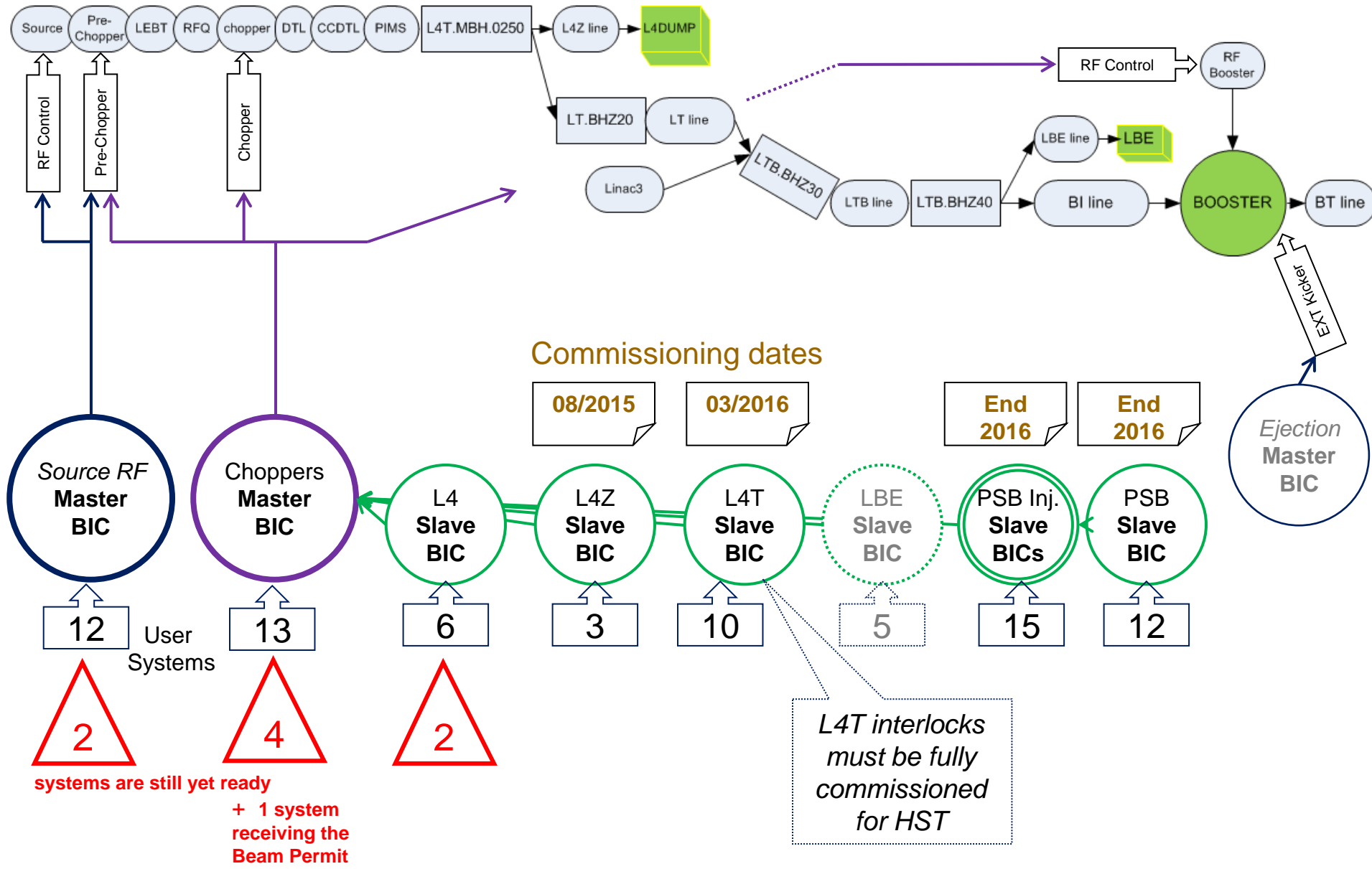


Machine Interlocks composed of 2 separate systems:

- **the Beam Interlock System**
- **the Magnet Interlock System**

## Beam Interlock System:

- ❑ For the time being, **no showstopper concerning the readiness of the BIS**
  - In Linac4, the system will be increasingly deployed along to different commissioning phases.
  - For the TL, the injection region and the PSB rings, it will be done in accordance with the (new) schedule
  - Note: the PSB Ejection BIC is operational since end of 2012
  
- ❑ The BIS will be fully Operational if **all connected systems** (i.e. “*User Systems*”) will be able to **correctly and safely provide their interlock signals**.
  - The latter point is to some extent outside of the BIS team responsibility.
  - As a reminder, the Interlock team is responsible for:
    - Providing and installing the User interface box (CIBU) in the *User System*’s rack
    - Ordering the pulling of cables between User racks and the Beam Interlock Controllers (BIC)
    - Proposing a commissioning date for the *User System* connection to the CIBU



# List of Interlock signals for Injection Line and Rings:

1	EN/STI	BI Beamstoppers Out	C. Mitifiot	BIC for PSB injection
2	BE/RF	PSB RF Global	A. Blas	BIC for PSB (rings)
3	BE/BI	PSB Injection Watchdog (high loss)	F. Lenardon	BIC for PSB injection
4		PSB Injection Watchdog (low loss)		BIC for PSB injection
5		H <sup>0</sup> /H <sup>-</sup> Current Monitor	F. Roncarolo	BIC for PSB injection
6		Injection Foil	S. Burger	BIC for PSB injection
7		BLMs in PSB extraction/transfert	C.Zamantzas	BIC for PSB (rings)
8		BLMs in BI line + PSB injection		BIC for PSB injection
9		BLMs Ring 1 & 2		BIC for PSB (rings)
10		BLMs Ring 3 & 4		BIC for PSB (rings)
11	TE/VSC	BI + BR + BT Vacuum Valves	J. De la Gama Serrano	BIC for PSB (rings)
12	TE/ABT	Distributor	W. Weterings	BIC for PSB injection
13		BI.KSW	E. Carlier/J. Schipper	BIC for PSB injection
14		BE.BSW	H. Gaudillet	BIC for PSB (rings)
15		Injection Foil	P. Van Trappen	BIC for PSB injection
16	TE/EPC	BI.BSW ring 1	D. Aguglia	BIC for PSB injection
17		BI.BSW ring 2		BIC for PSB injection
18		BI.BSW ring 3		BIC for PSB injection
19		BI.BSW ring 4		BIC for PSB injection
20		BI.SMV	D. Aguglia ?	BIC for PSB injection
21		BE.SMH	D. Aguglia ?	BIC for PSB (rings)
22		MPS status	M. Chamiot-Clerc	BIC for PSB (rings)
23	TE/MPE	WIC BI Line	R.Mompo	BIC for PSB injection
24		WIC PSB mains		BIC for PSB (rings)
25		WIC PSB Aux#1		BIC for PSB (rings)
26		WIC PSB Aux#2		BIC for PSB (rings)
27		WIC PSB Aux#3		BIC for PSB (rings)

.. extracted from the  
Eng. Specification  
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**Engineering Specification**

**BEAM INTERLOCK SPECIFICATIONS FOR  
LINAC4, TRANSFER LINES AND PS  
BOOSTER WITH LINAC4**

*Abstract*

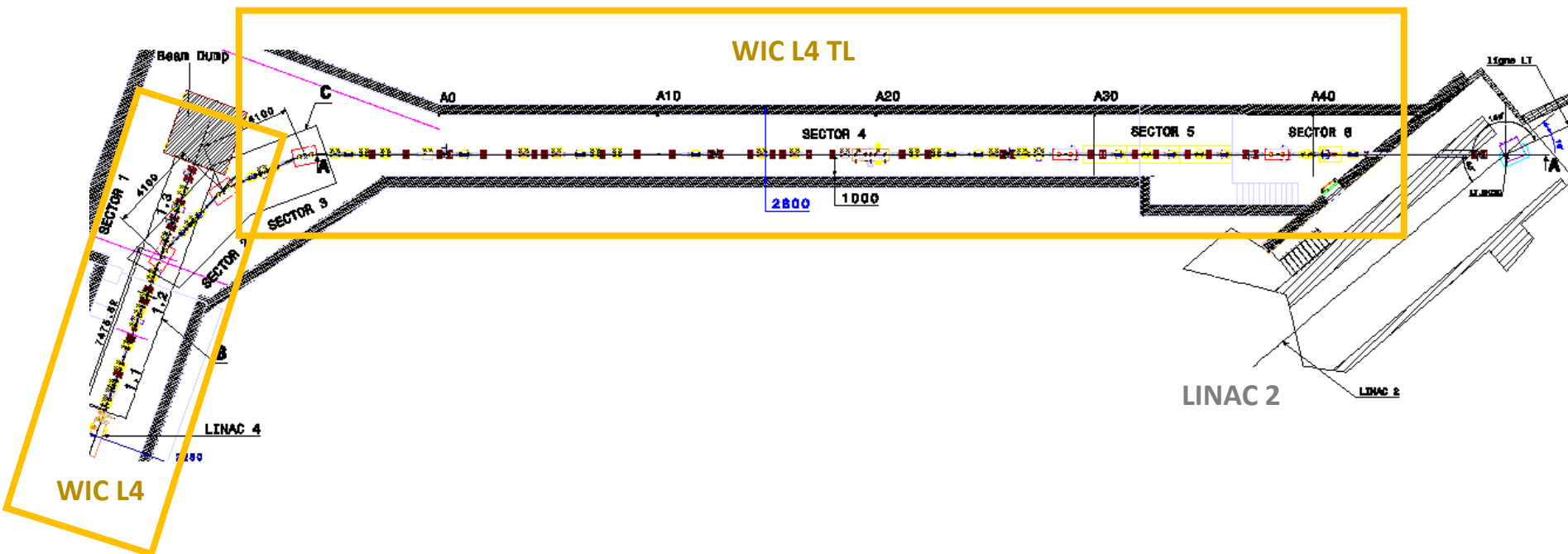
The beam interlock system for Linac4 and its transfer lines to the PSB will be based on a mixed system comprising hardware interlocks provided via the BIS (Beam Interlock System), software interlocks based on the SIS (Software Interlock System) and the concept of External Conditions used currently in the PS complex. This document summarizes the beam interlock specifications to safely operate Linac4, the Linac4-to-PSB transfer lines and the PSB with Linac4 injection.

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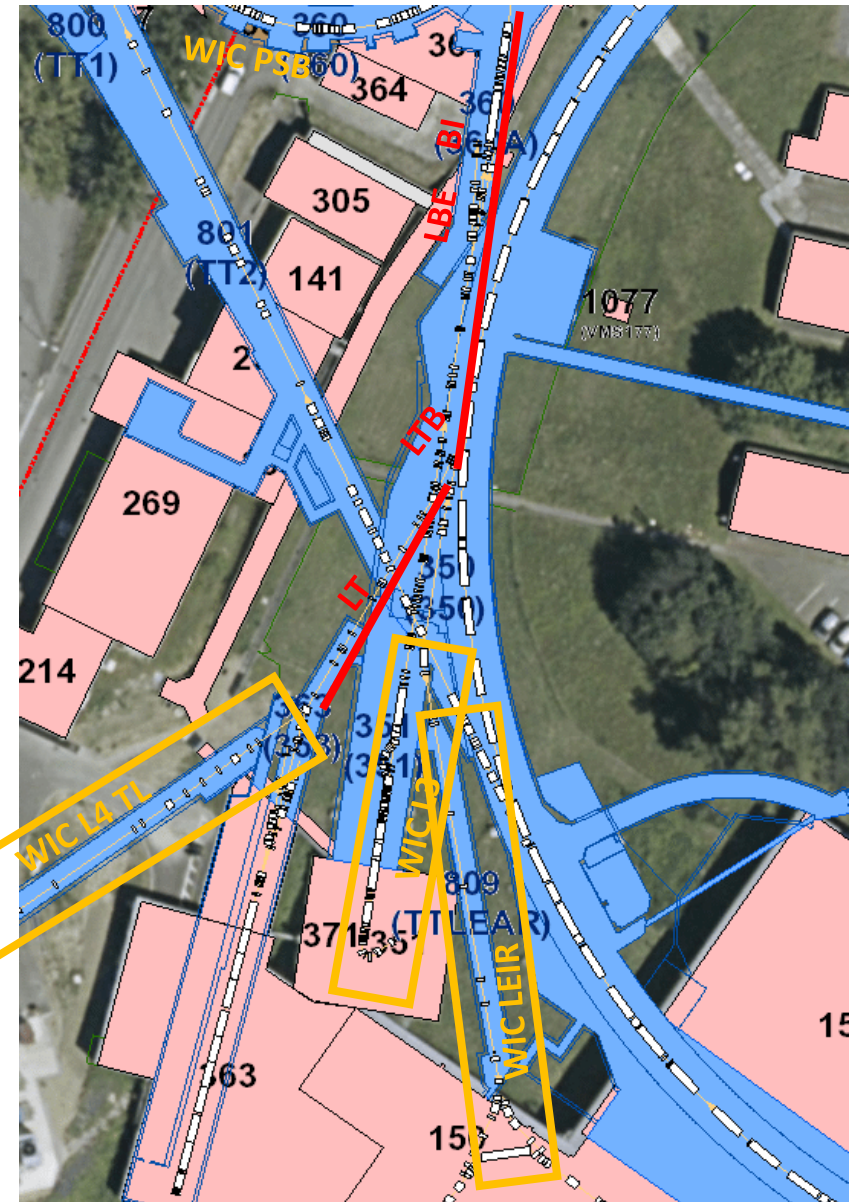
Distribution list: S. Myers, F. Bordry, R. Saban, P. Collier, R. Garoby, M. Meddahi.

## Warm Magnet Interlock system:

- ❑ The WIC has been fully deployed in LINAC4 and the LINAC4-TL and is commissioned with TE/EPC & TE/MSD according to the commissioning schedule
- ❑ WIC in LINAC 4 is only protecting magnets up to the LINAC2 connection (last element MQF.1710), LT.BHZ20 not included anymore!



- ❑ **LINAC4**, LINAC3, LEIR and **PSB** already equipped with standard WIC system
- ❑ Renovation of LT, LTB, LBE and BI lines is/was not included in LINAC4 WIC but is a (pending) consolidation request
- ❑ TE/MPE envisages this upgrade **in close collaboration with TE/EPC and TE/MSC** for LS2 or even EYETS 2016/17 (in agreement with LINAC4 connection schedule)
- ❑ **Requires confirmation of budget request asap** (estimate of ~120kCHF for installation of 2 PLC based systems, depending on final location of power converters and magnets)



End