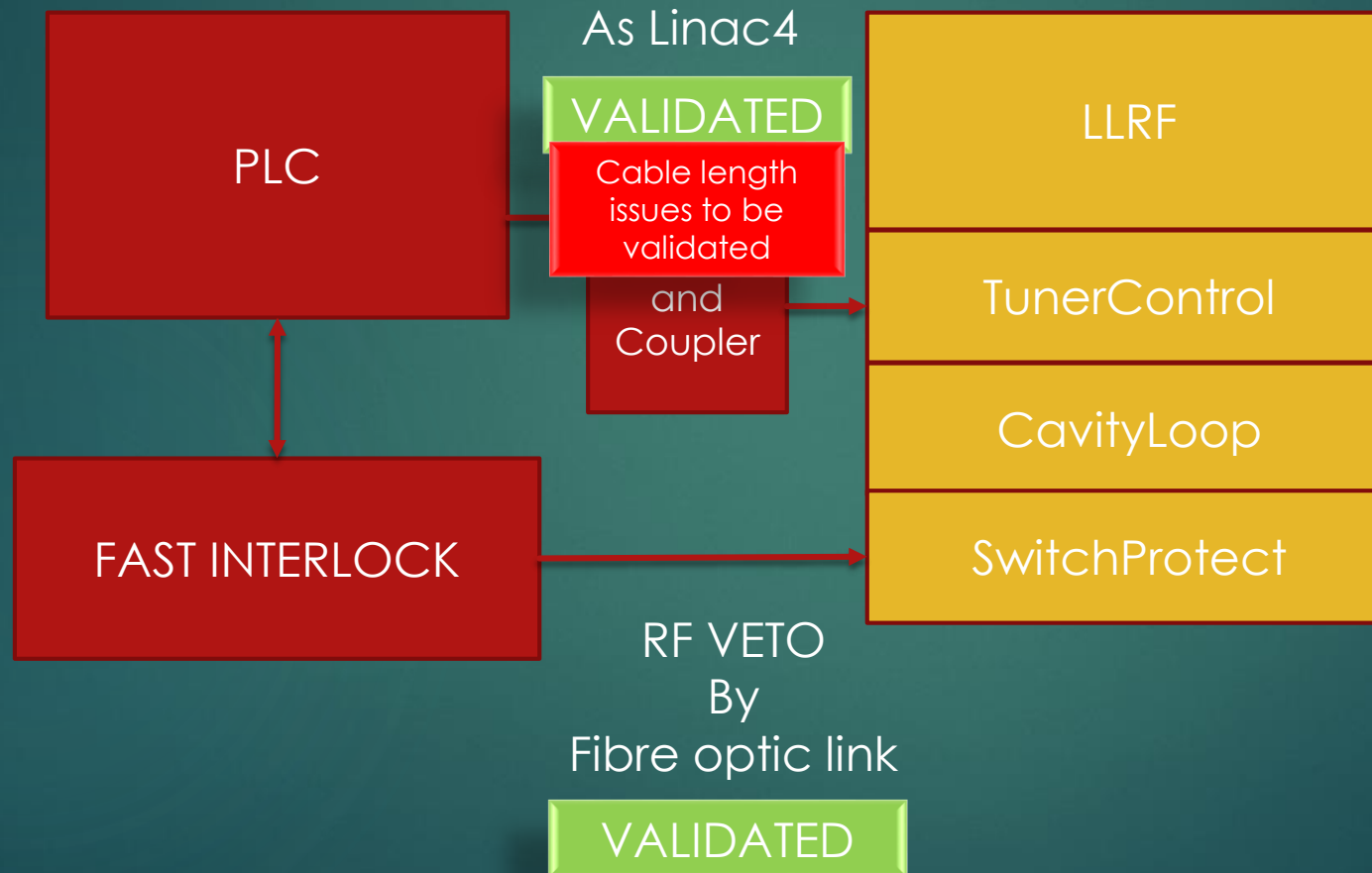




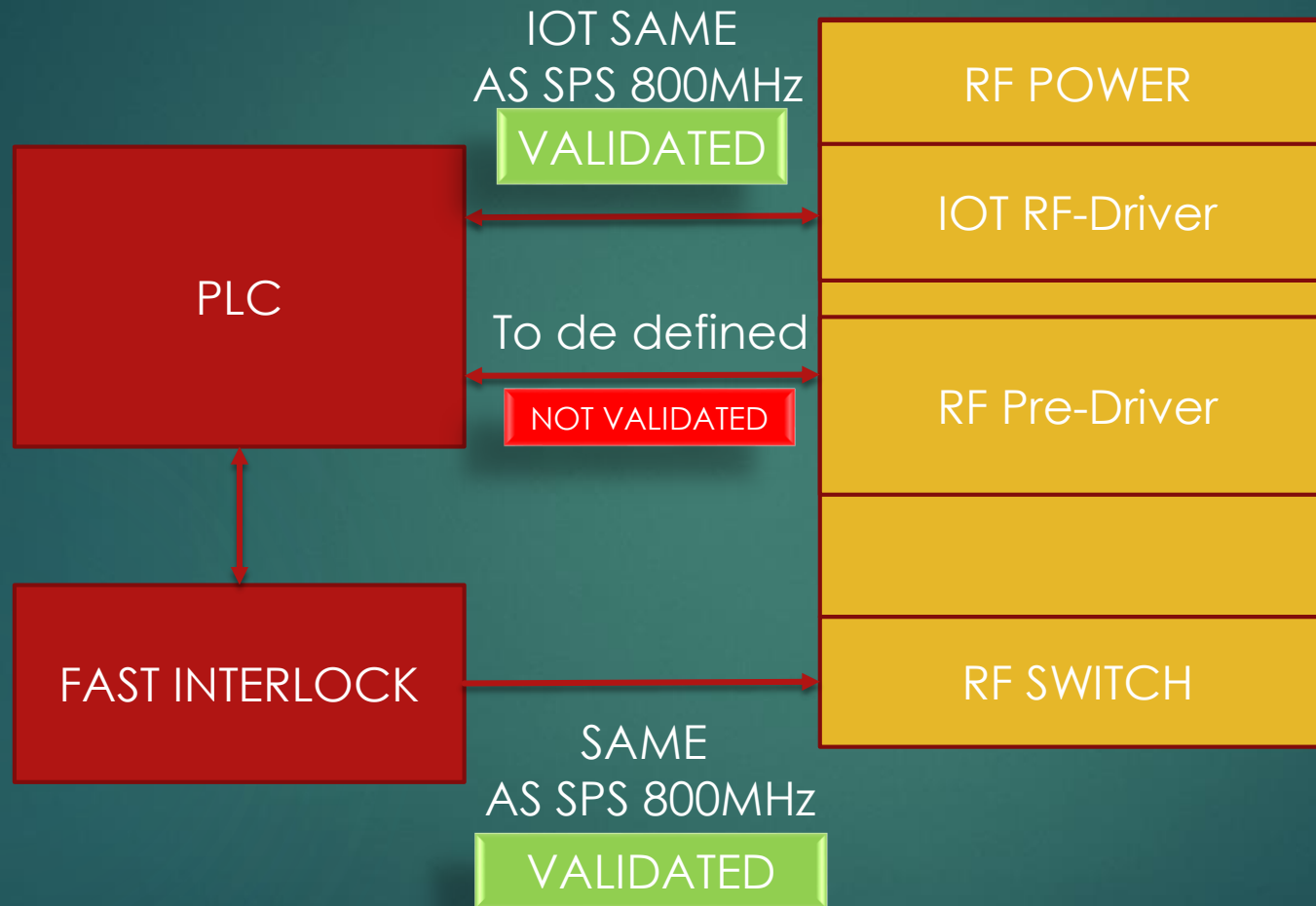
Controls & software

DAVID GLENAT, LUCA ARNAUDON, ANDY BUTTERWORTH

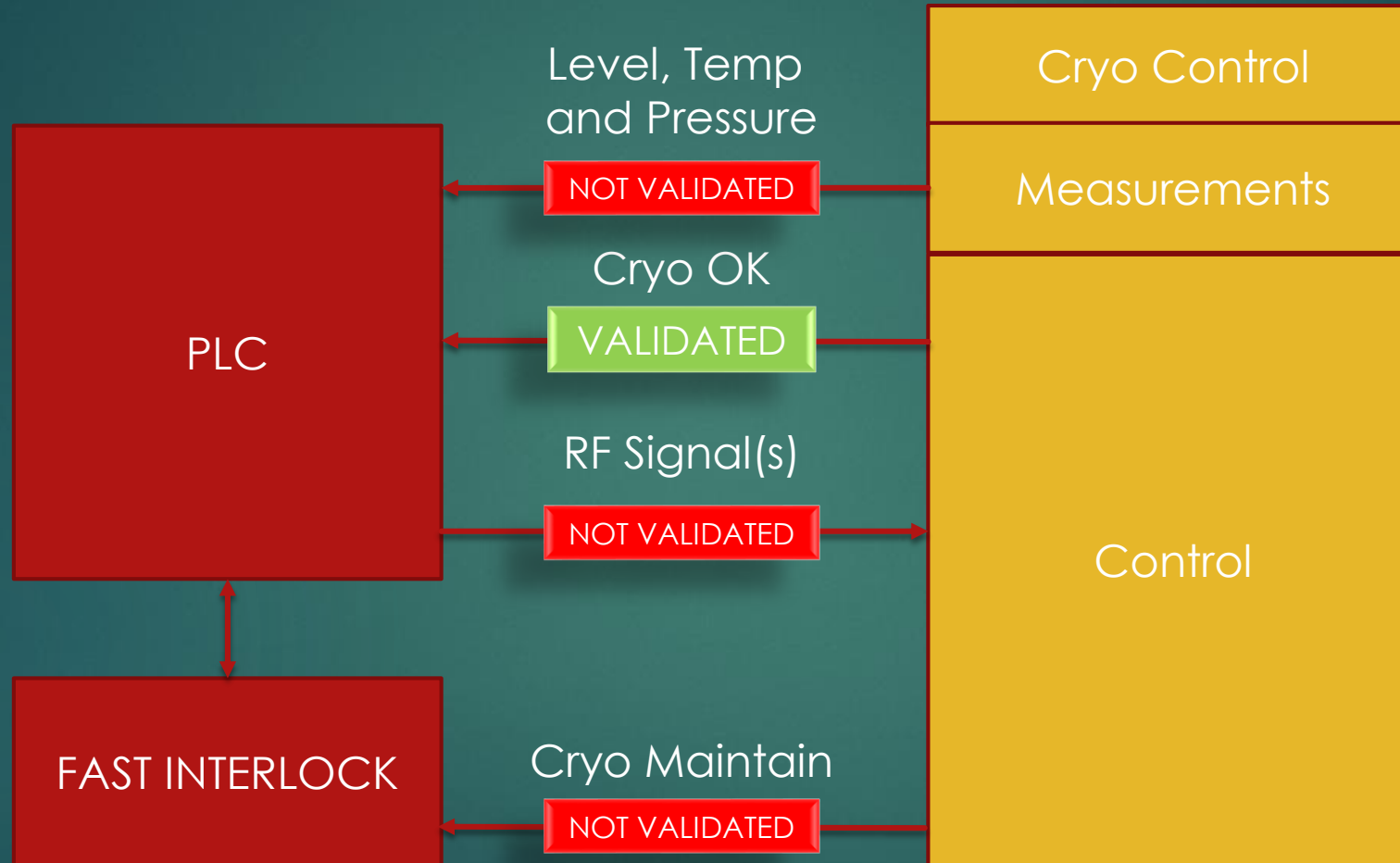
LLRF Interface



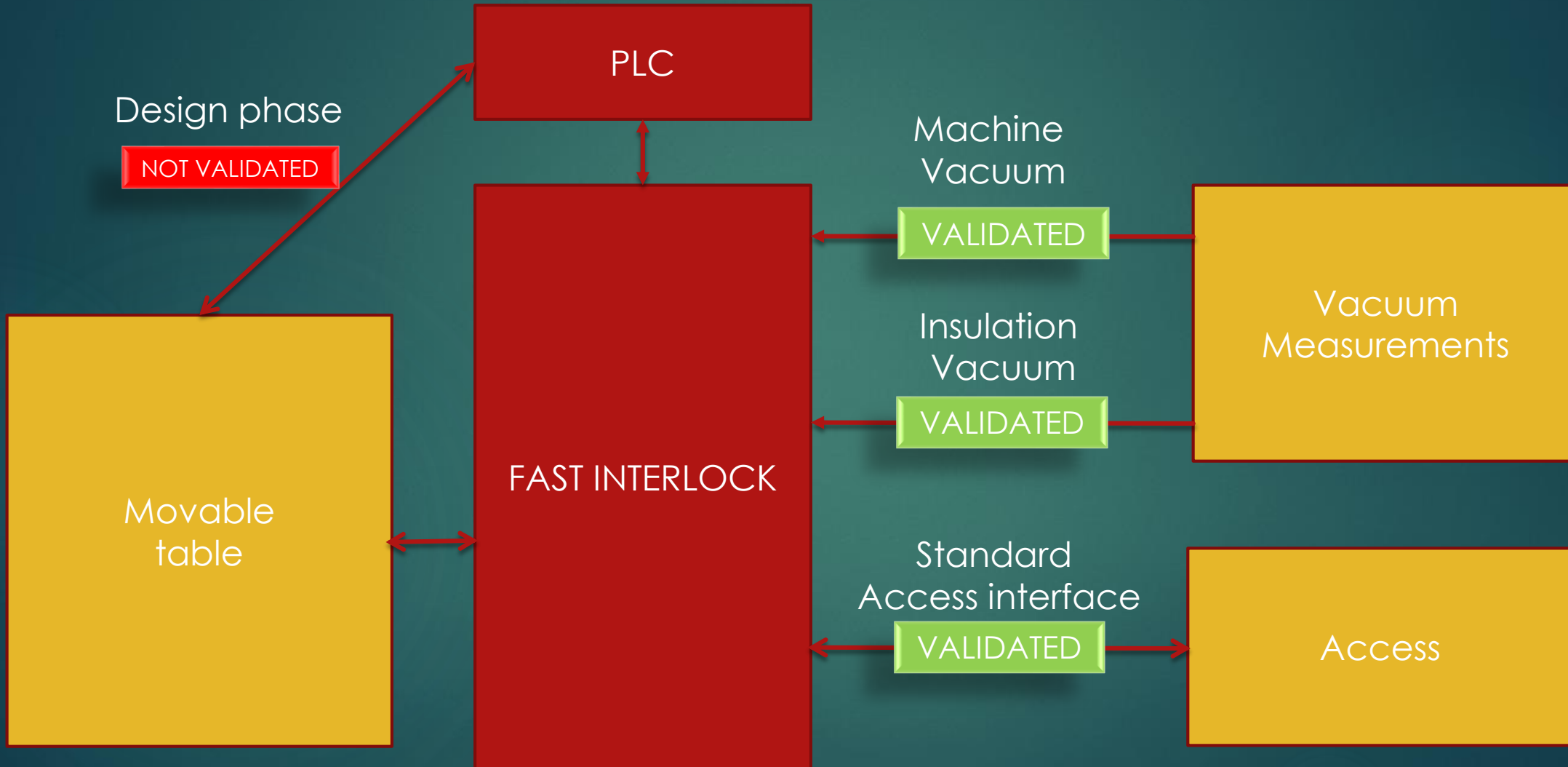
RF POWER Interface



CRYO Interface



Other systems Interface



Summary

SYSTEM	SIGNAL(S)	STATUS	COMMENTS / QUESTIONS
LLRF	RF VETO	VALIDATED	Optical
	Tuner&Coupler	VALIDATED	Same as linac4 (cable length issue!)
RF POWER	IOT RF-Driver	VALIDATED	Same as 800MHz SPS
	RF Pre-Driver		Do we have one ?
	RF Switch	VALIDATED	Same as 800MHz SPS ?
CRYO	CRYO OK to PLC	VALIDATED	
	CRYO Maintain to interlock		Do we have one ?
	Measurements		Direct or by software?
	RF signals		Do you need direct or by software?
Vacuum	Machine	VALIDATED	
	Insulation	VALIDATED	Who is providing this?
Access	Standard LHC interface	VALIDATED	Is SPS at LHC standard?
Table			In design phase

Front-end Software

FESA/SILECS interface for PLC controls

1 to 2 weeks development time

LLRF FESA software (5 RF VME modules):

- ▶ CMM
 - ▶ is common to LHC-Linac4
- ▶ Switch & Limit
 - ▶ adaptation of Linac4 module
- ▶ Clock Distribution
 - ▶ adaptation of designs for L4, SPS800MHz
- ▶ Tuner Module
 - ▶ adaptation of Linac4 module
 - ▶ dedicated FESA3 class will be needed
- ▶ Cavity Loop
 - ▶ adaptation of Linac4 module.
 - ▶ dedicated FESA3 class will be needed

Reuse existing FESA class

Reuse existing FESA classes with some modifications
1 to 3 weeks development time

Needed for vertical tests with tuner
FESA development will start when memory map available (end July)
4 weeks development time

Needed later for module tests & SPS
Firmware development ongoing
FESA development can start Q4 2016
4 weeks development time

User interfaces and application software

- ▶ Expert user interfaces (Inspector)
- ▶ Setting up of test environment (logging in Timber etc.)
- ▶ Setting up of operational environment for SPS
 - ▶ Integration with operations software (LSA)
 - ▶ Logging, alarms etc.

2 weeks development time

Standard configuration stuff (<1 week)

1 to 4 weeks development time depending on complexity (e.g. if LSA makerules required)

Standard configuration stuff (<1 week)

Software manpower

- ▶ 1 RF-CS staff (Bartek) supposed to work on crab cavity software
 - ▶ unfortunately diverted elsewhere due to colleague's illness
- ▶ Will have (we hope) 1 staff on secondment from BE-CO for 2 years
 - ▶ will work on SM18 tests and specifically Crab cavities
 - ▶ will launch him on Tuner module FESA development in the next few weeks
 - ▶ will also be able to develop user interfaces and control system integration

Status and conclusions

- ▶ PLC hardware not yet fully defined but standard parts
- ▶ Tuner and Coupler motor control is an issue due to distance
 - ▶ To be validated parts ordered for test in July
- ▶ Prototype ready two month after final validation of all interfaces
PRIORITY
 - ▶ First one to SM18 without table interface Q1 2017
 - ▶ Second set for SPS installation with table interface Q1 2018
- ▶ FESA software to be foreseen (SILECS interface) >1..2 weeks
- ▶ User interfaces standard Inspector GUI >2 weeks
- ▶ LLRF FESA software 4 weeks per class after firmware validation
- ▶ Software manpower available from CO for FESA and controls integration