

# BA6 Crab cavity test-stand YETS sequencing

EDMS 1843665

SPS crab-cavity test stand activities in YETS2017-2018

Giovanna Vandoni

# Worksite in BA6

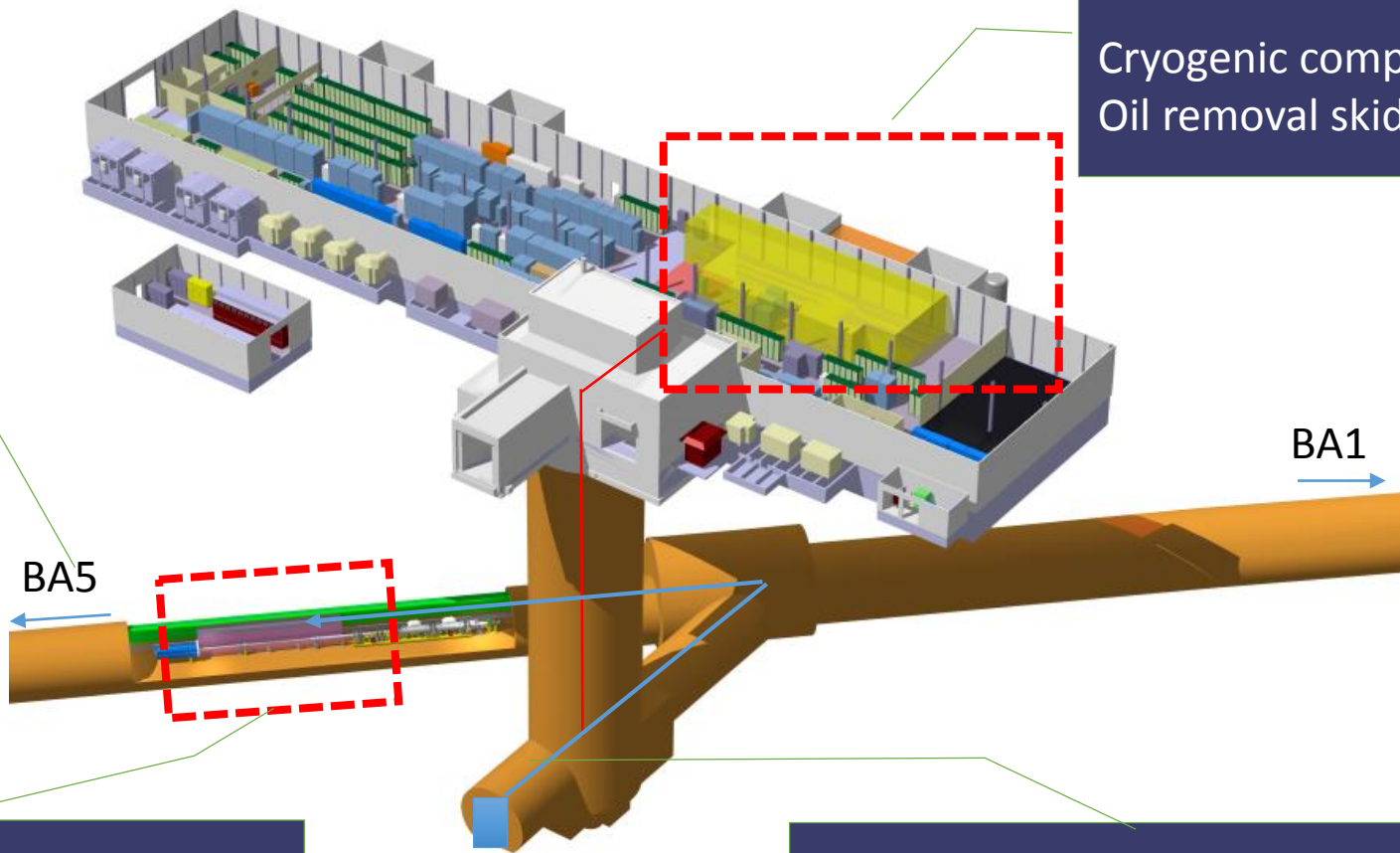
**Helium pump zone**  
Cryogenic pipework

**BA6 – surface area**  
Cryogenic compressor skid  
Oil removal skid

**ODH and Alarms**  
From TS6- to TS6+

**61739 Crab zone**  
ValveBox#2  
Transfer Table  
SB + cryomodule  
RF equipment and waveguides  
Vacuum beamline

**TA6 - alcove**  
Cryogenic Cold-Box  
ValveBox#1  
LN2 phase separator  
Connecting flexibles and pipework






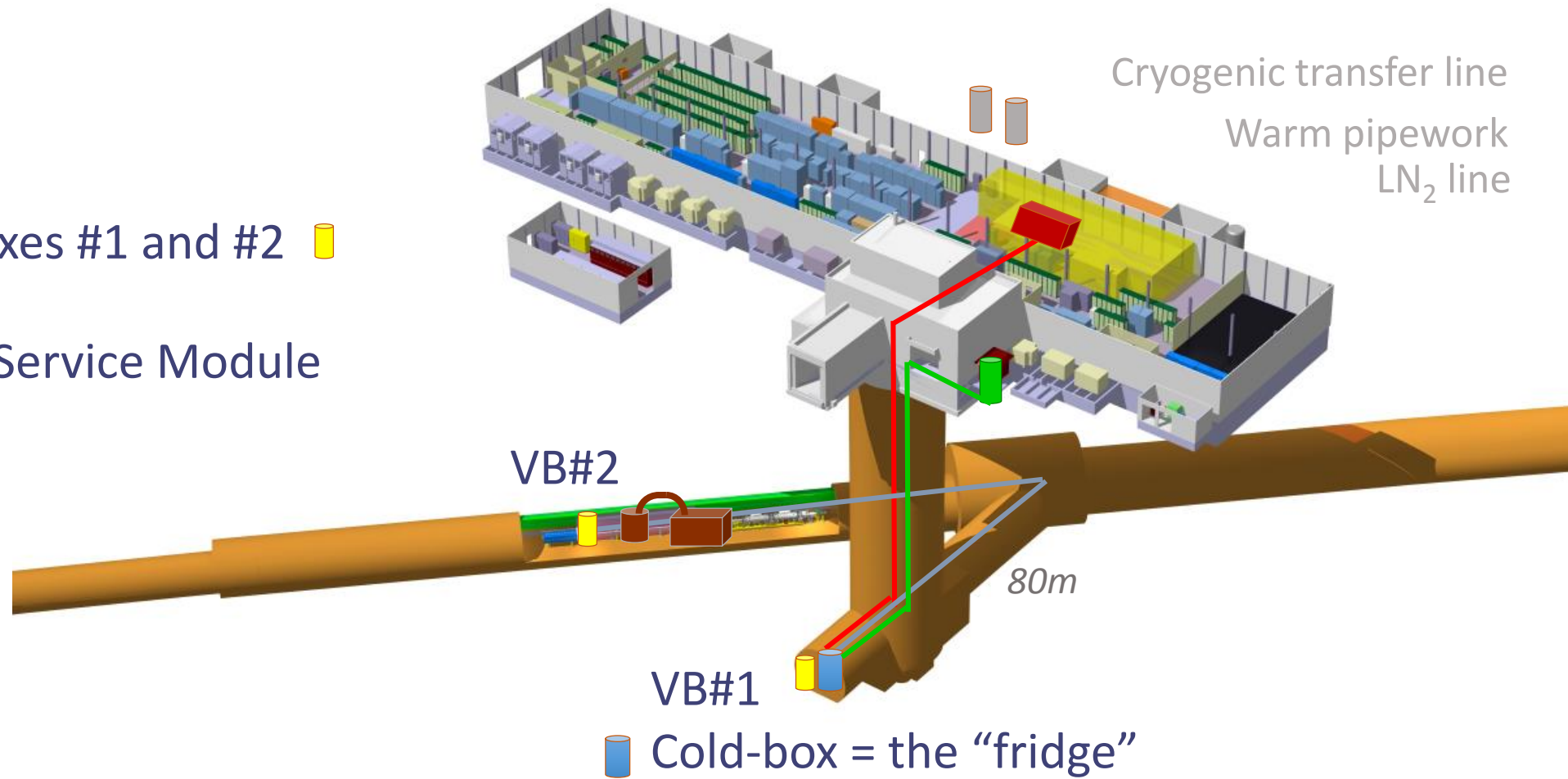
# Cryogenics layout

ValveBoxes #1 and #2 

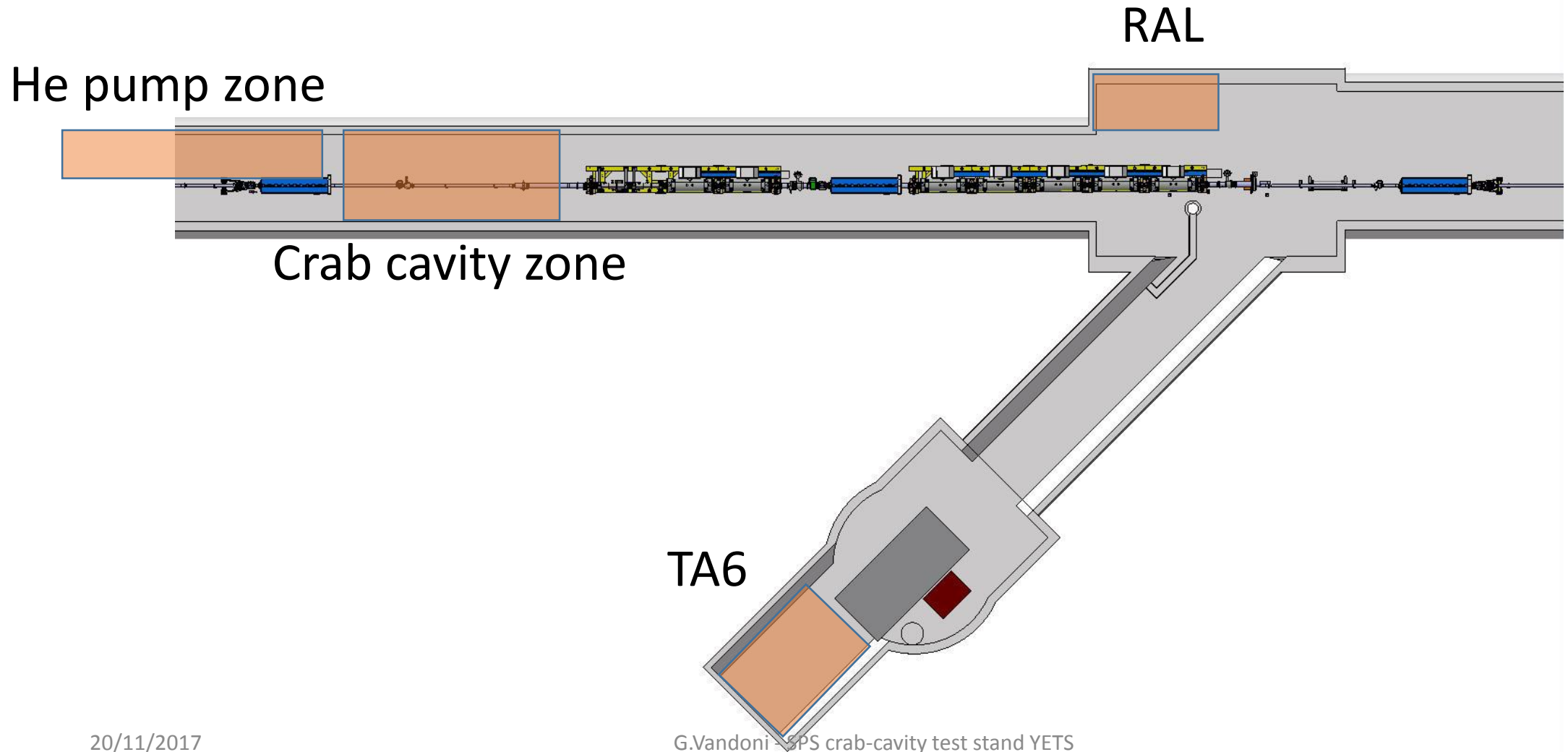
CCCM + Service Module 

Compressor   
Oil removal   
LN<sub>2</sub> tank 

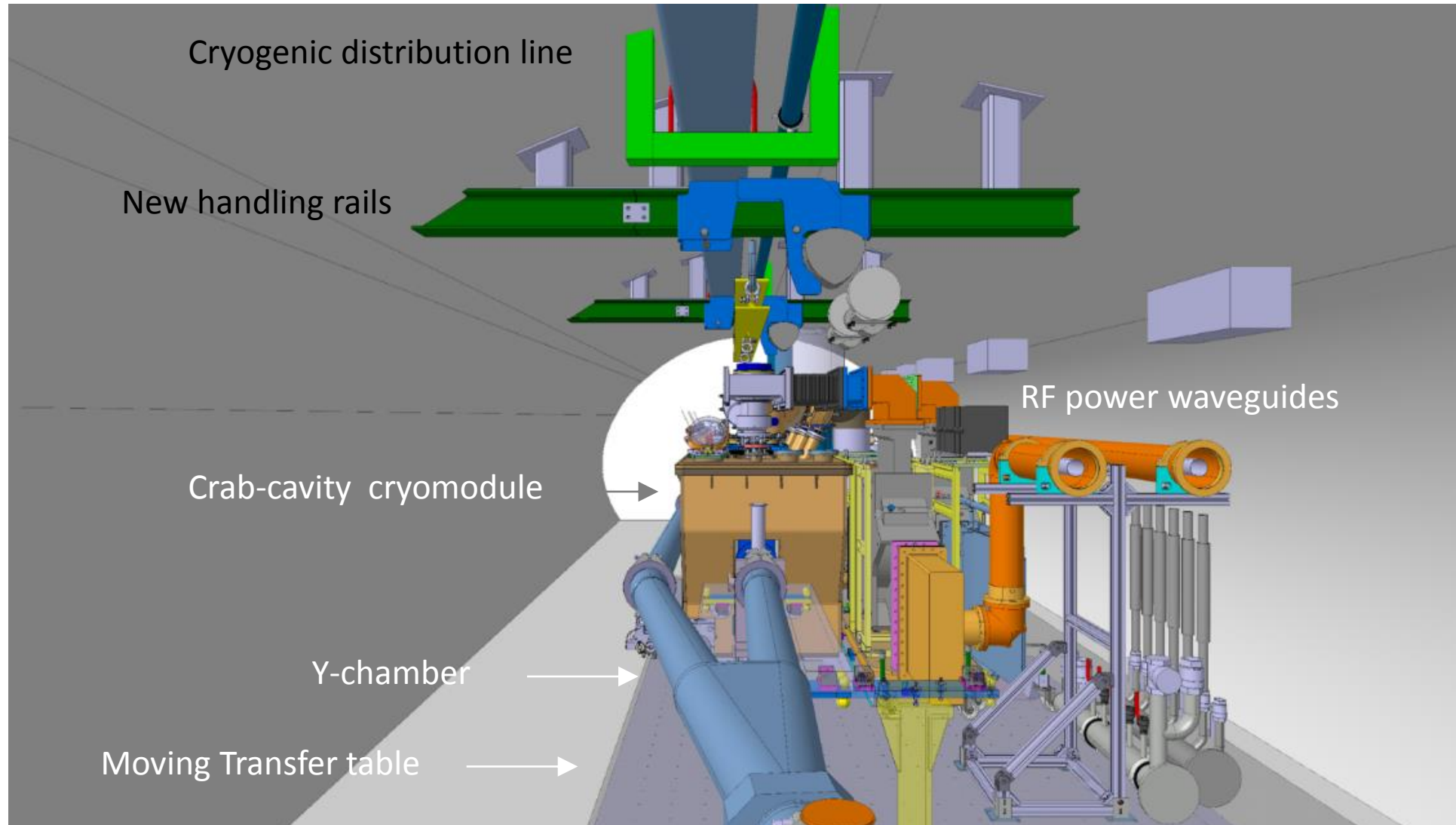
Cryogenic transfer line   
Warm pipework   
LN<sub>2</sub> line 



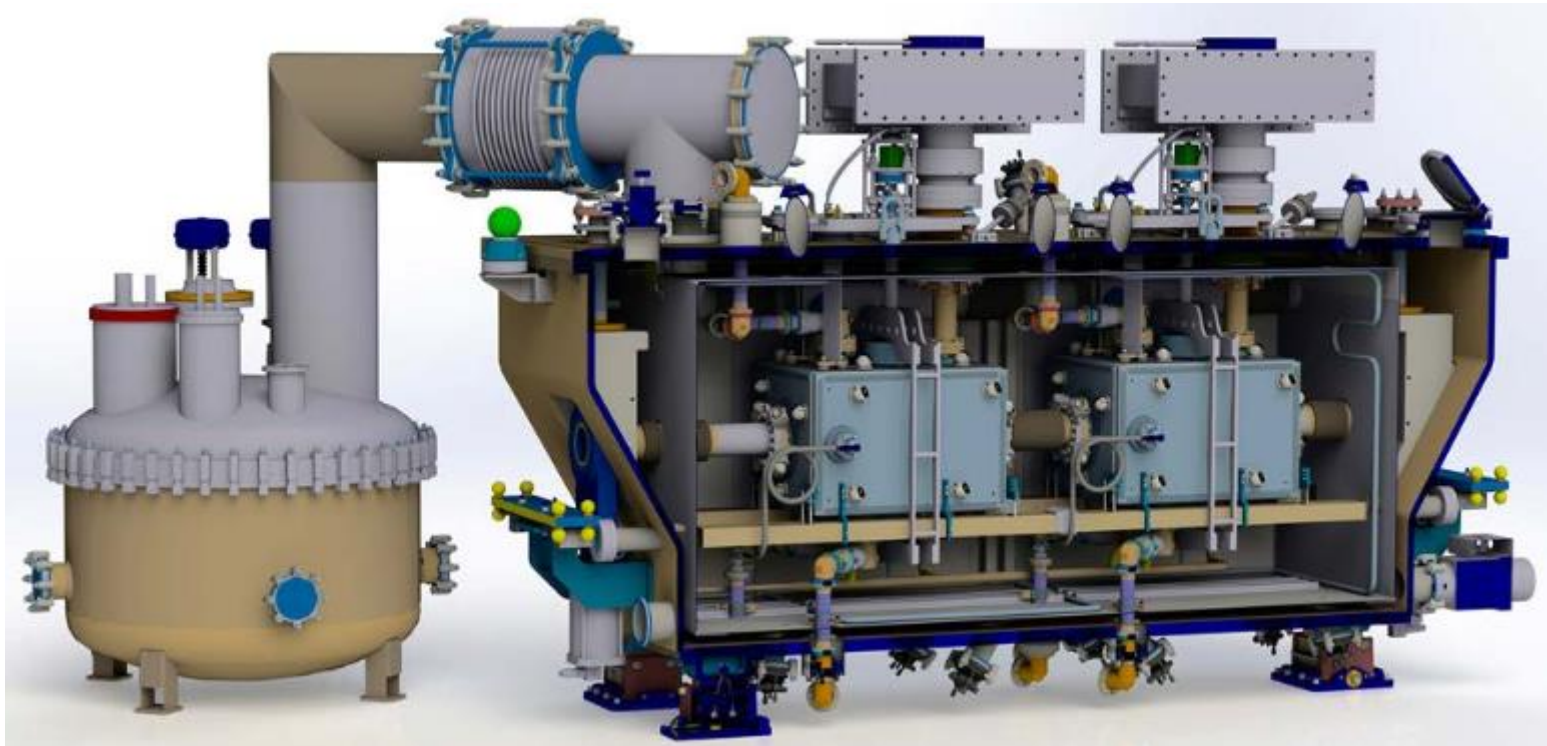
# Activity zones



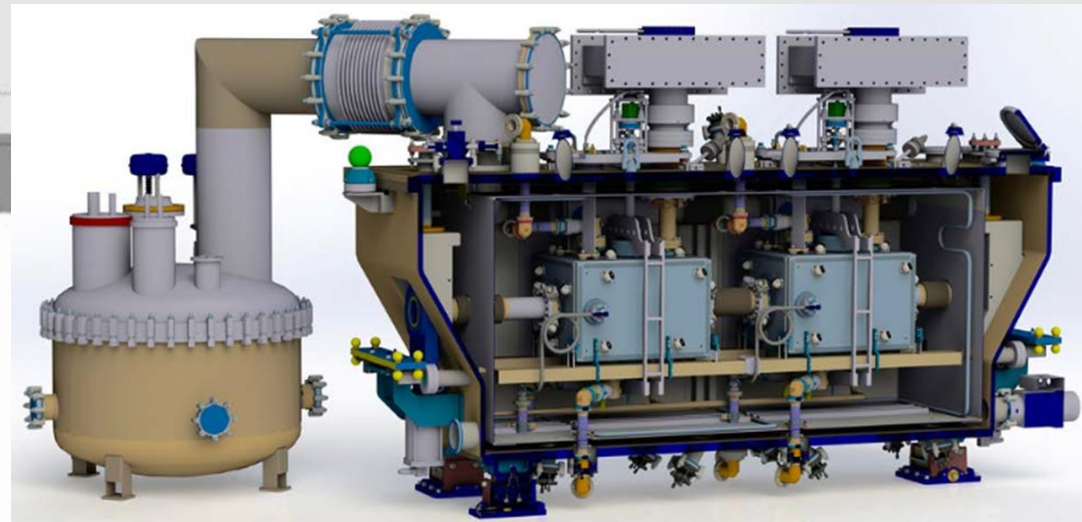
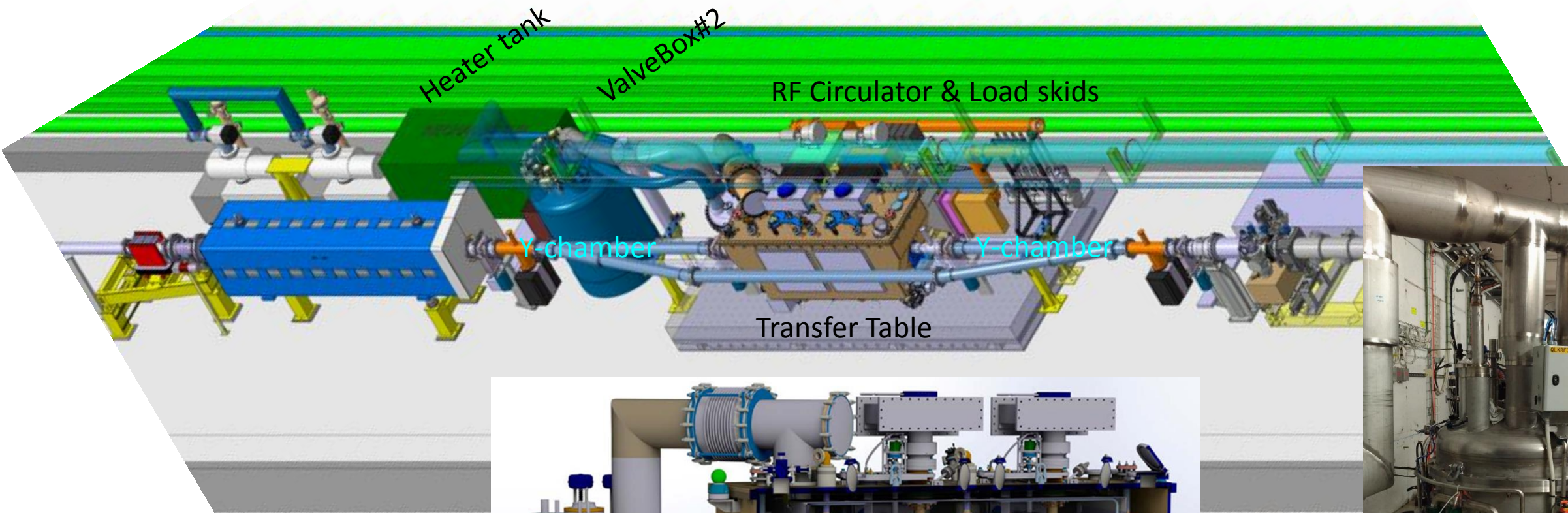
# Crab-cavity test-stand



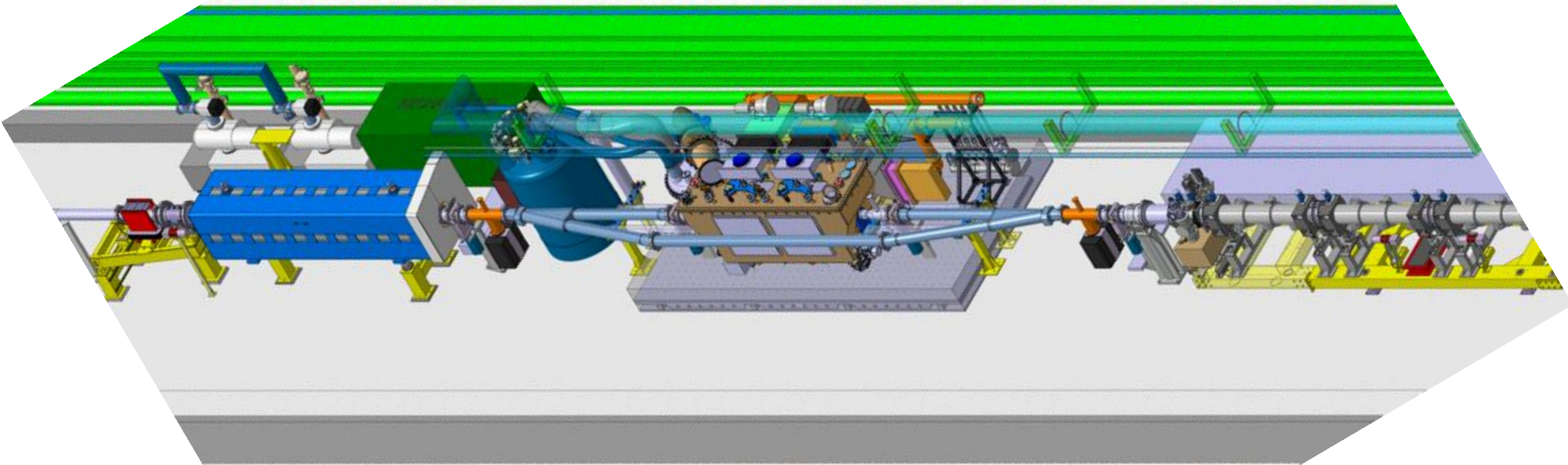
# Cryomodule and Service Box



# Crab cavity zone

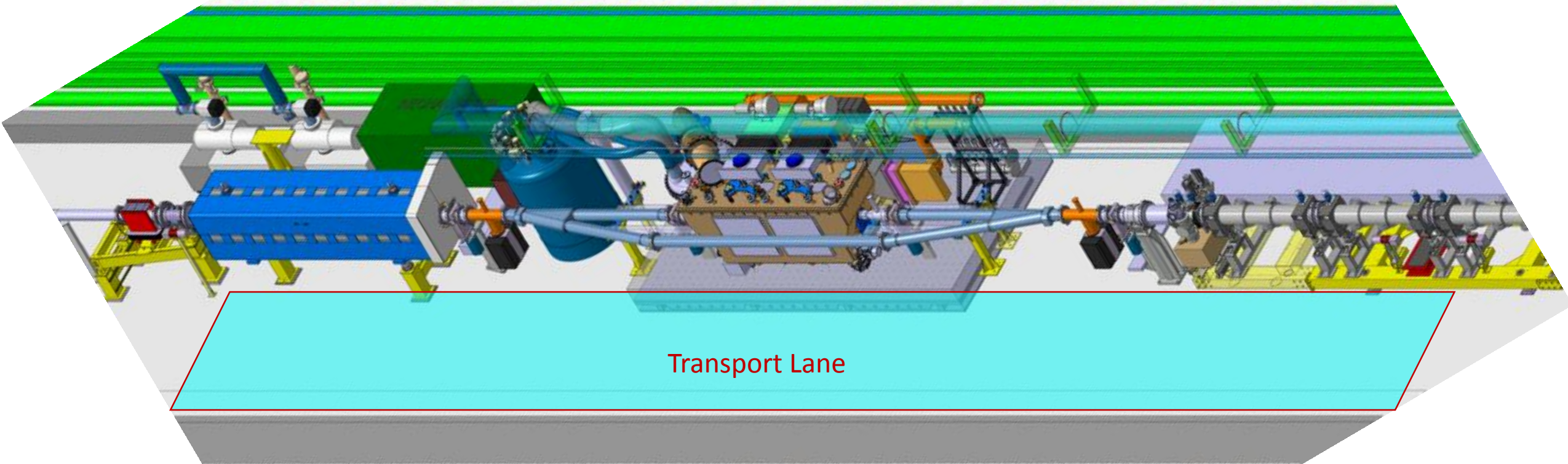


# Crab cavity zone

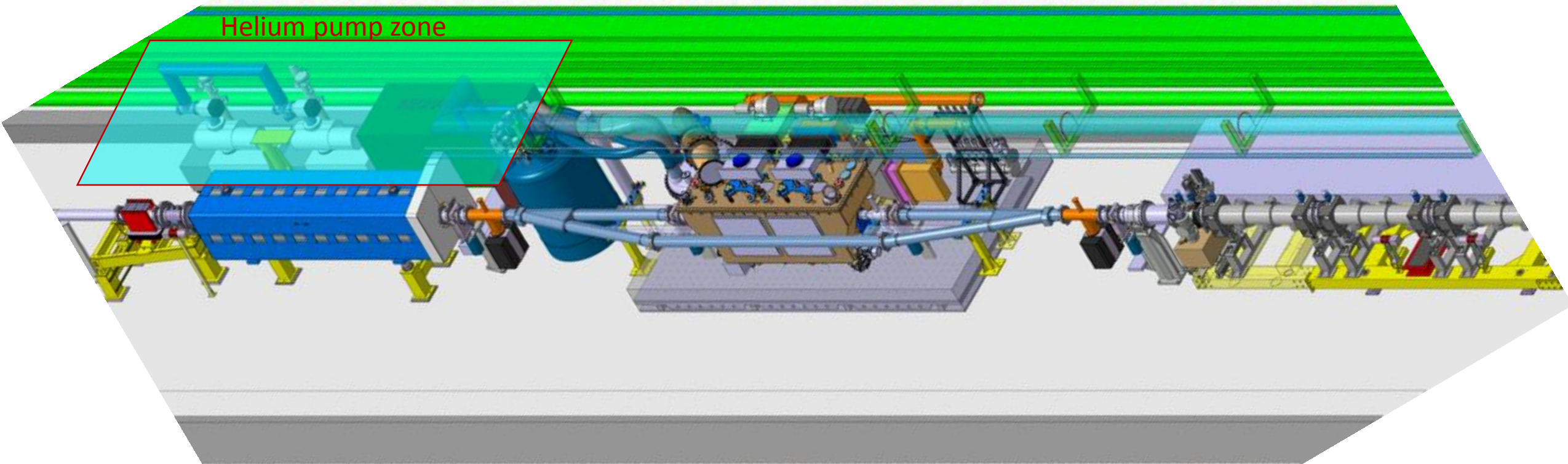




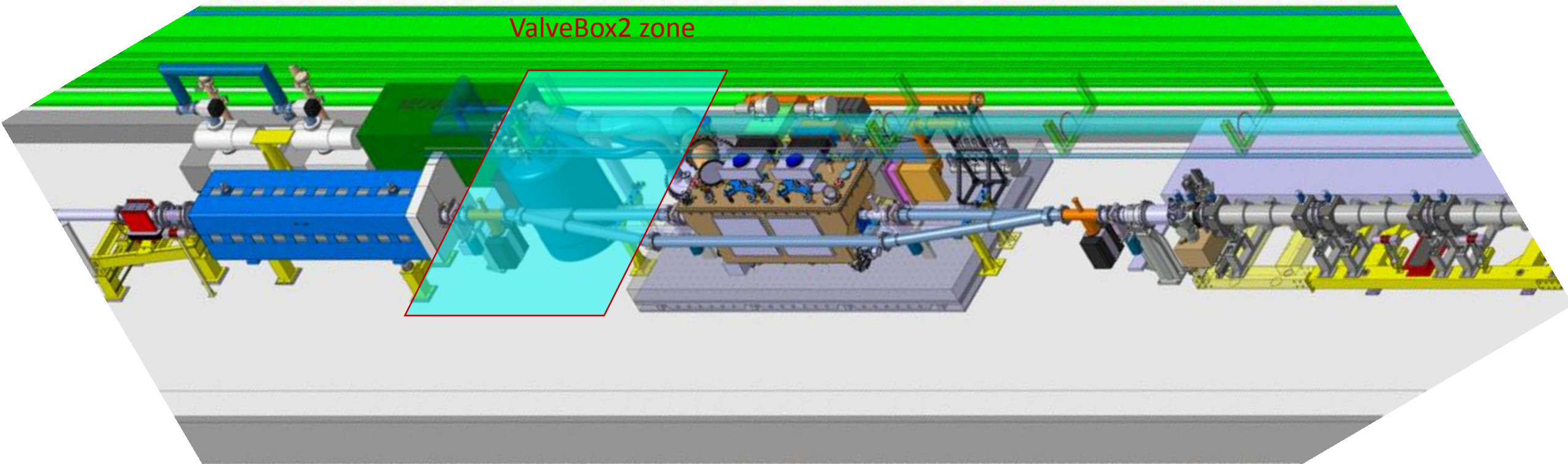
# Crab cavity zone



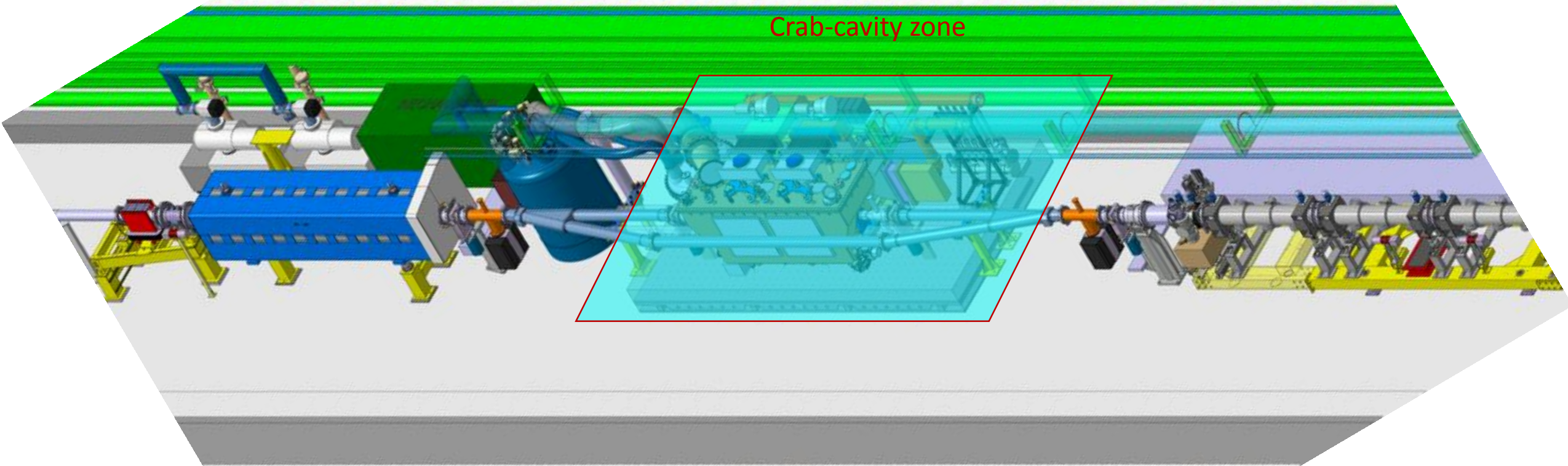
# Crab cavity zone



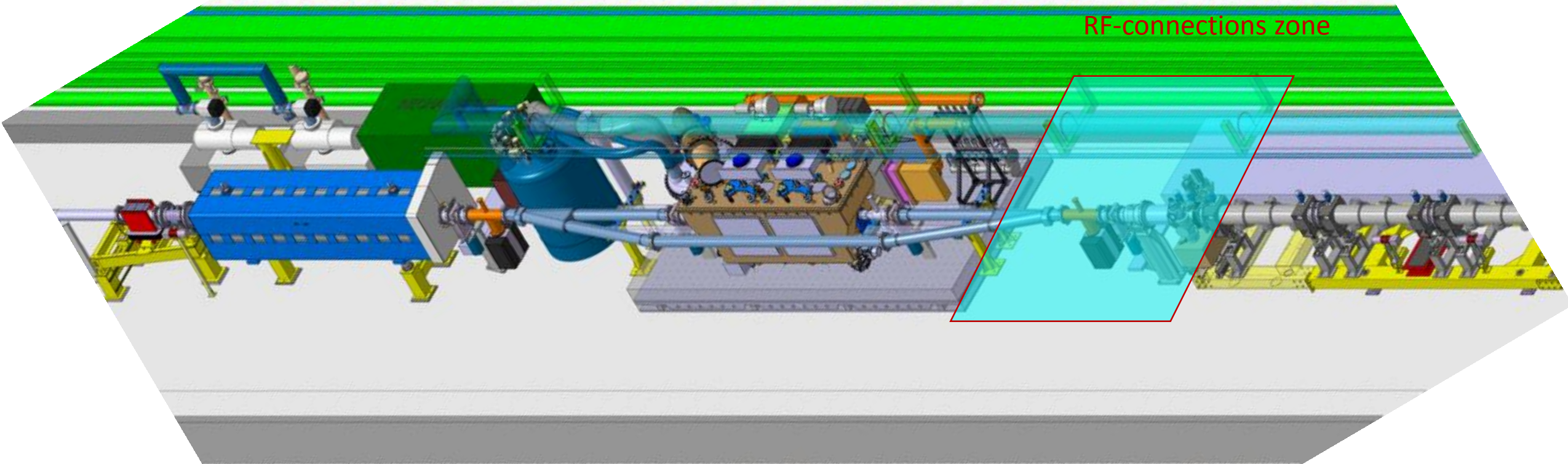
# Crab cavity zone

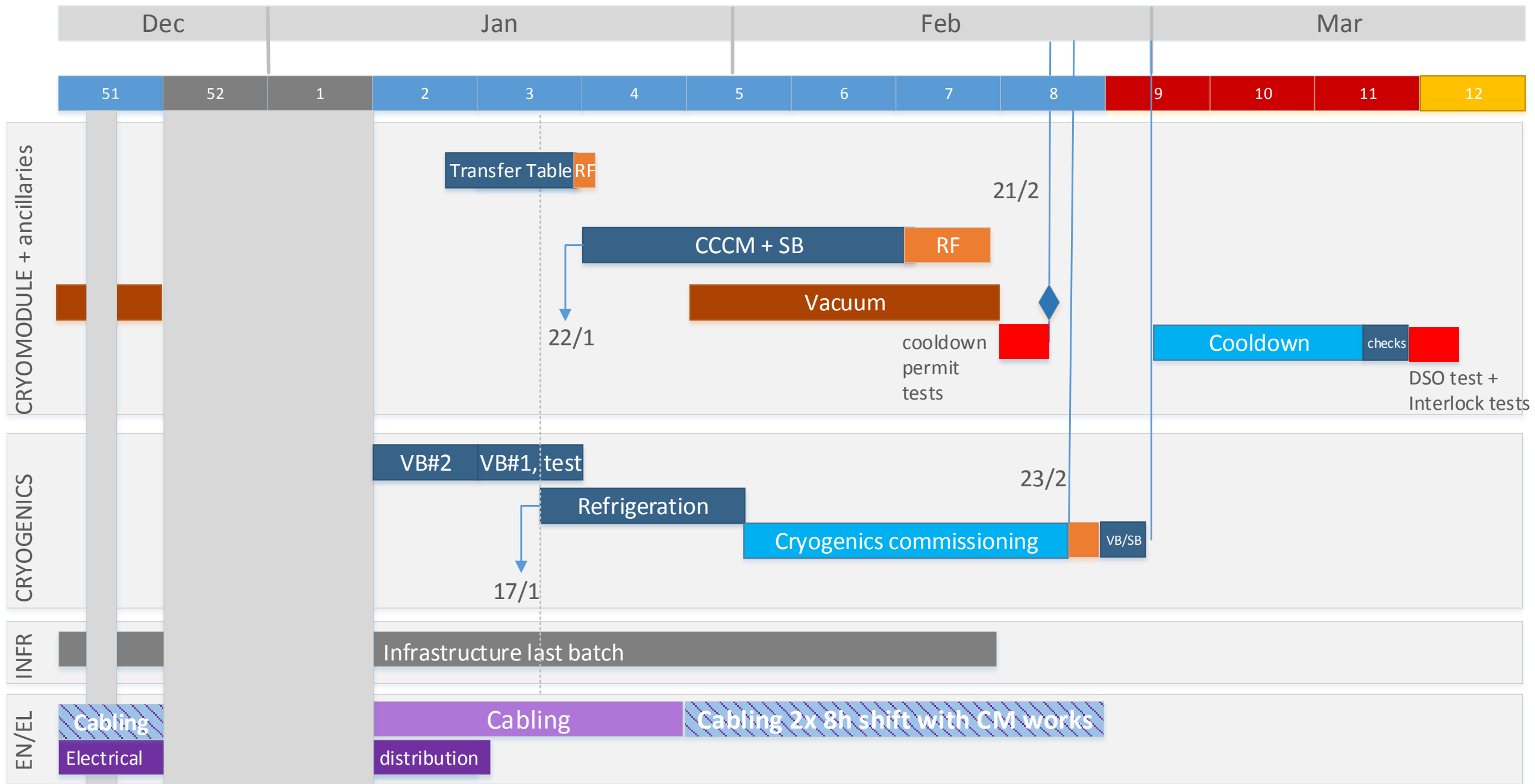


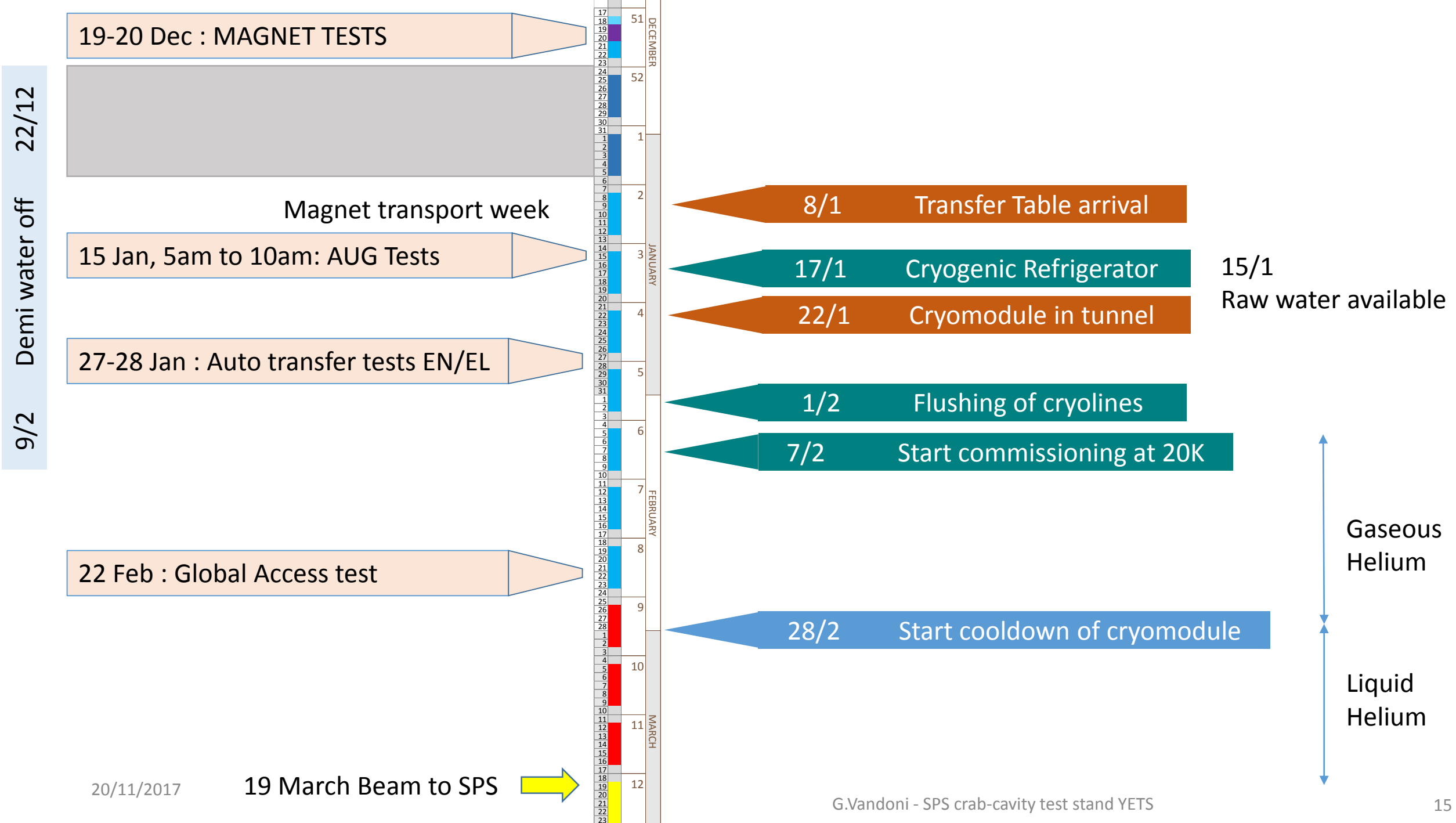
# Crab cavity zone



# Crab cavity zone







# 3 large blocks

CABLING	TA6
	Tunnel
	BA6 and ext

- A very important campaign with several clients
- Priorities to be worked out together with EN/EL to distribute workload: new cables will NOT be available on day 1
- Work partially at night to avoid coactivity and ensure efficient cabling activity

CRYOGENICS	BA6
	TA6
	Tunnel

+ all the rest around this

ODH  
Water, raw and demi

TEST STAND	Transfer Table
	RF equipment
	CRYOMODULE
	Vacuum

And of course, the rest of the SPS activities

D. Mcfarlane      Kickers  
                         Magnet campaign  
                         Lift maintenance  
                         AUG tests  
                         Access tests



# Cabling for signals & power - DEADLINES

EN/EL/FC new cables and fibers		Deadline for use	
Transfer Table	K.Artoos	15/1	week2
Mechanical instrumentation of CM	M.Guinchard	?	?
ODH	N.Broca	14/2	week 7
Cryogenics (to VB#2)	C.Fluder	24/1	week 4
Faraday cage LLRF	P.Baudrenghien	9/2	week 6
RF Powering	F.Killing	9/2	week 6

EN/EL/EIC Electrical distribution cabling and connections		Deadline for use	
Energization of transformer	G.Velazquez	15/1	week2
Cryogenics	C.Fluder	22/1	week3
Transfer table	K.Artoos	15/1	week2
IOTs	F.Killing	9/2	week6
Faraday cage equipment	P.Baudrenghien	15/2	week7

# Other Deadlines

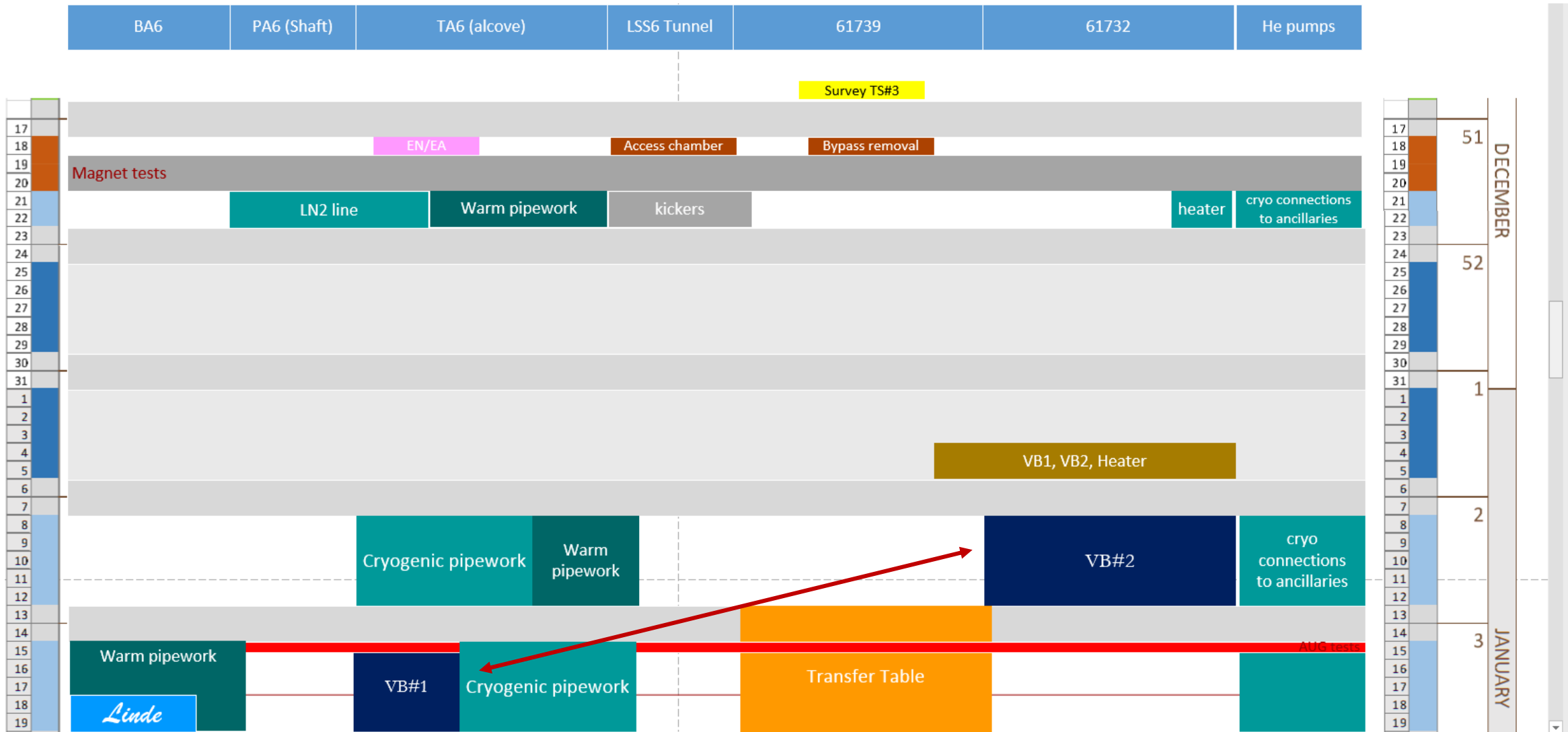
SYSTEM	Contact	Commissioning
Transfer Table	K.Artoos	17 <sup>th</sup> Jan
Cryogenics refrigeration + distribution	S.Claudet	1 <sup>st</sup> Feb to 21 <sup>st</sup> Feb
Cryomodule pumpdown	C.Pasquino/ J.Perez Espinos	8 <sup>th</sup> Feb
Faraday cage LLRF	P.Baudrenghien	15 <sup>th</sup> Feb
RF Power IOTs	F.Killing	15 <sup>th</sup> Feb
Cryomodule cooldown	S.Claudet	28 <sup>th</sup> Feb

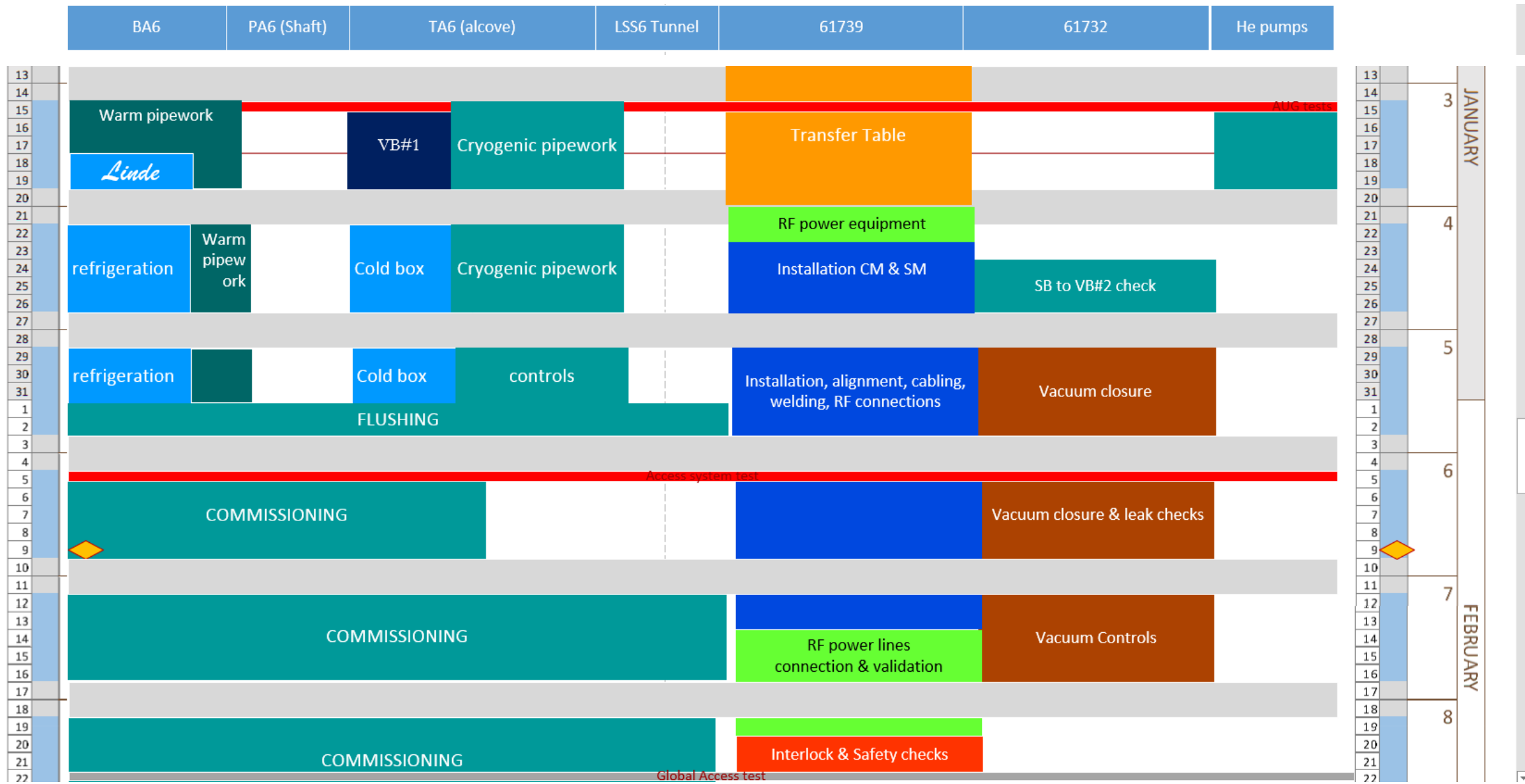
EN/CV		
Demi-water off	22 <sup>nd</sup> Dec 2017	9 <sup>th</sup> Feb
Ventilation Faraday cage	Station arrives on	8 <sup>th</sup> Jan
Raw water	Needed in BA6	15 <sup>th</sup> Jan

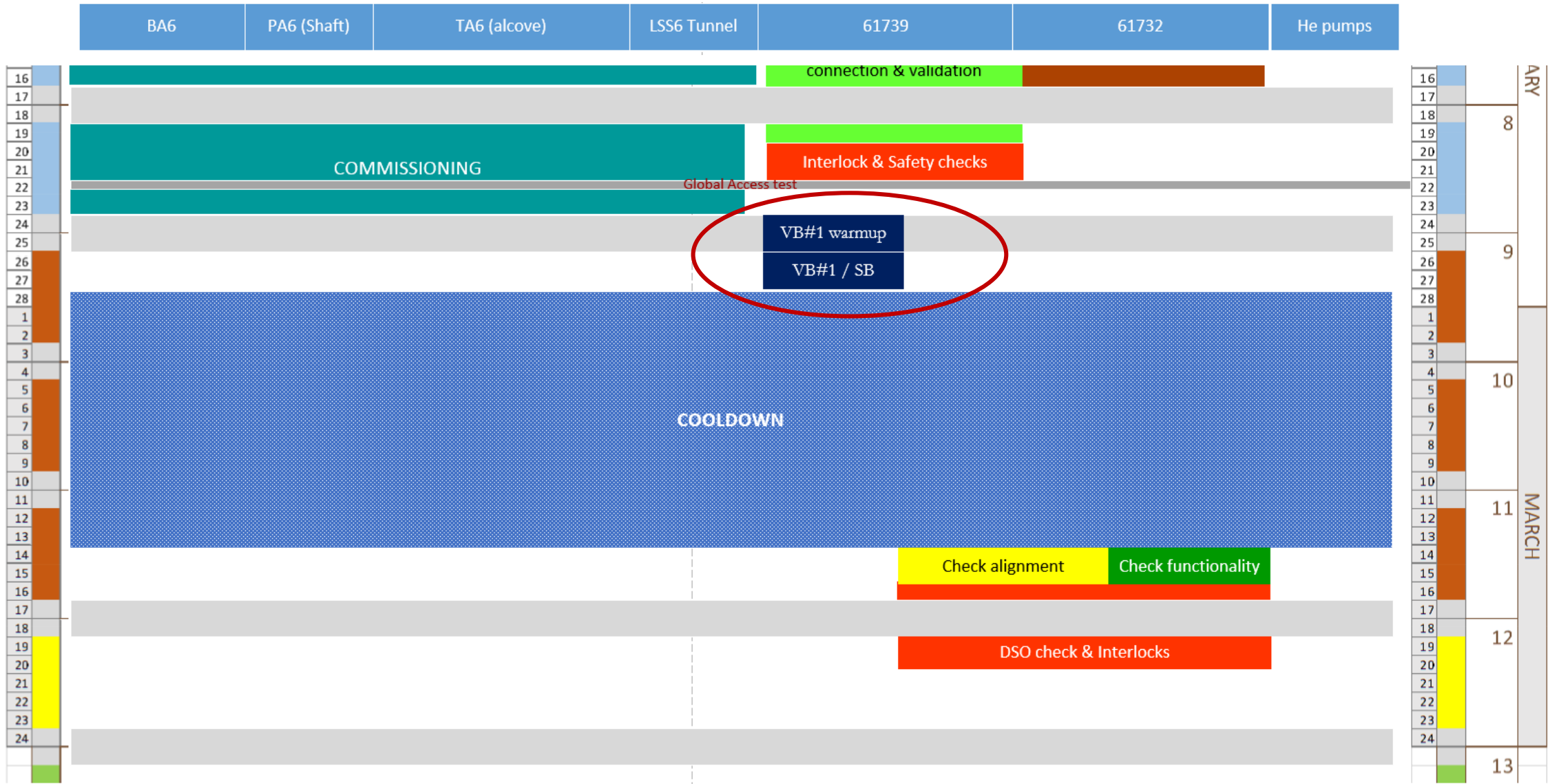
# Large Transports

DATES ARE INDICATIVE

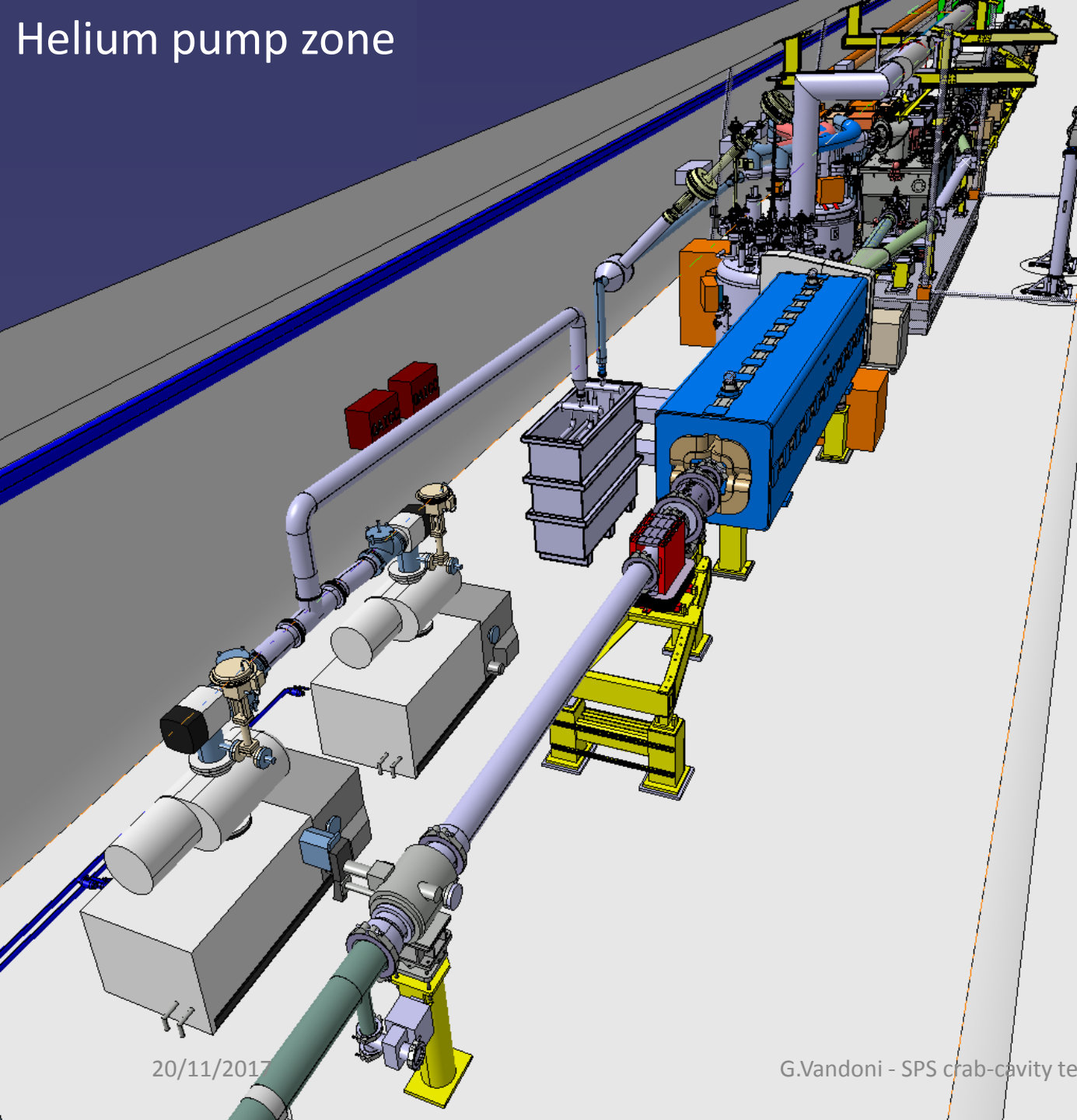
Item	Contact	Date
Heater tank	J.Metselaar	21 <sup>st</sup> Dec
ValveBox#1 & VB#2	J.Metselaar	22 <sup>nd</sup> Dec
Transfer Table	K.Artoos	12 <sup>th</sup> Jan
Circulator & Load skids	S.Calvo	15 <sup>th</sup> Jan
Service Box	G.Vandoni	19 <sup>th</sup> Jan
Cryomodule	G.Vandoni	19 <sup>th</sup> Jan
Cold-Box	J.Metselaar	17 <sup>th</sup> Jan
Compressor skid	J.Metselaar	18 <sup>th</sup> Jan
LN <sub>2</sub> tank	J.Metselaar	12 <sup>th</sup> Jan





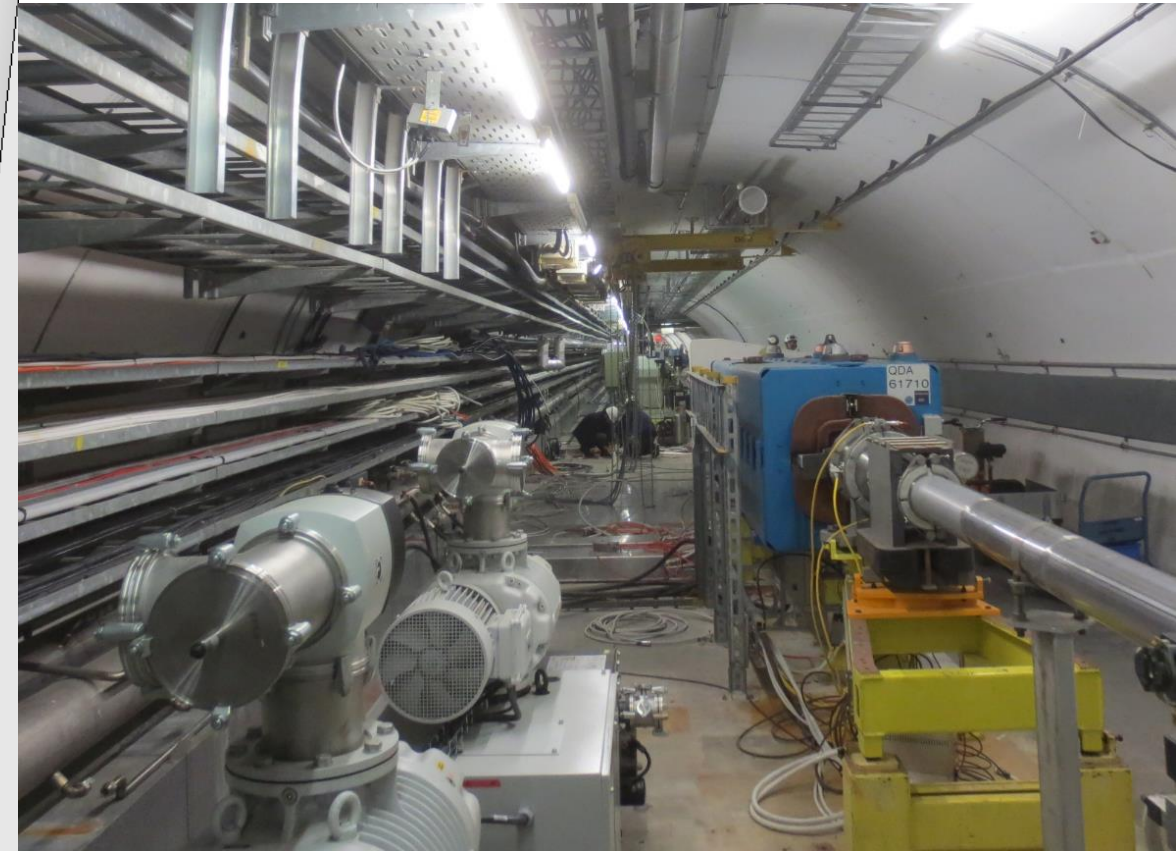


# Helium pump zone



In this zone, CRG manages all activities

- Installation of heater tank
- Installation and welding of pipework



## ValveBox#2 zone 61732

- Installation of VB#2 and flexible lines
- Connection to SB
- Electrical racks
- Vacuum lines

Cold Commissioning to 20K  
is up to here ||



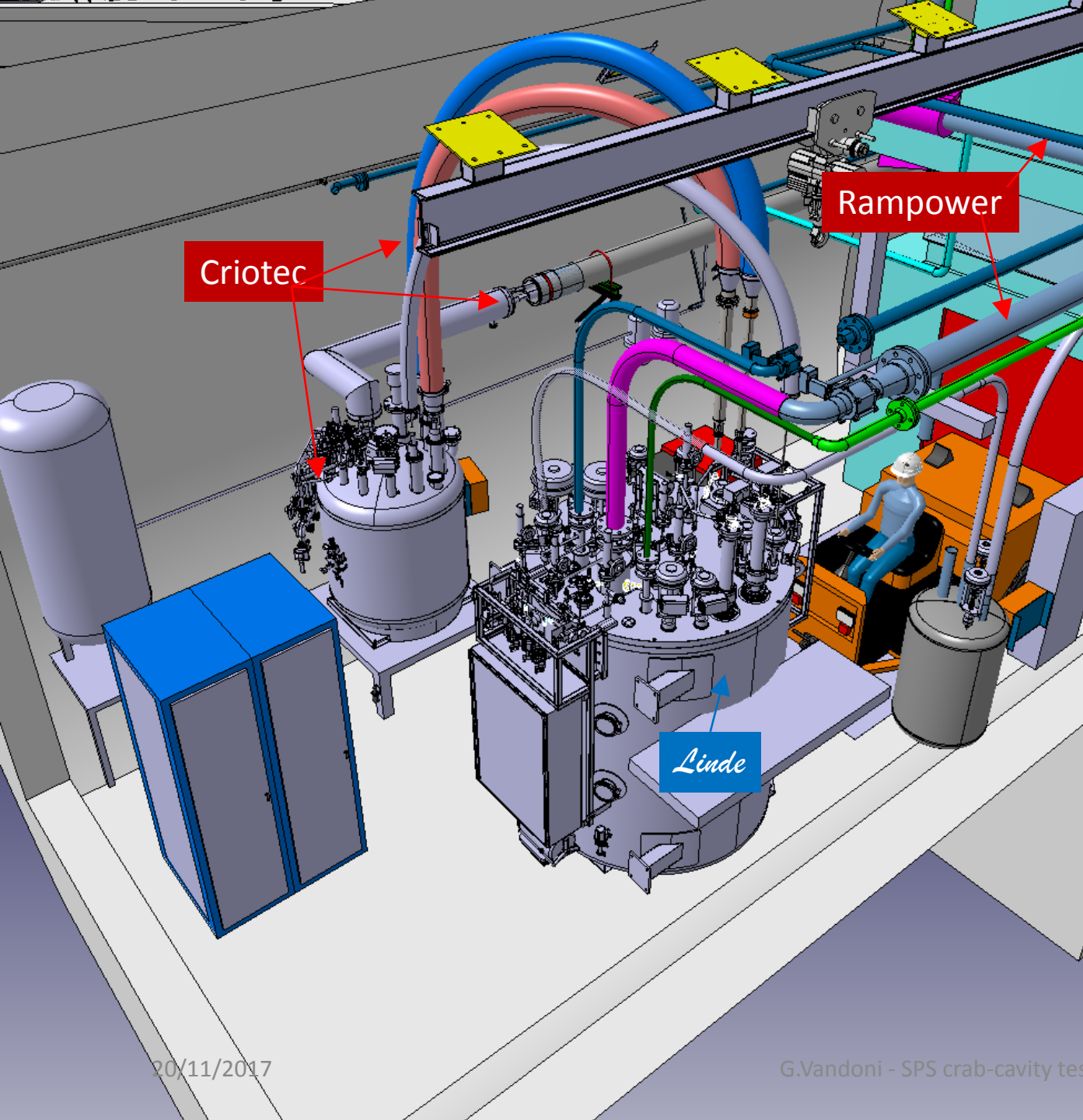
## ValveBox#2 zone 61732

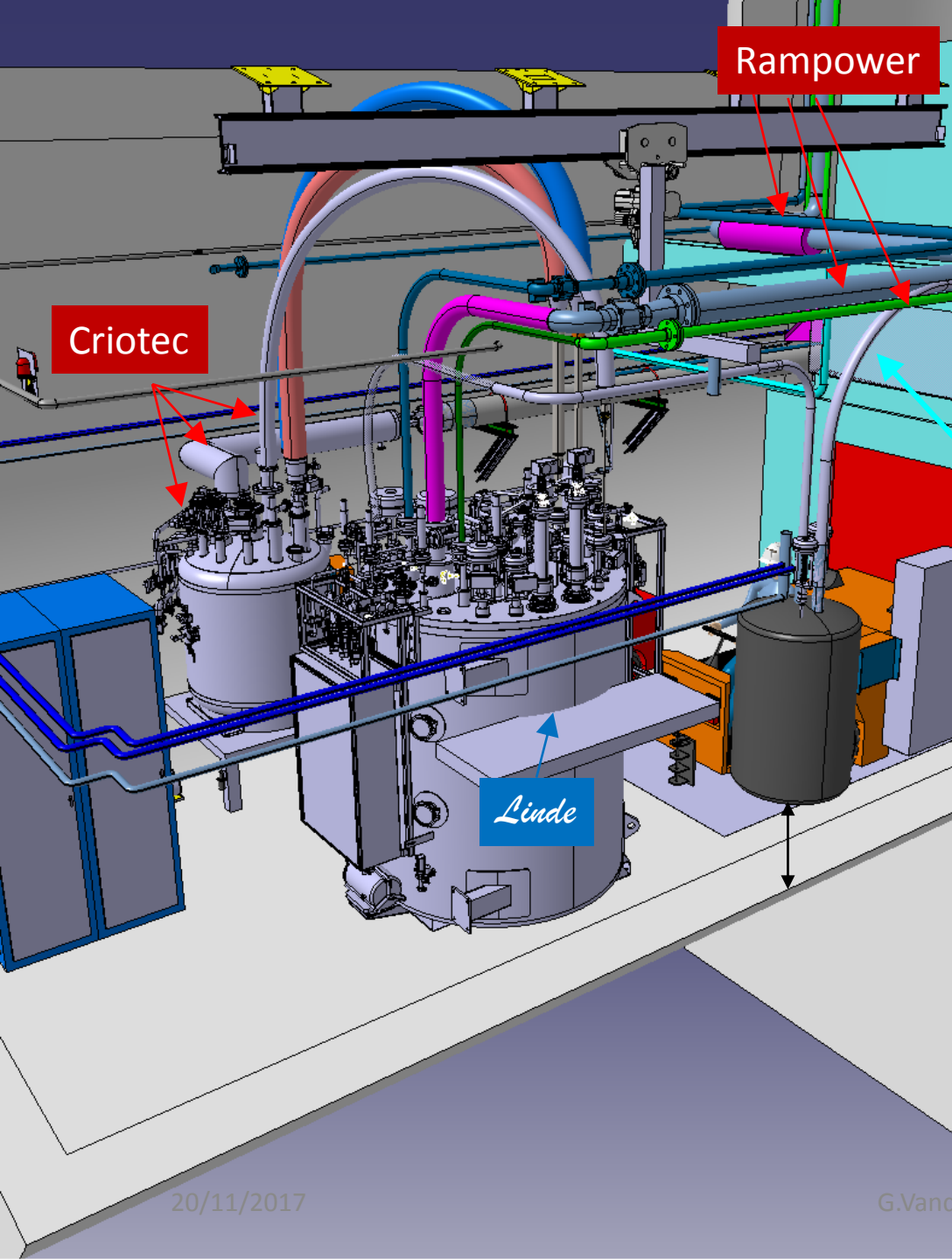
- Installation of VB#2 and flexible lines
- Connection to SB
- Electrical racks
- Vacuum lines

Cold Commissioning to 20K  
is up to here ||

Flushing 1<sup>st</sup> Feb  
Cold Commissioning 20K starts 7<sup>th</sup> Feb

# TA6 alcove, cryogenic installation



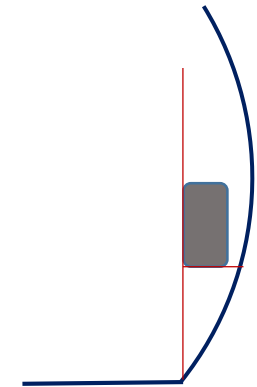


# TA6 alcove, cryogenic installation

Criotec  
 Rampower  
 Linde  
 TE/CRG/ME Mechanics  
 TE/CRG/TE Controls

The LN2 line serves as reference for installation of phase separator and related lines

The LN2 phase separator is installed at height, in the shadow of the curb



This zone is entirely in the hands of TE/CRG

EN/EA: scaffold

EN/HE: cold box and VB#1

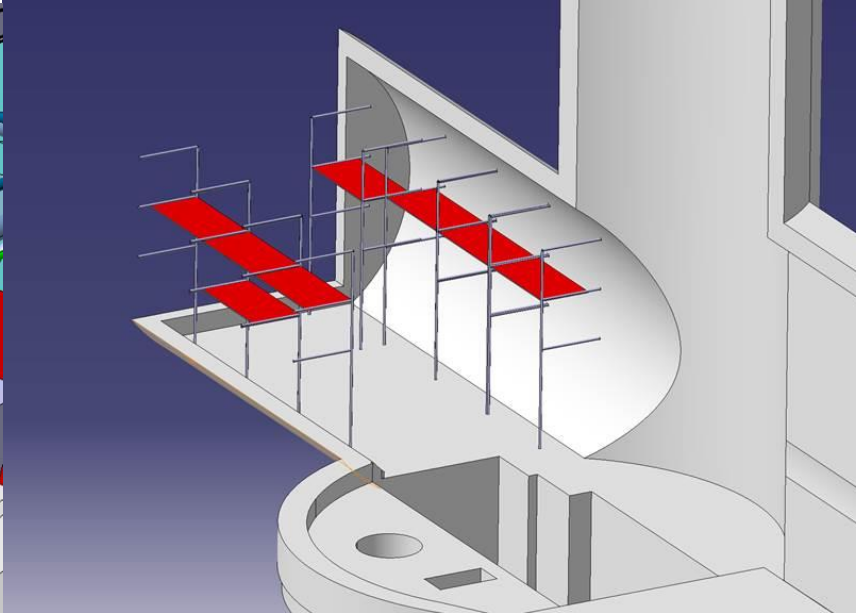
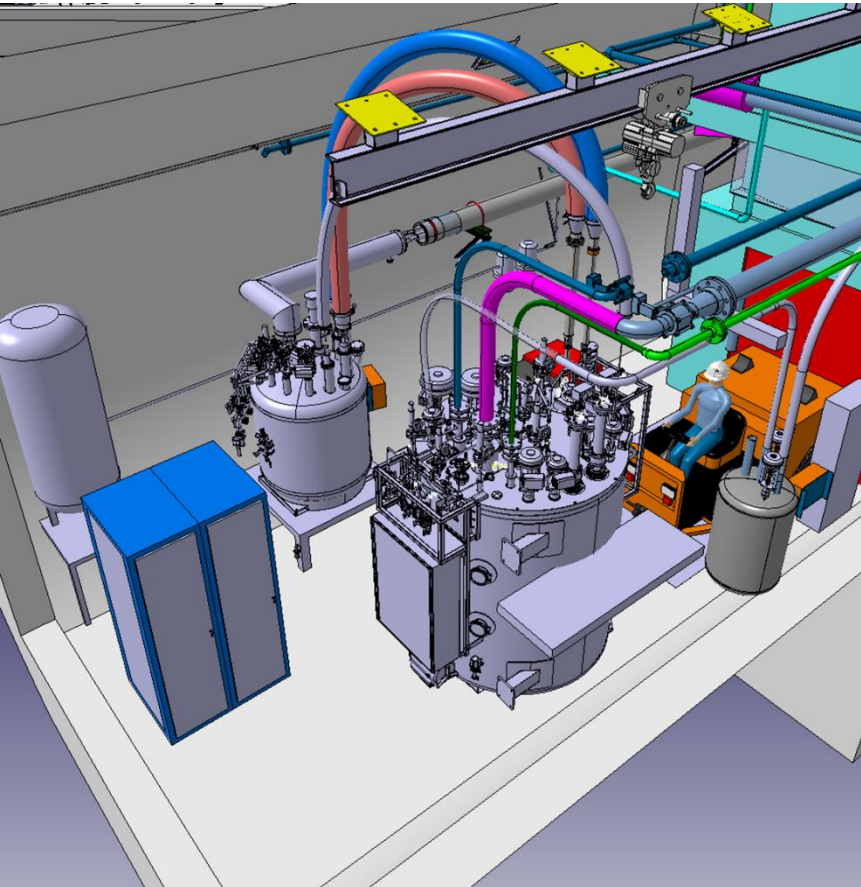
EN/CV: raw water

EN/MME X-rays

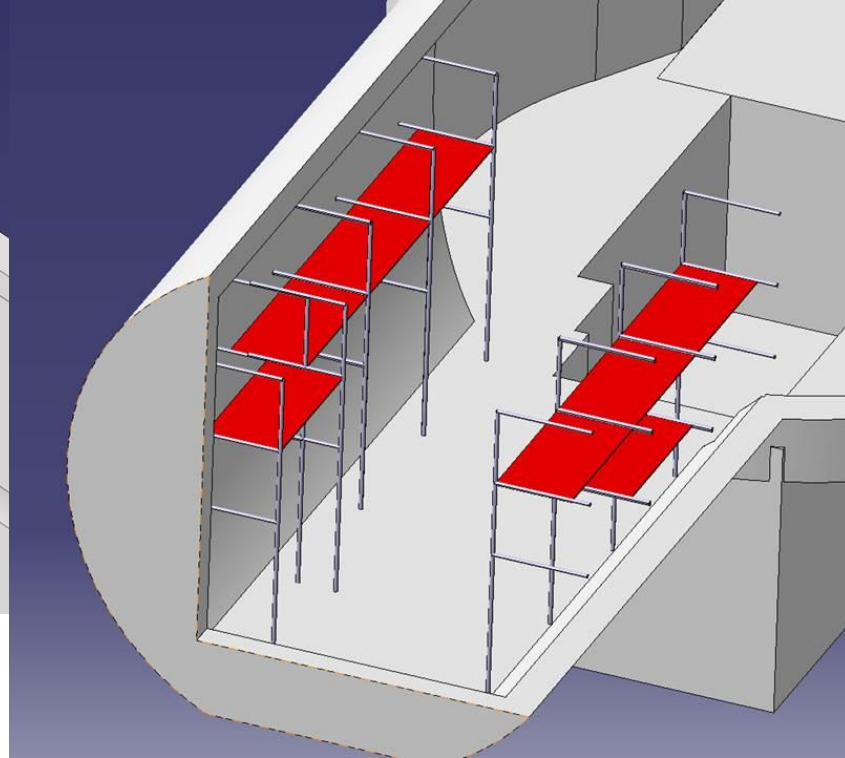
EN/EL/FC

EN/EL/EIC

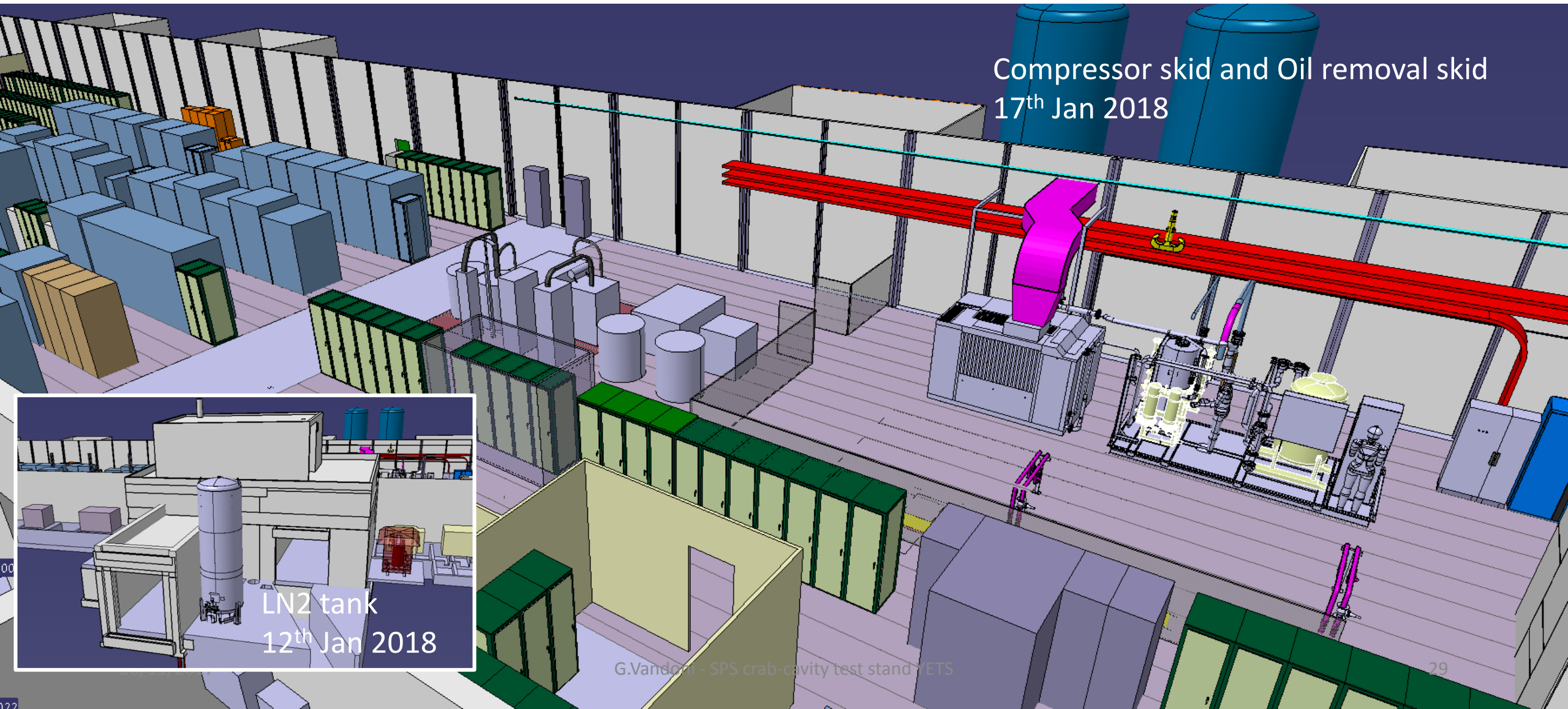
# Scaffold on Day 1



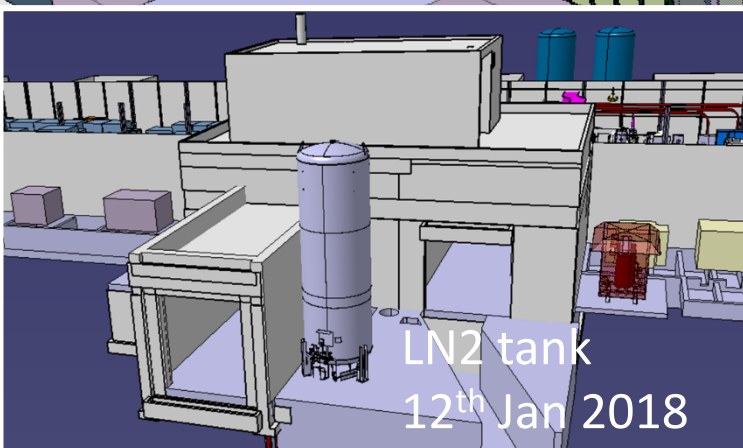
Jos Metselaar



# BA surface buidling



Compressor skid and Oil removal skid  
17<sup>th</sup> Jan 2018



LN2 tank  
12<sup>th</sup> Jan 2018

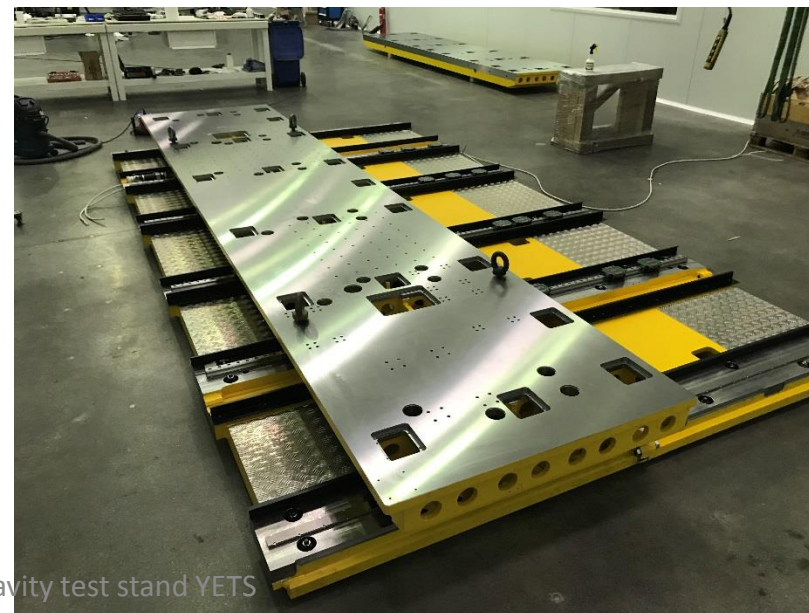
# Cryomodule installation

...movie here...

# Transfer Table

8/1	9	10	11	12	13	14
Table delivery		VIC and trainings		Earliest start	Table installation	
15/1	16	17	18	19	20	21
Cables & controls ready		Interlock tests	RF circulators and loads			
22/1	23	24	25	26	27	28
CM + SB						

Table movement under full load: 14-15 February



# Cryomodule installation

7		7.0	Position Service Box on the table	TE/CRG	K.Brodzinski	
8		8.0	Position Cryomodule on the table	EN/HE	C.Bertone	
9		9.0	Adjust Cryomodule position	EN/HE	M.Sosin	
10		10.0	Cable underneath the Cryomodule	BE/RF	S.Calvo	
11		11.0	Connect Service Box to Cryomodule	EN/MME	M.Garlasche	
11	1	11.1	Adjust Service Box position	TE/CRG	M.Sosin	
11	2	11.2	Weld internal lines of Service Box jumper to Cryomodule	EN/MME	D.Lombard	
11	3	11.3	Close external envelope of Service Box jumper	EN/MME	D.Lombard	
12		12.0	Install waveguides from loads + circulators to Cryomodule	BE/RF	S.Calvo	
13		13.0	Install flexible lines from ValveBox#2 to Service Box	TE/CRG	J.Metselaar	
14		14.0	Cabling of all services of Cryomodule and Service Box	All		
15		15.0	Close beam vacuum	TE/VSC	C.Pasquino	
16		16.0	Install insulation vacuum equipment	TE/VSC	J.Perez Espinos	
17		17.0	Install coaxial lines & clarinets	BE/RF	S.Calvo	
18		18.0	Adjust length of RF Power lines	BE/RF	S.Calvo	
19		19.0	Check table movement under load	EN/MME	K.Artoos	EN/ACE/S
20		20.0	Pumpdown and validation of cryomodule vacuum	TE/VSC	C.Pasquino	
20	1	20.1	Pumpdown cryomodule beam vacuum	TE/VSC	C.Pasquino	
20	2	20.2	Pumpdown insulation vacuum	TE/VSC	J.Perez Espinos	
20	3	20.3	Leak detection of new connections up to valves	TE/VSC	C.Pasquino	
20	4	20.4	air to beam leak check	TE/VSC	C.Pasquino	
20	5	20.5	LHe to beam vacuum leak check	TE/VSC	C.Pasquino	
20	6	20.6	Insulation vacuum to beam vacuum leak check	TE/VSC	J.Perez Espinos	
20	7	20.7	Air to insulation vacuum leak check	TE/VSC	J.Perez Espinos	
21		21.0	Pumpdown of bypass line	TE/VSC	C.Pasquino	
22		22.0	Vacuum controls commissioning	TE/VSC	F.Delsaux	
23		23.0	Survey of Cryomodule under vacuum	EN/ACE/SU	M.Sosin	

Access and presence only of required actors and experts: no bystanders  
 Procedure to be written



# Week 51

## MONDAY

- ☀ Joint VIC for EN/EL (distribution, cables, fibers)  
VSC Dismounting vacuum line in crab zone  
EN/EA Installation of scaffold in TA6

- 🌙 Connectors (RAL zone) /el. distribution (shaft)

## TUESDAY to WEDNESDAY

- Patrol at 6h30 in the morning  
Underground areas inaccessible  
until Wednesday afternoon (~17h00)

## WEDNESDAY

- Green light by J.Bauche for switching to open access  
EN/EL/FC Connectors  
EN/EL/EIC el. Distribution underground + 2 cables pulled under the false floors



## CONSTRAINTS

- Tunnel access only by keys  
Priority to EN/EL, VSC, EN/EA for keys  
No work under false floor in active cable zones



- (5 EN/EL/EIC)
- 10 EN/EL/FC
- 4 TE/VSC
- 2 EN/EA
- 4 EN/HE




## CONSTRAINTS REMOVED

- Tunnel access now free  
Work under false floor in active cable zones becomes possible

# Week 51

THURSDAY -FRIDAY

 EN/EL/FC in the crab cavity zone  
EN/EL/FC-fibers under the false floors and in crab cavity zone

Rampower in the TA6 alcove  
Installation LN2 line in alcove  
VIC Criotec

SMB/SE drilling of the wall for cryogenic pipework

Thursday: [transport of the kickers for alignment & pumpdown Friday/](#) transport of **heater** tank

Friday: if kickers finished, installation of VB#1 and VB#2

If needed, can we install VB1 & VB2 on 4-5/1/2018?

 THURSDAY -FRIDAY

EN/EL/FC in crab cavity zone and RAL  
EN/EL/EIC continues underground

# Who's Who

S.Mehanneche/ F.Galleazzi	Integration	
J.Dalla-Costa	Field coordination	
D.McFarlane	SPS Coordination	
F.Bais	TSO SPS	
J.Etheridge	EROS	
G.Vandoni	Work responsible/ Field coordination	
M.Garlasche	Cryomodule linkperson	
C.Pasquino	Vacuum linkperson	
J.Metselaar	Cryogenics linkperson	
T.Sletttestol/ G.Gros/ J.Blanc	EN/EL cabling (cabling & fibers)	
K.Artoos	Transfer Table	
S.Calvo	RF power and cables	
S.Fumey	Transports for crab-cavity	