

HST installation steps

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LHC Injectors Upgrade

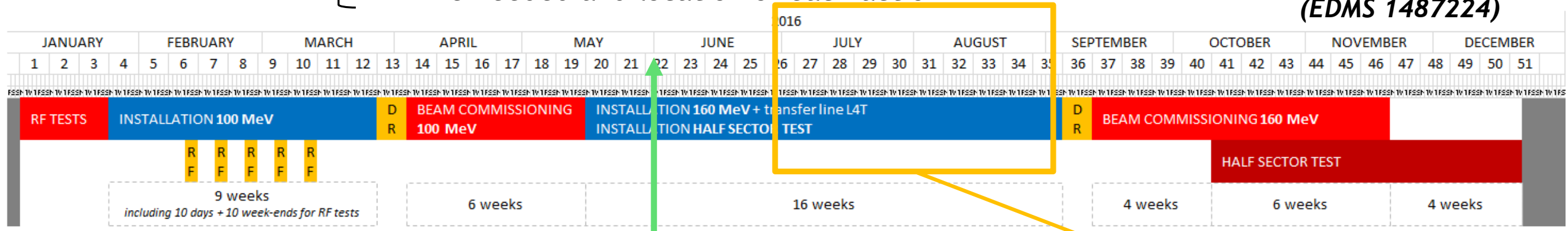
PSB Half Sector Test - Installation Meeting #2

April 5, 2016

AIM: definition of the program for the HST installation

- Indentification of
- List of actions
 - Group(s) and responsible person(s) for each action
 - Time needed and location of each action

LINAC 4 master plan (EDMS 1487224)



**Start of the INSTALLATION:
Beginning of June**

**Hardware test
(when the machine is closed,
in parallel with RF tests)**

YETS 2015-2016 in the injectors
YETS 2015-2016 in the LHC

EYETS

- Legend**
- No Access - RF Tests or Beam Commissioning
 - No Access - Half Sector Tests
 - No Access - RF Tests (RF) or Dry Run (DR)
 - Access - Installation
 - Year-End Technical Stops in the accelerators chain (injectors and LHC)

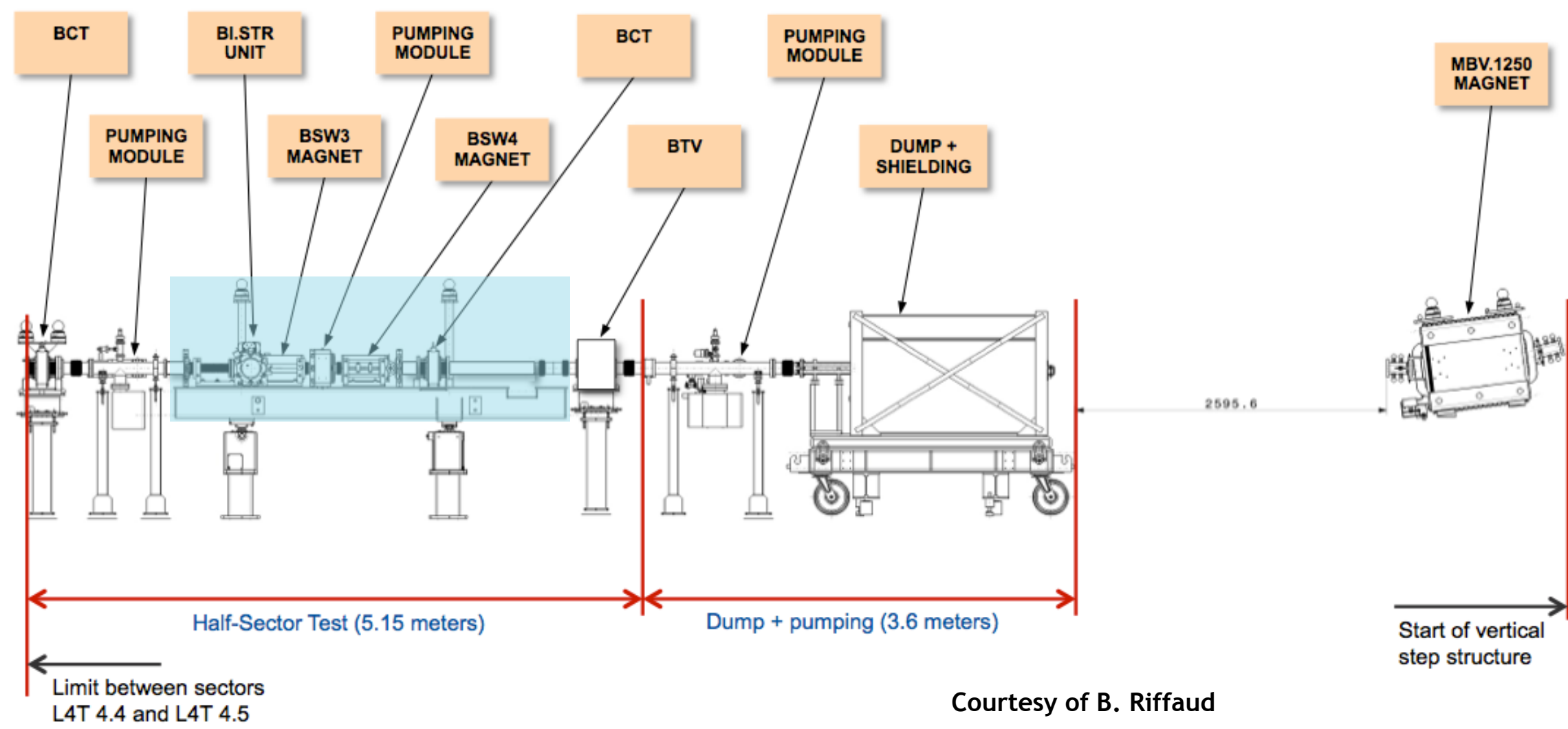
- Displacement of the test bench from 50MeV to 100 MeV location
- Installation of the RF cavities CCDTL 1, 2, 3
- RF conditioning of the RF cavity CCDTL 4
- RF conditioning (check) of the RF cavities CCDTL 1, 2, 3, 5, 6, 7 and PIMS 1

100 MeV
Source
LEBT
RFQ
MEBT
DTL 1-2-3
CCDTL 1-2-3-4-5-6-7
PIMS 1
Test bench
Beam Dump

- Remove the test bench from 100 MeV location
- Transport of the RF cavities PIMS 2, 3, 4, 5, 8, 9
- Installation of the RF cavities PIMS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
- RF conditioning of the RF cavities PIMS 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
- Installation of the Half Sector Test

160 MeV
Source
LEBT
RFQ
MEBT
DTL 1-2-3
CCDTL 1-2-3-4-5-6-7
PIMS 1-2-3-4-5-6-7-8-9-10-11-12
Main Dump
Half Sector Test

Half Sector Test elements



Support girder and its alignment jacks to be reused from 100 MeV test
Special plate for Strip. foil unit, BSW3, pumping module, BSW4 (not visible in the picture)

2 PHASES:

- ❑ Preparation to 160 MeV (girder preparation and dump 100 MeV removal)
- ❑ 160 MeV

WHERE actions take place:

- ❑ In the tunnel
 - ❑ Bldg. 400, upstairs/Bldg. 867
- Some actions done in parallel

NOT LISTED: the installation of racks, power supplies, interlocks and transformers take place in parallel in Bldg. 400.

PHASE 1: preparation to 160 MeV

In the TUNNEL

Group	Action	Time needed
HSE-RP-AS	Cool down of <u>girder</u> with equipment	1 week
HSE-RP-AS	Cool down of beam <u>dump</u> for 100 MeV	1 week
EN-HE-HH and ?*	Removal and store equipment from the girder**	1 week
Survey	Measure empty girder	0.5 day
Survey	Mark new holes (12?)	1 day
Michel Arnaud??	Drill new holes	1 day

Bldg. 400 (upstairs)/Bldg. 867

Group	Action	Time needed
EN-HE-HH	Transport trolley with 100 MeV <u>dump</u> to Bldg. 867	1 day
EN-STI	Removal dump core in radioactive lab	12 days
EN-STI	Modify trolley and install dump for 160 MeV	
EN-HE-HH	Transport <u>girder</u> Bldg. 867	1 day

Comments:

* Who are the owners of the equipment?

** BI: tunnel+modification. Magnets: stored in tunnel.

In the TUNNEL

Group	Action	Time needed
BE-BI-PI	Installation L4H.BCT.1043	1 day
EN-HE-HH	Construct shielding around and behind the dump*	1 week
EN-ACE-SU	Pre-align feet jacks of girder	0.5 day
Equip. experts	Intall BTV.1052 + strip. foil + remaining vac. equip.	2-3 days
	Install BTV.1077	1 day
EN-ACE-SU	"Fiducialisation" of SU arms (for BTV.1052 on girder)	0.5 day
EN-ACE-SU	Check alignment	1+1 days
TE-VSC	Install pumping group (between BTV and dump)	0.5 day
BE-BI-BL	Install external BLMs	0.5 day
TE-VSC	Connect vacuum-equip.+leak test	1-2 days
TE-VSC	Bake out of external dump	2-3 days
All	Connect HST to services (+ tests)	2 days
EN-HE-HH	Install lateral shielding	3 days

Bldg. 400 (upstairs)/Bldg. 867

Group	Action	Time needed
EN-HE-HH	Transport trolley in the tunnel	1 day
Wim's group?	Install Strip. Foil Unit +BSW2**,3+ BSW4+BCT on girder	1.5 weeks
EN-ACE-SU	Align Strip. Foil Unit +BSW2,3+ BSW4+BCT on girder	
Survey	Check reproducibility of BSW4 installation	1 day
EN-HE-HH	Transport girder to the tunnel	1 day

PHASE 2: 160 MeV

Comments:

* make sure shielding blocks are available

** BSW2 added to BSW3 and 4 for stability

Summary

- ❑ Start HST installation about the beginning of June
 - Equipment ready by the end of May
- ❑ Hardware Tests in July/August
- ❑ Installation steps have been defined but there are **missing information!**

We would like to:

- **Complete missing information within ONE WEEK**
- Send information to Julie Coupard to be included in the detailed Linac 4 installation planning

Thanks for your collaboration!

(It's not finished yet...)