R2E relocation & shielding activities

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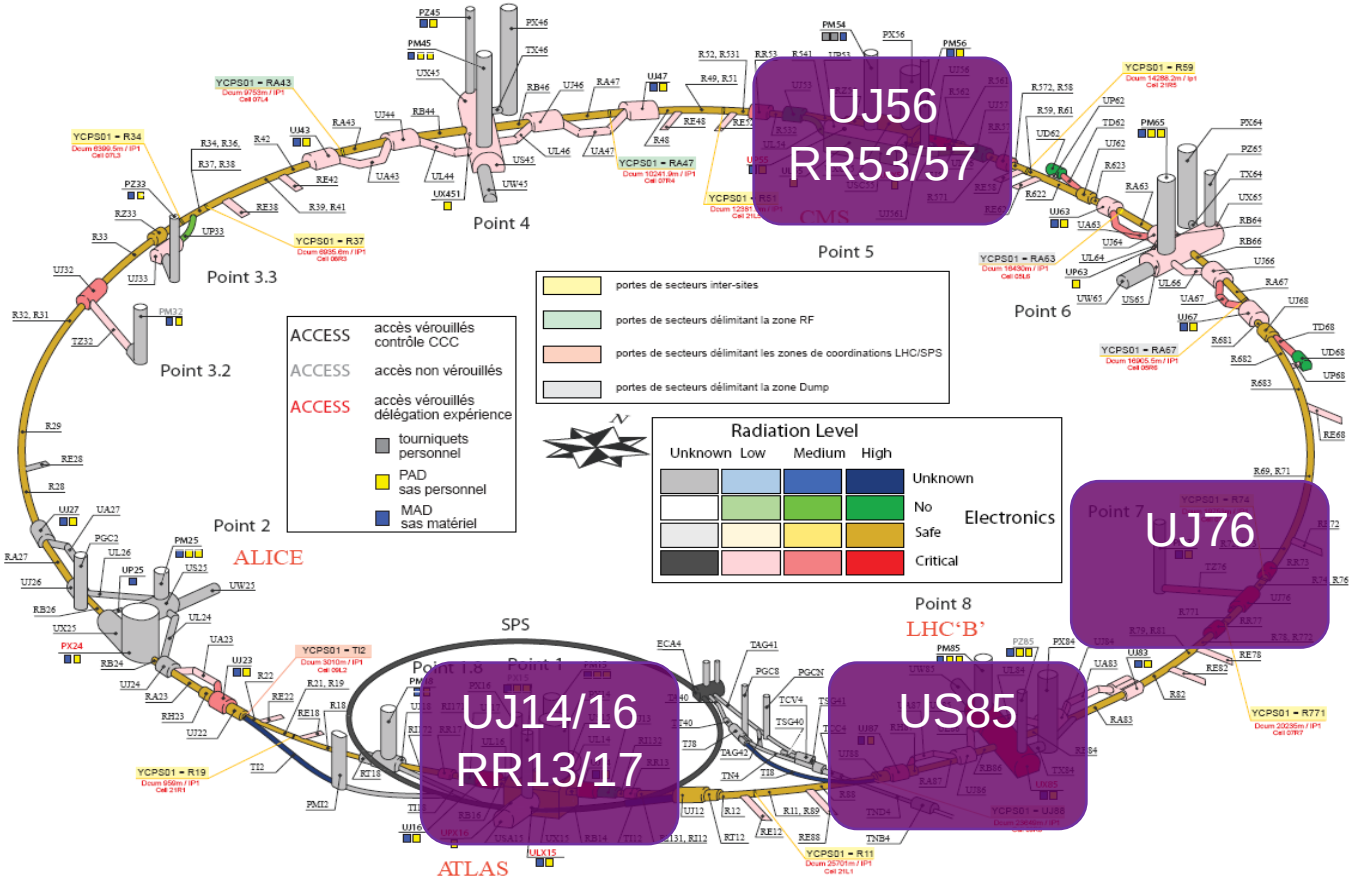
R2E project meeting, 23rd October 2012

Outline

1. R2E mitigation activities - status
2. R2E LS1 planning
3. Documentation
4. Organisational aspects

Areas of the R2E mitigation activities

Main critical areas today considered

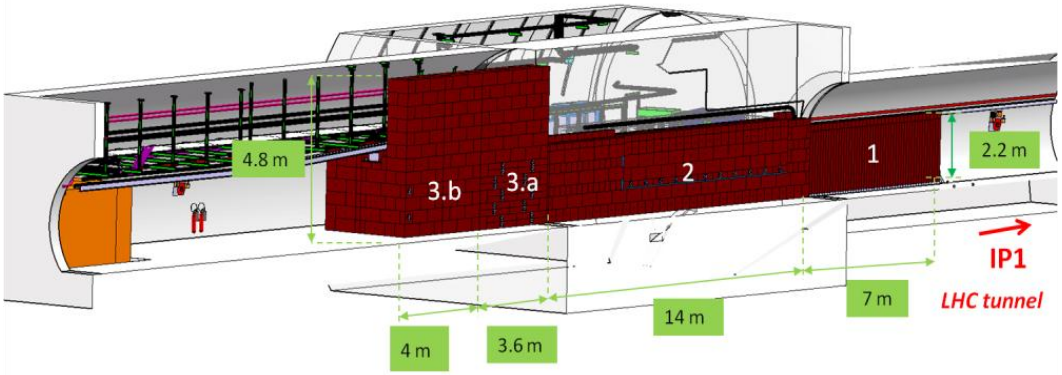


Status of the mitigation activities

Actions already performed – shielding (2009-2012)

Xmas break 2011

Point 1: RBs/UJs
Points 2 & 8: UJ22/23/88/87
Point 7: UJ76 wall
Point 6: ducts between RAs/UAs 63/67



RBs and UJs in LSS1, Xmas break 2011

Courtesy M. Lazzaroni

Shielding activities - 2011 Christmas break

Point 1: RBs/UJs

Shielding activities - 2011 Christmas break

Point 1: RBs/UJs

Status of the mitigation activities

Actions already performed – relocation (2008-2011)

2008: UX85 cryogenics cold compressor system, PLCs QURCA & QUICC

2008 - 2009: UPS removed from UJ76

2009: UX85 cryogenics valves positionners (QURCA, QUICC)

2009: US85 fire & ODH detector control racks and associated detectors units

2010 - 2011 Christmas break:
UJ56/76 EN/EL RTUs
UJ56/76 fire & ODH detection control racks

2011- TS4: UJ14/16 PIC
TS5: cryogenics US85 CPU (QURCb)

Status of the mitigation activities

Actions already performed – relocation (2011-2012)

2011 Xmas break

Point 1: Fire detectors (from RR13/17 to US15)
Points 4/6: cryogenics CPUs (from UX to UL)
Point 5:UPS (from UJ56 to UL557)
UL557: Civil engineering activities (ducts, vault along 20 m)
Point 8: Ethernet racks (startpoint) (from US85 to UL86)
WIC & timing racks (from US85 to UA83)
QURCb & rack EYQ (from US85 level 2 to lUS85 level 0)

2012 Technical Stops (TS1-3)

Point 1: cable trays, survey references, empty racks installed in ULs
Point 5: cable trays, GGPSO preparatory work for installation, UL557 new lightning, pipes survey of the UL557 by CE
Point 7: cables trays, survey references, empty racks moved to nominal location
EL preparatory work before wall dismantling
Point 8: cable trays

Status of the mitigation activities

Actions to be performed during Xmas break 2012

Relocation

Point 1: cable trays, if time start cables installation,
Point 5: UL557: GGPSO installation, cable trays modification, new lightning
UJ56: survey activity to link UJ56 to LHC tunnel framework
Point 7: power sockets replacement
Point 8: start installing the UPS cables between US85 and UA83,

Shielding

Point 8: CE activities (rail installation) for US85 mobile shielding

Status of the mitigation activities

Integration studies

Shielding

Points 1, 5, 7 & 8 ✓

Relocation

Point 8 ✓

Point 5 ✓

Point 1 ✓

Point 7 ✓

Finished and approved

Planning – LS1

R2E activities in

Point 8 ✓

Point 5 ✓

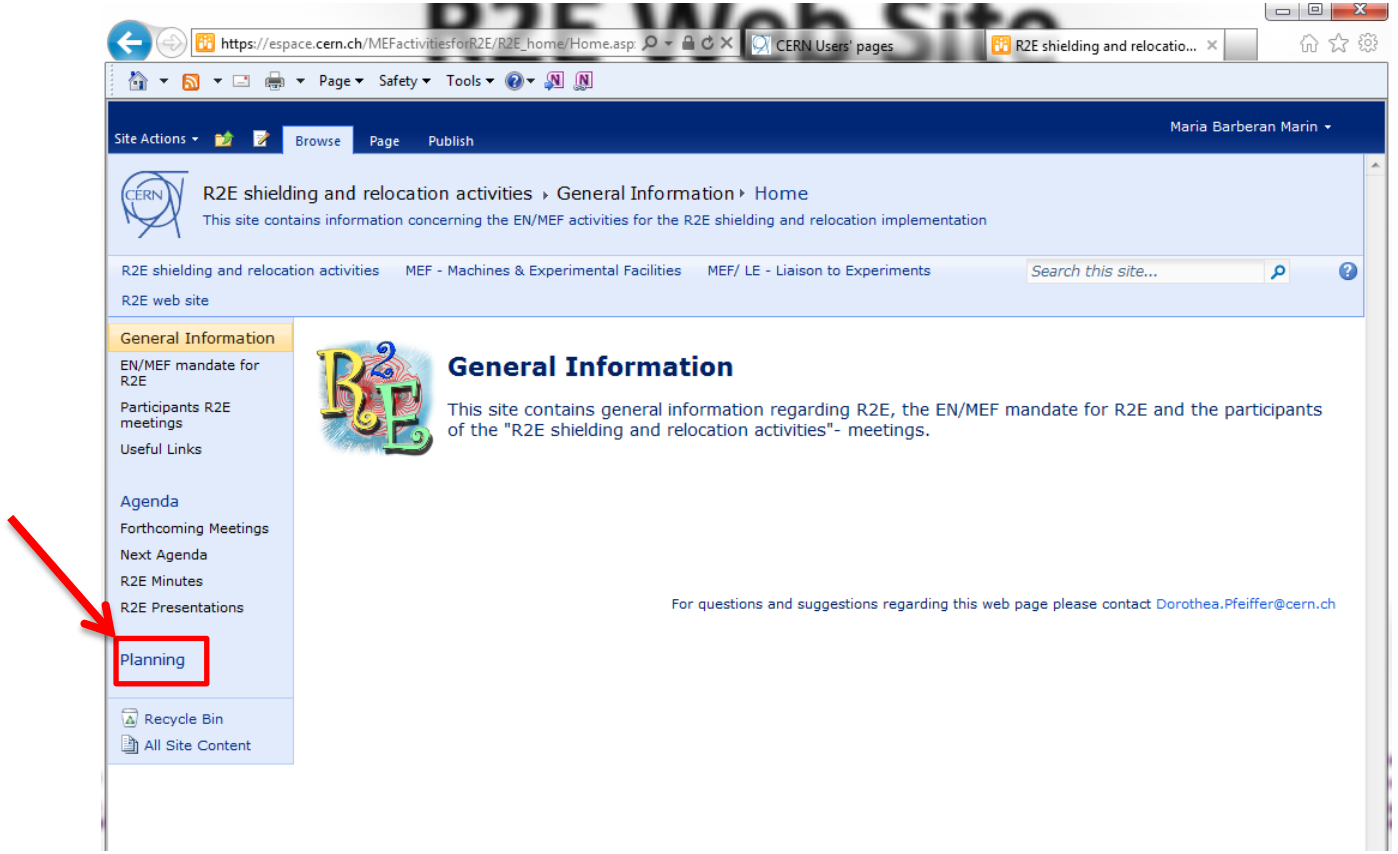
Point 1 ✓

Point 7 ✓

Sequences finished
Merged into LHC LS1 planning

R2E LS1 planning

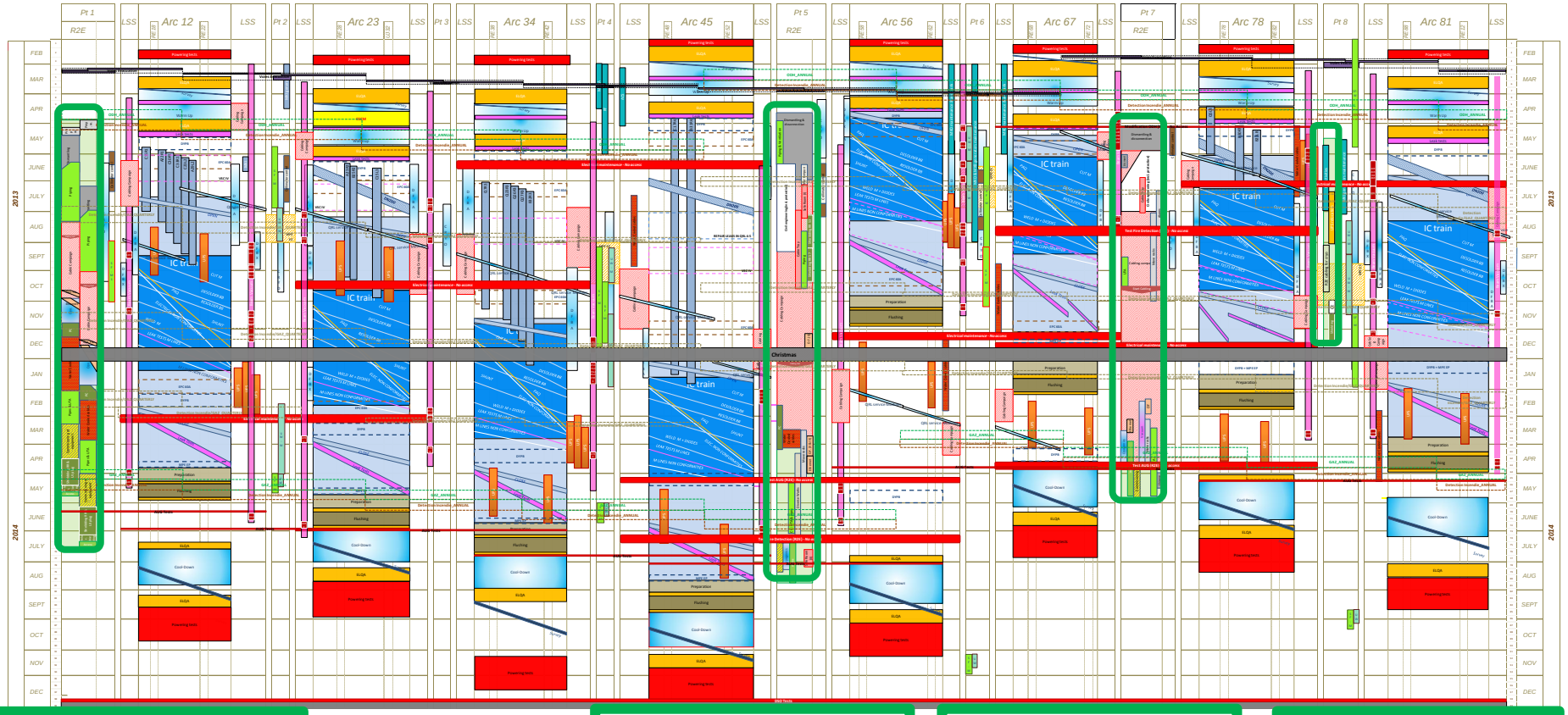
work by M. Barberan



https://espace.cern.ch/MEFactivitiesforR2E/R2E_home/Home.aspx

R2E LS1 planning

work by M. Barberan & K. Foraz



Point 1 - 62 weeks
Start = End of April 2013
End = mid July 2014

Point 5 – 68,5 weeks
Start = mid April 2013
End = Aug. 2014

Point 7 – 54 weeks
Start = May 2013
End = June 2014

Point 8 - 31 weeks
Start = mid May 2013
End = mid Dec. 2014

R2E LS1 planning

Criticality

No margin!

Point 1: EL 45 weeks, CV 33 weeks

Point 5: EL 59 weeks (2 shifts), CV 32 weeks (2 teams), CE 9 weeks

Point 7: EL 58 # weeks, CV 16 weeks, CE 9 weeks

Minimise the criticality level

Key points to avoid delays

- Material procurement
- Installation procedures
- Storage areas management
- Very close supervision of work in-situ

&

Anticipation in implementation (2012 Technical stops)

- 20 days in total
- Profit of each day & each available ressource

R2E LS1 planning

Constraints by LHC activities

- R2E after ELQA tests in adjacent sectors
- Exception: Point 1- preparatory work start during ELQA sectors 12 &81;
  but equipment unplug only after ELQA

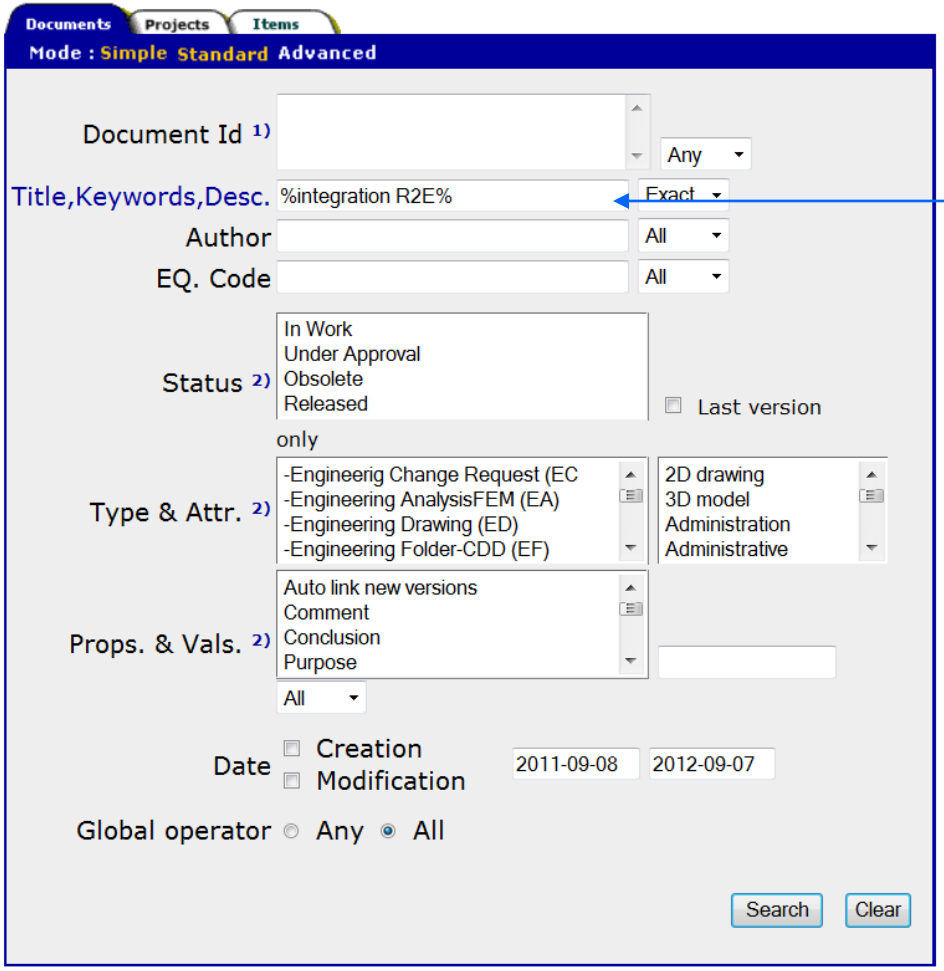
Constraints on LHC activities

- Point 1: Cool down starts when R2E commissioning activities are finished
- Point 5: - Cool down depends of the R2E cryo activities
  - Shielding transport via Pt4/6 and/or via PM54
  => co-activities with LHC and/or CMS to be optim
- Point 7: Cryo and 3 VAC control racks (insulation vacuum cont for QRL and cold magnets) relocated and commisionned before the cool down can start in adjacent sectors .

Pt5 planning may slightly change

Documentation (1/2)

Integration studies



Title= %integration R2E% (exact)

in EDMS: **32 documents**

Documentation (2/2)

ECRs

- 'Protection of equipment located in UJ76 ' (Phase I, edms: 977085)

- 'Mobile shielding for RR73/77' (edms: 985313)

- 'Protection of equipment located in US85': Phase I (edms: 1053225) & Phase II (edms 1146827)

- 'Strategy against SEE for Fire and Oxygen deficiency detection systems' (edms: 1126688)

- 'Protection of equipment located in UJ56' (edms: 1215705)

- 'R2E shielding for LHC Points 1, 5, and 8' (edms: 1182068)

- 'Protection of equipment located in UJ14 and UJ16' (edms: 1218906)

- 'Protection of equipment located in UJ76 (phase II)' : under preparation

All in EDMS:/projects/LHC machine/LHC R2E Project/related documents/Integration and Installation

Organisation towards LS1

- Work-package analysis
  - ✔ Point 1 : 28/09/2012
    Point 5: 19 & 26/10/2012
    Point 7: 9 & 16/11/2012
  - ✔ Point 8: 10/09/2012

Documents by Maria
(soon in edms for approval

- Installation drawings checks

ICL

Start in December by EN/MEF-int if drawings available

Drawings provided by
EN/EL and EN/CV (firm)

- Installation procedures

LS1 & R2E meetings

Request by EN/MEF-OSS at the end of the WPA

Follow-up in R2E meetings
(start mid-November)

- R2E relocation & shielding meetings are now weekly
  from mid November focus on installation & material issues

Critical points during LS1 implementation

Critical points	⇨	Required action	Team
➢ Material			
- procurement	⇨	Follow-up	Eqpt owners & services
- storage before installation	⇨	Management of storage areas	EN/MEF
➢ Installation	⇨	Day-to-day in-situ supervision	EN/MEF, BE/OP
➢ Integration			
- Installation non conformities	⇨	Intermediate survey scans	BE/ABP
	⇨	Cross-checks with models	EN/MEF
➢ Delays vs planning	⇨	Follow–up & adaptation	EN/MEF

R2E implementation & worksite organisation

Organisation during the LS1 installation

R2E Point coordinator in charge

1. Day-to-day in-situ management & supervision
   (rapidly react/solve problems of all nature as they occurred, direct contact with the groups supervisors, cleaning/ waste management)
2. Safety supervision
   (sites managers to enforce safety and environment protection rules, 'VIC', follow the implementation of safety measures/procedures)
3. Material delivery & contracts: weekly follow – up

4. Integration: non conformities follow-up
   (weekly reports, intermediate survey scans)
5. Planning: follow – up and adaptation
   (detailed installation planning & critical path weekly updated, impact on/of the non R2E works)
6. **Communicating**
   (periodical reviews of the activities, non conformities & planning)

R2E point coordinator involved

Main concerns – Review 2011

➢ Integration

- Relocation of EN/EL equipment located in the UJ56 safe room

Technical solution proposed by EN DSO and M. Brugger to DGS/SEE:
Fire proof racks in TZ76 (see Markus presentation)

- TZ76 separating wall dismantling

➢ Worksite supervision – R2E point coordinators

Point 1: M. Jeckel
Point 5: B. Lefort
Point 7: O. Andujar
Point 8: B. Mikulec

➢ Storage requests (surface- tunnel)

- Space already reserved in surface for shielding blocks

- Material storage under the equipment owners responsibility
(discussed during work-package analysis)

Main concerns towards LS1

➢ Integration

- Installation drawings

Checks by LHC integration team (ICL)

Should start in Dec. 2012 with EN/EL – EN/CV

- Cables trays in USC55

Discussion with CMS and EN/EL

➢ Material procurement

Regular follow-up by R2E will start mid November

➢ Manpower

Equipment owners should finalise their requests

Summary

- Integration & planning studies = finished
  R2E activities will start Mid April 2013

- ECR documentation almost finished (Pt7 ECR missing)

- WPA : in progress

- Main concerns raised during R2E 2011 review= solved

- Main concerns towards LS1:
  Installation drawings & procedures, material requirement, storage areas, manpower
  Follow-up start Mid November in the R2E relocation & shielding meetings

Addendum

R2E LS1 planning

Evolution Point 5

7/06/2012 → 54 weeks

12/06/2012 → 64,5 weeks (10 weeks)
CV No work in // with EL
CV → 2 Teams
EL → 2 Shifts

13/07/2012 → 66,5 weeks
No works during Christmas (2 Weeks)

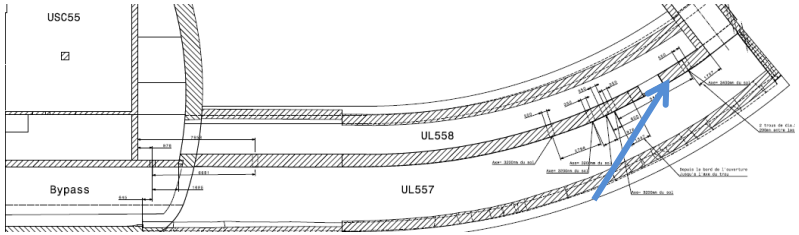
10/08/2012 → 67, 5 weeks
Transport UTAs (1 Week)

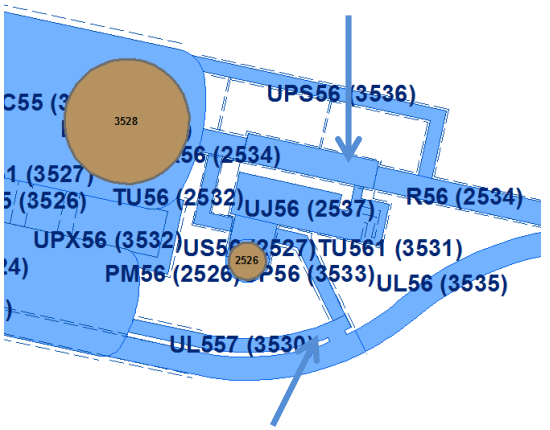
23/10/2012 → 68,5 Weeks
ERD & Power Converters Board (1 Week)

LS1 R2E civil engineering activities

- Point 5:

  UL557-UL558: 2 ducts Ø350mm





  UL557: mini 'safe room' implementation

  UL557-UJ56: 4 ducts 16 m long Ø400mm

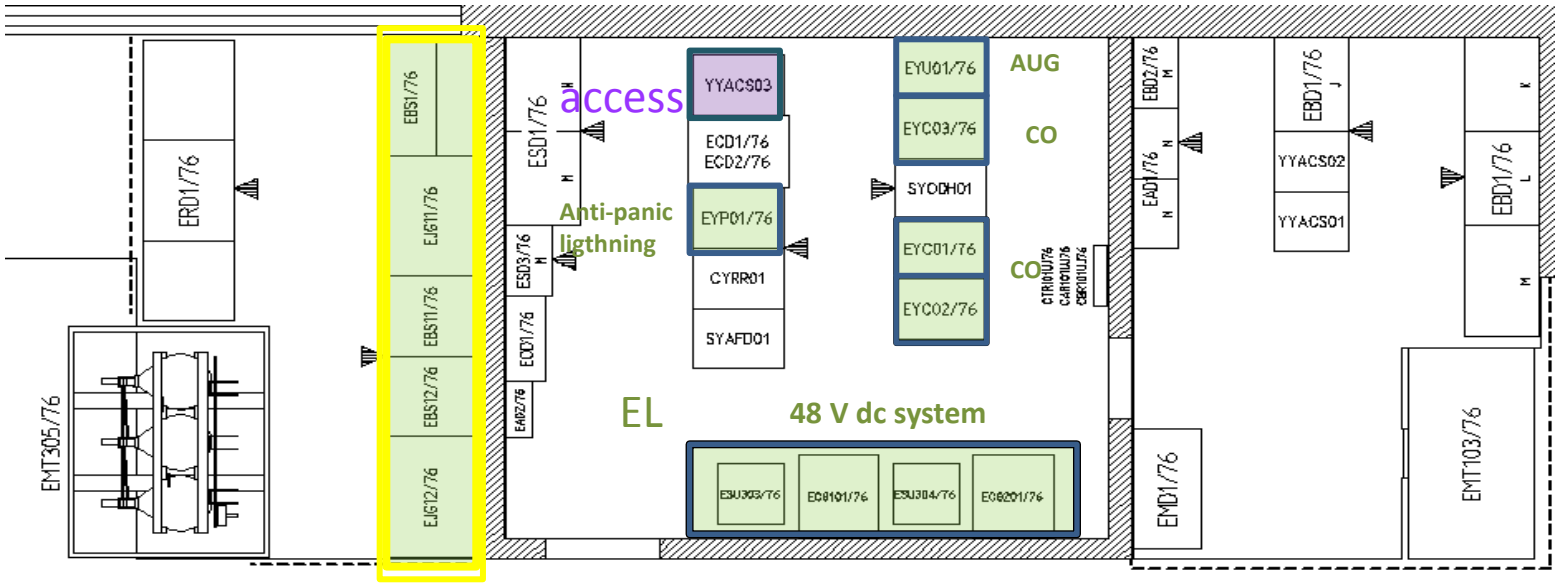
  UJ56 – LHC tunnel: 5 ducts Ø350mm

- Point 7

  TZ76 wall dismantling

Point 7 – Relocation

Equipment to be relocated outside UJ76- level 0



UPS: already relocated in TZ76

inside blue thick borders equipment to be relocated .

Point 7 – Relocation

TZ76 equipment layout after relocation