

# IKON 14 NBOA update

## ... into the brink

NSS Project team  
I.Sutton

ALL NBOA  
DELIVERED to SITE IN .....



0

?

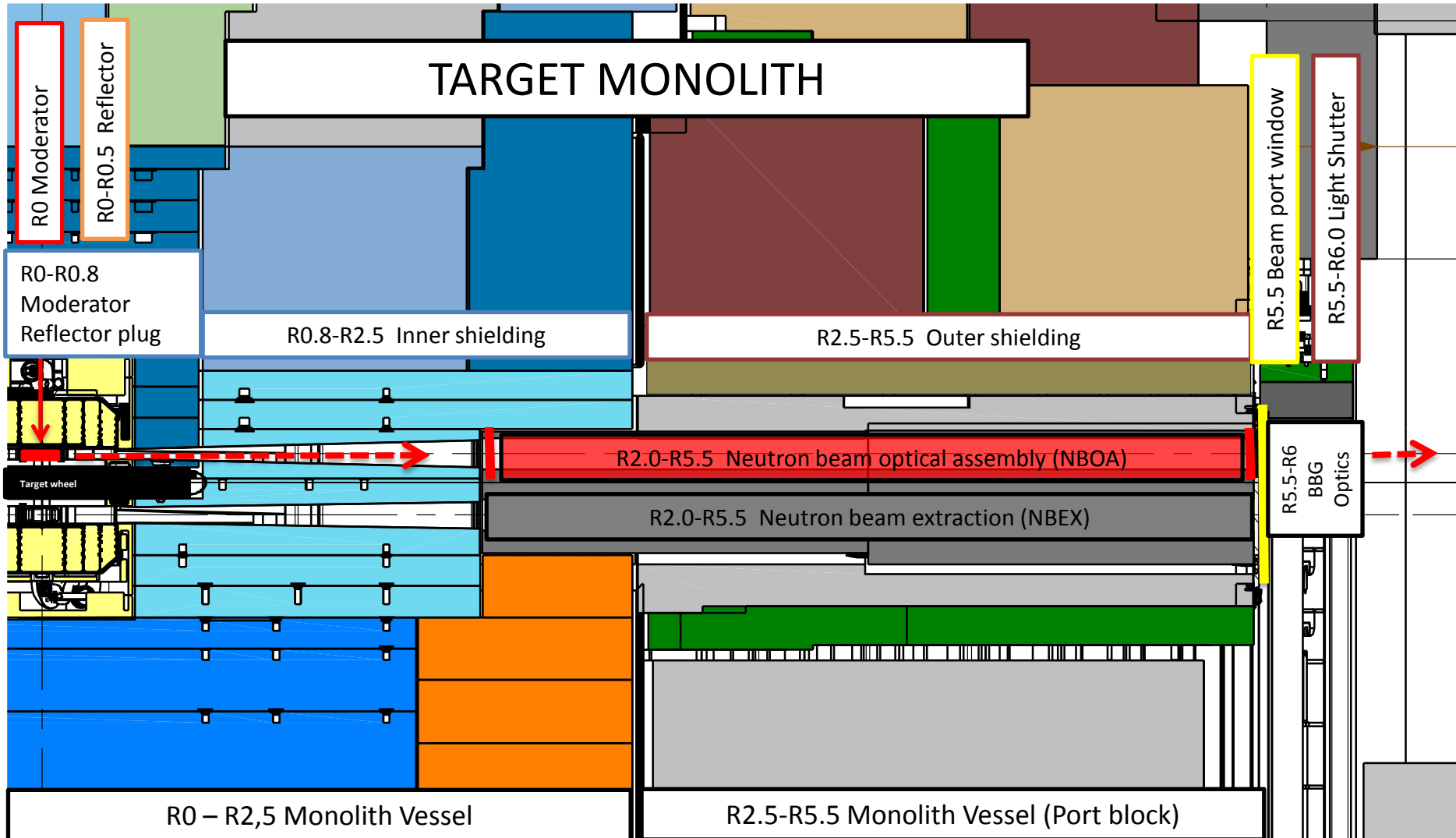
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# Agenda

- Update
  - Moderator
  - Inner shielding
  - NBEX
- Re-schedule
  - What changes
- Procurement support
  - What doesn't
  - Wrap up



# What is what ?

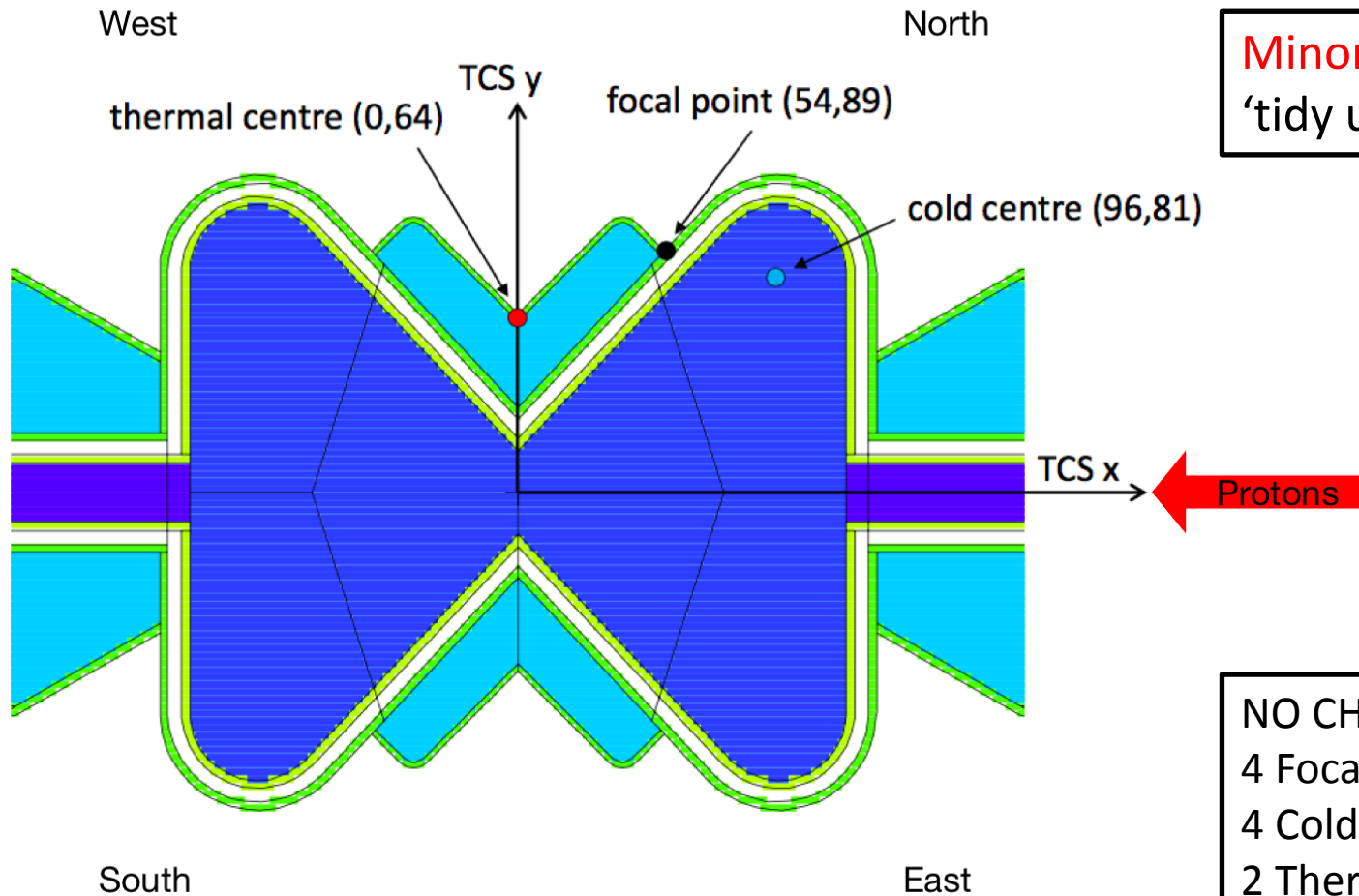


R0-R0.5

Moderator  
Moderator plug

# Moderator

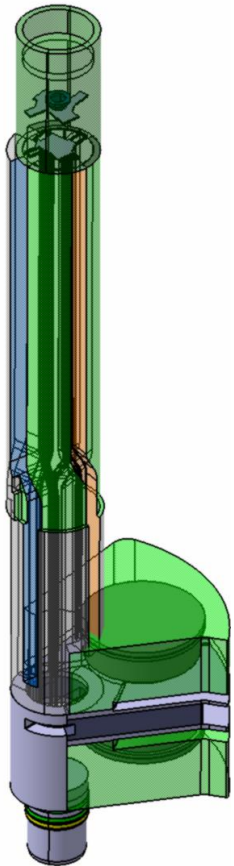
## No (significant) change on BF1



Minor dimension  
'tidy up' - 6 July 2017

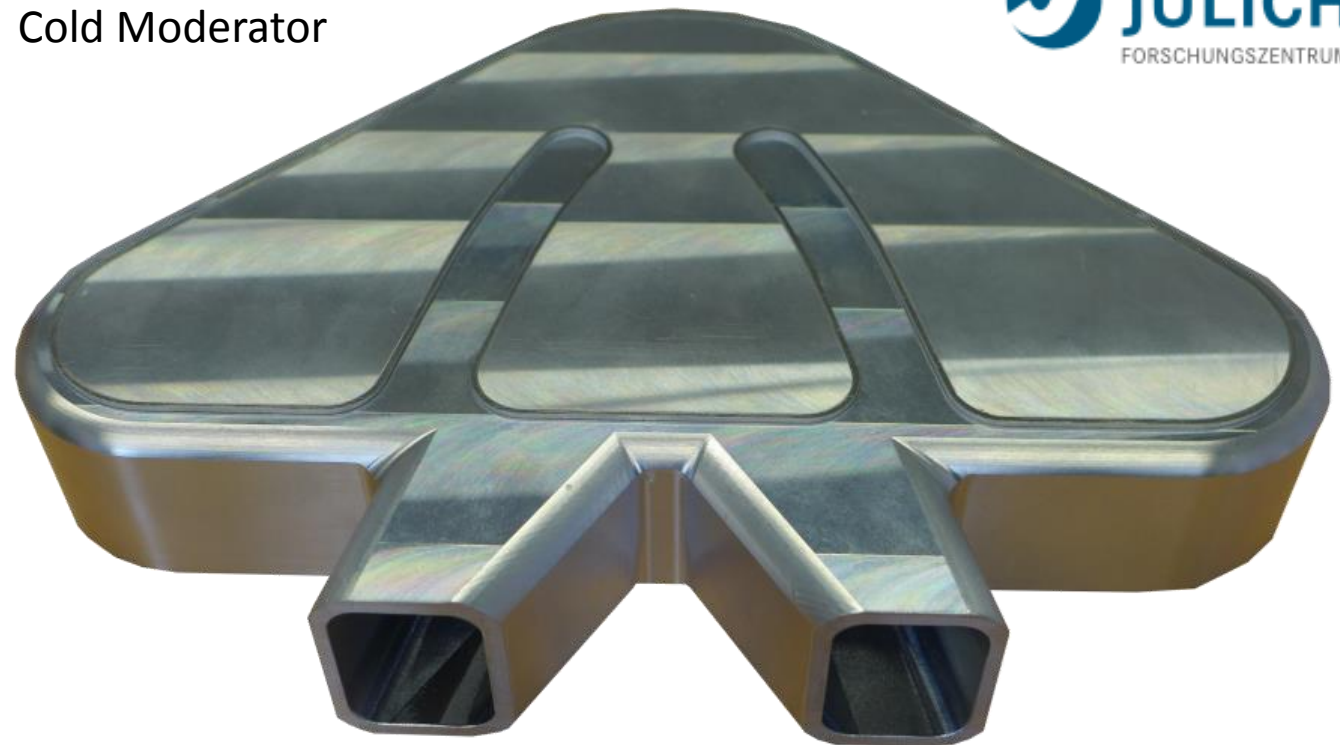
NO CHANGE  
4 Focal points  
4 Cold Centers  
2 Thermal Centers

# Moderator mark I (BF2) update



Moderator plug  
assembly

Cold Moderator



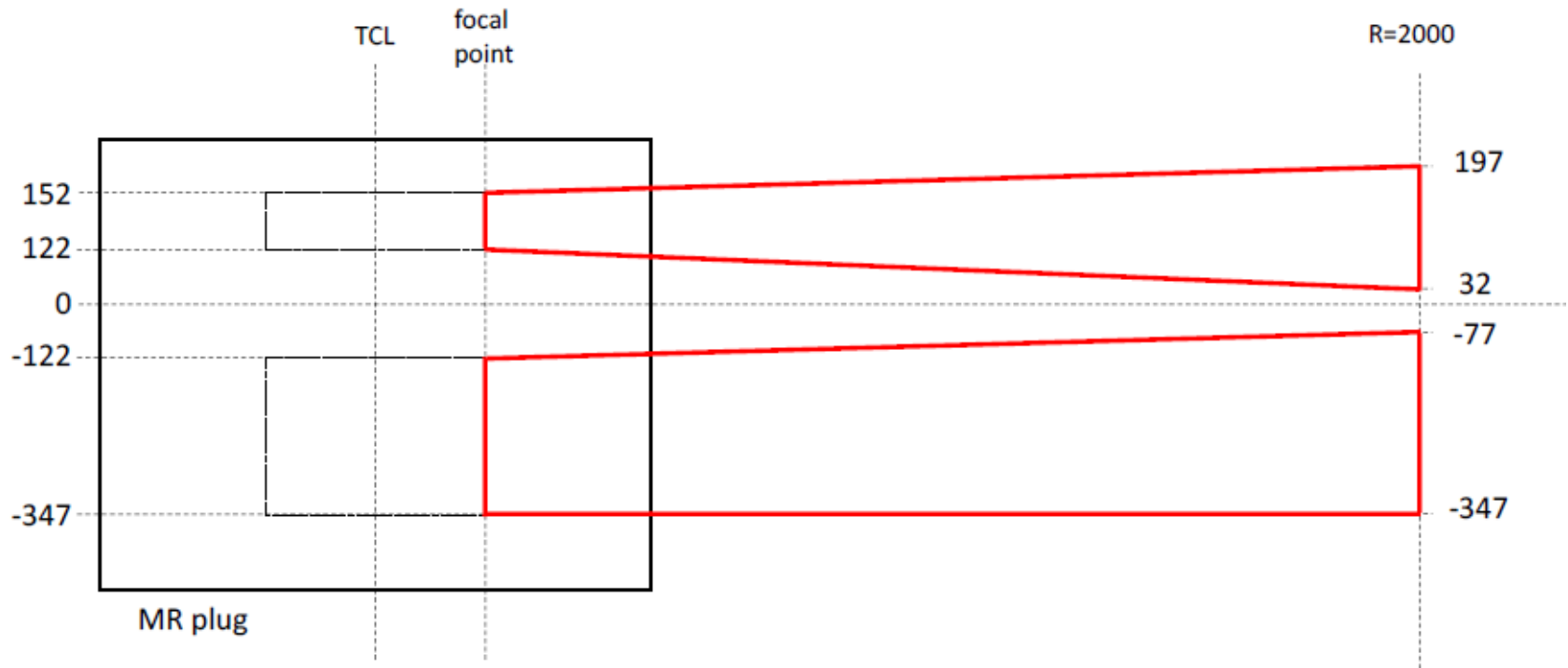
Completing manufacturing of moderators  
Moderator plug Assembly on target for delivery August 2018

R0.5-R2

Inner shielding



# R0.5 – R2 inner shielding



Status W6

Instrument requested changes have been made to 2 beam port  
Paperwork in process

R2-R5.5

NBOA-NBEX

# NBPI

## neutron beam port insert

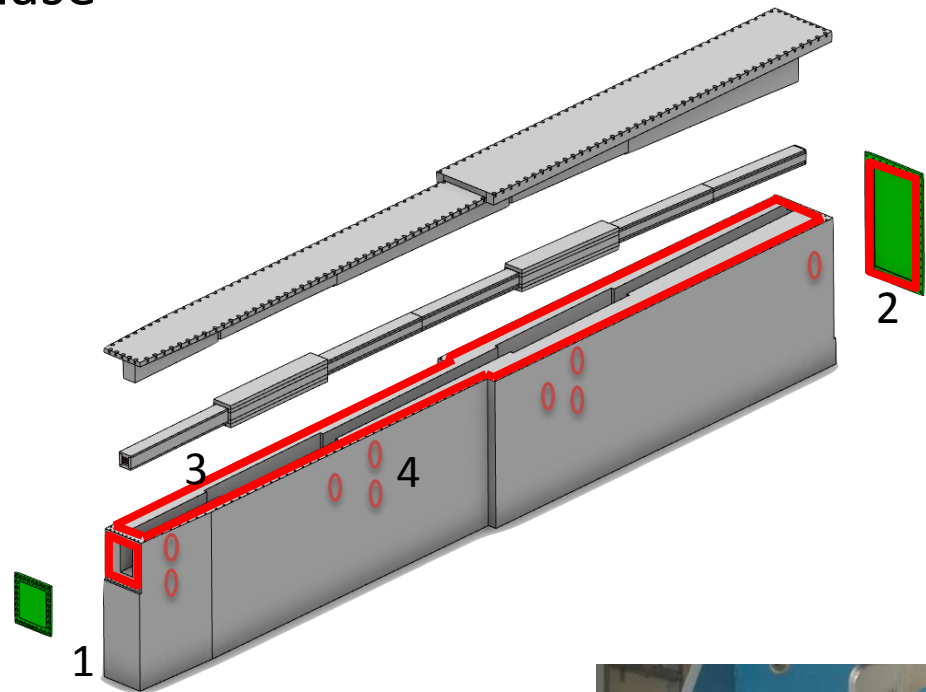
Currently in detailed design phase

Using NBOA 'frozen volumes'

- Windows
- Sealing
- He system
- Connectors
- Manufacturing study

NEW !

- Prototype this fall
- Critical design review October 2018

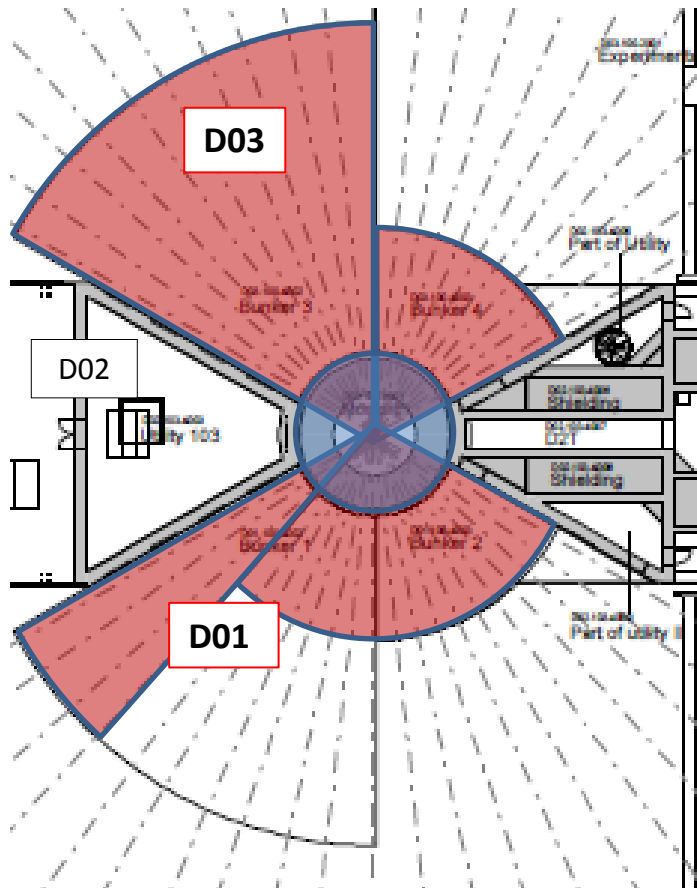


# Schedule part I

Good news, bad news ...

But always lets get this rolling 😊

# Schedule the bad news ...



Installation delayed  
Current estimates prior to  
Target re-baseline

Estimated NBEX installation dates

D03 Commencing

D01 Commencing

Earliest Q3 2020

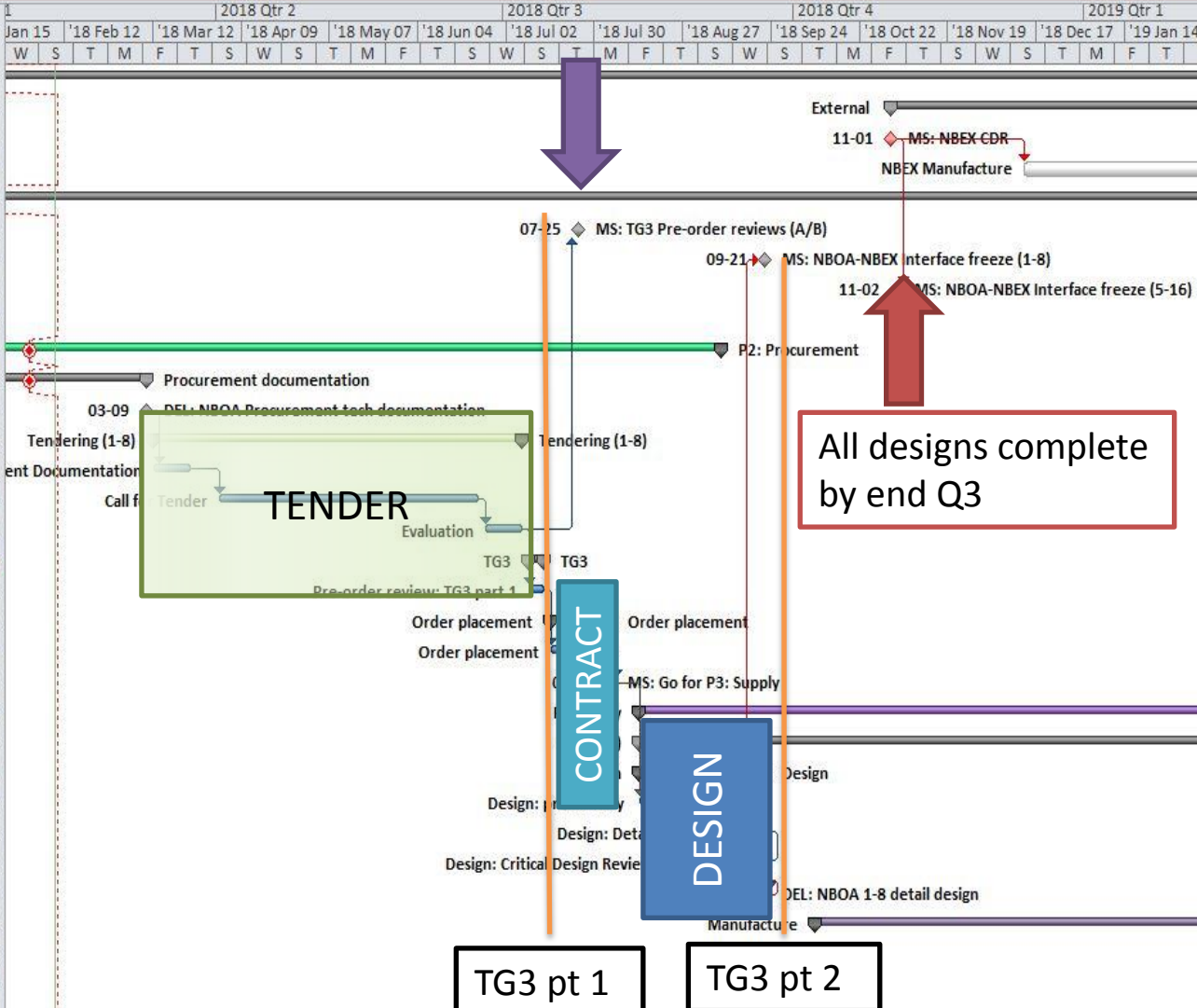
Earliest Q4 2020

# Schedule part 1: now to manufacture

All orders placed by end Q2



Task Name	Group	% Co
<b>Milestones</b>	<b>MS</b>	<b>0%</b>
<b>External</b>		
MS: NBEX CDR		0%
NBEX Manufacture		0%
<b>Project internal</b>		
MS: TG3 Pre-order reviews (A/B)	1-8	0%
MS: NBOA-NBEX Interface freeze (1-8)	MS	0%
MS: NBOA-NBEX Interface freeze (5-16)	MS	0%
MS: NBOA delivery deadline (A2146884580)	MS	0%
<b>P2: Procurement</b>	<b>1-8</b>	<b>17%</b>
<b>Procurement documentation</b>		
DEL: NBOA Procurement tech documentation		0%
<b>Tendering (1-8)</b>	<b>1-8</b>	<b>0%</b>
Write: Procurement Documentation	1-8	0%
Call for Tender	1-8	0%
Evaluation	1-8	0%
<b>TG3</b>	<b>1-8</b>	<b>0%</b>
Pre-order review: TG3 part 1		0%
<b>Order placement</b>	<b>1-8</b>	<b>0%</b>
Order placement	1-8	0%
MS: Go for P3: Supply	1-8	0%
<b>P3 Supply</b>		
<b>A/B (1-8)</b>	<b>1-8</b>	<b>0%</b>
<b>Design</b>	<b>1-8</b>	<b>0%</b>
Design: preliminary	1-8	0%
Design: Detailed	1-8	0%
Design: Critical Design Review (TG3 Part 2)	1-8	0%
DEL: NBOA 1-8 detail design	1-8	0%
<b>Manufacture</b>	<b>1-8</b>	<b>0%</b>
<b>Delivery</b>	<b>1-8</b>	<b>0%</b>
MS: A/B Ready for Integration	1-8	0%



All designs complete by end Q3

TG3 pt 1

TG3 pt 2

# STATUS REPORT

## Design maturity



Procurement group	Instrument	Progress	Clear to proceed ?	CURRENT step	CURRENT action (ESS)	Draft optical geometry defined	Conceptual model released	Focal point confirmed	Beam Geometry definition	Coating definition	Full model issued	External envelope confirmed	Focal point internal check	Window integration	NBEX integration	Waste Materials validation	Design complete & confirmed	Preparation of tenderdocs
				13		1	2	3	4	5	6	7	8	9	10	11	12	13
A	ESTIA	12.5	YES	Preparation for procurement	ESS supporting proc prep	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%
A	LoKI	12.4	YES	Preparation for procurement	ESS supporting proc prep	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%
A	ODIN	12.2	YES	Preparation for procurement	ESS supporting proc prep	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%	100%	100%	40%
A	DREAM	12.2	YES	Preparation for procurement	ESS supporting proc prep	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	20%
B	BEER	12.0	YES	Preparation for procurement	Start proc support W37	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%
B	C-SPEC	12.0	YES	Preparation for procurement	Start proc support W37	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%
B	BIFROST	12.2	YES	Preparation for procurement	Start proc support W37	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	20%
B	MAGIC	11.0	NO	Preliminary design freeze	Resolve outstanding engineering issues	100%	100%	100%	100%	100%	100%	100%	100%	50%	50%	100%	100%	0%
C	SKADI	8.5	NO	PD - Awaiting CR	awaiting CR	100%	100%	100%	50%	50%	50%	50%	50%	100%	100%	100%	0%	0%
C	NMX	12.2	YES	Preliminary design freeze	Start proc support W40	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	20%
C	MIRACLES	11.4	YES	Preliminary design freeze	confirm design maturity	100%	100%	100%	100%	100%	100%	80%	60%	100%	100%	100%	100%	0%
C	T-REX	10.5	NO	PD - unresolved issues (coatings)	resolve coating situation	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	0%	0%
D	HEIMDAL-A	7.0	NO	Preparation for procurement	confirm design maturity	100%	100%	50%	50%	0%	50%	50%	50%	50%	100%	100%	0%	0%
D	HEIMDAL-B	7.5	NO	Preparation for procurement	confirm design maturity	100%	100%	50%	50%	50%	50%	50%	50%	50%	100%	100%	0%	0%
D	VESPA	8.0	NO	PD - unresolved issues (coatings)	awaiting CR	100%	100%	50%	50%	50%	50%	50%	50%	100%	100%	100%	0%	0%
D	FREIA	10.5	NO	PD - unresolved issues (coatings)	awaiting CR	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	0%	0%

**Group A**  
 Ready for Tendering  
 Design is complete & stable

**Group B**  
 Ready for tendering  
 Design is complete & stable

**Group C**  
 partial completeness  
 further work required

**Group D**  
 partial completeness,  
 further work required



# Change control

**All changes now require formal approval by ESS lund prior to implementation.**

Change request + Justification  
Approval process

- Space claim
- Interfaces
- Materials
- Neutronics
- Schedule

**Late change = change request = delay  
= risk to miss installation**





# STATUS REPORT

## Design maturity



### Recently updated

- HEIMDAL
- ESTIA
- SKADI

### In the process

- LOKI
- MAGIC
- C-SPEC

### Starting shortly

- VESPA
- FRIEA

# Input from instruments

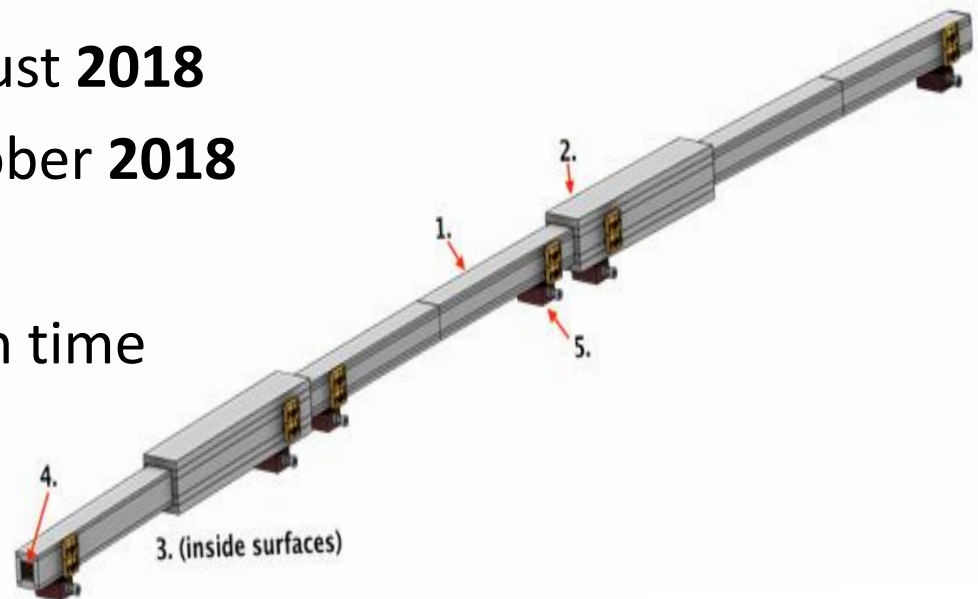
## Deadlines

We need your **final detailed design (ie the output of CDR with your suppliers)** to complete design of the NBPI and issue drawings for its manufacture.

### Deadline for final models

- Instruments 1 -8    End August **2018**
- Instruments 9-15    End October **2018**

If they do not get your model in time  
you will get a blind plug !

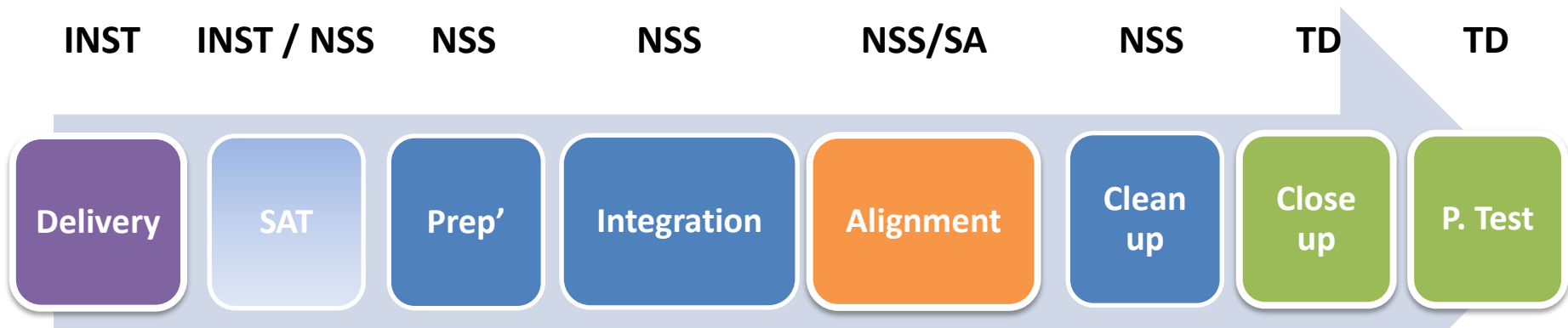


# Schedule part II

Onwards to installation

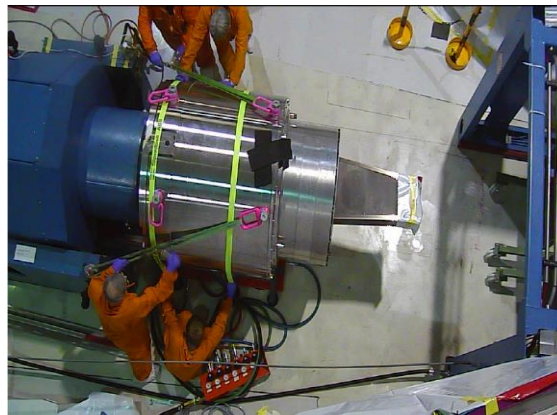
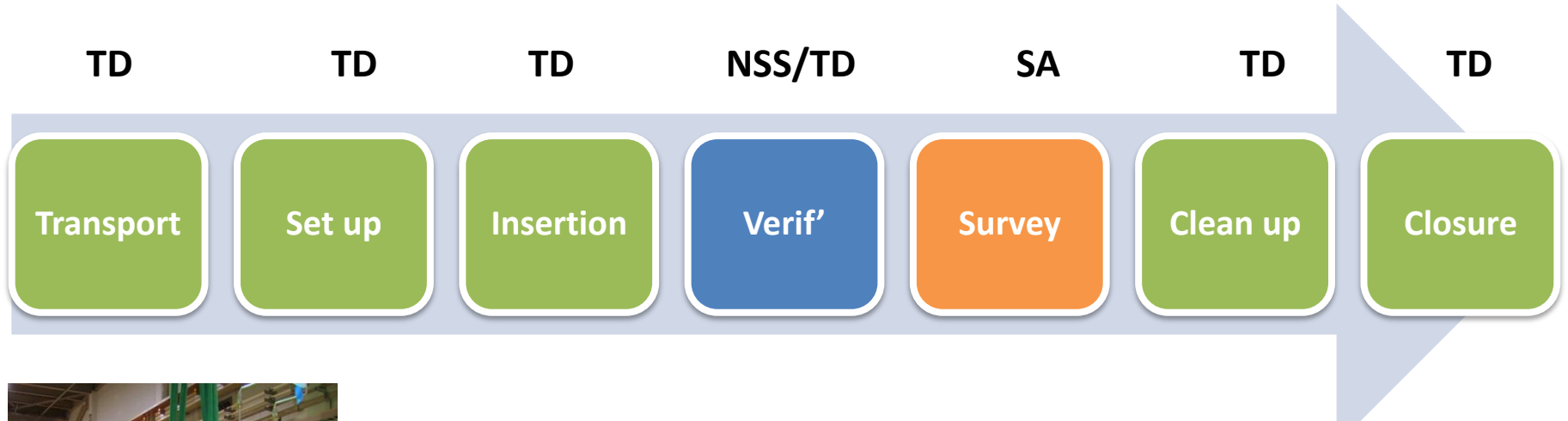
# Phase 4

## Integration activities



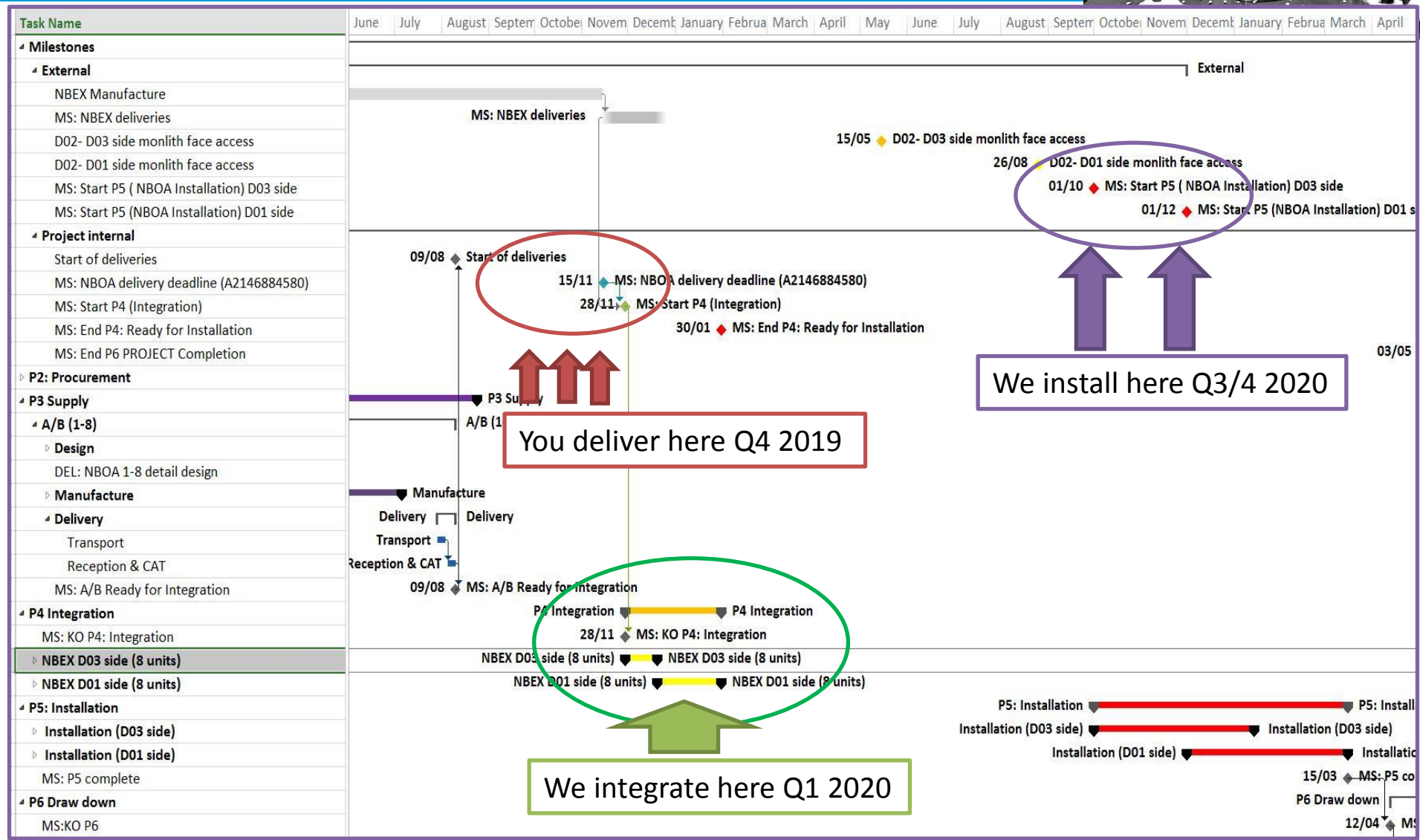
(Most) Activities will be carried out by ESS internal team <sup>20</sup>

# Phase 5 Installation



Activities will be carried out by ESS internal team

# Schedule part2: Tender - Delivery



# Procurement support

61 weeks



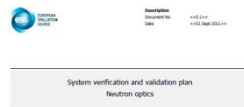
# Draft procurement documentation

## Tech spec

All communication via confluence

<https://confluence.ess.lu.se/display/BO/NBOA+Procurement+phase>  
<https://confluence.ess.lu.se/x/JIPxDQ>

This is instrument scope  
 ...but we will support within  
 the limit of our resources.



Name	Role	Signature

Distributors: <add names>

Description  
 Document No.  
 Date

GENERIC Neutron Beam Optic Assembly  
 Technical Specification

WORK IN  
 PROGRESS V3.75

Name	Attribution

Distribution:

Document Revision History

Version	Reason for revision	Date
0.1		2017-08-21

### Tender Documents

#### Cover letter

Intro  
 Scope of tender  
 Tender conditions  
 Outline Production Schedule  
 Contact details  
 Document list

#### Contract, terms & conditions

General contract terms  
 Warranty  
 Payment schedule  
 Payment conditions  
 Rights to inspection  
 Packing  
 Transport

#### Verification & Validation program

Document scope  
 Validation plan  
 Verification plan  
 Test standards  
 Inspection regime  
 Production / Inspection Schedule

#### Technical specification

Document scope  
 Intro  
 Description  
 Requirements  
 Manufacture standards

#### Annex

Test specifications  
 Manufacturing specifications  
 Preliminary drawings

### Input

ESS	Partner	
NO	YES	
YES	YES	Agreement ESS/Partner on services - ie install.
NO	YES	
YES	YES	Delivery to site dates from ESS
NO	YES	
NO	YES	
YES	YES	Some input for ESS ?
YES	NO	ESS input to requirements
NO	YES	
NO	YES	
YES	YES	ESS input to requirements
NO	YES	
NO	YES	
NO	YES	
NO	YES	ESS input to requirements to be confirmed
YES	YES	ESS input to requirements
YES	YES	ESS input to requirements
NO	YES	
NO	YES	
NO	YES	
YES	YES	ESS input to requirements
YES	YES	ESS input as to accepted standards
YES	YES	Where applicable
YES	YES	Where applicable
YES	NO	Layout drawings from NBOA team



# Good news

## A New NBOA team

- Leader

Iain



- Engineers

Hans  
Dieter

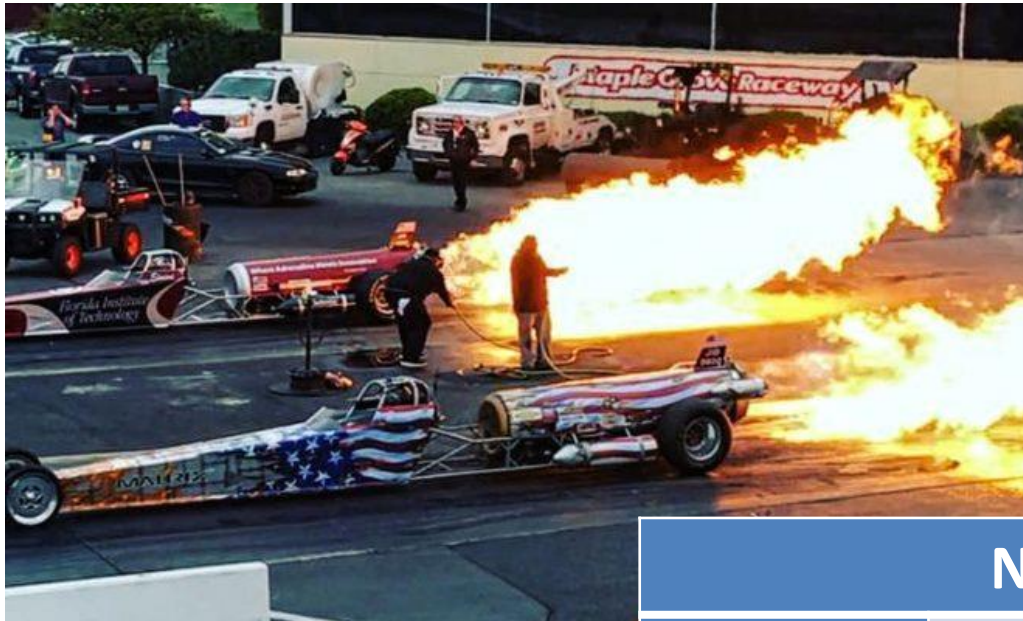
March 1st

Talal  
Osman



# SUMMING UP

# Key points to remember



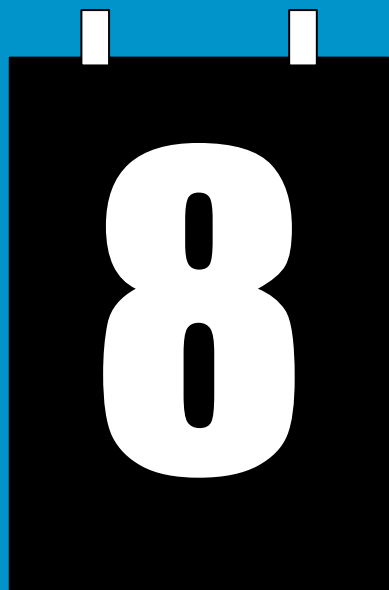
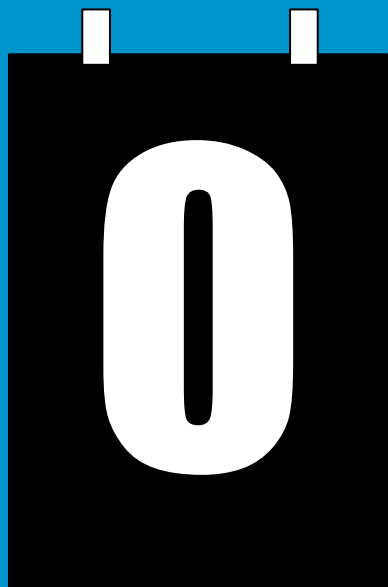
**DON'T  
SLOW  
DOWN !**

**DON'T  
SLOW  
DOWN !**

NBOA		
A/B/C/D	Start tendering ASAP	NOW
A/B/C/D	NBOA Order placed before	June 2018
A/B	Design complete	August 2018
C/D	Design complete	November 2018

NBOA

DELIVERed to Site .....



Thanks for joining us  
Questions are welcome !

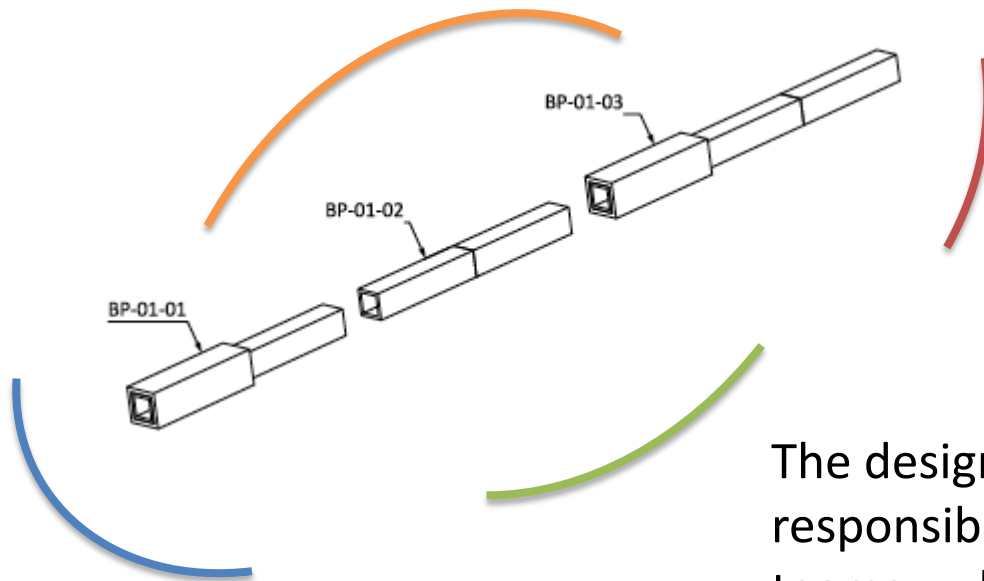


On behalf of  
NSS Engineering integration  
NBOA – NBEX Team



# NBOA in a nutshell

NBOA is a 3,5m of neutron optics installed within the target monolith.  
It's job is to extract the good neutron from the moderator for use by instruments ...  
.... and to stop as many of the bad ones from getting out.



The installation of NBOA  
is on the critical path of  
all instruments

It is the first part of all of the facilities  
neutron instruments .... each one is unique  
and critical their performance

The design and procurement is the  
responsibility of individual instrument  
teams .... however the integration into  
the facility is shared.