & DREAM – but ensuring all first 8 instruments have plans in place
- All instrument scientists are asked to develop ideas and collaborations
- Cross-collaboration between instrument scientists on different instruments is encouraged
- Instrument Class Co-ordinators help develop ideas and link teams to other ESS groups (e.g. SAD & DMSC)
- STAPs give advice on those plans – already underway
- Plan to include external experts (“Friendly Users”) via transparent process
- Plans are being presented to SAC

Steps to First Science and Beyond



Conclusions

- ESS is making good progress
- Some impact by ongoing pandemic
- Installation of Instruments and scientific infrastructure is progressing well
- BOT and First Science planned in 2023





NSS Update

STAP Meetings October 2020

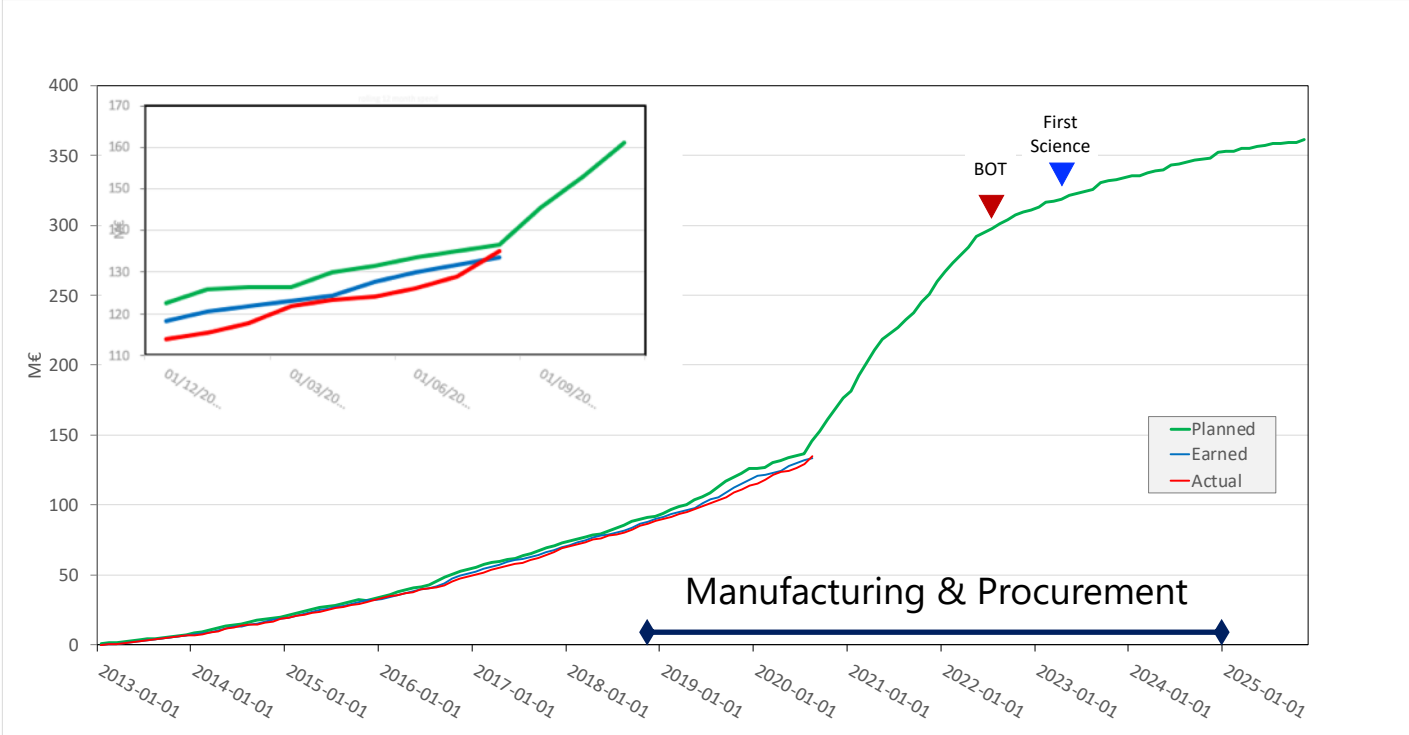
PRESENTED BY SHANE KENNEDY

2020-10-09



Construction project

NSS performance progress (Aug 2020)



Planned	Earned	Actual	SV	CV	SPI	CPI*
136,576,182	133,533,794	135,186,046	-3,042,388	-1,652,252	0.98	0.99

SV -3 M€ & **SPI = 0,98**
 CV -1,6 M€ & **CPI = 0,99**

NSS budget = 361 M€

NSS Project is **38,6 % complete**
 i.e. **43,3 % towards First Science**
 (+0,5 since July 2020)

~ 209 M€ by IK partners
 - In part treated as cash IK

IK status:
 14/15 instruments have IK TA's
 endorsed by IKRC

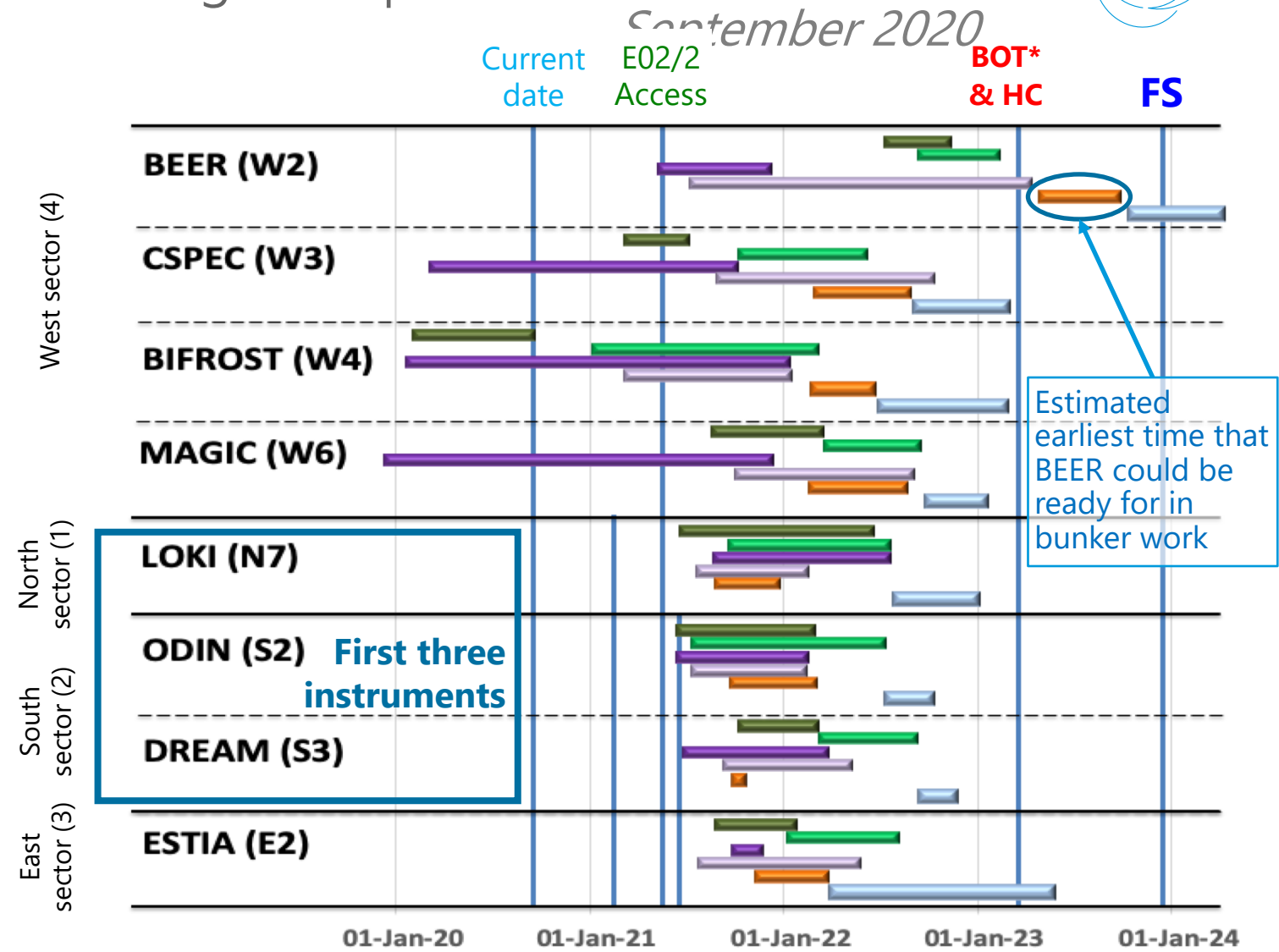
BEER needs signed TAs.

* In kind included through EV

High level installation chart for first 8 instruments: Current forecast: based on ESS rolling wave plan



- Instrument TG5 dates from Critical path map, IK Partner workshop (August) & confirmations from partners
- Assume shift of 18 months for BEER for all in bunker & cave installation & commissioning due to delays in IKCA & TA
- MAIN messages:**
 - NSS RBOT¹ is 23 Jan 2023 (8 weeks float to BOT)
 - 6 instruments (ODIN, DREAM, LOKI, BIFROST, CSPEC & MAGIC²) plan to make BOT.
 - TG5 date range (excl. BEER) Oct '22 -> May '23
 - 7 Instruments could potentially make FS milestone



1. NSS RBOT is defined as Bunker & Test Beamline ready for Beam on Target
2. MAGIC still has high manufacturing schedule risk

*BOT in rolling wave plan is 17 March 2023

High level schedule – access for Instruments



1. Buildings are NOT delayed !

Hall access for Instruments according to baseline schedule

Plan is to start installations outside Bunker area as soon as access to halls is available

First installation process will take more time for each team – practice will speed it up.

Cranes are confirmed to be available from point of instrument access.

2. Target delays -> impacting in-bunker access

Vessel, inner shielding, port blocks etc. (need to be installed before the insert installations)

deliveries are foreseen Q4-20 / Q1

Light shutter system

forecast deliveries Q2-Q3 2021

Blind plugs

confirmed deliveries Q4202-Q1 2021

NBPI

forecast deliveries between June-21 and Feb-22

NSS & Science Directorate Staff News



- Gábor László appointed Section Leader for Instrument Engineering
- Caroline Curfs joined SAD in September as Group Leader for Sample Environment
- Daria Noferini joined in May as instrument scientist working on CSPEC
- Instrument Data Scientists in post or recruited at DMSC for Diffraction (Celine Durniak), SANS (Wojciech Potrzebowski), Imaging+Engineering (Søren Schmidt), Reflectometry (start in Jan '21), and Spectroscopy (start in Jan '21)
- Grant Wallace & Dennis Vedelgart joined NSS in September as Instrument Support Technicians
- Tobias Mamani - Design support for sample environment
- Ümit Hardal - Data Acquisition
- Steen Andersen - Chopper Technician

Neutron Bunker



Bunker R6 section complete – June 2020



Steel support pillars in E02 ready for installation



First pillar in place – 6 October



West wall pre-build complete & final adjustments underway



Cave Installation



NMX cave complete and accepted



BIFROST Cave First 3 layers complete – 10 September

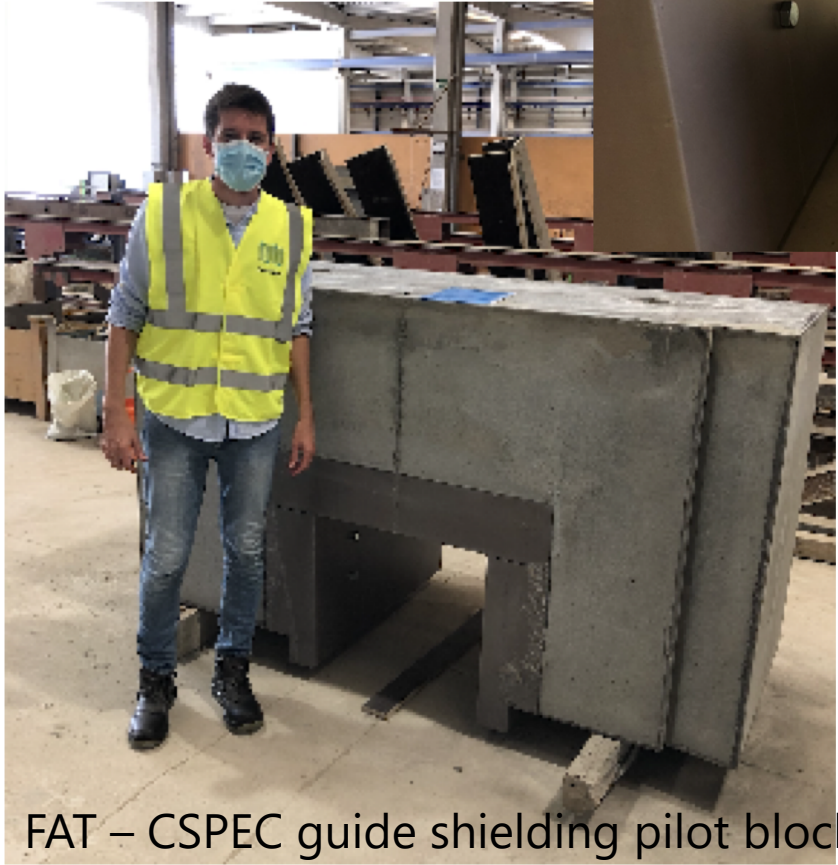
Heavy Shutters



1st of 4 NSS designed heavy shutters delivered and SAT complete – Sept '20

LoKI Heavy Shutter assembled at ISIS and ready for testing

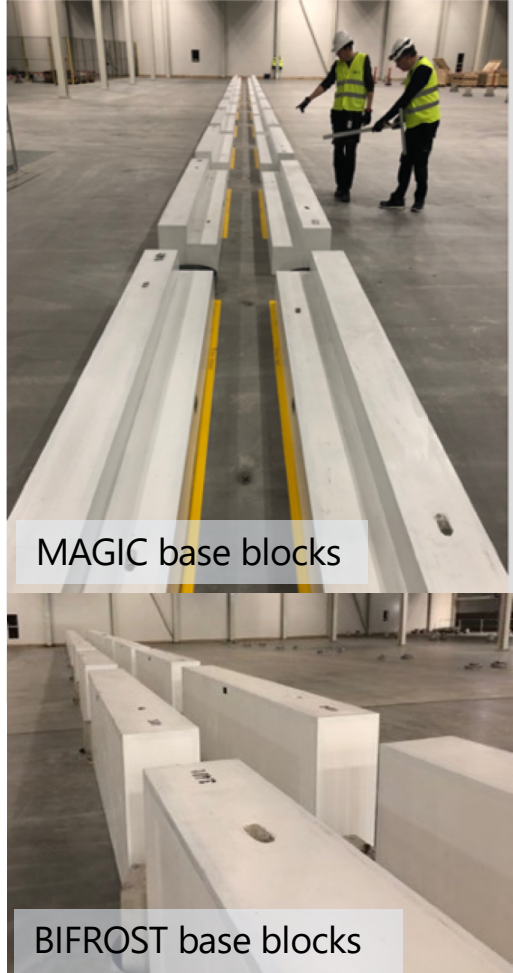
Common shielding project



FAT – CSPEC guide shielding pilot blocks



CSPEC base blocks



MAGIC base blocks

BIFROST base blocks

Detector Tanks



Bifrost Detector tank ready for FAT at AVS (Spain)



LOKI Detector tank under construction at Cadinox (Spain)



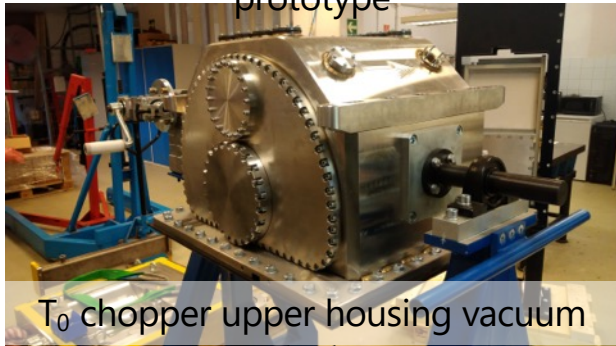
Chopper Systems



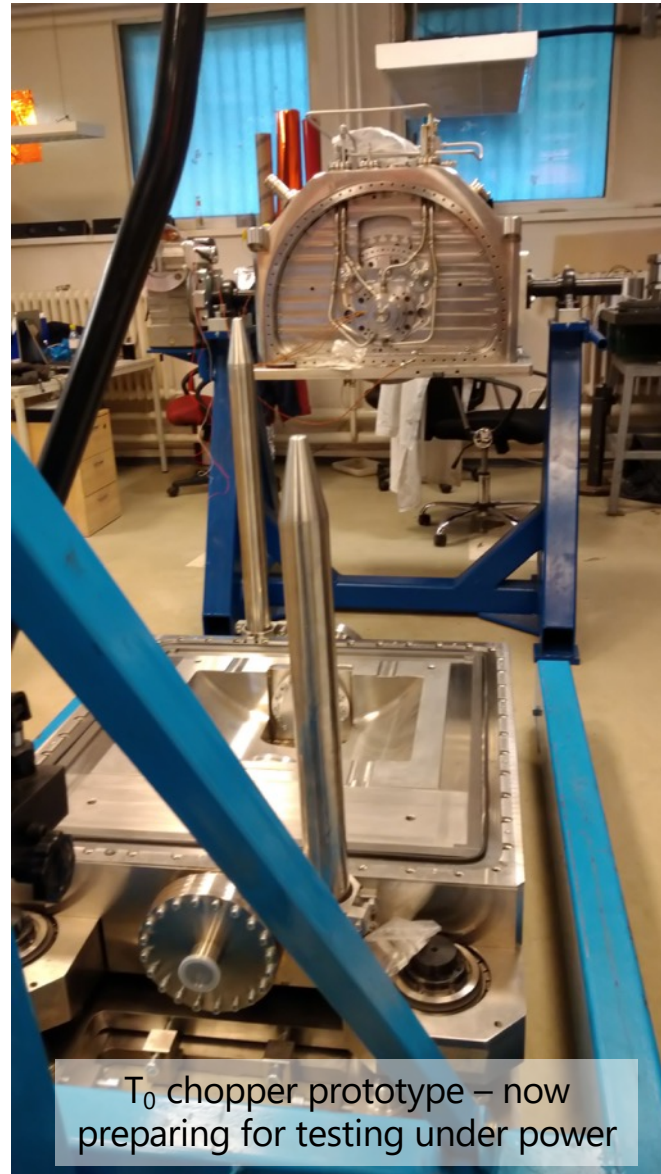
SEP 2020



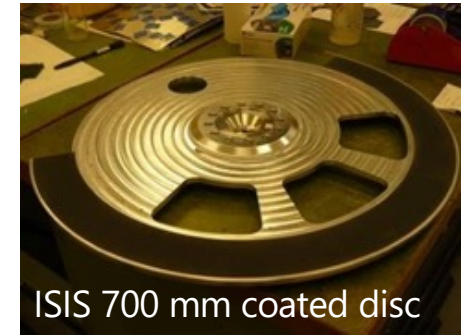
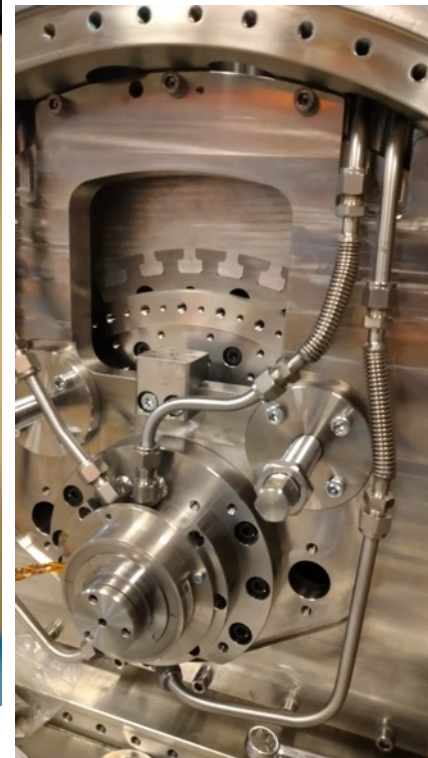
NSS T₀ chopper prototype



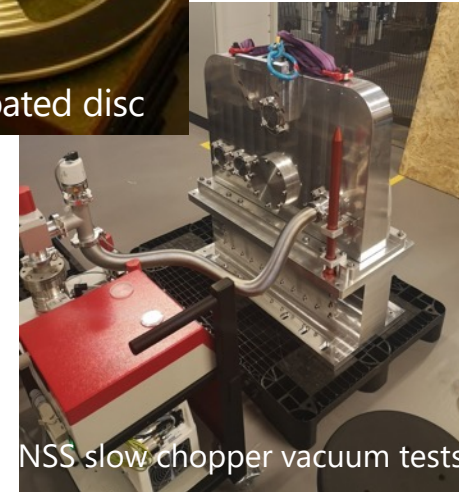
T₀ chopper upper housing vacuum test



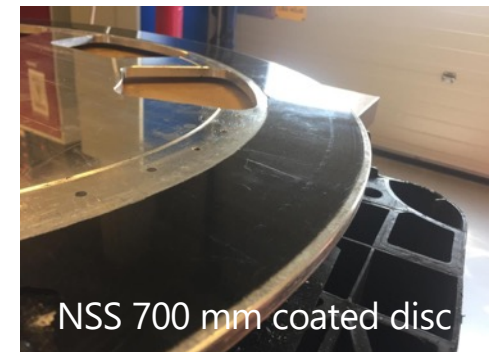
T₀ chopper prototype – now preparing for testing under power



ISIS 700 mm coated disc



NSS slow chopper vacuum tests

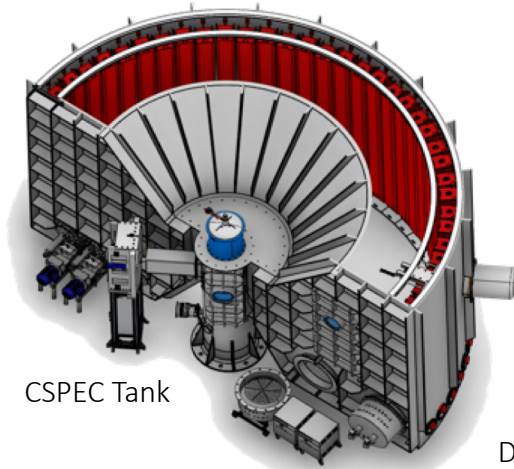


NSS 700 mm coated disc

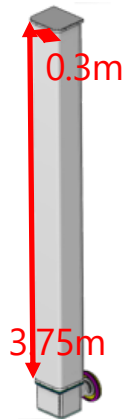


The Multi-Grid detector for C-SPEC

Under construction

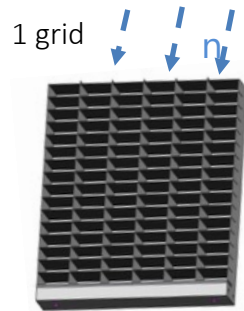
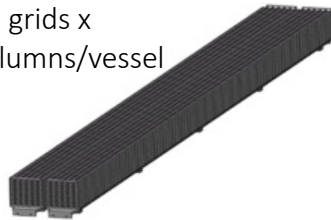


CSPEC Tank

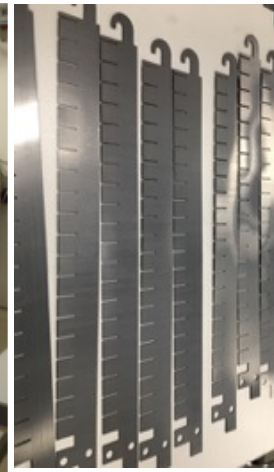
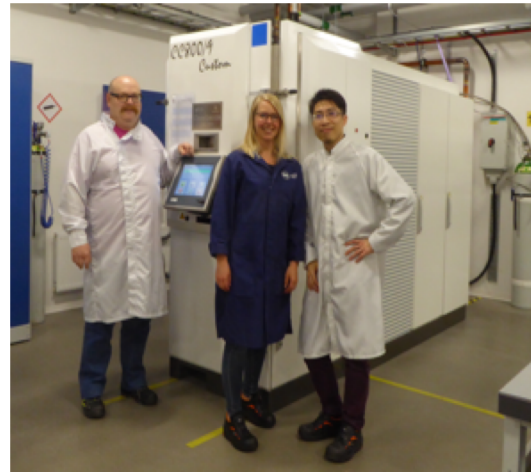


Detector Module
18 x vessels in total

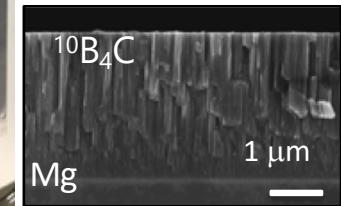
140 grids x
2 columns/vessel



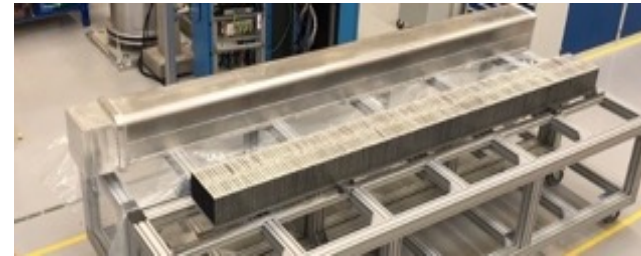
- Cost: 4.3 M€ (including installation)
- Delivery agreement between TUM & NSS signed in June 2020



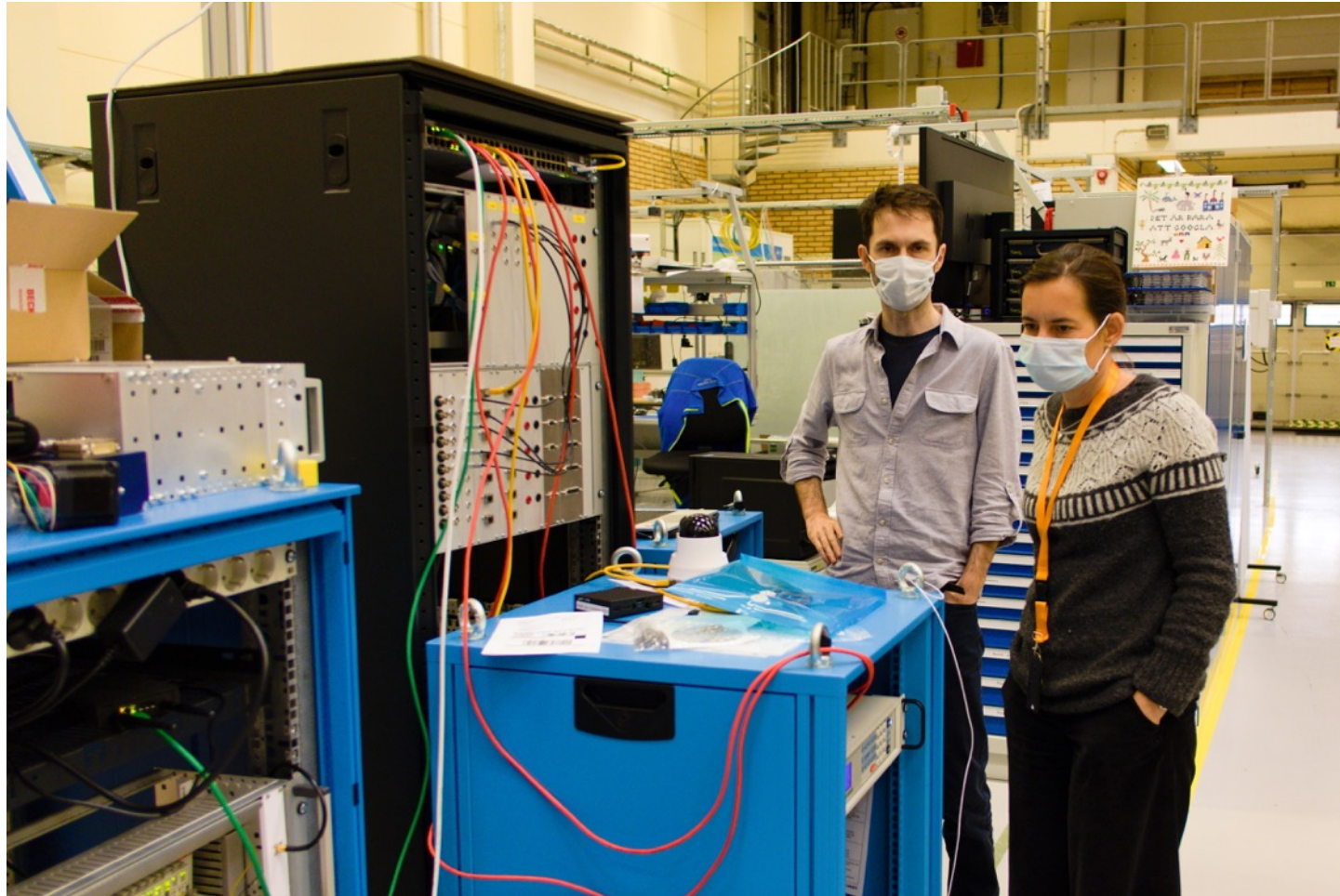
ESS Coating facility
(Linköping)



ESS Assembly workshop (Utgård, Lund)



ECDC - Ymir @ Utgård



Matt Clarke (ECDC) & Caroline Curfs (SAD) inspecting control system integration tests at Ymir - 6 October 2020

Thanks!

