

Powering Test Overview

This presentation have been prepared with the help of a lot of people: Rudiger, Hugues, Antonio, Mirko, Matteo, Hugues, Gianluigi, Markus Z., Markus A., Laurette, Reyes, Magali, Alick, Knud, Valerie, Serge, Roger, Amalia, Katy, Julie



QUESTIONS I TRIED TO ANSWER

- ◆ What happens before powering tests after cooldown?
- ◆ Organization of hardware commissioning, meetings...
- ◆ What happens before powering tests after cooldown?
- ◆ Commissioning of Warm sectors, Cold sectors and sector 34: what needs to be done? What can be dropped?
- ◆ When should we work: 2 shifts during 5 days versus 3 shifts during 7 days, MPP analysis, what can be done in a nightshift – WE? Bottlenecks in manpower
- ◆ Rules for patrols during powering tests



AIM OF THIS PRESENTATION

- ◆ It is an invitation to an open discussion
- ◆ It points out how HC should work during the different periods
- ◆ It makes some proposals to the organization w.r.t. the 2008 one



ON 28 FEB. 2008...

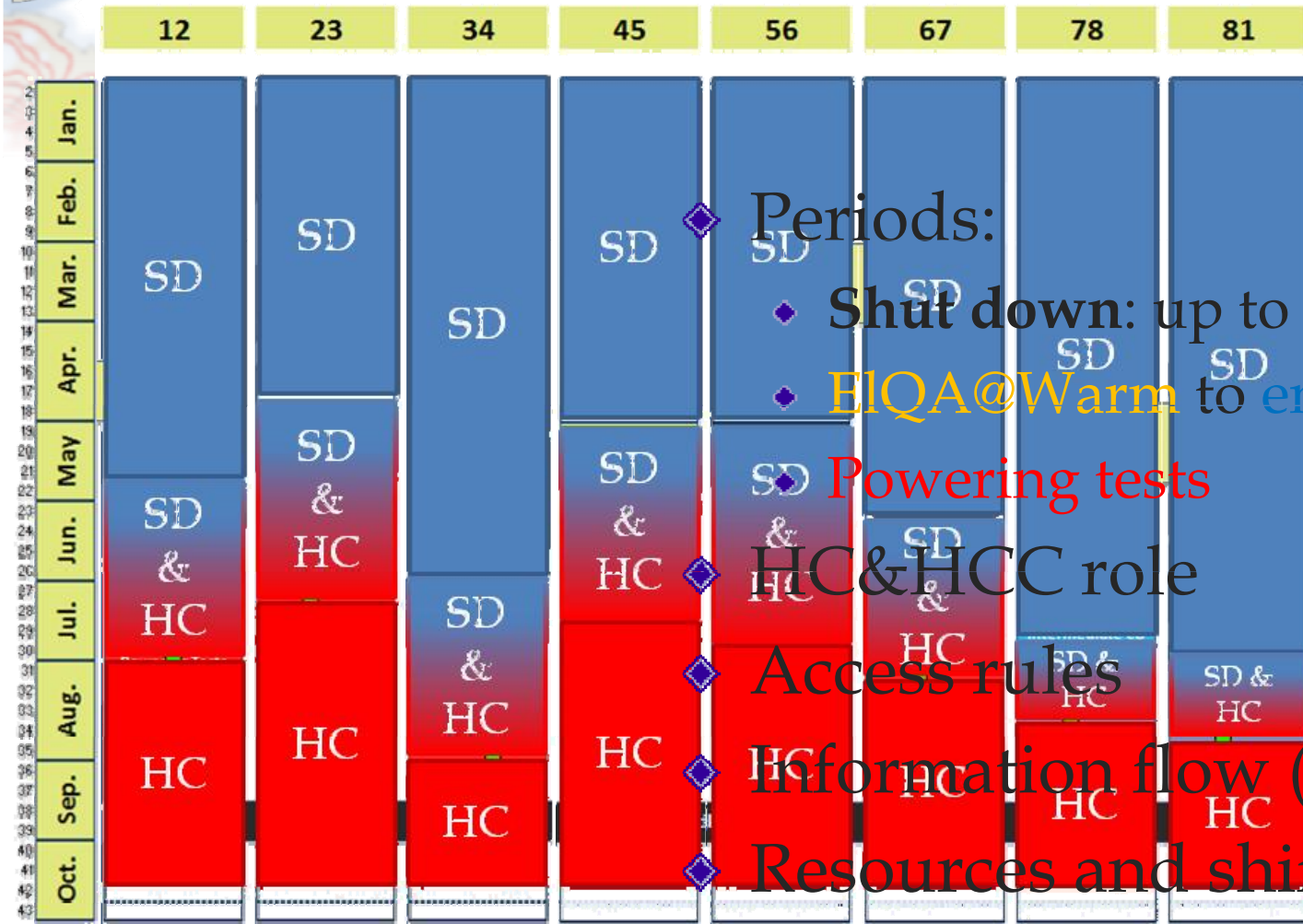
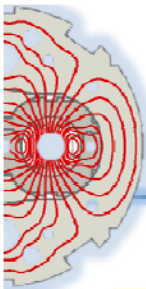
◆ Feb. 2008



THE ORGANIZATIONAL ISSUES

- ◆ 2 shifts during 5 days: do we need to go to 3 shifts during 7 days? Can we?
- ◆ MPP analysis: can it be done during a nightshift, the weekend?
- ◆ Where are the bottlenecks in manpower?
- ◆ A Commissioning Coordinator on duty on a weekly basis to coordinate across sectors
- ◆ Are the 8.30 and the 16.30 meetings efficient? Are they held at the right time? How can the activities continue during meetings?

PLANNING



Periods:

- ◆ Shut down: up to ElQA@warm
- ◆ ElQA@Warm to end of Cool Down

◆ Powering tests

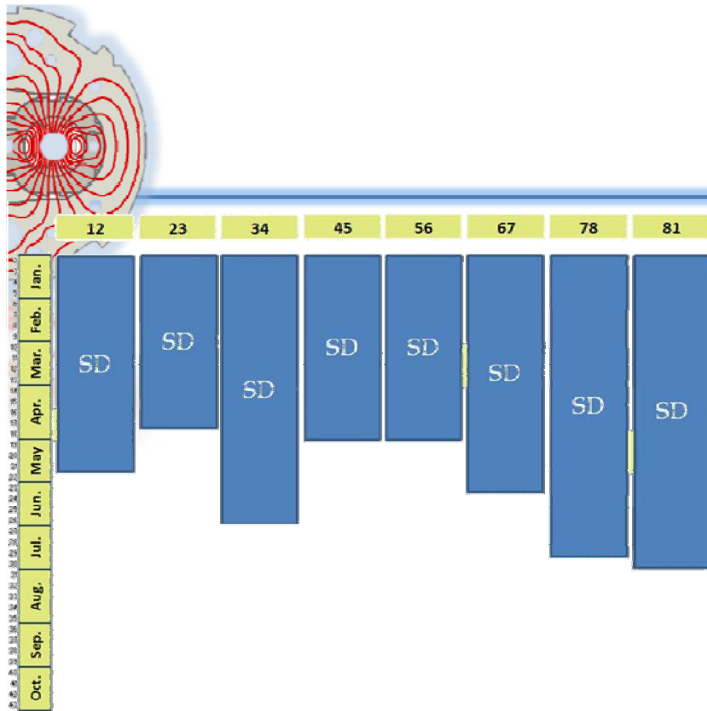
◆ HC&HCC role

◆ Access rules

◆ Information flow (meetings)

◆ Resources and shift work (PT)

SHUT DOWN



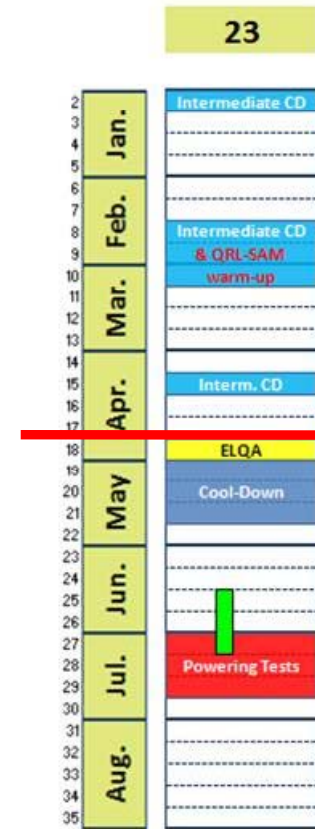
◆ Information flow:

- ◆ SD coordination meeting is the reference meeting for tunnel activities
- ◆ HC meeting every 2 weeks.
 - ◆ To follow up the:
 - ◆ Sequences implementation
 - ◆ HC activities
 - ◆ Short circuit tests
 - ◆ Warm magnets commissioning
 - ◆ Access rules
 - ◆ Tools: PM,PT page, event database...
 - ◆ MTF-Powering procedure
 - ◆ Alternate with BC (Tuesday) or SDC (Thursday)?

- ◆ HC activities (not yet in the planning)
 - ◆ Short circuit tests
 - ◆ UJ33 and UA43: 8/24h heat run
 - ◆ UA63: hear run
 - ◆ Warm magnets re-commissioning
 - ◆ Interlock test everywhere
 - ◆ EIQA
 - ◆ Heat runs (could be integrated in PT)

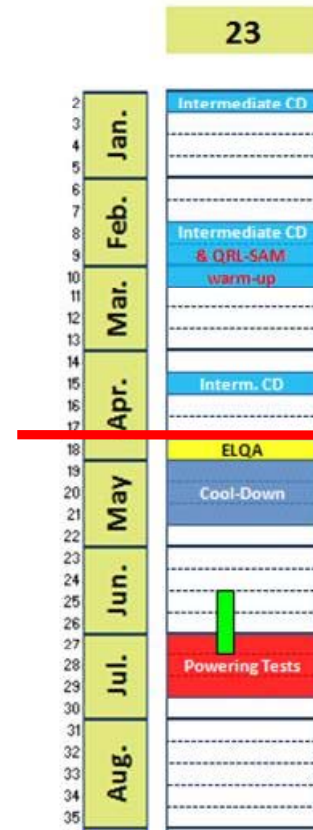
SD & HC

- ◆ The hand-over between SD and HC is the ElQA@warm.
- ◆ For a smooth hand over SD and HC have to work in a strict contact
- ◆ Point Owners will be again “on line” with the SD coordinators
 - ◆ Matteo Solfaroli: Point 2
 - ◆ Boris Bellesia: Point 4
 - ◆ Mirko Pojer: Point 6
 - ◆ Antonio Vergara: Point 8
- ◆ Meetings:
 - ◆ Twice a week at 8:30 (or keep Monday morning meeting?)
 - ◆ long term planning (PL section)
 - ◆ Critical path
 - ◆ Major changes in the planning
 - ◆ short term planning (Point Owners)
 - ◆ Fine granularity of the planning of the 2 following weeks
 - ◆ Activities interference in the field
 - ◆ HC meeting once per 2 weeks



SD & HC: access rights

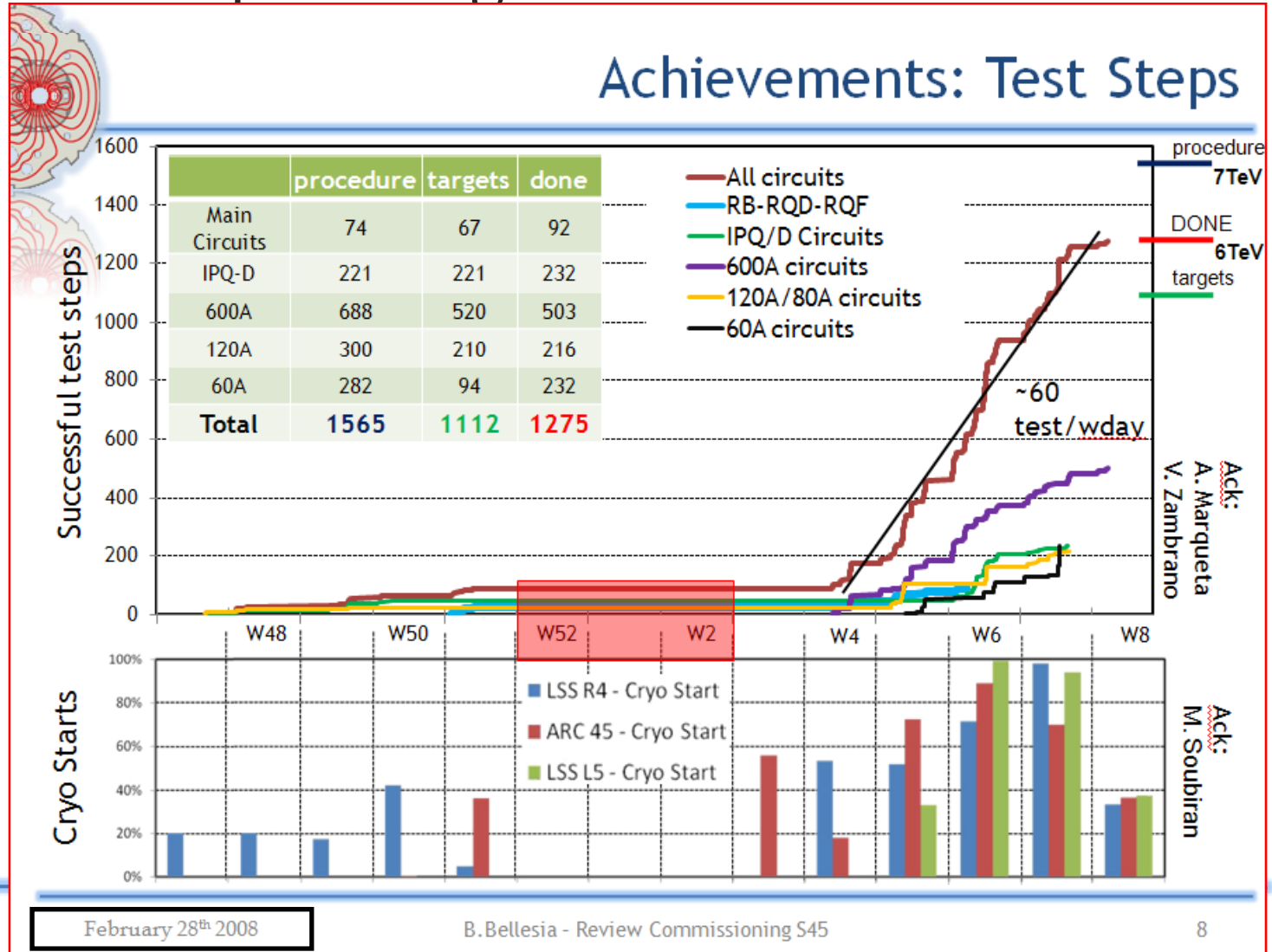
- ◆ All the **access** points of the sectors will be in **restricted** and the end-sector door armed (envelop closed).
- ◆ up to the beginning of any powering tests, including 0A tests: **no patrols**
- ◆ Access allowed with an approved **ADI** [Hugues]
 - ◆ **Request:** by the team as last year, EDH form, to be filled (customized w.r.t. few suggestions – pre-defined list of activities)
 - ◆ **Approval:** given by the Point Owner with respect to the safety rules @ different stage (cooldown, ELQA, heat runs...)
 - ◆ **Endorsement:** viewer ready soon to easy the work (Magali, Laurette, Marc).



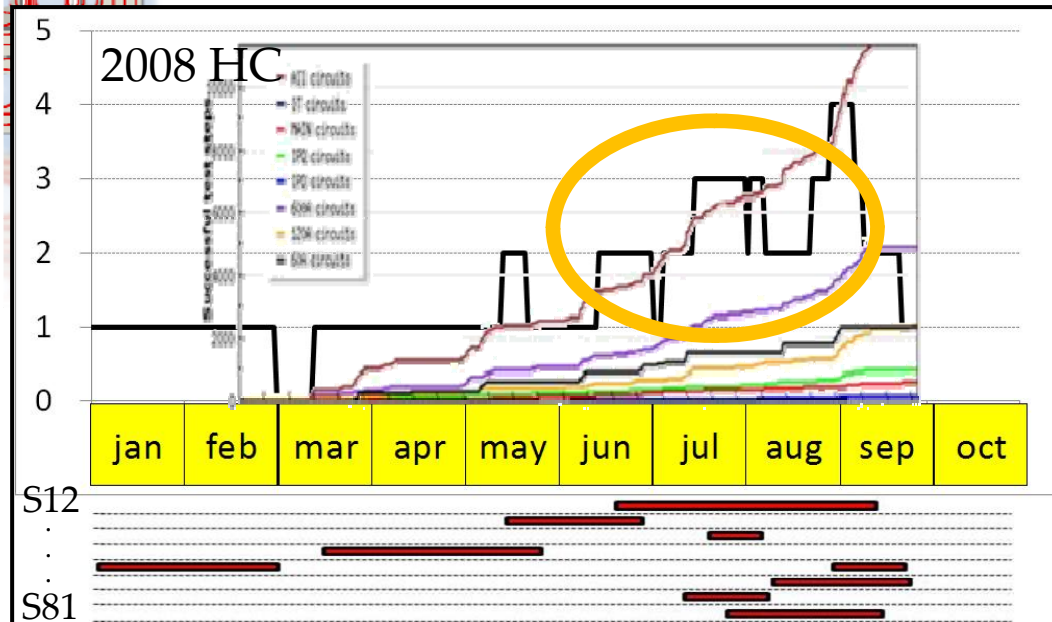
POWERING TEST: On 28 Feb. 2008...

Review of the powering test of S45

Achievements: Test Steps



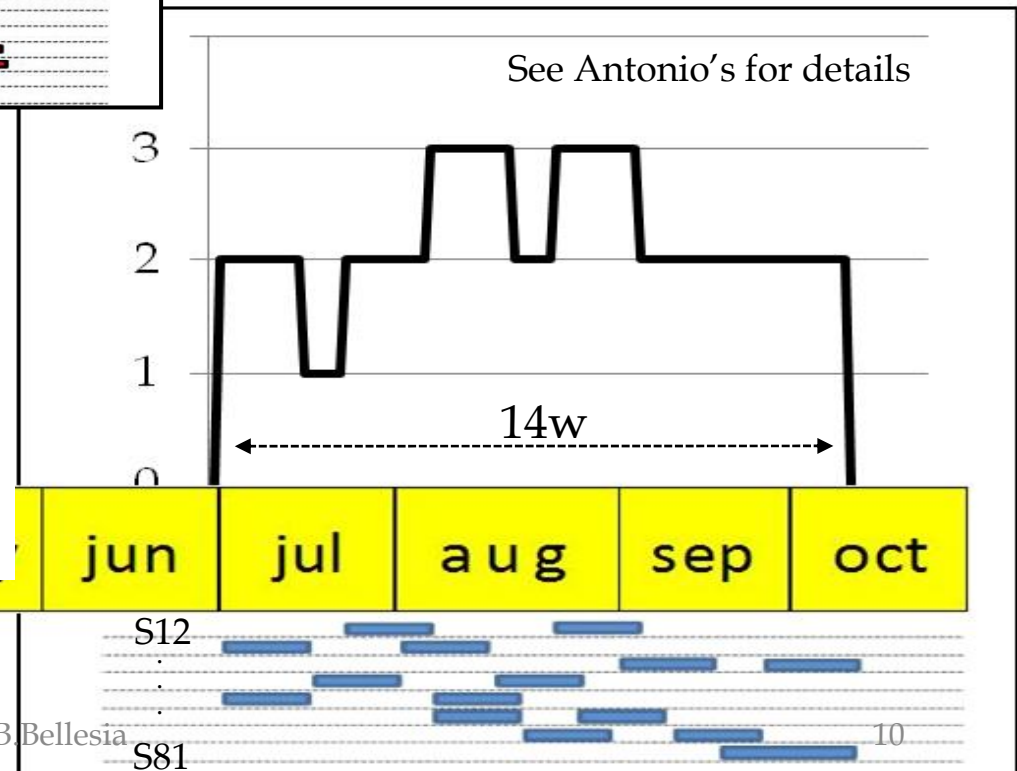
...AN THEN...



- ◆ In total ~ 12000 steps
- ◆ At regime up to 100-110 step/wday evaluated on a period of 3 months
- ◆ max 4 sectors in parallel

...AND NOW?

- ◆ Max 3 sec in //
- ◆ About 10-15% less of test
- ◆ Squeezed time (14w vs. 5months)
- ◆ (quite) a few unknowns (nQPS)
- ◆ Interference with installation activities
- ◆ With 100-110 step/wday: 18-20 weeks





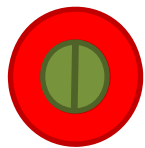
POWERING TESTS: New definitions

- ◆ 19/9 forced us to re-evaluate the risk associated to the powering tests.
- ◆ Definition of 2 PT phases: identification of a I_{\max} **per circuit type** that corresponds to a magnetic energy whose uncontrolled release cannot be harmful for people working in the tunnel. [see Ralf, Matteo's]
 - ◆ Phase 1: tests below I_{\max}
 - ◆ Access with ADI
 - ◆ No access limitation in the caverns
 - ◆ Patrol only of the tunnel zones (services area not patrolled) [tbd]
 - ◆ Phase 2: tests above I_{\max}
 - ◆ No access - Access point in surface in closed mode (?).
 - ◆ Very likely (Task Force will comment) experiments and caverns access affected.
 - ◆ All access sectors patrolled

PATROL RULES

- ◆ During powering test the underground areas are in patrol mode and...
- ◆ ...*“if we patrol we will really patrol”* [Cfr. Magali]
- ◆ How:
 - We will patrol the tunnel w.r.t. the powering test phase and zone [see Matteo's]
 - **Pool of people** (help from EN-MEF, site managers for working hours and volunteers for outside w.h.; Magali, Laurette are working on this)

- ◆ Few rules (phase 2):



Patrol broken in the external envelope : PT stopped and immediate patrol (contamination issue)

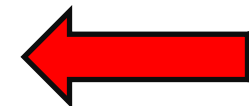
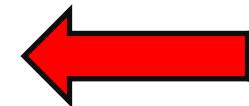
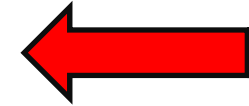


Patrol broken inner access sector: PT NOT stopped; patrol to be done as soon as the “working hour” patrol team available.



POWERING TESTS: Resources, needs & shifts

- ◆ **QSP** [see Knud's] :
 - ◆ 7 team leaders on shift (9)
 - ◆ 11 operators on shift (14)
 - ◆ 6-7 Field team working hours
- ◆ **PC** (ex-PO)
 - ◆ 9 engineers on call (9)
 - ◆ 10 technicians on shift (10)
 - ◆ First line (field work)
- ◆ **PIC**
 - ◆ 3 engineers on call (4)
- ◆ **Operation (also Dry runs, Access coord., MP tests)**
 - ◆ 9 HC-EiC on shift (13)
 - ◆ 11 operators on shift (11)
- ◆ **HCC**
 - ◆ 1? Hard.Comm. Coord. Weekly shift (4)
 - ◆ 4 Point Owners Weekly shift (6)
- ◆ **nMPP**
 - ◆ 10? analysts on shift (10)
- ◆ **Cryo:** 7days – 24h shift coverage with CERN staff [see Serge's]
- ◆ **ElQA:** on demand in case of needs – 2 teams
- ◆ **Current leads:** 2 on call (2)





POWERING TESTS: Resources, needs & shifts

◆ Minimum people per shift:

- ◆ 1EiC, 2op,1QPS,2QPSop,1PCop,"nMPP", 1/2CRYop: **9-10 people**

- ◆ HR sufficient to cover up to 2shifts/5days (agreed with all team leaders): **at the limit for QPS and still to be proven for OP**

◆ Shift proposals:

- ◆ 2 shifts M.A. 5 d/w Mo-Fr (10s/w)
 - ◆ Morning for tunnel activities once HC on going in // in at least 2 sectors, or sector with no activities

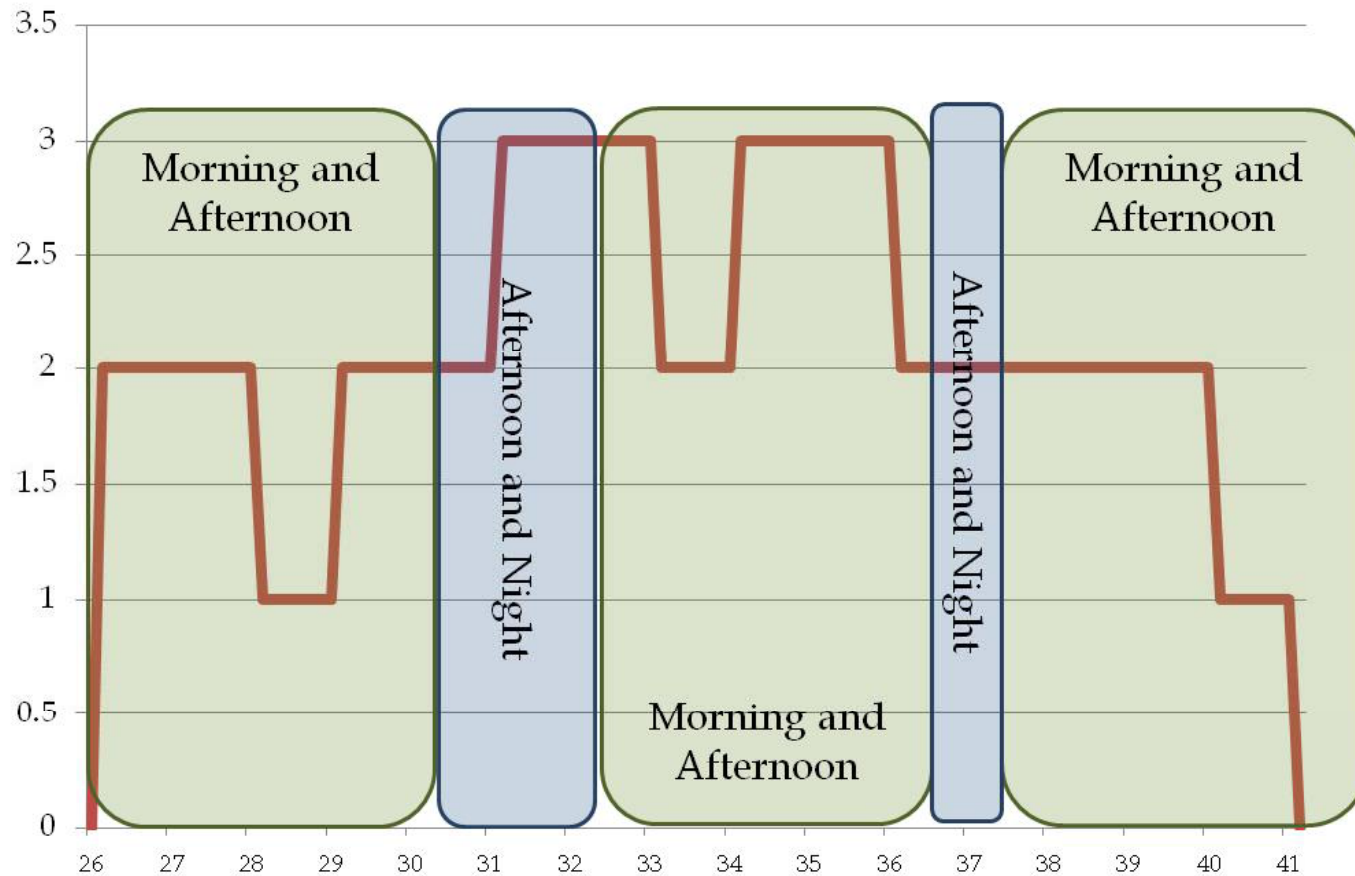
- ◆ 2 shifts M.A. 5 d/w Tu-Sa (10s/w)
 - ◆ 1 entire day devoted to tunnel activities

- ◆ 2 shifts A.N. 5 d/w Mo-Fr (10s/w)
 - ◆ Morning for tunnel activities everywhere

- ◆ 3 shifts M.A.N. 3 d/w Th.-Sa. (9s/w)
 - ◆ Tunnel activities / commissioning 50-50

POWERING TESTS: Resources, needs & shifts

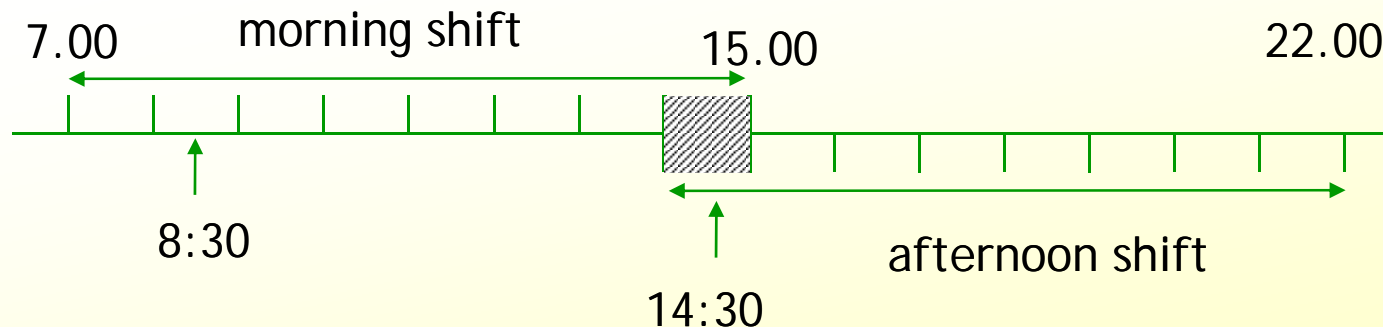
- ◆ Flexibility and adapt to needs

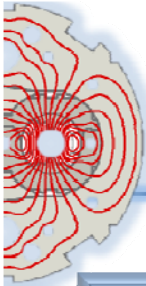


See also Antonio's

POWERING TESTS: Meetings

- ◆ 8:30
 - HC coordinator, experts, Point Owners
 - Report of the previous day
 - Discuss of the priorities and of the mission of the day
 - This meeting should not stop the CCC activities
- ◆ 14:30
 - Hand-over meeting: 2 EiCs + experts + Point Owners
 - Very effective last year (15 min)





POWERING TESTS: CCC roles

HC Coordinator:

- Runs the 8:30 meeting
- Manages the priorities
- Gives OK to mask interlock signals
- Collects the mission of the days
- "ad hoc" test preparation

Point Owners:

- Provide the mission of the day
- Coordinate the field activities
- Keep track of any NC
- Keep track of any masked interlock signal
- Block circuits via PIC in case of unexpected failure and problem cannot be solved from CCC

EiC:

- Ensure smooth run/quality of the tests
- Ensure the safety condition during the tests
- Close collaboration with the P.Ow.
- Request for masking interlock signals

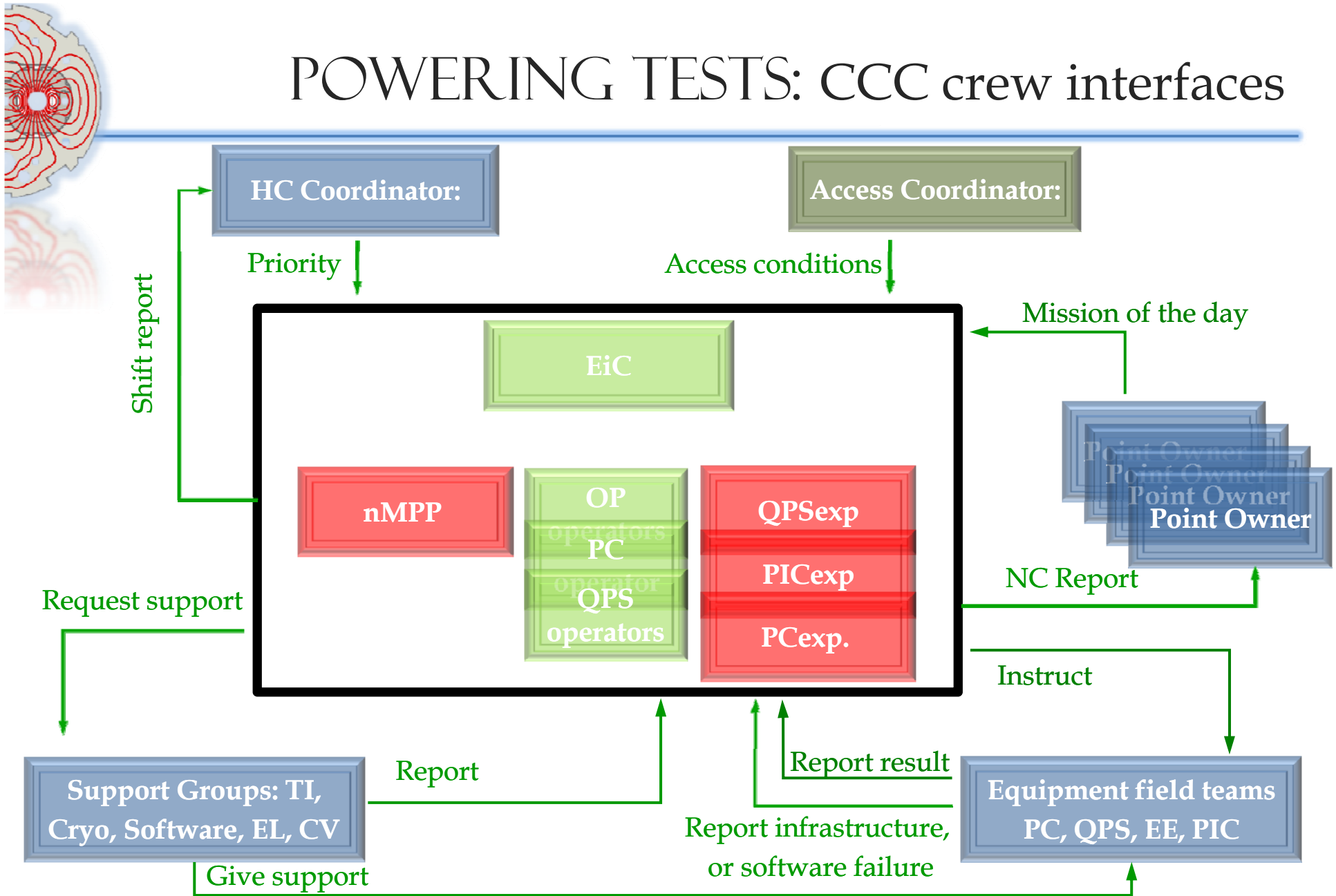
nMPP + Poexp. + QPSexp + PICexp:

- Validates and reports test results
- Gives the OK to Unblock circuits
- Collaborates to ad hoc test preparation
- Open the NC


Access Coordinator:

- Interface with AG/ ASE
- Access problem management
- Patrols organization

POWERING TESTS: CCC crew interfaces



CONCLUSIONS

- 
- ◆ Very stringent time constraints (14w to commission 8 sectors)
 - ◆ Many activities in preparation for the PT
 - ◆ We did it once, it worked well. The organization will not be drastically modified
 - ◆ HR:
 - ◆ possible problems with QPS and OP (staff number reduced – parallel activities)
 - ◆ Cryo: shift on 24h/7d.
 - ◆ Shift work, few proposals identified that could fit the team resources. Be flexible!