

# The CERN Control Centre



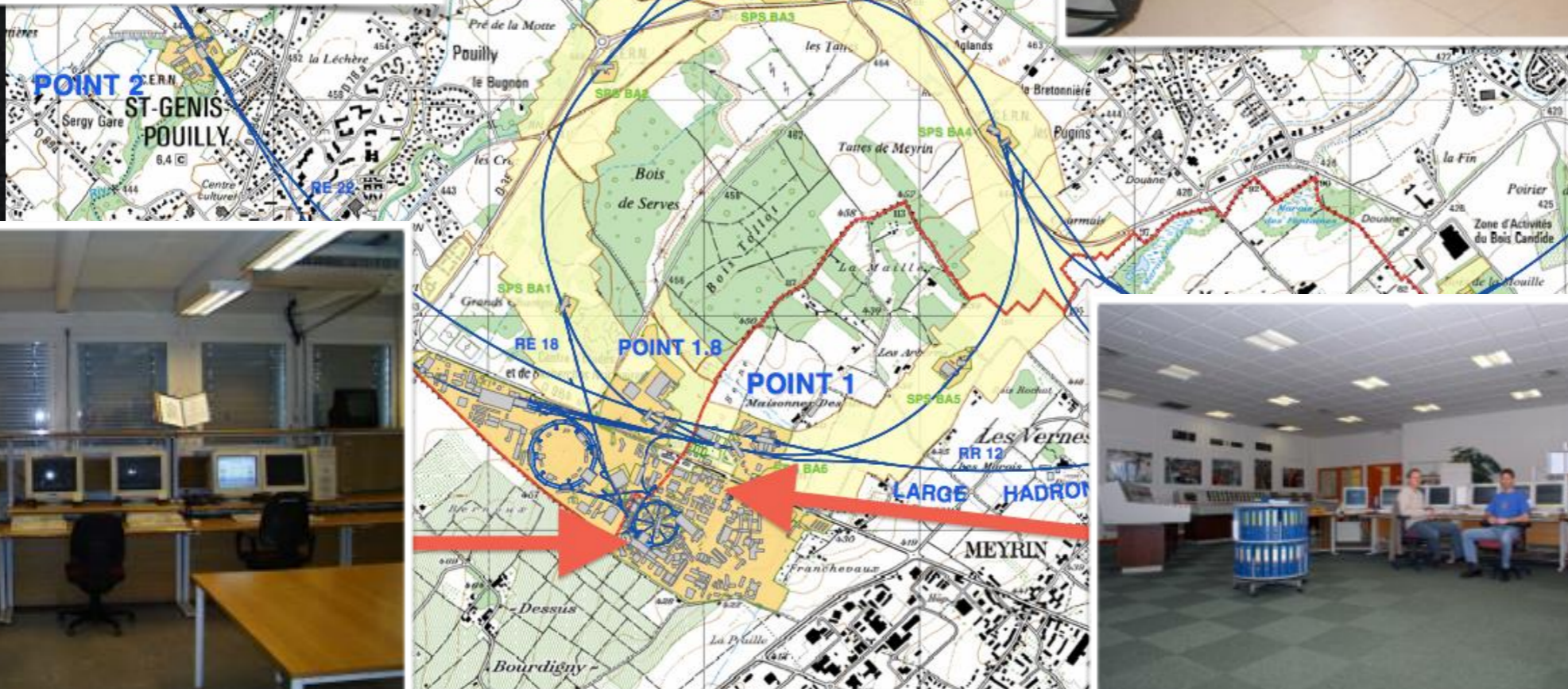
Who am I?

- Software Engineer, at CERN since 3/2000
- Section leader of a group of SW Engineers providing the high-level SW for the CCC

# Outline

- Control room
- Operators
- Systems and Accelerators
- What you can see in the CCC

# Unifying CERN control rooms



# Into a single room

since 2006



# CERN Control Centre



24h\*365.25

# 9 operators on shift

## CCC shift crew

**CPS**



DURAN-LOPEZ



CHAPUIS



METRAL

**SPS**



PEREZ BRUNET



MASSOT

**LHC**



NORMANN



PAPOTTI

**TI**



WETTON

**CRYO**



DONNIER-MARECHAL

E. Lienard BE/OP

**CCC shift crew**

**CPS**

**SPS**

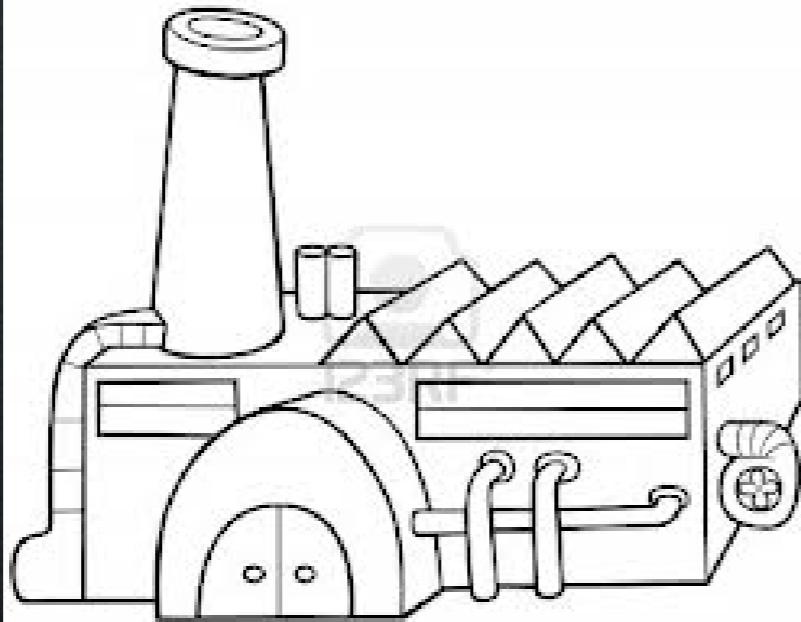
**LHC**

**TI**

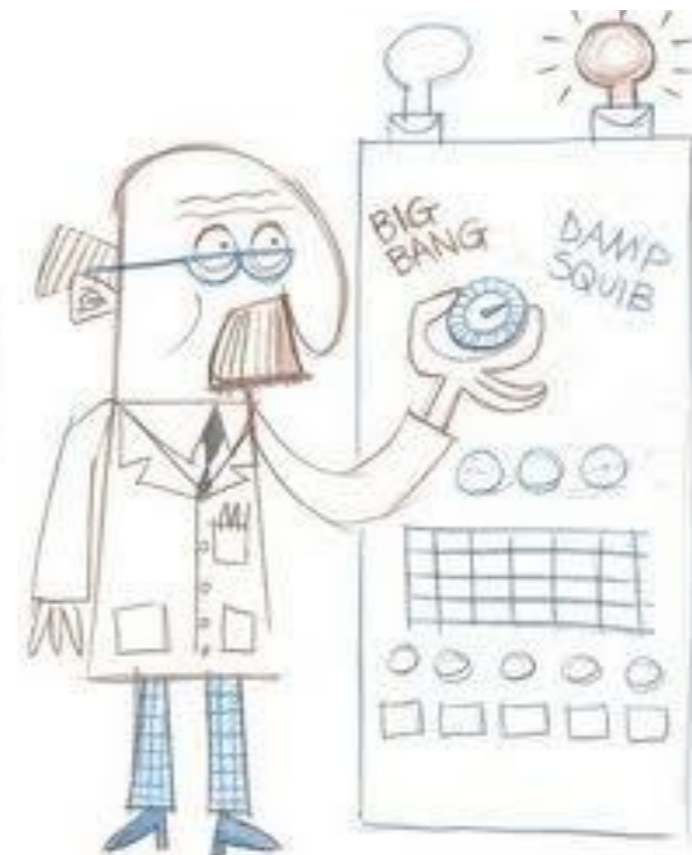
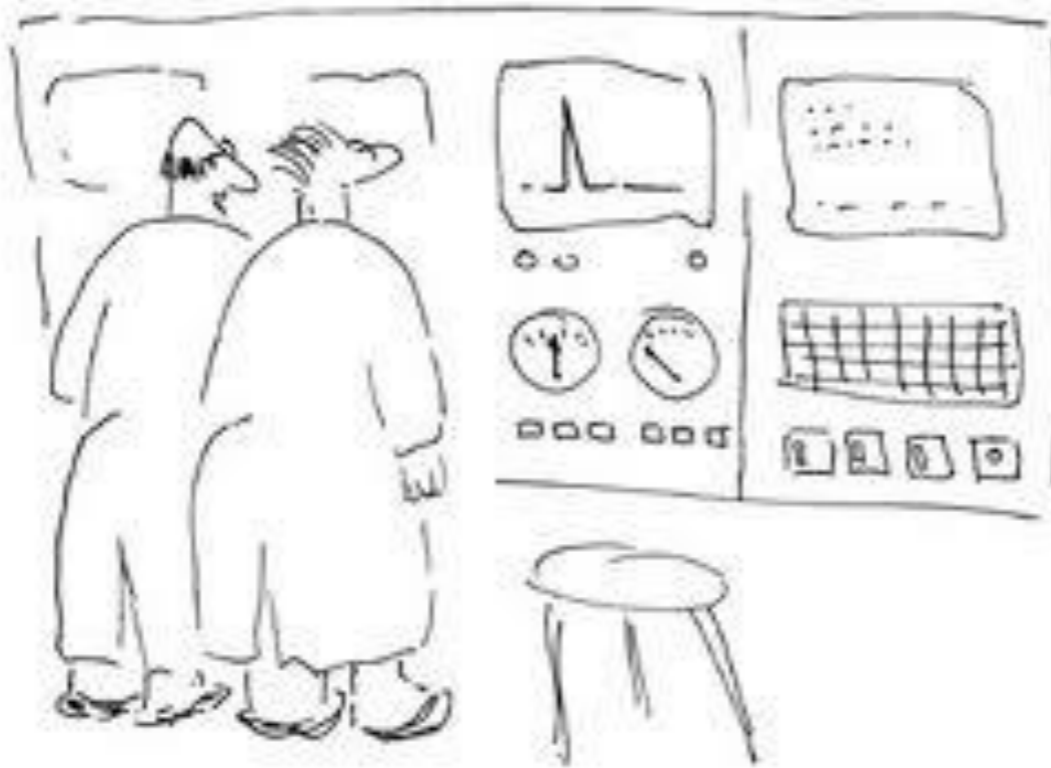
**CRYO**



# Monitoring & Control

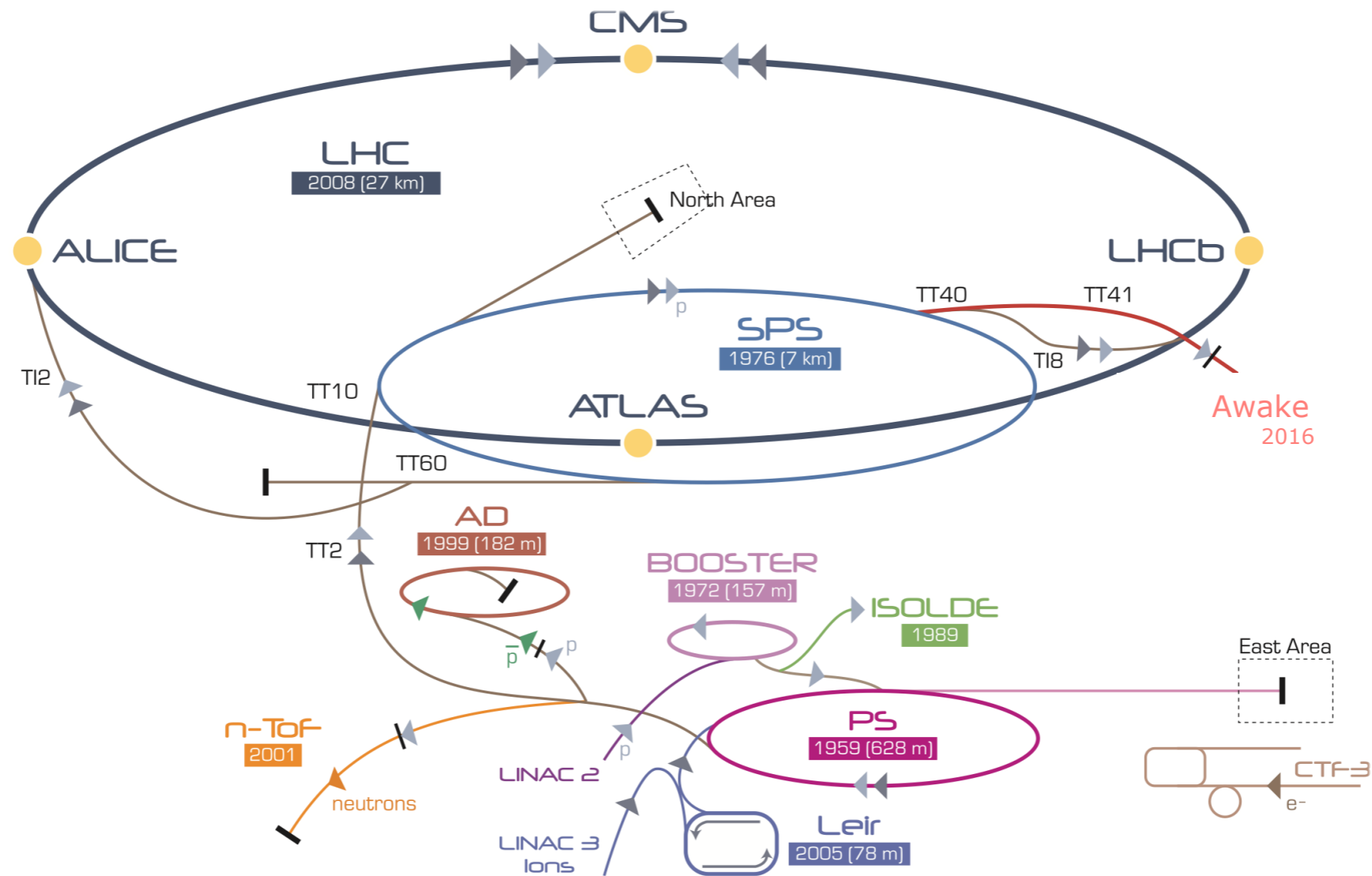


fb-1 .... fb-1 .... fb-1 .... fb-1 .... fb-1 .... fb-1 ....





# Our “machines”



▶ p (proton)   ▶ ion   ▶ neutrons   ▶  $\bar{p}$  (antiproton)    $\leftrightarrow$  proton/antiproton conversion   ▶ neutrinos   ▶ electron

LHC Large Hadron Collider   SPS Super Proton Synchrotron   PS Proton Synchrotron

AD Antiproton Decelerator   CTF-3 Clic Test Facility   CNGS Cern Neutrinos to Gran Sasso   ISOLDE Isotope Separator OnLine DEvice  
 LEIR Low Energy Ion Ring   LINAC LINear ACcelerator   n-ToF Neutrons Time Of Flight

# Technical Infrastructure

# Electricity distribution



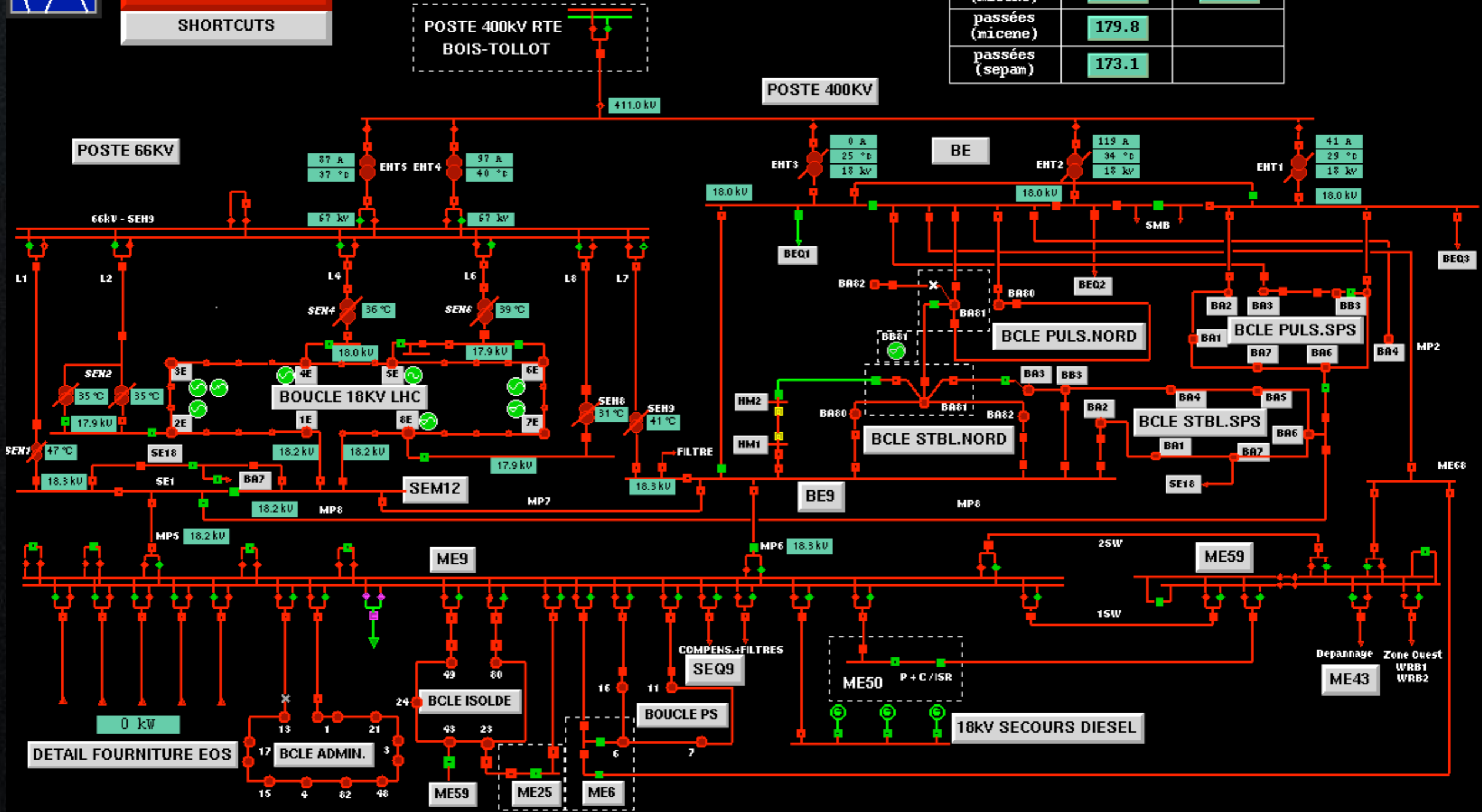
RESEAU CERN

EMERGENCY OVERVIEW

SHORTCUTS

Puissance souscrite: 220 MW  
 DETAIL FOURNITURE RTE/EDF

Puis. 10min. en cours (micene)	Moyenne (MW)	Pic max (MW)
	178.2	318.6
passées (micene)	179.8	
passées (sepam)	173.1	



# Power consumption

Puissance moyenne facturée sur 10 min



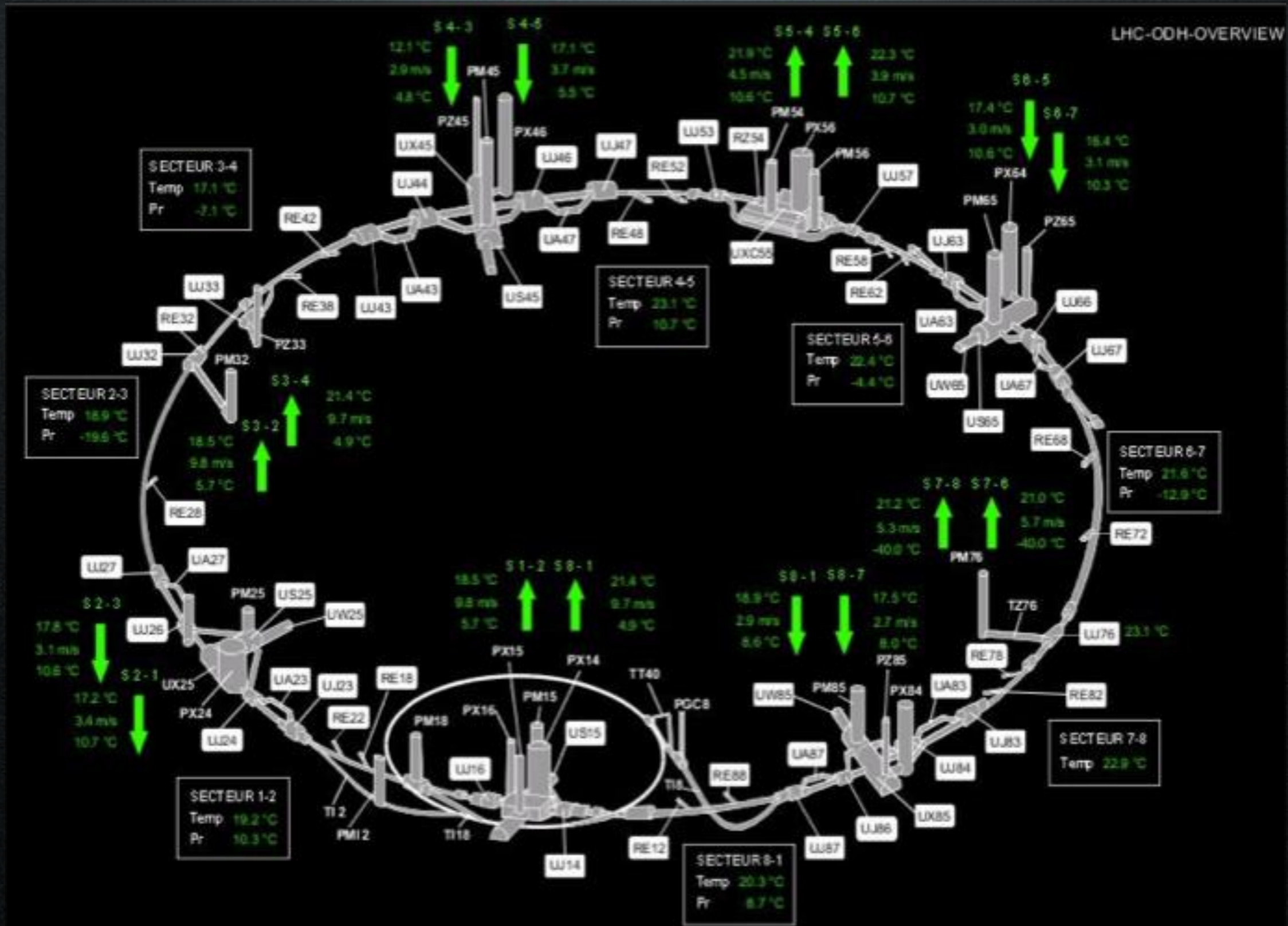
**181 MW**

Puissance actuelle

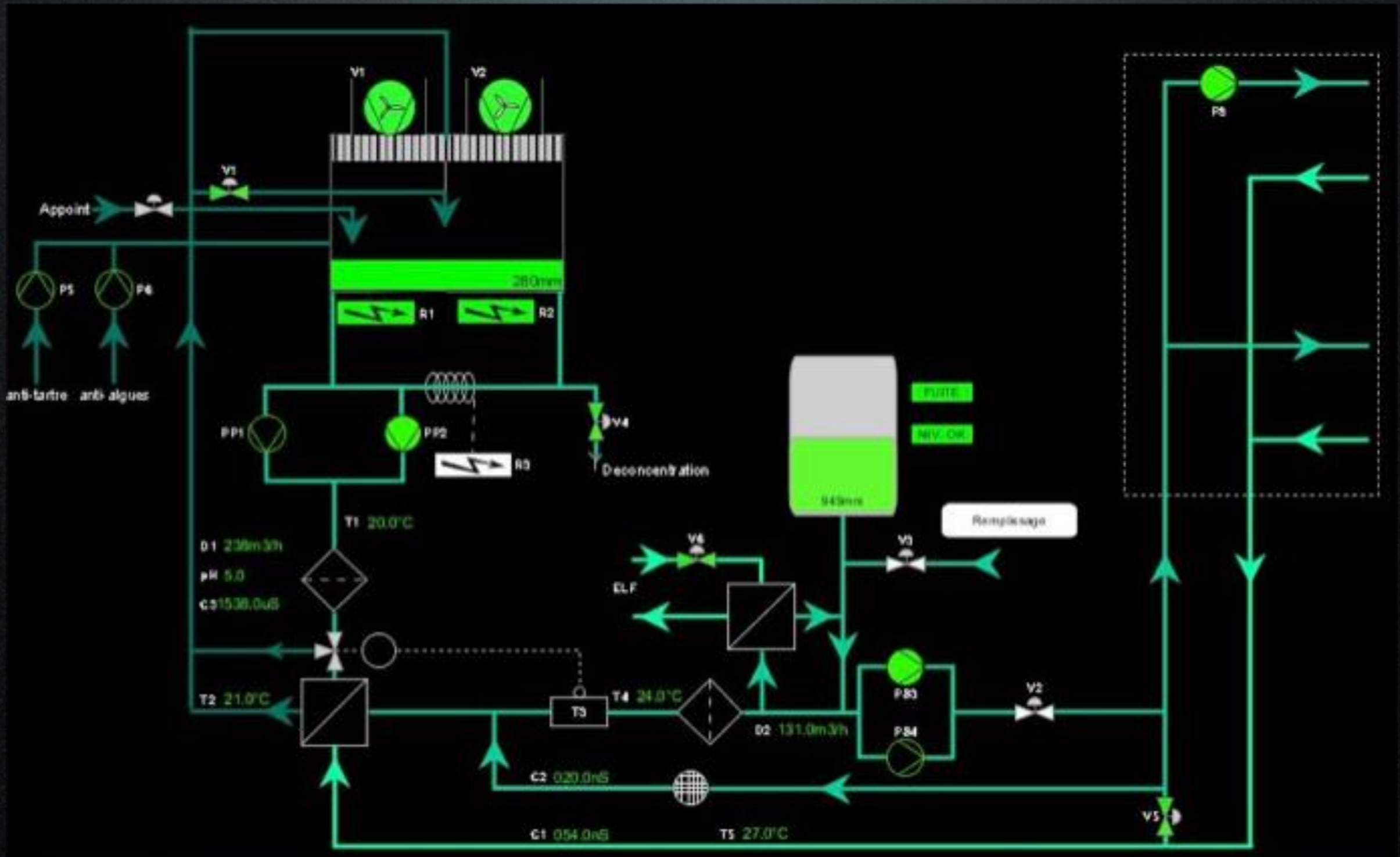


**180 MW**

# Ventilation



# Cooling



# Safety

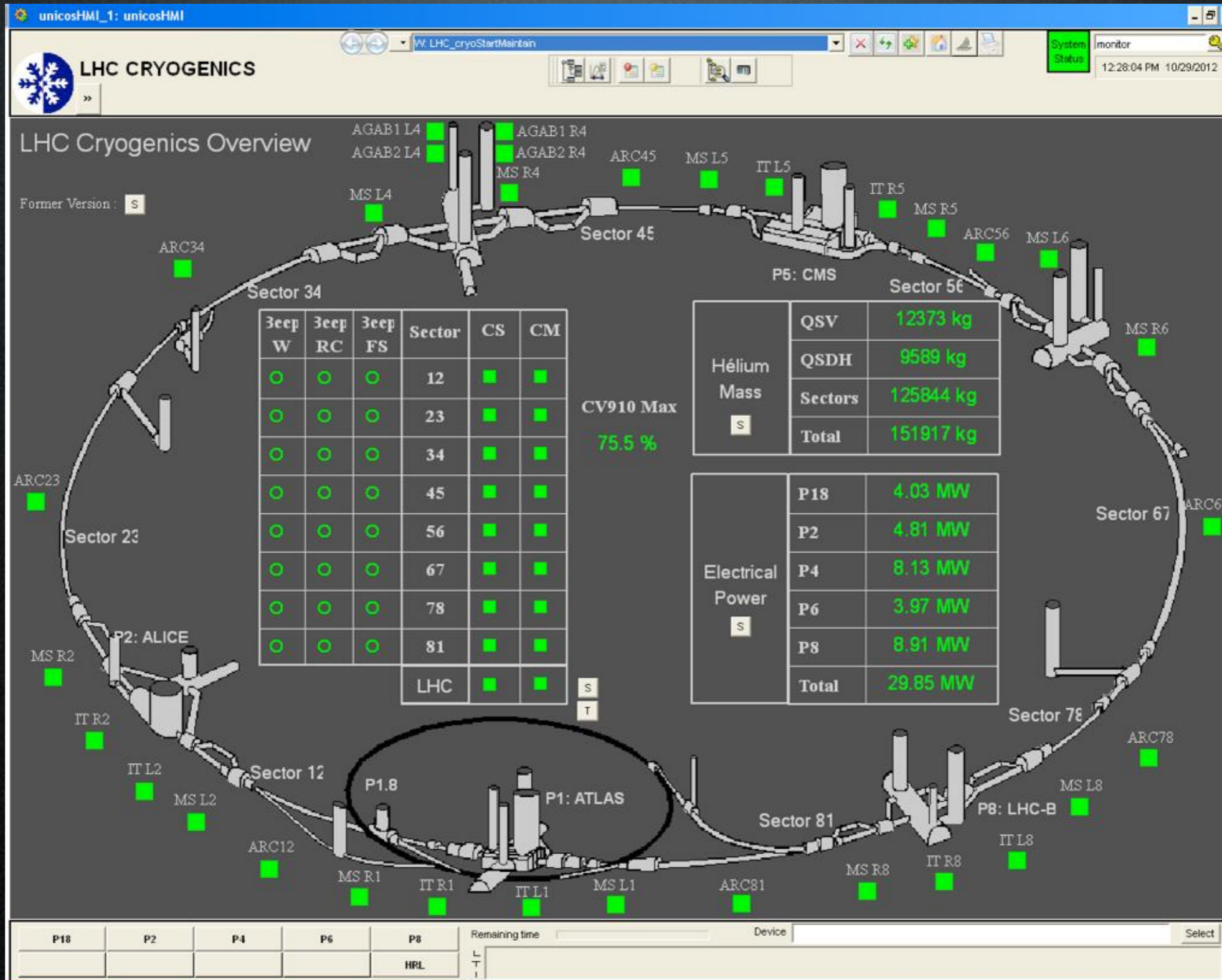
## LHC ODH Overview



# LHC cryogenics



# Cryogenics for LHC



# Cryogenics for LHC



Linac, PSB & CPS

# Linac 2



# PS Booster



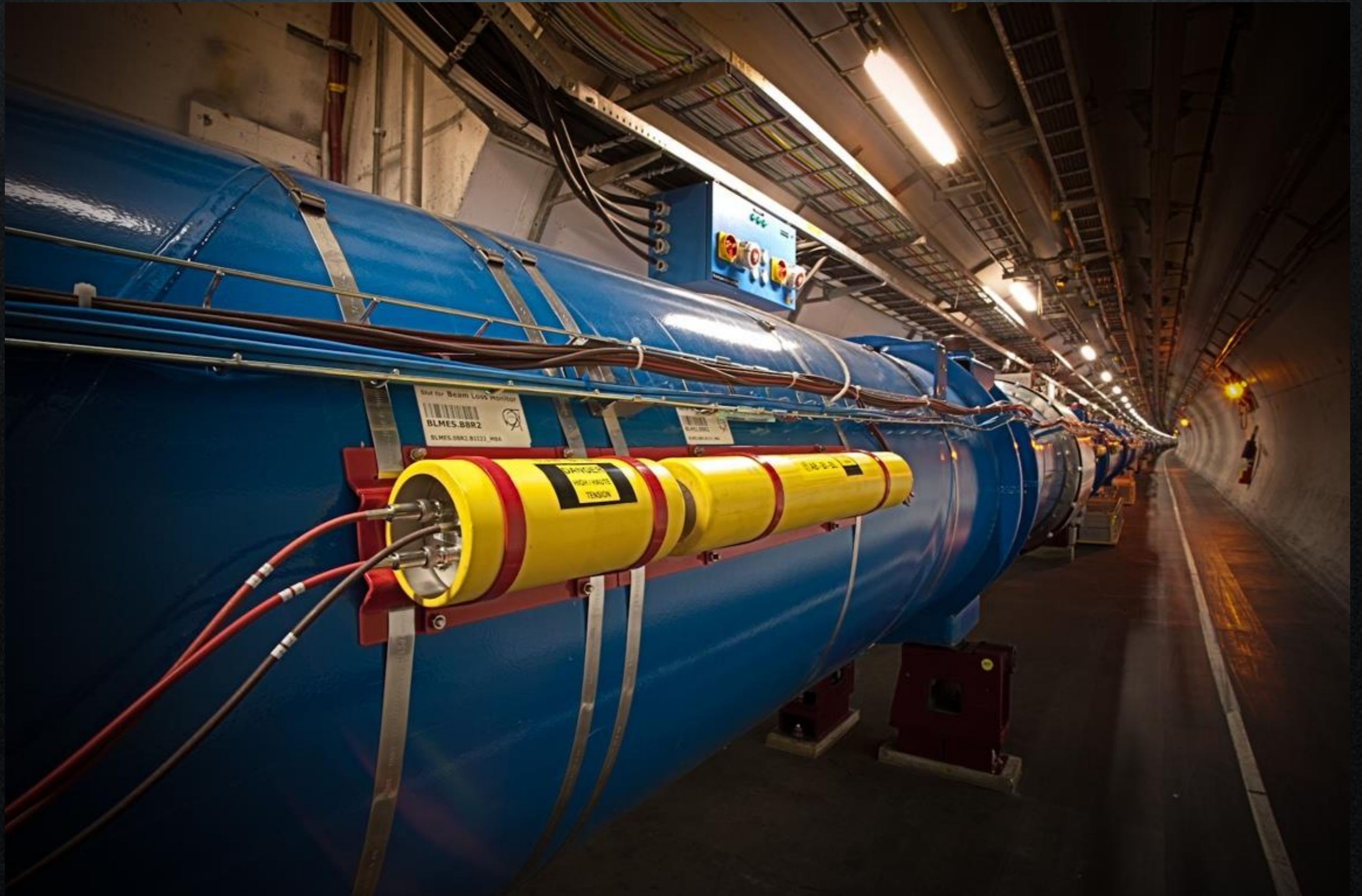
# Proton Synchrotron



# SPS



# LHC





# LHC "page 1"

LHC Page1

Fill: 3236

E: 4000 GeV

t(SB): 17:11:14

29-10-12 11:20:14

## PROTON PHYSICS: STABLE BEAMS

Energy:

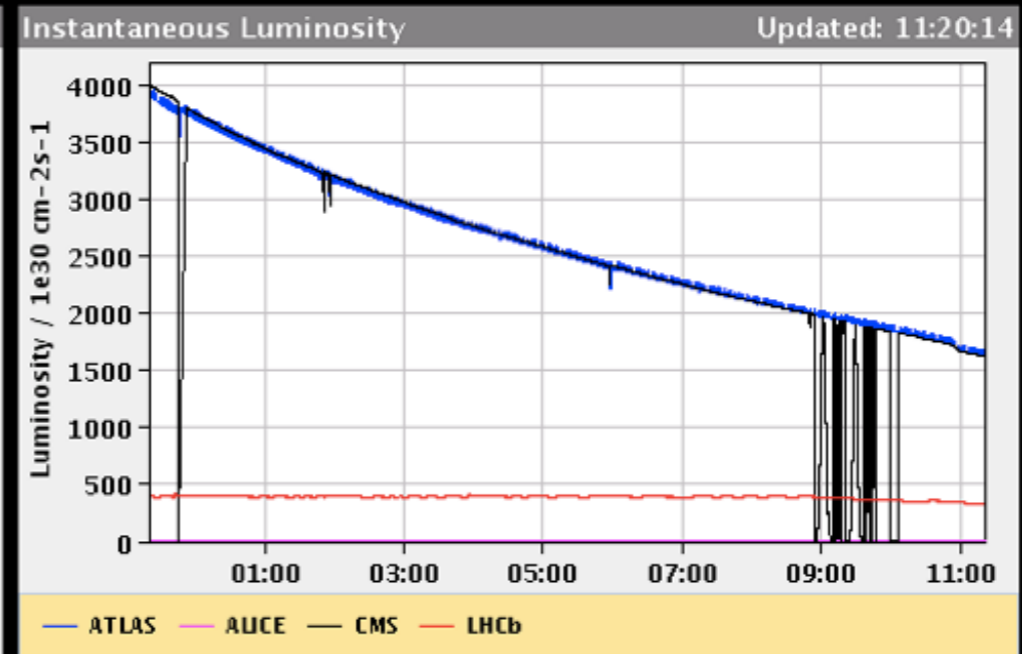
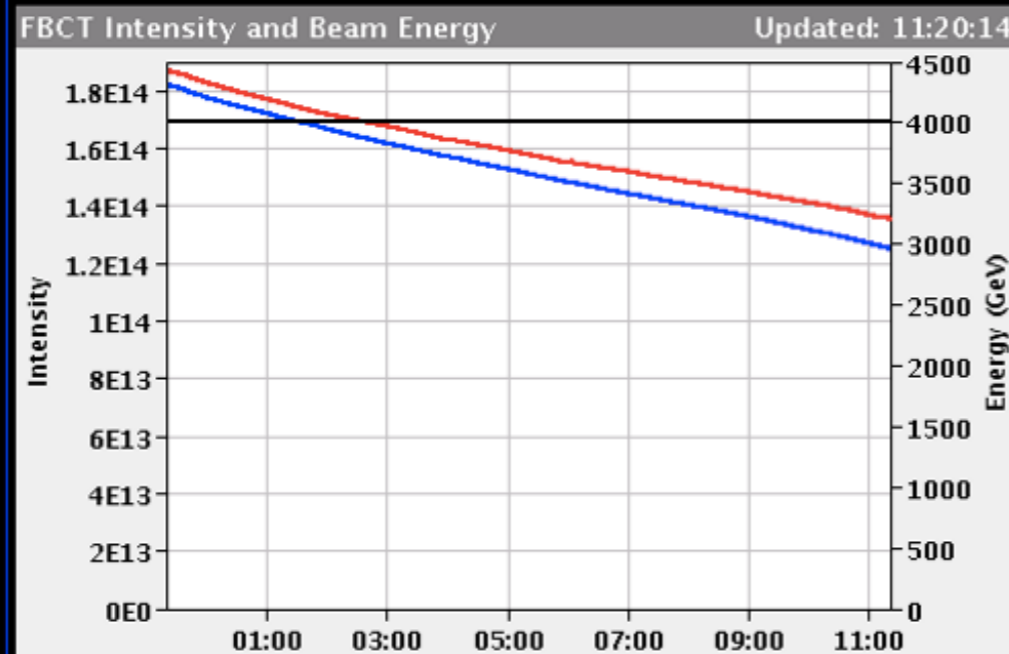
4000 GeV

I(B1):

1.26e+14

I(B2):

1.35e+14



**Comments (29-Oct-2012 11:21:36)**

We keep this fill a bit longer as MKI8 temperature is still well above the injection interlock level

Now: RF EOF studies for ~1h

**BIS status and SMP flags**

B1 B2

Link Status of Beam Permits	true	true
Global Beam Permit	true	true
Setup Beam	false	false
Beam Presence	true	true
Moveable Devices Allowed In	true	true
Stable Beams	true	true

AFS: 50ns\_1374\_1368\_0\_1262\_144bpi12inj

PM Status B1

ENABLED

PM Status B2

ENABLED

# LHC Operation 24 h

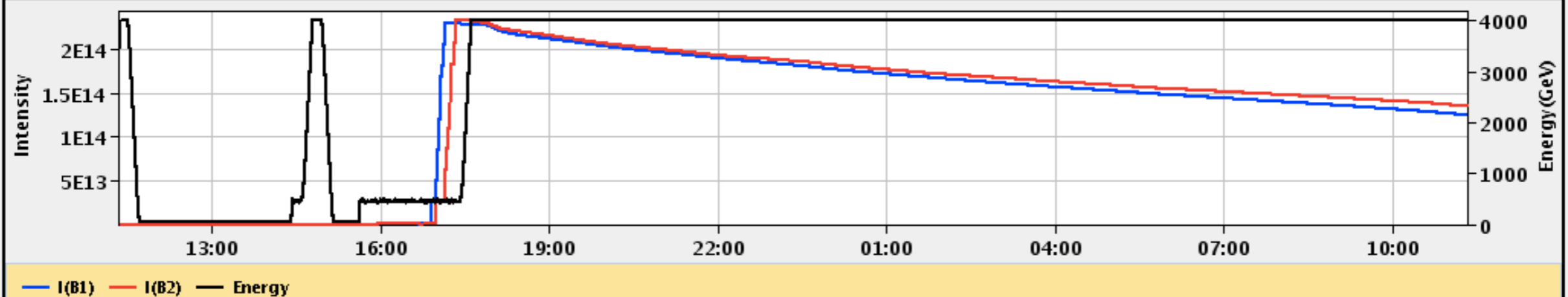
29-Oct-2012 11:19:50    Fill #: 3236    Energy: 4000 GeV    I(B1): 1.25e+14    I(B2): 1.36e+14

	ATLAS	ALICE	CMS	LHCb
Experiment Status	PHYSICS	PHYSICS	PHYSICS	PHYSICS
Instantaneous Lumi [(ub.s) <sup>-1</sup> ]	1637.5	0.951	1630.0	329.2
BRAN Luminosity [(ub.s) <sup>-1</sup> ]	1631.0	0.659	1440.5	271.4
Fill Luminosity (nb) <sup>-1</sup>	210774.1	194.7	205942.1	24107.0
BKGD 1	0.133	0.343	3.175	0.786
BKGD 2	53.604	35.890	1.906	36.018
BKGD 3	1.158	1.350	6.758	1.152

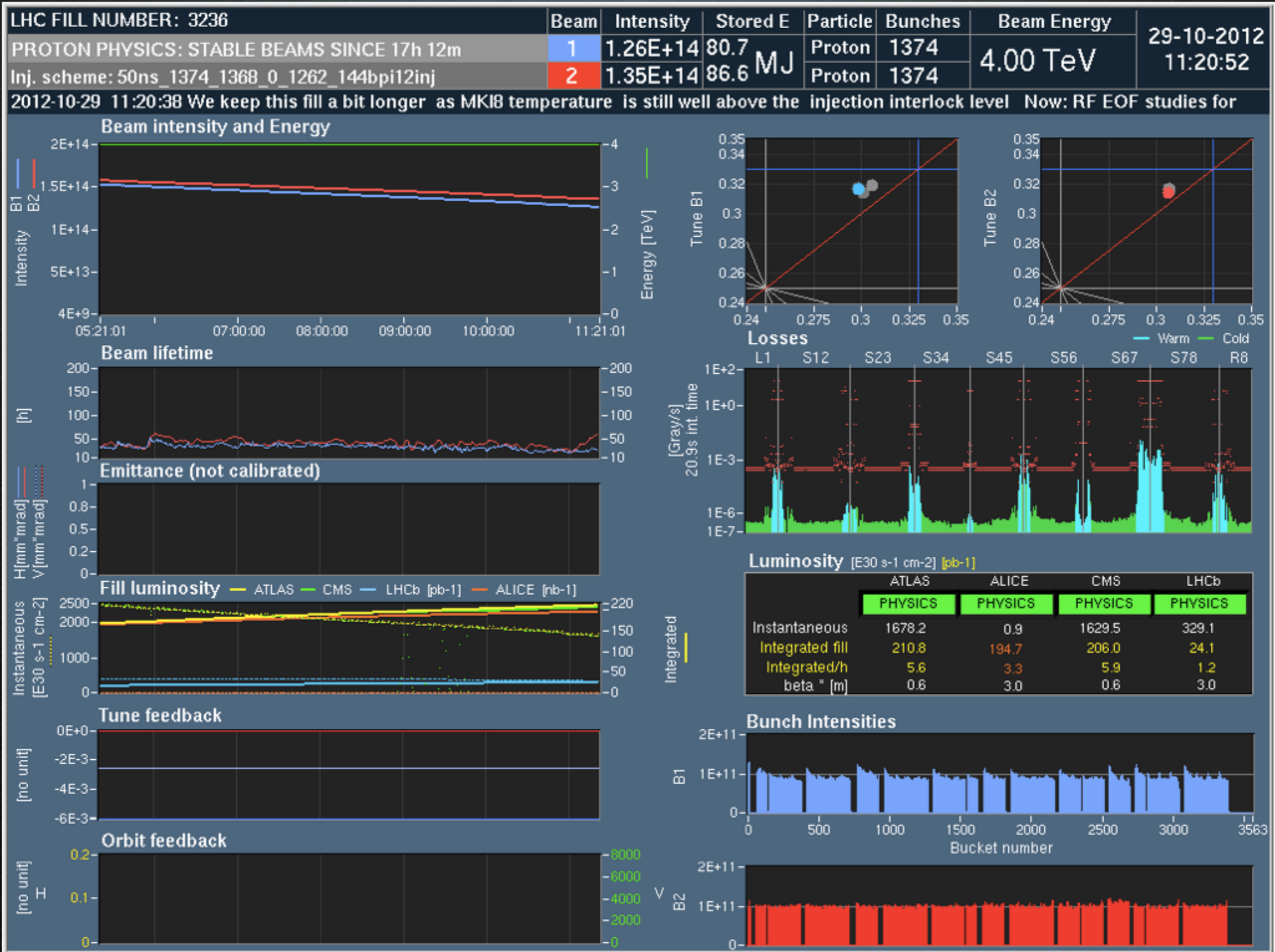
LHCb VELO Position **IN**    Gap: -0.0 mm    **STABLE BEAMS**    TOTEM: **STANDBY**

Performance over the last 24 Hrs

Updated: 11:19:45



# LHC Dashboard





Questions?