



# NSS Project Update

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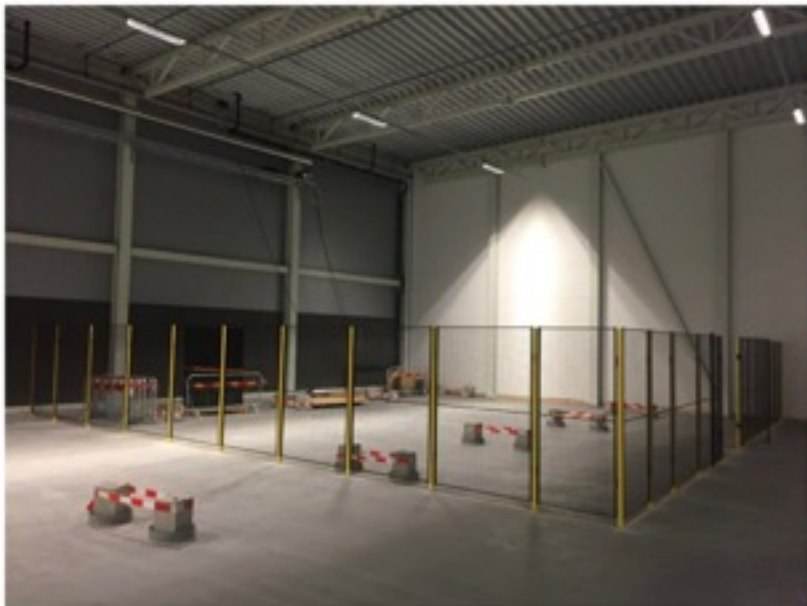
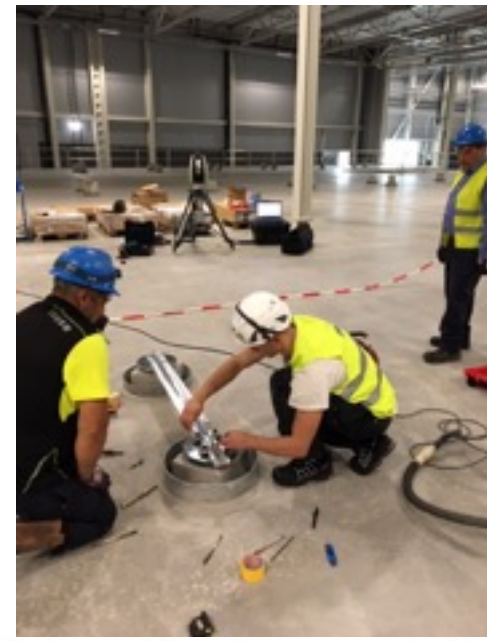
IKON18, Grand Hotel Lund, 24 February 2020



# NSS Highlights since last IKON

## First installations in E01/E02:1

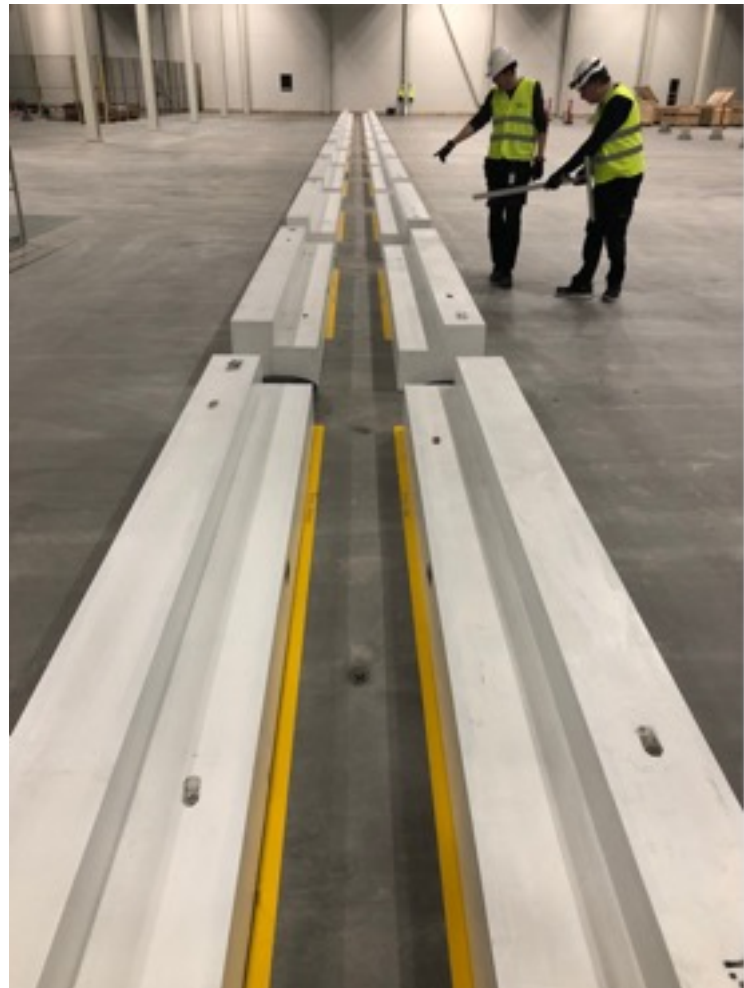
- **September** : Mounting of Instrument interface plates on top of the beamline piles in the E02 hall.
- **October**: Temporary tent in E01 for NBPI/NBOA pre-alignment
- **October**: Chopper workshop: temporary until the permanent CMF1 and 2 workshops are available
- **December**: E03/E04 handed over -> Lab fit out started



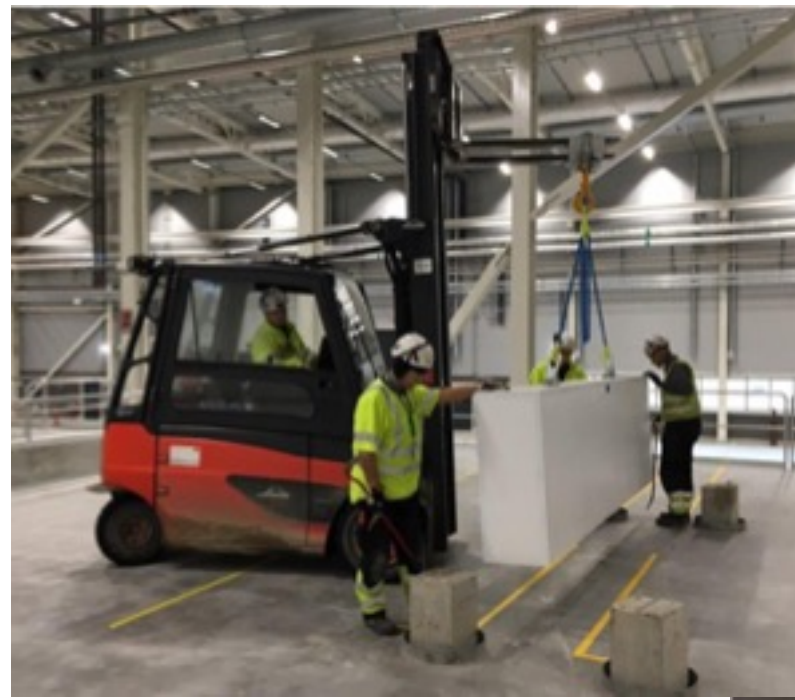


# NSS Highlights since last IKON

## Common Shielding base block installation



MAGIC  
December 2019



BIFROST  
Jan/Feb 2020





# NSS Highlights since last IKON

## NMX cave installation



Foundation cast in place  
December 2019



January/February: Internal cave floor  
cast-in-place





# NSS Highlights since last IKON

## BIFROST hutch installation



20 Feb 2020



12 Feb 2020

# NSS Highlights since last IKON



## Bunker Manufacturing and Start of Installation

- *Manufacturing start*
- *First IRR completed & Installation started (R6 brackets)*
- *West wall production start*
- *West wall installation start*
- *Bunker ready for BOT*

*October 2019*

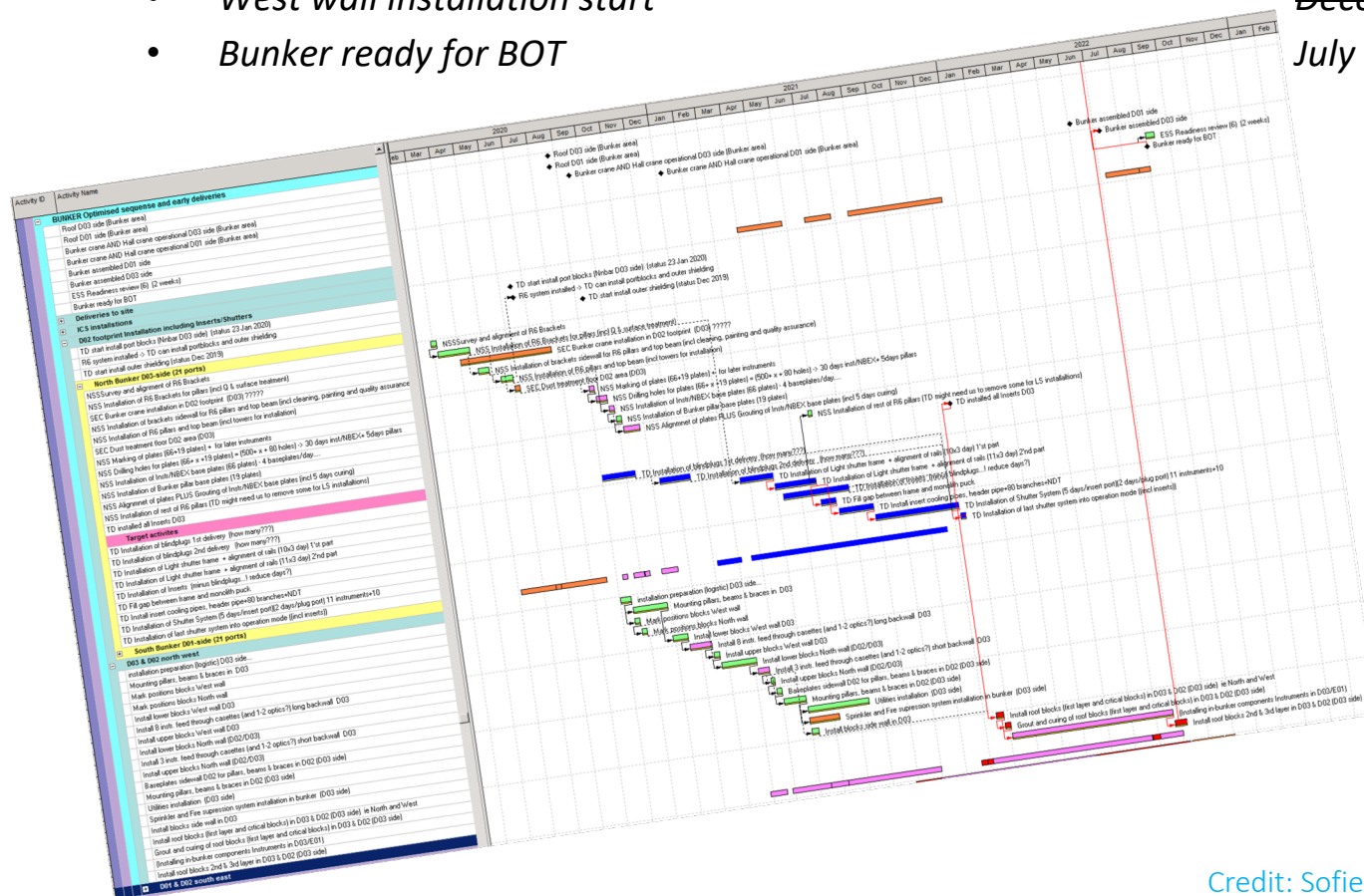
*February 2020*

*March 2020*

~~*December 2020*~~ *shifted to October 2020*

*July 2022 -> 2 months negative float and is currently in Sep 2022*

*Mitigations ongoing ESS wide to bring it back.*



# NSS Highlights since last IKON

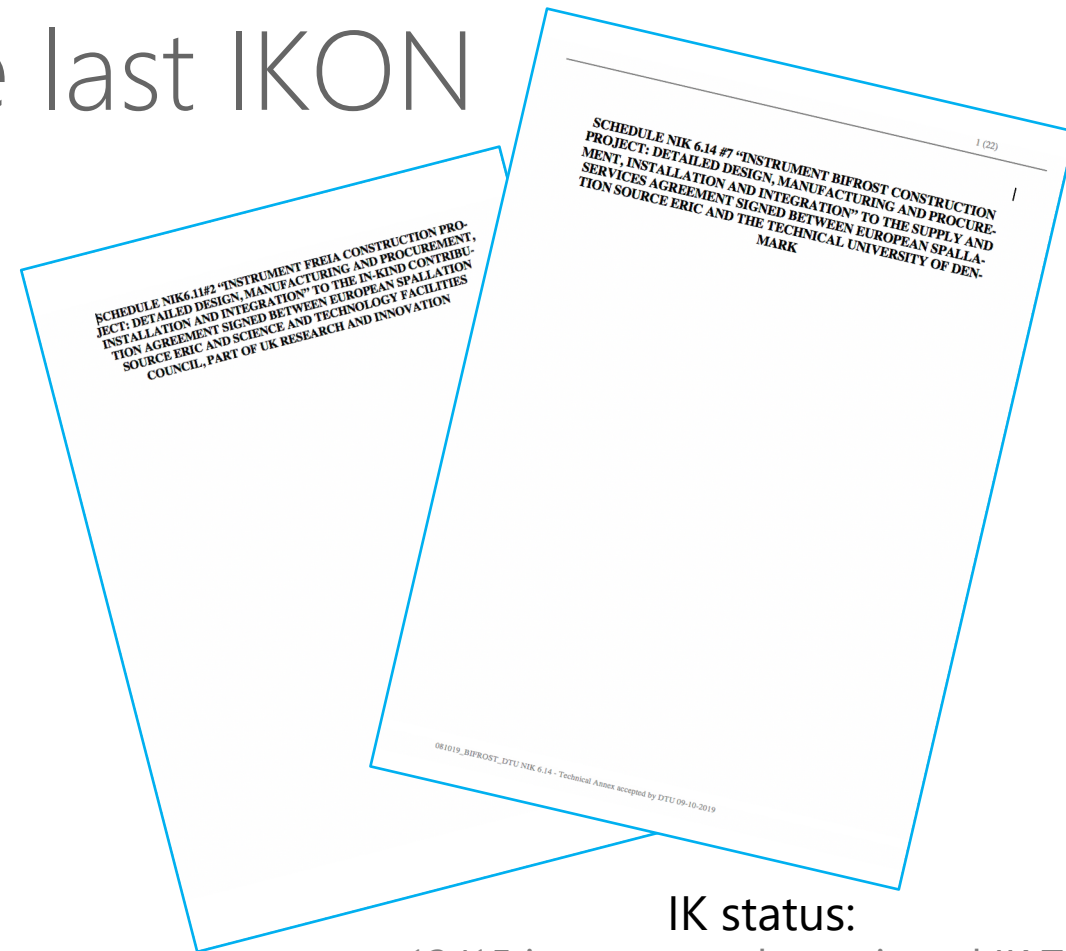


October 2019 IKRC TA recommendations for Council approval:

- SKADI (FZJ, LLB)
- BIFROST (DTU, PSI, LLB, IFE & KU)

January 2020 IKRC TA recommendations for Council approval:

- FREIA (ISIS)
- T-REX (FZJ, CNR)
- HEIMDAL (AU, IFE & PSI)
- MIRACLES (Bilbao)



**IK status:**

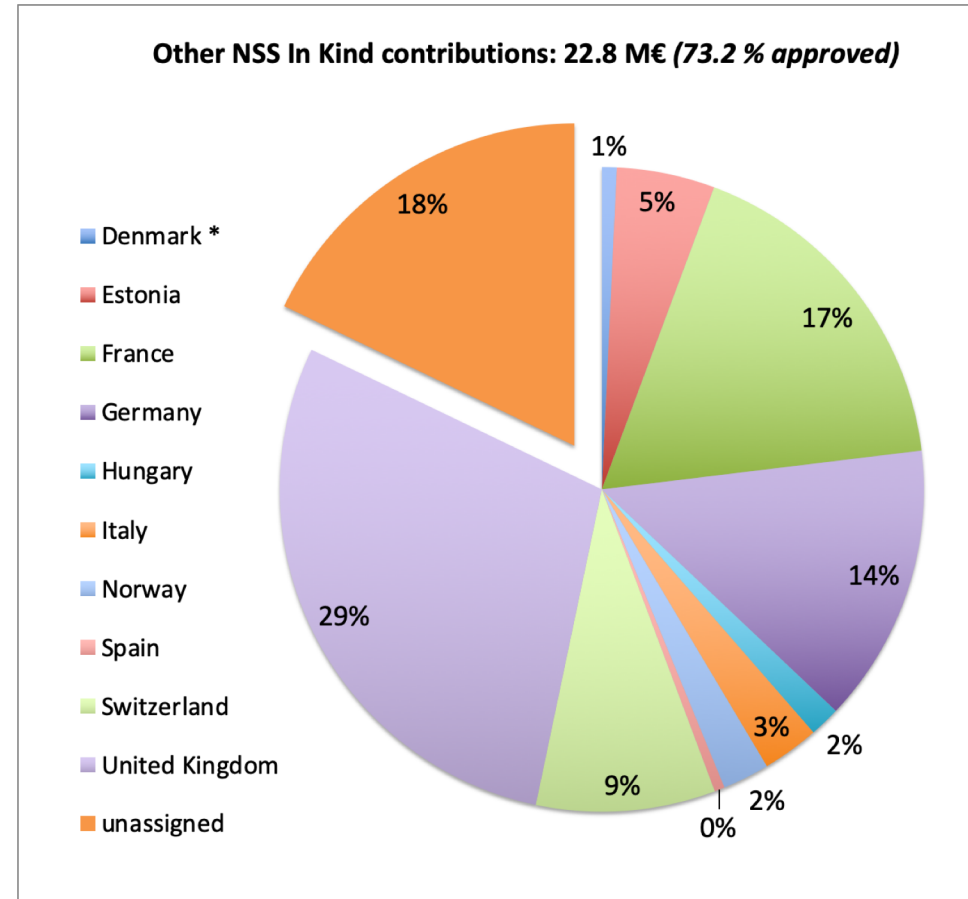
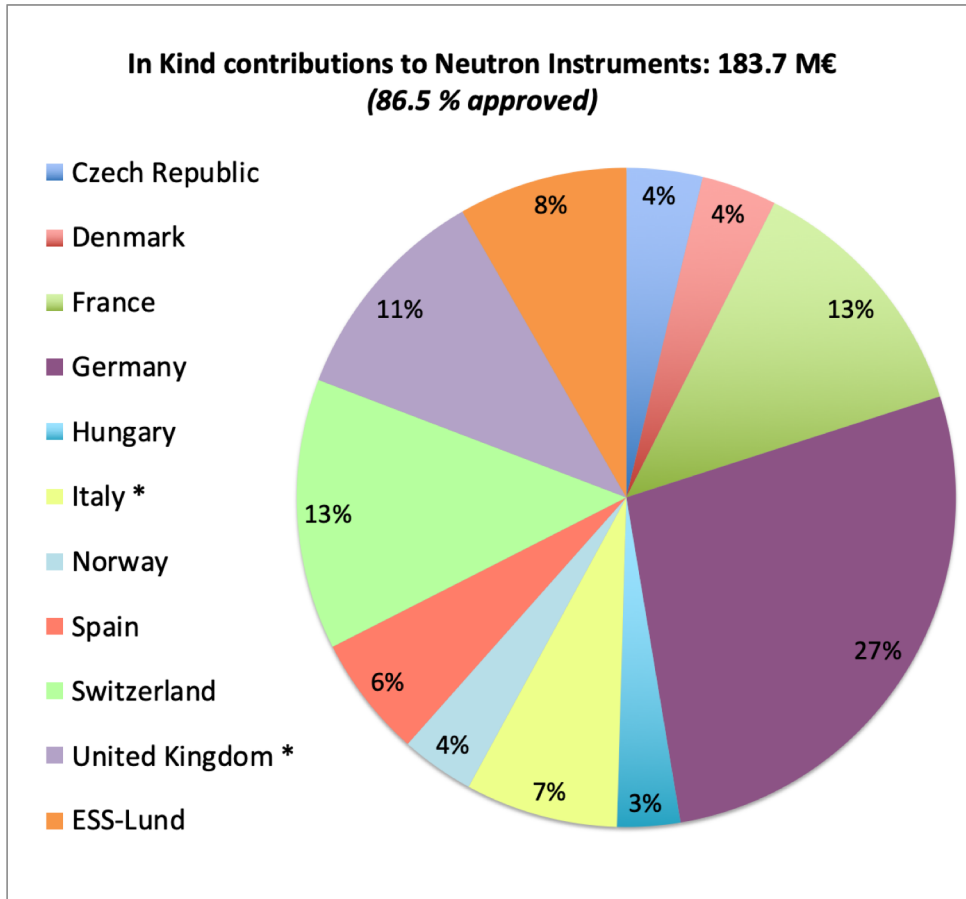
13/15 instruments have signed IK TA's  
(86.5 % of Instrument IK approved)  
BEER & VESPA need TAs signed.

*Tracking of IK progress through  
monthly reports is needed*

# In-Kind Contributions: Summary by Country



IKC constitutes 59 % of NSS scope



Total IK contributions (approved, planned & potential): 206.5 M€ (91 % of the NSS IK target)

\* Nominal split of IT (90%) & UK (10%) contributions to VESPA under review - could shift delivery further to UK & ESS



# The NSS Project Neutron Instruments



Including contribution common shielding and common chopper projects

Common  
Shielding Project      Common  
Chopper Project

**86.5 %** of  
Instrument scope  
is in signed TAs

● *Confirmed*  
● *Potential  
or in for racks*

*ESS common  
shielding &  
Chopper scope:  
Confirmed value  
= 11.8 M€*

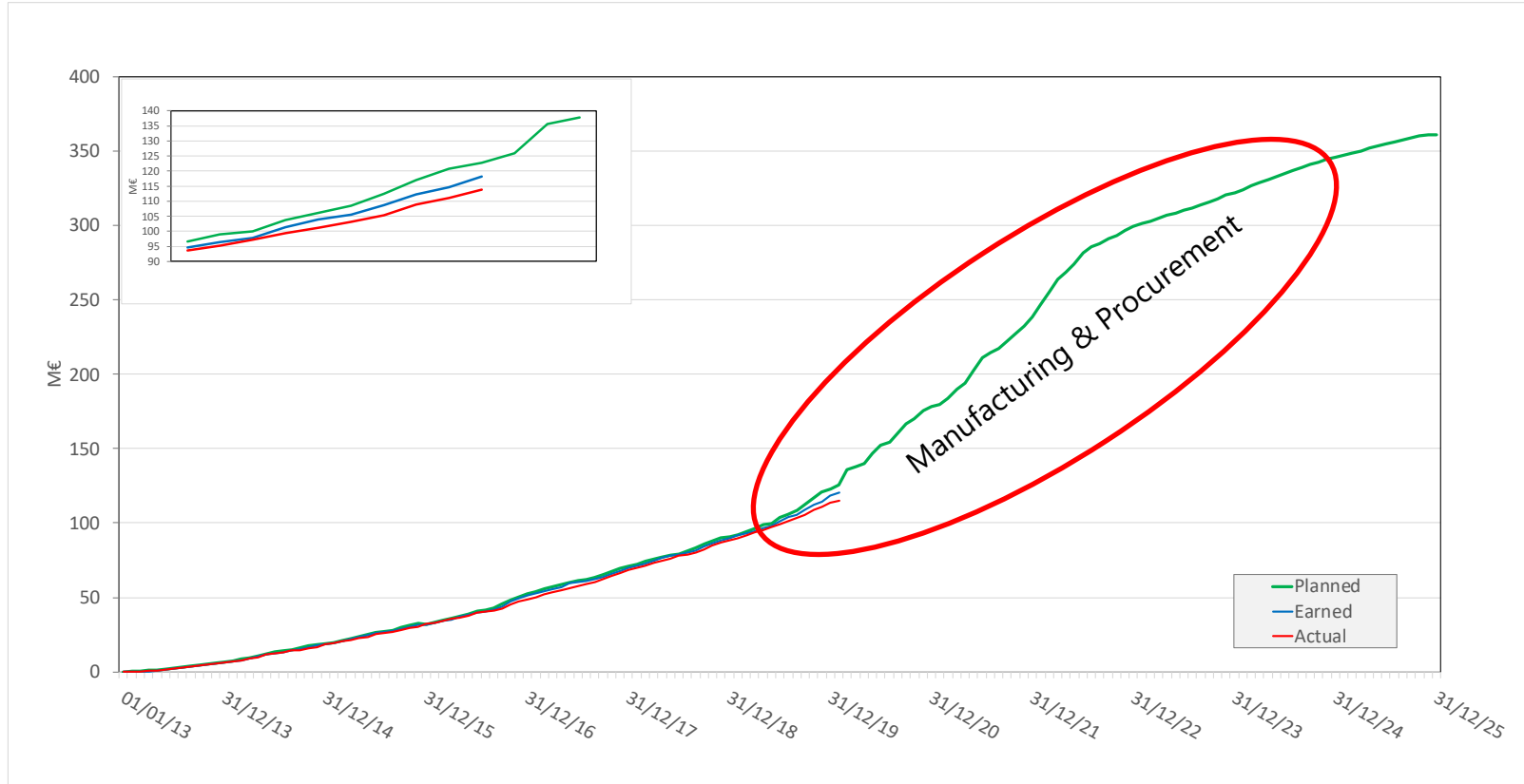
Neutron Instrument	Budget (M€)	Partners (% includes ESS common projects)
LOKI (Broad band SANS)	12.85 ●	ISIS (81%) + ESS (19%)
SKADI (General Purpose SANS)	11.50 ●	FZJ (50%) + LLB (50%)
ESTIA (Focusing Reflectometer)	11.80 ●	PSI (100%)
FREIA (Liquids Reflectometer)	13.20 ●	ISIS (78%) + ESS (22%)
DREAM (Bispectral powder diffractometer)	● 13.66 ●	FZJ (76%) + LLB (20%) + ESS (4%)
HEIMDAL (Hybrid diffractometer)	● 13.55 ●	Åarhus U. (30%) + PSI (35%) + IFE (25%) + ESS (10%)
MAGIC (magnetism single xtal diffraction)	● 13.10 ●	LLB (52%) + FZJ (24%) + PSI (16%) + ESS (8%)
NMX (Macromolecular crystallography)	● 11.67 ●	ESS (24%) + WI/IER(53%) + Bergen (22%) + LLB (7%)
BEER (Engineering diffractometer)	● 14.99 ●	NPI (50%) + HZG (50%)
ODIN (multi-purpose imaging)	● 11.76	TUM (60%) + PSI (36%) & ESS (4%)
BIFROST (extreme environment spectro.)	● 13.45	DTU/KU (23%) +PSI (27%) +IFE(14%) +LLB (20%) +ESS (16%)
C-SPEC (cold chopper spectrometer)	● 16.50	TUM (50%) + LLB (40%) + ESS (10%)
T-REX (bispectral chopper spectrometer)	● 16.85 ●	FZJ (75%) + Perugia U. (25%)
VESPA (vibrational spectroscopy)	● 12.00 ●	CNR (100%)
MIRACLES (backscattering spectrometer)	● 13.4 ●	ESS-Bilbao (89%) + KU (2%) + ESS (9%)

**200.28**

February 2020

# NSS Construction project :

## NSS performance progress (Jan 2020)



NSS budget = 361 M€

**NSS Project is 34.9 % complete**  
*(+4.9 % since IKON 17)*

~ 206 M€ by IK partners  
 - In part treated as cash IK

IK status:  
 13/15 instruments have signed IK TA's  
 (86.5 % of Instrument IK approved)  
 BEER & VESPA need TAs signed.

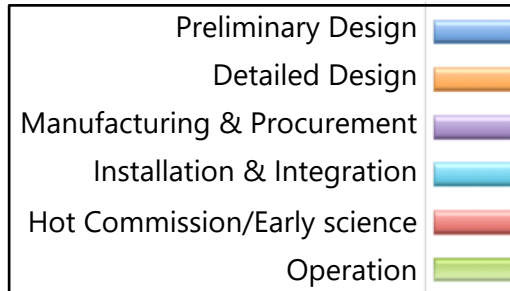
*Tracking of IK progress through  
 monthly reports is needed*

Planned	Earned	Actual	SV	CV	SPI	CPI*
125,905,429	120,639,989	115,323,914	-5,265,440	5,316,075	0.96	1.06

# Baseline schedule for Neutron Beam Instruments



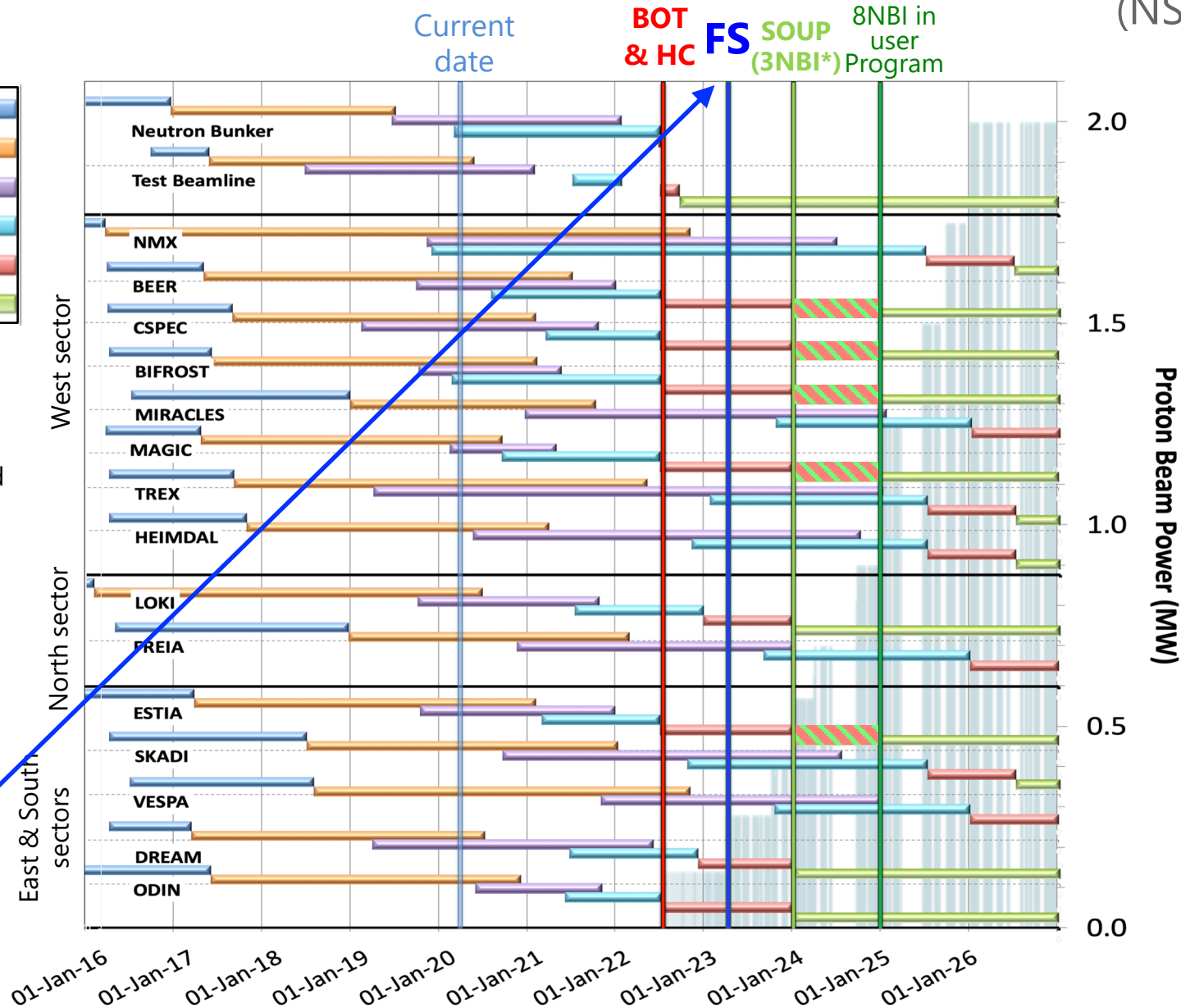
(NSS MS V4.3)



- **First 3 NBI selected for SOUP: DREAM, LOKI & ODIN** (best chance for early impact, as agreed by NSS, SAC and ESS Council)
- **Back-up instruments:** (for risk of late access to D01 & D03) BEER, CSPEC, MAGIC or BIFROST, ESTIA

March 2023:

- **First Science (FS)** with expert teams on some of instruments above
- Review progress of first 3 NBI\* for SOUP, implement backup plan if needed.



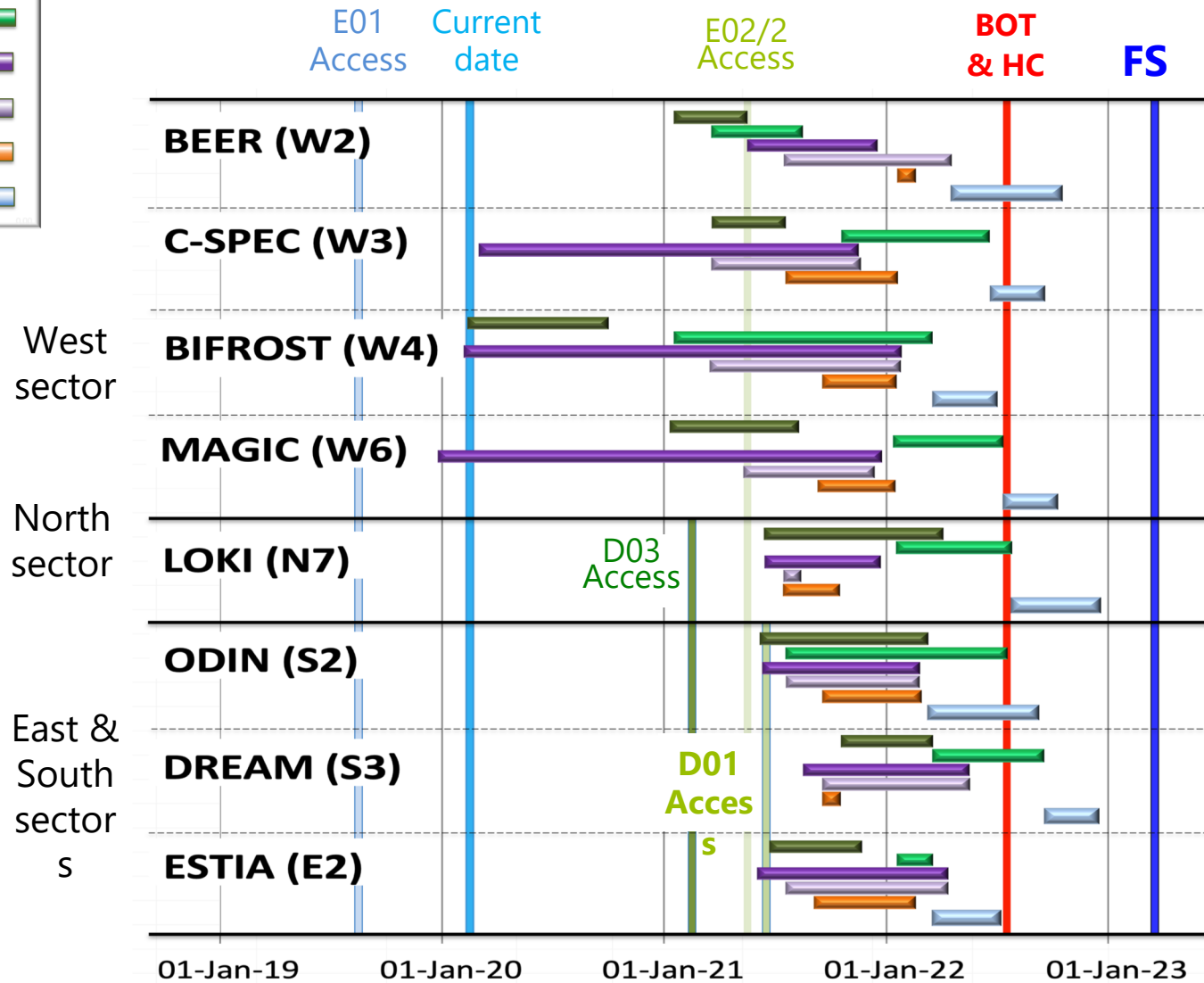
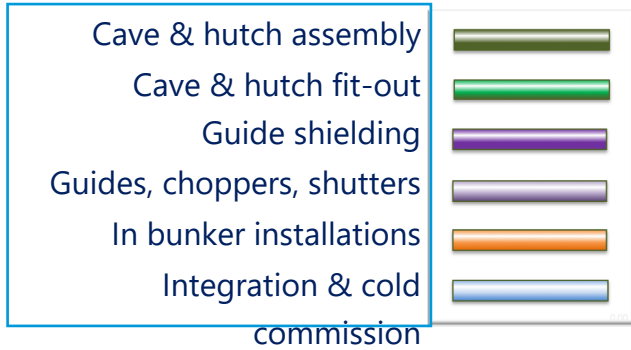
- ESS Major Milestones (BOT, FS, SOUP) have not changed since early 2018.
- BOT currently has negative float of 8 weeks
- ESS is working to reduce this as far as possible

\* NBI = Neutron Beam Instrument

# Detailed installation chart for first 8 instruments



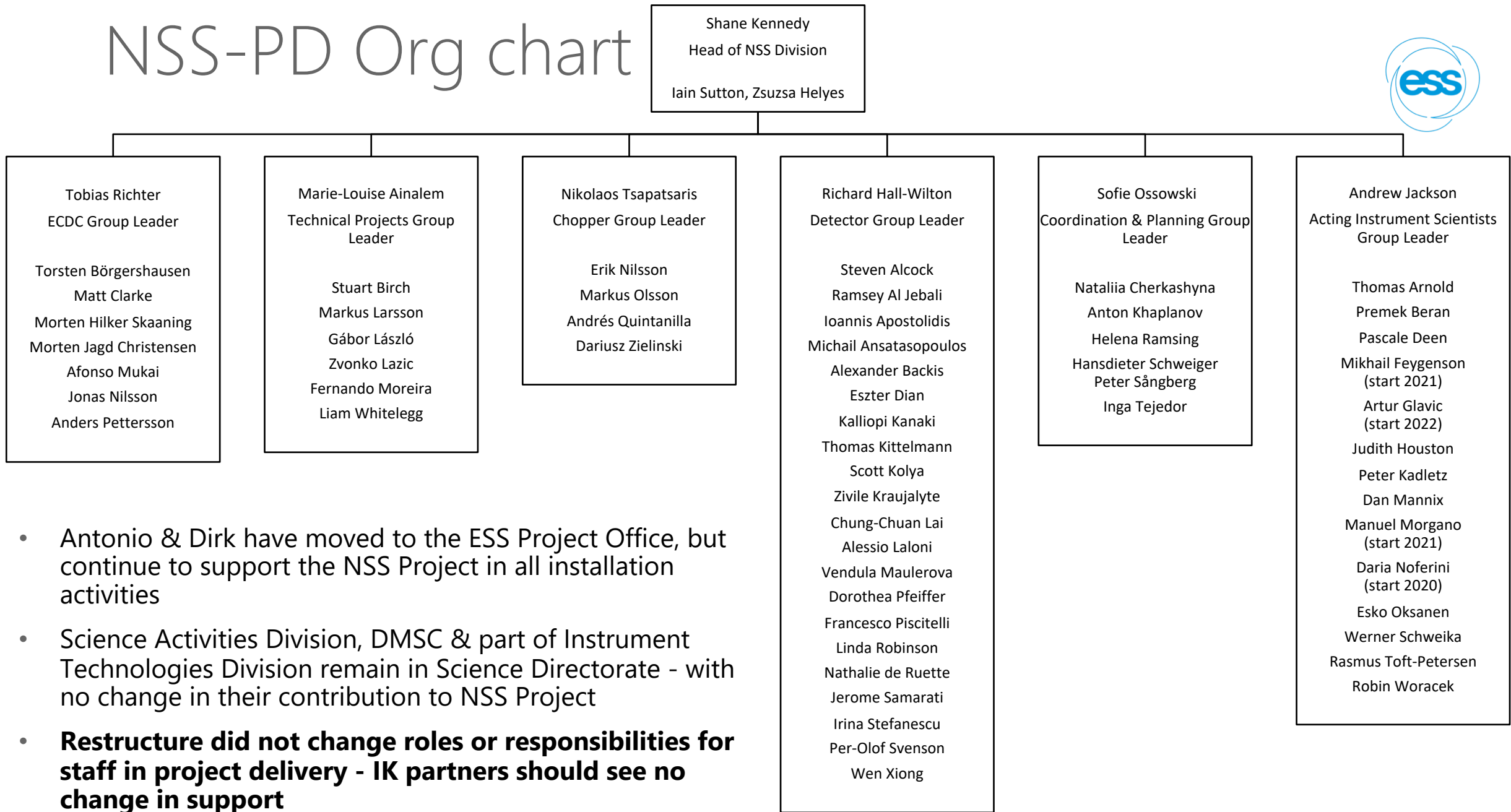
(NSS MS V4.3)





# NSS Project Division Reorganization

# NSS-PD Org chart



- Antonio & Dirk have moved to the ESS Project Office, but continue to support the NSS Project in all installation activities
- Science Activities Division, DMSC & part of Instrument Technologies Division remain in Science Directorate - with no change in their contribution to NSS Project
- **Restructure did not change roles or responsibilities for staff in project delivery - IK partners should see no change in support**

# The NSS-PD Team



First NSS-PD all hands meeting  
(9<sup>th</sup> October meeting 2019)

NSS-PD team building (Utmaningarnas Hus,  
Limhamn, 21<sup>st</sup> November 2019)

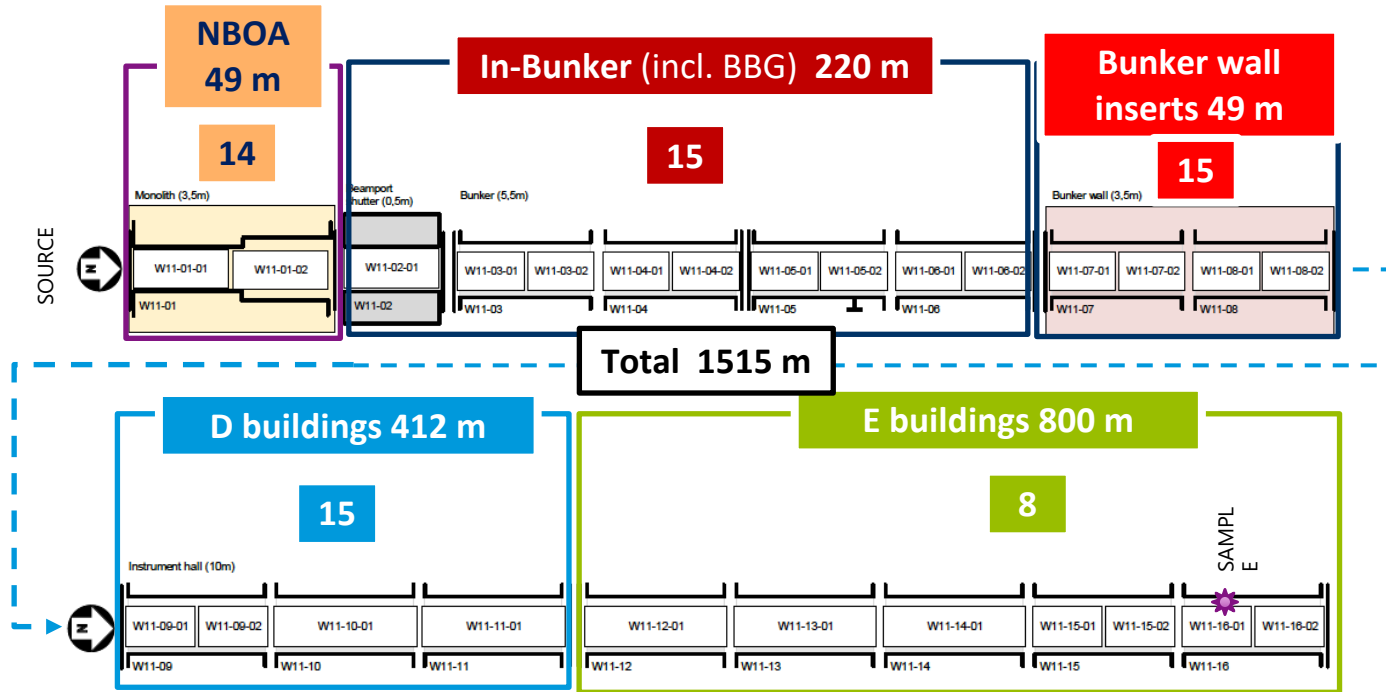




Delivery of critical systems &  
next 6 months



# Progress on neutron guide manufacturing for ESS Instruments



Apart from in-monolith feed throughs (NBOA), manufacturing of all guides for Instruments 9-15 (707 m) is on hold until sufficient progress has been made with Instruments 1-8

*Based on current progress and forecast. NSS will approve further procurements from 1<sup>st</sup> July 2020*

section	NBOA		In-Bunker			Bunker wall			Out of bunker		
	Progress MS	Contract	CTV	Tender	Contract	CTV	Tender	Contract	CTV	Tender	Contract
length		49 m	117 m	79 m	42 m	24.5 m	17.5 m	10.5 m	618 m	471 m	288,5 m
completion*		100 %	100 %	67 %	36 %	100 %	71 %	43 %	100 %	76 %	47 %
<i>forecast completion* by 30 June 2020</i>		<i>100 %</i>	<i>100 %</i>	<i>70 %</i>	<i>70 %</i>	<i>100 %</i>	<i>71 %</i>	<i>71 %</i>	<i>100 %</i>	<i>79 %</i>	<i>79 %</i>

\* % Completion for Instruments 1-8 + all NBOA

# Next Six Months

Manufacturing progressing for First 8 Instruments\*  
 First Installations in E01 & E02



- Intermediate Design Review
- Subsystem TG3 (intermediate)
- TG4
- STAP

\* 13/14 NBOA already in manufacturing

2019-2020	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
LoKI	<span style="color: green;">●</span>				<span style="color: darkgreen;">●</span>					<span style="color: darkgreen;">●</span>	<span style="color: darkgreen;">●</span>	
SKADI										<span style="color: darkgreen;">●</span>		
ESTIA							<span style="color: green;">●</span>					<span style="color: green;">●</span>
FREIA												
NMX			<span style="color: darkgreen;">●</span>	<span style="color: orange;">●</span>	<span style="color: darkgreen;">●</span>					<span style="color: green;">●</span>		
MAGIC			<span style="color: orange;">●</span>			<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>		<span style="color: darkgreen;">●</span>	<span style="color: green;">●</span>
HEIMDAL									<span style="color: darkgreen;">●</span>	<span style="color: green;">●</span>		
DREAM										<span style="color: darkgreen;">●</span>		
BEER	<span style="color: darkgreen;">●</span>				<span style="color: darkgreen;">●</span>							
ODIN					<span style="color: green;">●</span>				<span style="color: darkgreen;">●</span>	<span style="color: green;">●</span>	<span style="color: darkgreen;">●</span>	
CSPEC				<span style="color: orange;">●</span>					<span style="color: darkgreen;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>	<span style="color: green;">●</span>
BIFROST			<span style="color: orange;">●</span>	<span style="color: darkgreen;">●</span>	<span style="color: darkgreen;">●</span>	<span style="color: orange;">●</span>		<span style="color: green;">●</span>	<span style="color: darkgreen;">●</span>	<span style="color: green;">●</span>	<span style="color: darkgreen;">●</span>	<span style="color: darkgreen;">●</span>
MIRACLES												
T-REX												
VESPA												

# Next six months



## Priorities:

Resource loaded installation plans for first 3 instruments,

Progress with cave and hutch assembly in E01,

Progress with guide shielding in E02

Start production of CSPEC & ESTIA detectors

Start guide installation in E02

## Processes:

Monthly reporting of progress with all instruments

Monthly reporting of common shielding and common chopper progress to instrument teams

Sub TG3, IRR/TG4

## Progress:

Completed installation of Bunker R6 system (brackets, pillars and beams)

Pre-build of bunker west wall done (in Hungary), and shipping to Lund started.

8 (possibly 10) NBOAs delivered to ESS, and Integration tent ready

Start preinstallation of LOKI (at ISIS) & of ESTIA (at PSI)

E01 installations: NMX cave cont., BIFROST cave, CSPEC lower shielding blocks

First Instrument to complete Detailed Design

Electrical infrastructure start of installation in E01

Successful completion of the Common chopper QA phase

Completion of T0 FAT test and start of manufacturing of ODIN choppers



Thanks to all for your hard work!

Questions?