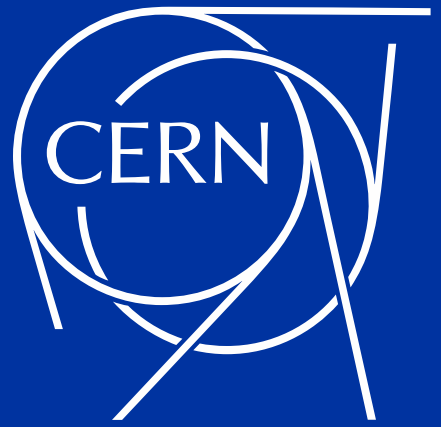


VIC - Installation of the ALICE IP2.X vacuum sector during the LS2

Josef Sestak; Jerome Chaure

03/09/2020

Content of the presentation

- **Overview of the activities;**
- **Expected schedule;**
- **Worksite and intervention related co-activities;**
- **Overview of the environmental and equipment risks;**
- **Discussion;**

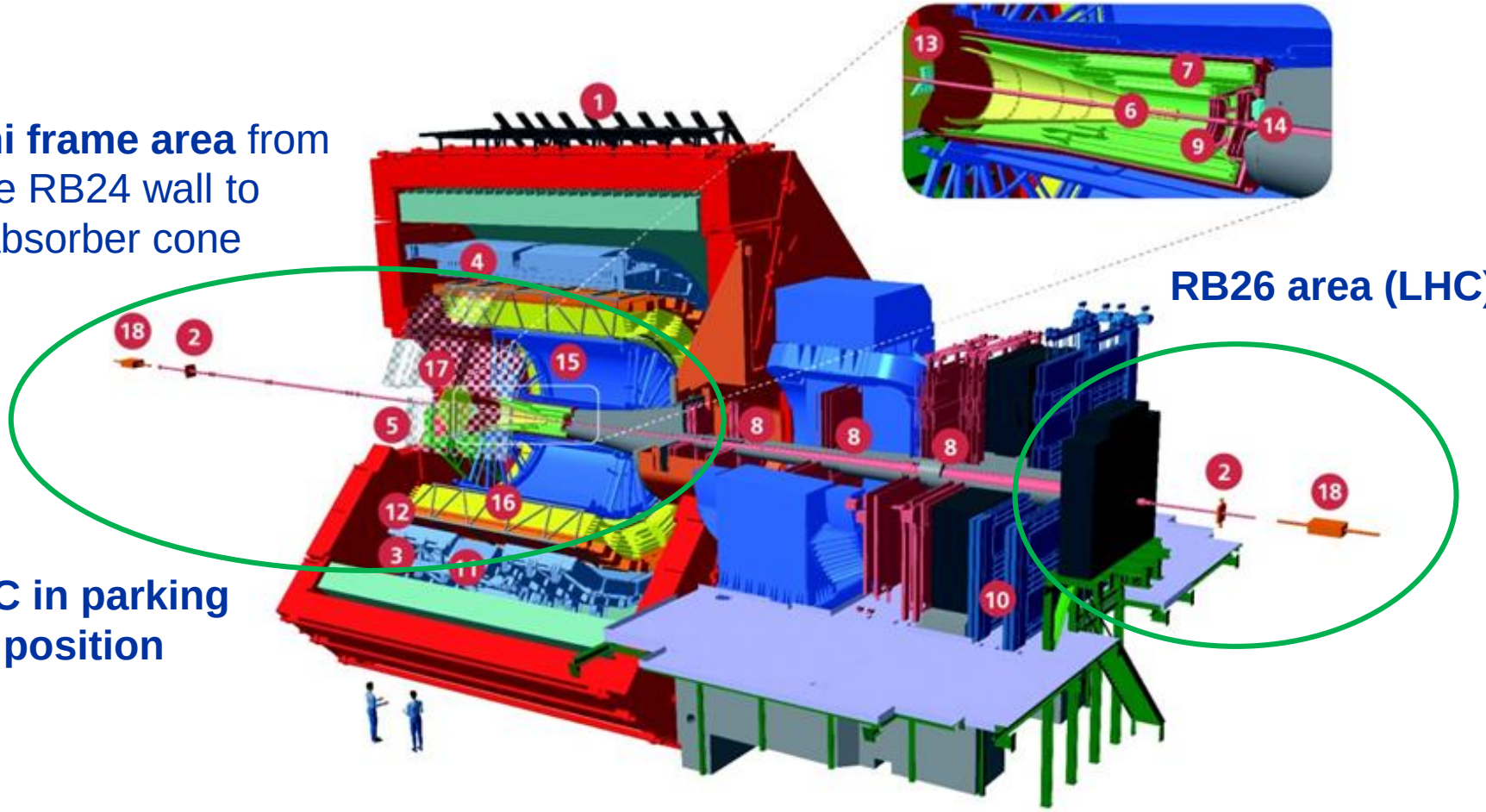
Overview of the activities

Installation of the LHC beam vacuum equipment (IP2.X) takes place in two main zones

Delphi frame area from the RB24 wall to absorber cone

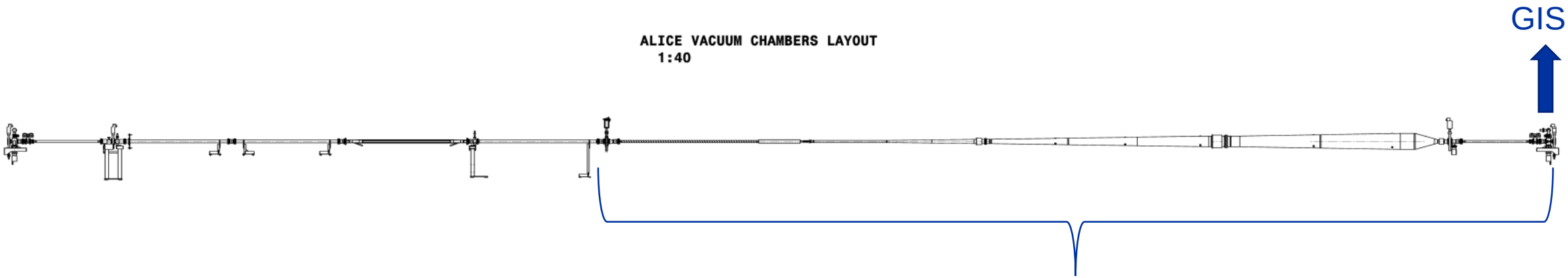
RB26 area (LHC)

TPC in parking position



1. **ACORDE** | ALICE Cosmic Rays Detector
2. **AD** | ALICE Diffractive Detector
3. **DCal** | Di-jet Calorimeter
4. **EMCal** | Electromagnetic Calorimeter
5. **HMPID** | High Momentum Particle Identification Detector
6. **ITS-IB** | Inner Tracking System - Inner Barrel
7. **ITS-OB** | Inner Tracking System - Outer Barrel
8. **MCH** | Muon Tracking Chambers
9. **MFT** | Muon Forward Tracker
10. **MID** | Muon Identifier
11. **PHOS / CPV** | Photon Spectrometer
12. **TOF** | Time Of Flight
13. **T0+A** | Tzero + A
14. **T0+C** | Tzero + C
15. **TPC** | Time Projection Chamber
16. **TRD** | Transition Radiation Detector
17. **V0+** | Vzero + Detector
18. **ZDC** | Zero Degree Calorimeter

Overview of the activities



IP2.X recommissioning requires common recommissioning with A1R2.X (GIS connection)

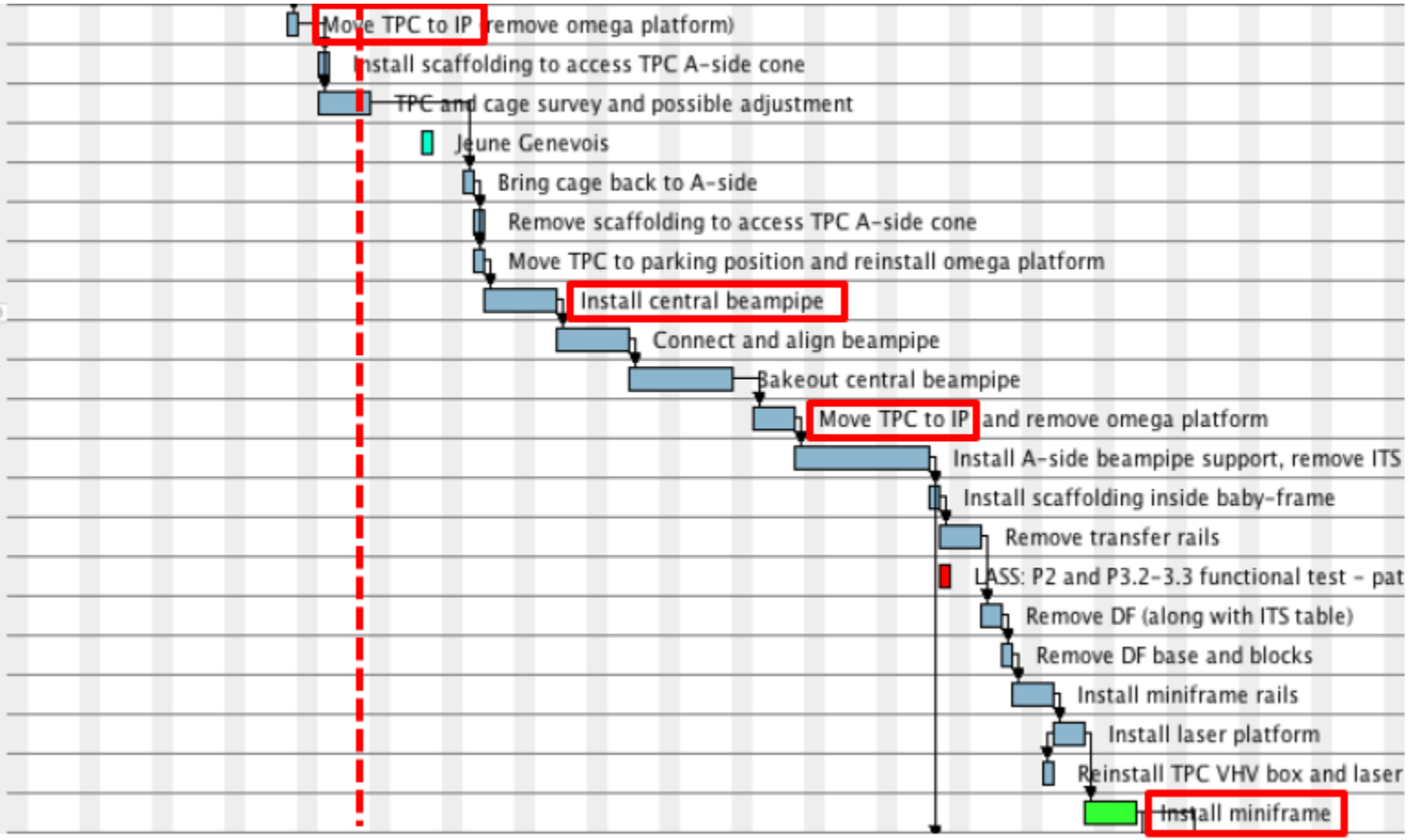
Main categories of the activities

- Transport (EDH requests in preparation for both Meyrin to SX25; SX25 to UX25);
- Mechanical activities (BVO team 2 – 3 person + 1 – 2 from ALICE);
- Bake-out preparation activities (BVO team 2 person);
- Vacuum related activities – Pump-down, Activation, Neon injection (BVO team 3 person);
- Survey activities (ALICE in charge);

Expected schedule

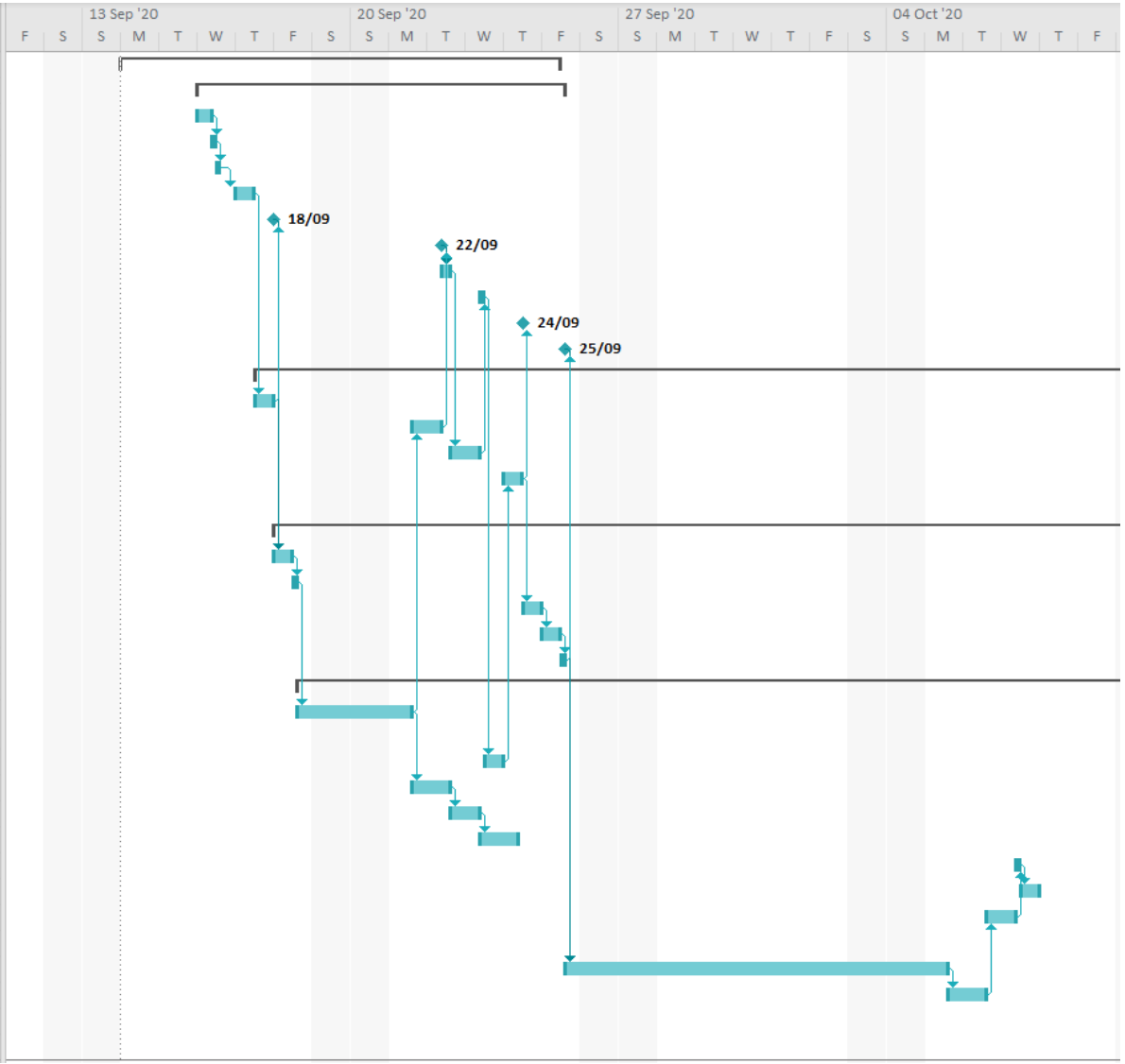
Main intervention contains weeks 38, 39, 40 and 41

28/8/20	28/8/20	1
31/8/20	31/8/20	1
31/8/20	4/9/20	5
10/9/20	10/9/20	1
14/9/20	14/9/20	1
15/9/20	15/9/20	1
15/9/20	15/9/20	1
16/9/20	22/9/20	5
23/9/20	29/9/20	5
30/9/20	9/10/20	8
12/10/20	15/10/20	4
16/10/20	28/10/20	9
29/10/20	29/10/20	1
30/10/20	2/11/20	2
30/10/20	30/10/20	1
3/11/20	4/11/20	2
5/11/20	5/11/20	1
6/11/20	9/11/20	2
10/11/20	12/11/20	3
9/11/20	9/11/20	1
13/11/20	17/11/20	3

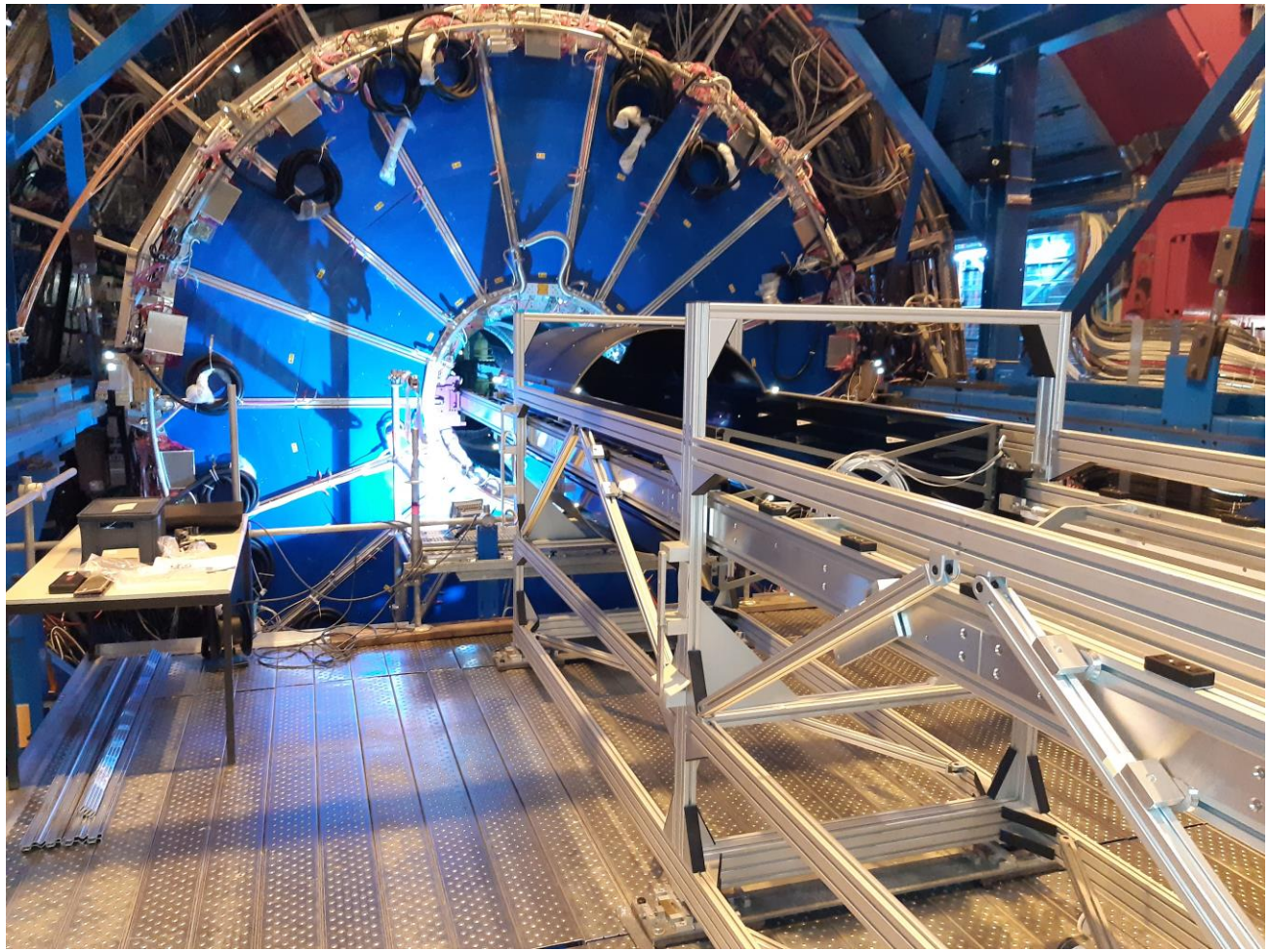


Detailed schedule

	Task Name	Dura	Start	Finish
1	**Transport activities**	**9.5 days**	**Mon 14/09/2(**	**Fri 25/09/20**
14	**Mechanical activities**	**7.75 day**	**Wed 16/09/2(**	**Fri 25/09/20**
15	Preparation for central chamber insertion (box on Delphi frame)	2 hrs	Wed 16/09/2(	Wed 16/09/2(
16	Insertion of the central chamber	2 hrs	Wed 16/09/2(	Wed 16/09/2(
17	Adjustment of the central chamber	1 hr	Wed 16/09/2(	Wed 16/09/2(
18	Installation of the upstream equipment	4 hrs	Thu 17/09/20	Thu 17/09/20
19	Ready for the sub-assembly leak test - LD-STEP 1	0 days	Fri 18/09/20	Fri 18/09/20
20	Ready for the cage insertion	0 days	Tue 22/09/20	Tue 22/09/20
21	Insertion of the Cage Assembly	4 hrs	Tue 22/09/20	Tue 22/09/20
22	Double bellows extension and downstream flange connection	2 hrs	Wed 23/09/2(	Wed 23/09/2(
23	Ready for the IP2 leak test - LD-STEP 2	0 days	Thu 24/09/20	Thu 24/09/20
24	Ready for the bake-out of IP2.X	0 days	Fri 25/09/20	Fri 25/09/20
25	**Survey and adjustments**	**22.5 day**	**Thu 17/09/20**	**Mon 19/10/2(**
26	Assembly position adjustments (survey) and inspection before the IP2.X (partial) leak test	4 hrs	Thu 17/09/20	Thu 17/09/20
27	Assembly position adjustments (survey) and inspection before the insertion	4 hrs	Mon 21/09/2(	Tue 22/09/20
28	Assembly position adjustments (survey) and inspection after the insertion	4 hrs	Tue 22/09/20	Wed 23/09/2(
29	Assembly position adjustments (survey) and inspection before the IP2.X leak test	4 hrs	Thu 24/09/20	Thu 24/09/20
30	Assembly position adjustments (survey) and inspection after the IP2.X bake-out	4 hrs	Mon 19/10/2(	Mon 19/10/2(
31	**Activities when IP2.X is under the vacuum (main bake-out cycle excluded)**	**20.5 day**	**Fri 18/09/20**	**Fri 16/10/20**
32	Pump-down of the VVGMT-VMDBB-VC2C assembly inside the cage	4 hrs	Fri 18/09/20	Fri 18/09/20
33	Leak detection of the VC2C; VMDBB and VVGMT (LD-STEP 1)	2 hrs	Fri 18/09/20	Fri 18/09/20
34	Pump-down of the IP2.X	4 hrs	Thu 24/09/20	Thu 24/09/20
35	Leak detection of the IP2.X (LD-STEP 2)	4 hrs	Fri 25/09/20	Fri 25/09/20
36	Bake-out equipment test	2 hrs	Fri 25/09/20	Fri 25/09/20
37	**Bake-out installation & removal activities**	**19.75 da**	**Fri 18/09/20**	**Fri 16/10/20**
38	Installation of the bake-out equipment for VMDBB; VVGMT and the VC2C (including the powering extensions for VJ (Be), VT (Bellows) and VC (OD75))	8 hrs	Fri 18/09/20	Mon 21/09/20
39	Installation of the bake-out equipment (VJ-Be; VT-bellows; VC-OD75)	4 hrs	Wed 23/09/2(	Wed 23/09/2(
40	Installation & connection of the bake-out in RB26 (A1R2.X and VVGSW)	8 hrs	Mon 21/09/2(	Tue 22/09/20
41	Connection of the GIS bake-out	4 hrs	Tue 22/09/20	Wed 23/09/2(
42	Connection of the VC2Ax absorber chambers bake-out	8 hrs	Wed 23/09/2(	Thu 24/09/20
43	Disconnection of the GIS bake-out	2 hrs	Wed 07/10/2(	Wed 07/10/2(
44	Disconnection of the VC2Ax absorber chambers bake-out	4 hrs	Wed 07/10/2(	Wed 07/10/2(
45	Disconnection and removal of the VJ; VT; VC downstream of the IP2 (central chamber)	4 hrs	Tue 06/10/20	Wed 07/10/2(
46	Disconnection and removal of the IP2 central assembly bake-out (VVGST and VVGMT)	4 hrs	Fri 16/10/20	Fri 16/10/20
47	**Bake-out cycle of the IP2**	6 days	Fri 25/09/20	Mon 05/10/2(
48	**Neon venting of the IP2**	1 day	Mon 05/10/2(	Tue 06/10/20
49	**TPC to IP - ALICE**	4 days	Mon 12/10/2(	Thu 15/10/20
50	Load transfer on the upstream side (table installation)	*2dayd*	Fri 16/10/20	Mon 19/10/2(



Worksite and intervention related co-activities



Worksite UX25

- Cage and installation frame on Delphi;
- Absorber cone area;
- Bake-out interconnection patch-panels;
- GIS area on RB26 side;

Worksite LHC

- RB26 (between the cavern wall and Q1R2)
- Rack zone.

Separate IMPACTS for Cavern, LHC and control activities in preparation

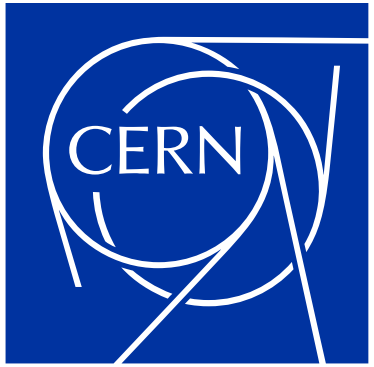
Transport team assistance for VC2C handling activities + bake-out racks

Overview of the environmental and equipment risks

- **Equipment under the vacuum (no access in close vicinity or above);**
- **Bake-out – temperatures up to 250 degrees of Celsius (GIS even more);**
- **Beryllium chamber.**

Activities within the cavern should be limited once the system is under the vacuum

No activities around the beam-pipe!



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