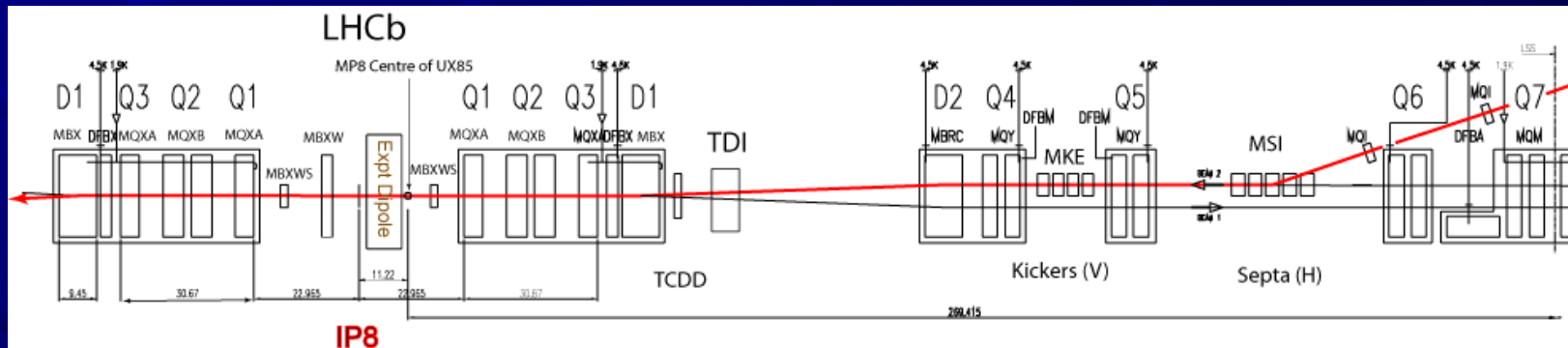


AIM

- **Establish planning from now to the test**
- **Fully define requirements for controls, instrumentation, and beam-related equipment.**
- **Badger those responsible to ensure that installation and commissioning schedule will meet requirements.**
- **Liaise with hardware commissioning team and establish responsibilities during overlap.**
- **Establish detailed consequences for installation and commissioning of other sectors of the machine, before, during and after the test.**

Injection

- End TI8
- Kickers, septa, TDI, TCDD: system tests, high level control system tests
- Septa, Q5, Kickers, Q4, D2 etc...
- TDI
- Vacuum:
 - Bake-out, NEG activation



Minimum...

- No TCDDI
- No TCDD
- No TCLI

BI

- **Beam instrumentation:**
 - Detail requirements
 - request additional hardware,
 - plan extra BLMS,
 - track progress.

Beam Instrumentation

• Beam Position Monitors

- 1 BPTX: “timing pick-up”
- BPM: Standard Cold BPM (Arc,DS,Q7)
- 2*BPMR: Cold BPM (rotated beam screen)
- 2*BPMS: Cold Directional Coupler (Q2)
- 2*BPMSW: Warm Directional Coupler (Q1)
- 2*BPMSX: Warm Directional Coupler (D1)
- 2*BPMWB: Warm BPM (D2)
- 3*BPMYB: Cold Enlarged BPM (rotated beam screen)

SHOULD ALL BE READY – See Rhodri Jones

NAME
BPMYB.5R8.B2
BPMYB.4R8.B2
BPMWB.4R8.B2
BPMSX.4R8.B2
BPMS.2R8.B2
BPMSW.1R8.B2
BPMSW.1L8.B2
BPMS.2L8.B2
BPMSX.4L8.B2
BPMWB.4L8.B2
BPMYB.4L8.B2
BPMR.5L8.B2
BPMR.6L8.B2
BPM.7L8.B2
BPM.9L8.B2
BPM.10L8.B2
BPM.11L8.B2
BPM.12L8.B2
BPM.13L8.B2



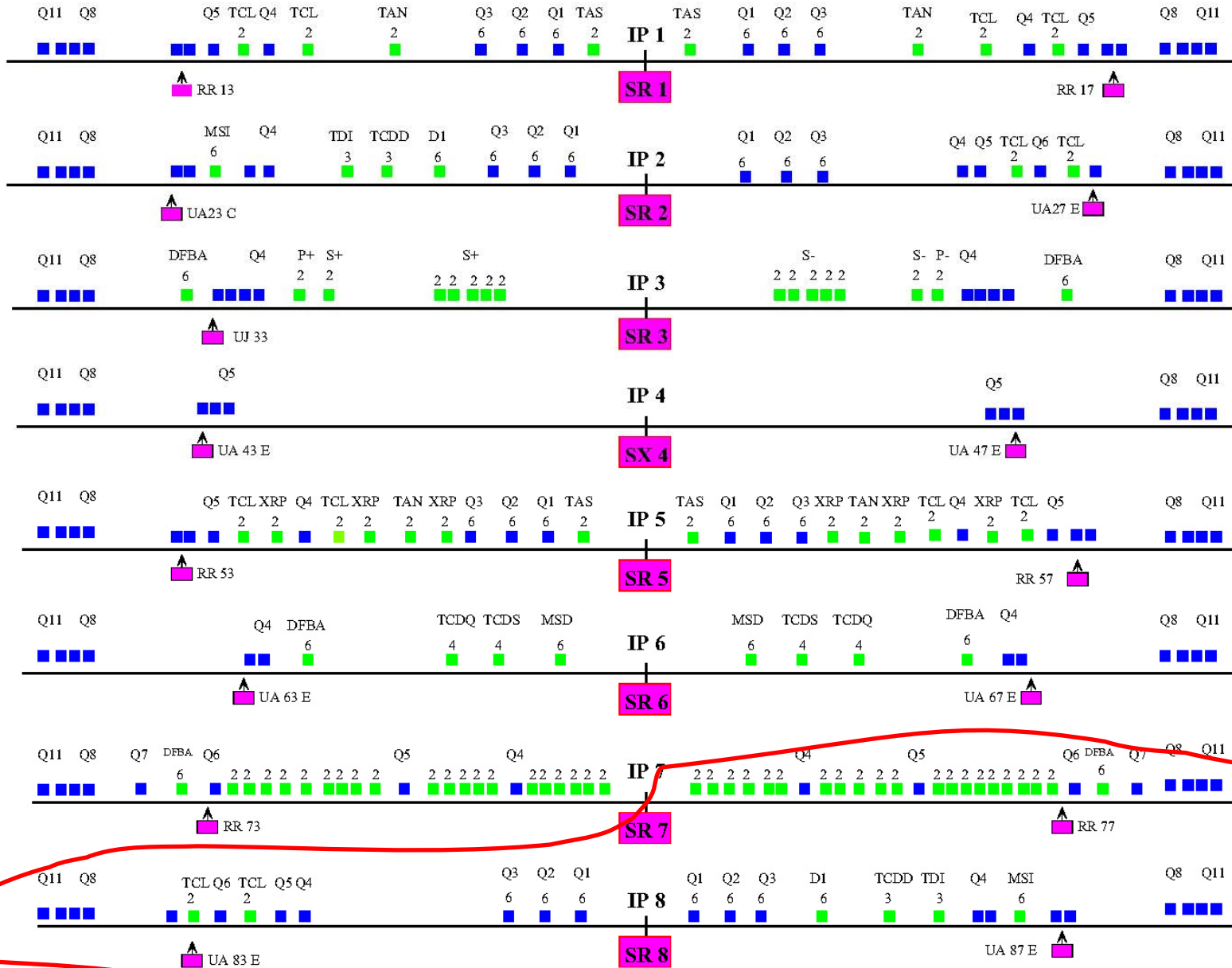
Standard ARC – beam 2

Beam Loss Monitors

- **BLMA**
 - Quadrupoles along the ring (6 per quadrupole), ionization chambers attached outside of cryostat, time resolution 2.5 ms.
- **BLMS**
 - Critical aperture limits or positions, ionization chambers, time resolutions 1 turn.
- **BLMS***
 - Critical positions for injection losses, extended dynamic range: BLMSI (ion. ch.) + BLMSS (SEM), time resolution 1 turn. **Not need for injection test.**

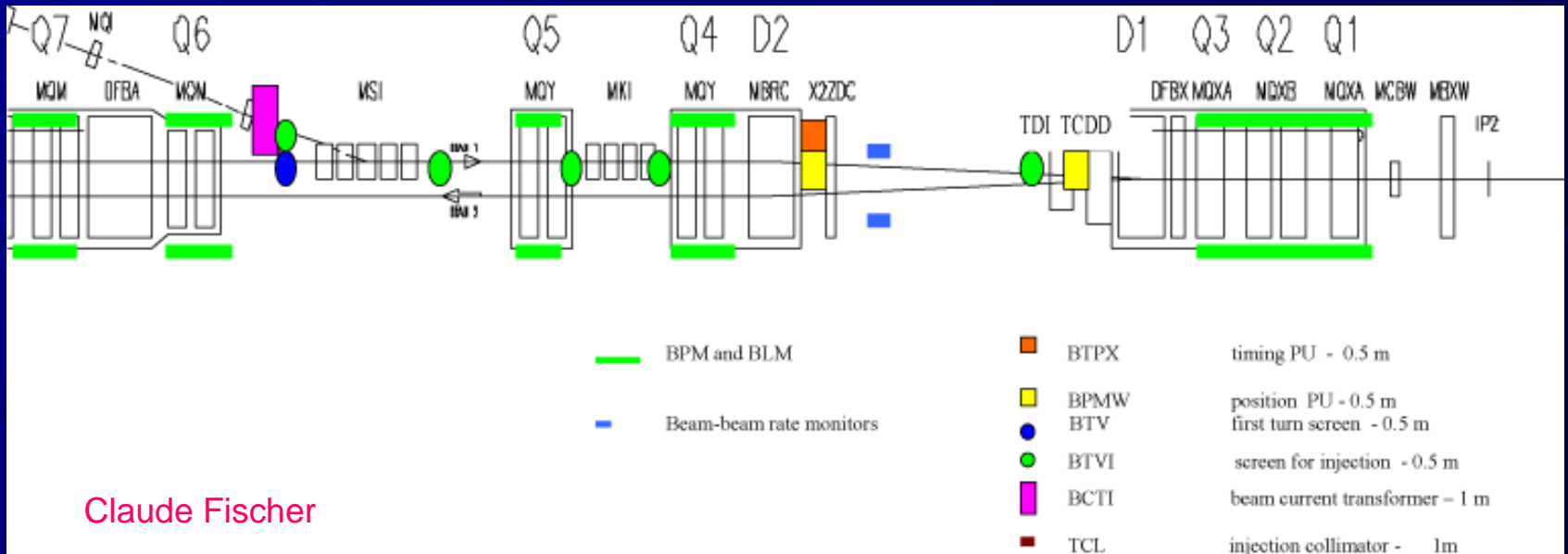
BLMs

- **Injection region**
 - BLMS: Septum MSI, Target TDI, TCDD, TCL, D1
- **IR2: Triplet plus BPM.Q1**
 - BLMS at maximum of beam size
 - BLMS at exit of IP
- **DIS:**
 - BLMS: MB adjacent to Q8 (* IR8R), between Q7/Q8, last MB before Q11 (*IR8R)
- **Arc:**
 - BLMA at every quadrupole
- **Additional monitors needed in LHCb**
 - Every 10 m., both planes



Screens

- Screen before septa (TI8) **BTVI**
- After septa, **BTVSI**
- Screen before and after kickers, **BTVSI**
- Screen before TDI **BTVST**
- Temporary screen before dump IR7 **BTVI**



BCT

- **Beam Current Transformer end TI8**
 - Transfer line BCT
- **Temporary installation of spare Beam Current Transformer right of IP7**
 - Spare transfer line BCT on a foot between Q6 and the dump.

LHCb

- **Status during test, lead time, access**
- **RAMSES radiation monitoring**
- **Additional PMI monitors**
- **Additional Beam Loss Monitors**

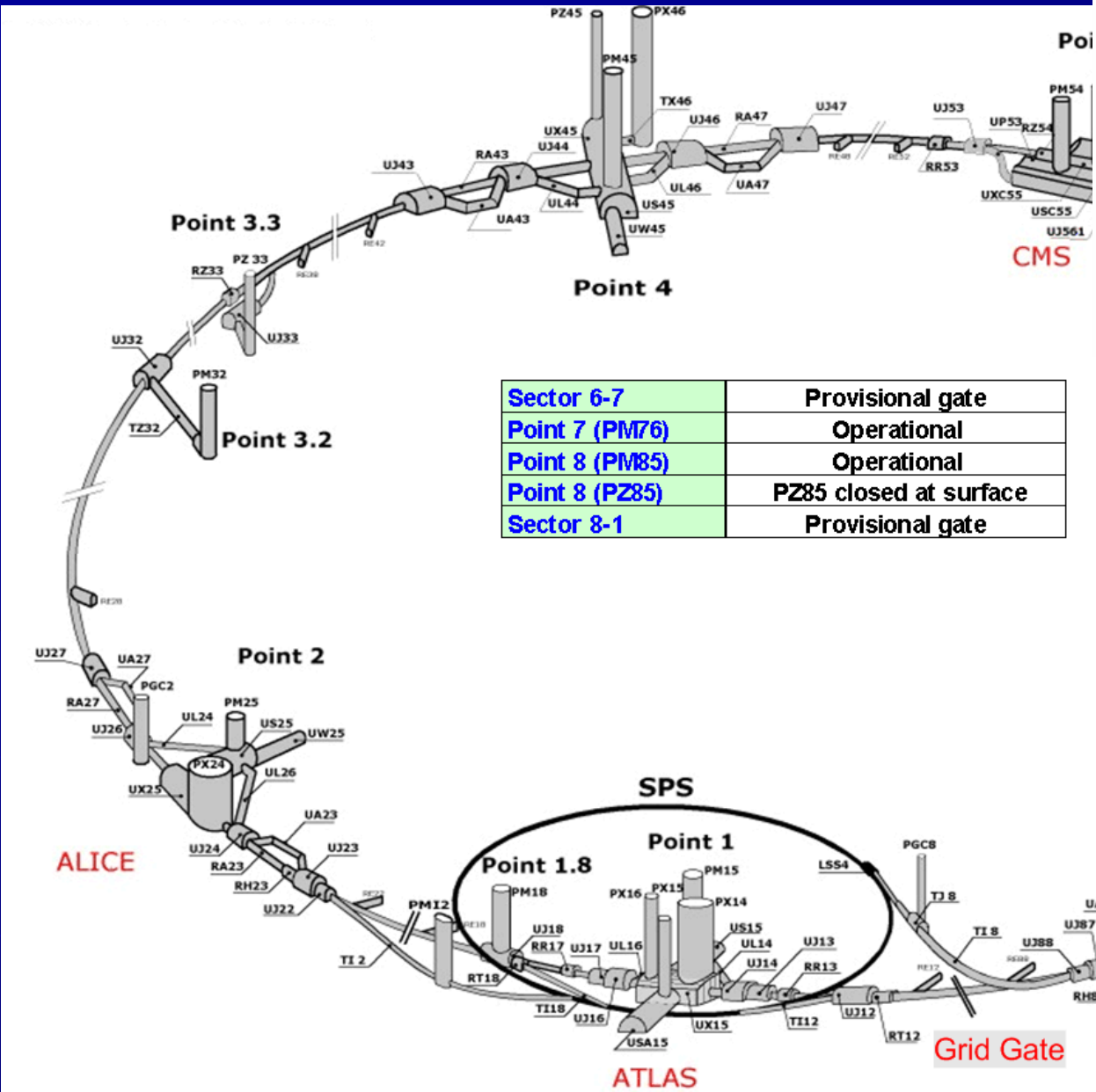
IR7

- Dispersion suppressor to Q6 cold and commissioned.
- D4, D3, Q5 etc. not installed.
- Additional vacuum pipe - layout IR7 & installation planning
- Dump (TED?) & shielding: where, installation plans, likely radiation dose installed
- Radiation monitors
- Additional beam instrumentation:
 - Fast BCT, Screen
 - Vacuum:

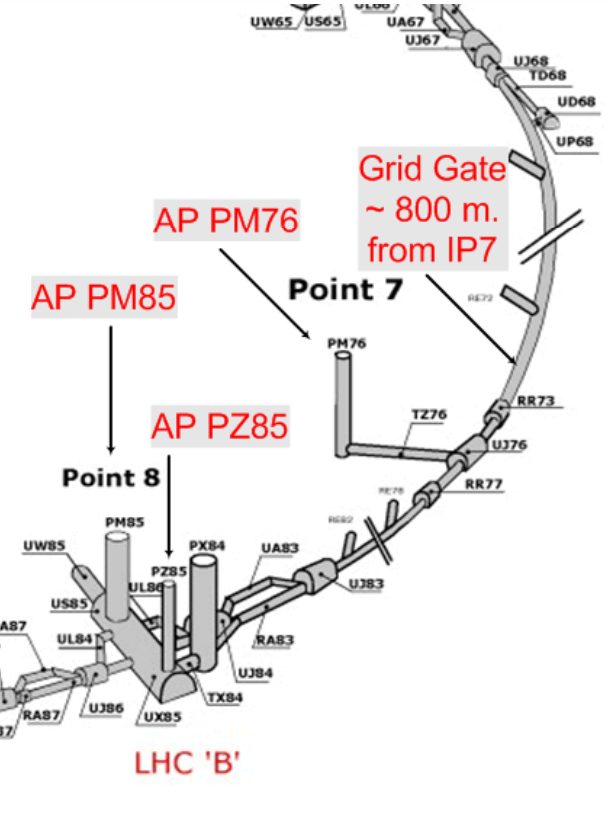
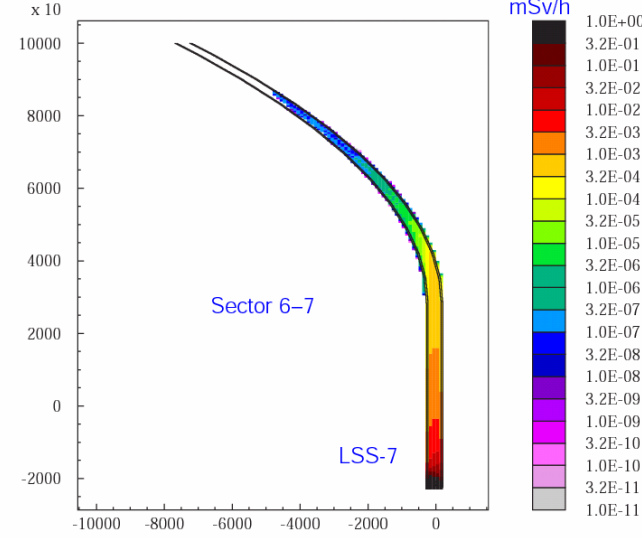
Access

Fully define requirements, cross-check, implication of installation and tests.
Access conditions after test.

- **Sector 6-7.**
 - Interlocked gate \approx 800 m from IP7 is required. Gate & infrastructure to be removed after the test.
- **Point 7 (PM76)**
 - Machine access point at operational.
- **Point 8 (PM85)**
 - Machine access point operational.
- **PZ85**
 - Interlocked gate must be placed at the top
- **Sector 1-8:**
 - Interlocked gate. The gate to be removed after the test



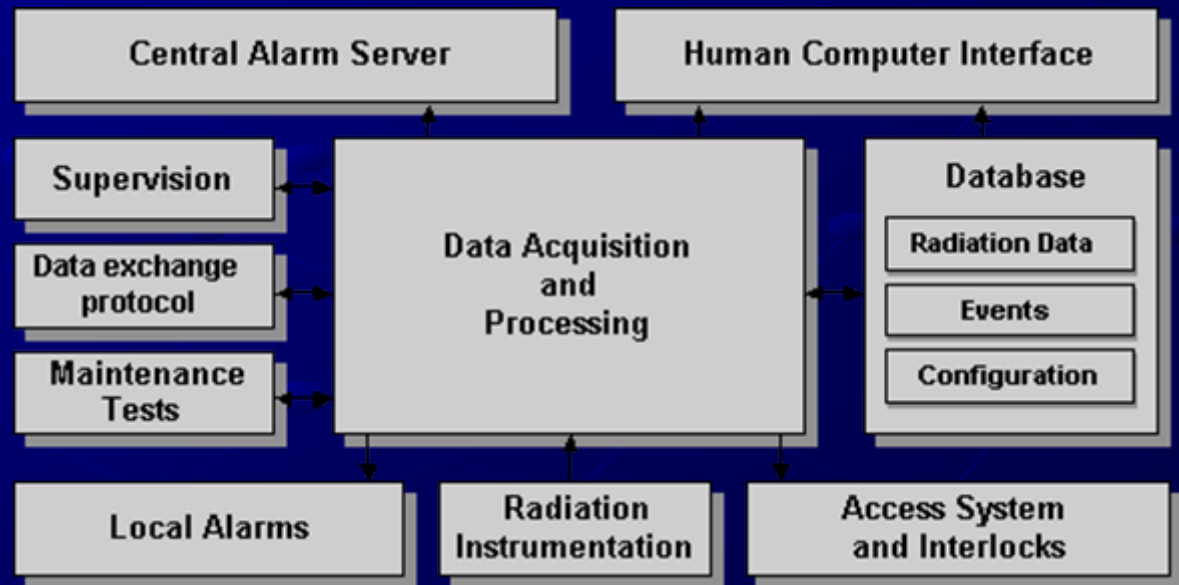
Sector 6-7	Provisional gate
Point 7 (PM76)	Operational
Point 8 (PM85)	Operational
Point 8 (PZ85)	PZ85 closed at surface
Sector 8-1	Provisional gate



Radiation monitors

Requirements of LHCb. Implementation. Track RAMSES progress.
Radiation monitor configuration (LHCb, gates).

- **Tunnel access gates**
 - Monitors connected to interlock system
- **LHCb**
 - RAMSES
 - Additional



Controls

List

Requirements, implementation, testing. Check require
infrastructure in place. Control room requirements.
Timing.

RADIATION

- **INB: Ensure that the necessary formalities required are in place**
- **plus status of contractors vis a vis access to controlled areas after test**
- **Implications of remenant radiation**

Issues

- **Planning**

- End TI8 - Installation, HWC, Checkout
- Injection region – installation, vacuum, HWC, checkout
- Beam Instrumentation: absolute essentials? ->BI, delivery, commissioning
- IR7 Dump etc
- Access
- Radiation Monitoring
- Controls

ID	Task Name	Duration	Start	Finish	Mar 27, '06	Apr 3, '06	Apr 10, '06	Apr 17, '06	Apr 24, '06	May 1, '06	May 8, '06
3	Hardware re-commissioning 7-8	28 days	Thu Mar 30	Wed Apr 26							
4	Cold checkout, system tests	7 days	Thu Apr 20	Wed Apr 26							
5											
6	SPS commissioning (after 2005)	26 days	Sat Apr 1	Wed Apr 26							
7	T18 re-commissioning	2 days	Mon Apr 24	Tue Apr 25							
8	Install beam dump and shielding	2 days	Mon Apr 24	Tue Apr 25							
9	Install Access Gates in tunnel	3 days	Mon Apr 24	Wed Apr 26							
10	Commission access system	8 days	Wed Apr 19	Wed Apr 26							
11	Test with beam	14 days	Thu Apr 27	Wed May 10							
12	Radiation Survey	1 day	Thu May 11	Thu May 11							
13	Remove Gates	2 days	Thu May 11	Fri May 12							
14	Remove Dump	2 days	Thu May 11	Fri May 12							
15											
16	Installation 6-7	180 days	Wed Feb 1	Fri Sep 15							
17	Magnet transport 2-3-4-5-6	30 days	Sat Apr 1	Sun Apr 30							
18	Magnet transport 2-1-8-7	15 days	Mon May 1	Mon May 15							
19	Interconnection works	180 days	Wed Feb 1	Fri Sep 15							
20											
21	Hardware commissioning 4-5	90 days	Mon Feb 20	Wed May 31							
22	Hardware commissioning 3-4	84 days	Mon Apr 24	Mon Aug 7							

Issues

- **Radiation protection**
 - INB
 - Contractors
- **Machine Protection**
 - Machine protection and interlocks. Requirements, installation and test schedule. Interface with SPS
- **Impact analysis on ongoing installation**

Issues

- **Power converters: required circuits, maximum energy, software**
- **Magnets: transfer functions, de-Gauss cycle, errors**
- **Operations: planning for 2006**
 - Detail overlap with HWC
 - Cryogenics requirements fully defined.
- **Detail tests with beam**

Variations

- **Contingency?**
- **Absolute minimum, striped down**
 - Time, instrumentation etc.

- **To TDI**
- **Through IP8 – temp dump R8**
- **JIT Sector test?**