LS2 planning meeting
A. Tauro
## Key dates

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move TPC to SX2</td>
<td>16 Mar 2020</td>
</tr>
<tr>
<td>Install TPC (parking position)</td>
<td>17 Mar – 9 Apr</td>
</tr>
<tr>
<td>Install cage and central beampipe</td>
<td>14 Apr – 5 May</td>
</tr>
<tr>
<td>Move TPC to IP</td>
<td>6-7 May</td>
</tr>
<tr>
<td>Install Miniframe</td>
<td>28-29 May</td>
</tr>
<tr>
<td>FIT-C &amp; MFT installation and checks</td>
<td>2 Jun – 13 Jul</td>
</tr>
<tr>
<td>ITS installation and checks</td>
<td>14 Jul – 5 Oct</td>
</tr>
<tr>
<td>FDD-C installation</td>
<td>First half Aug*</td>
</tr>
<tr>
<td>FDD-A installation</td>
<td>1-10 Sep</td>
</tr>
<tr>
<td>FIT-A installation</td>
<td>6-12 Oct</td>
</tr>
<tr>
<td>ITS &amp; MFT commissioning time</td>
<td>8w</td>
</tr>
<tr>
<td>ALICE global commissioning time</td>
<td>21w</td>
</tr>
<tr>
<td><strong>End of LS2 – stop UX25 access</strong></td>
<td><strong>1 May 2021</strong></td>
</tr>
<tr>
<td>Start commissioning with beam – ALICE in super-safe</td>
<td>10 May 2021</td>
</tr>
</tbody>
</table>

* we need to redo tightness UX-RB26 before w35 (start cool down S23)
EN-EL interventions

- 18kV, 3.3kV and LV network maintenance: 20-24 Jan 2020 – Done
- AUG on Monday 27 January 2020 – Done
- Auto transfer test: 27-29 Apr 2020
- Test secours (10 min at 6:00 AM): 26 May 2020
- BIW test: 5 and 6 Oct 2020 from 18:00 to 00:00 – no access underground
Racks status

- Racks currently powered on:
  - HMID racks
  - PHOS-CPV: A16, A17
  - CTP: C24, C25 (CTP) (and VME crates on)
  - MCH: C08, C10, C37, C39
  - TOF: O03, O04, O05, O30, O31, O32, I03, I04, I05, I30, I31, I32
  - TRD: O26, O27, O28, O29, C16-18, I08, O08, C19, C29
  - DCal: A14
TPC upgrade sequence

**TPC schedule v41**

### 2020

<table>
<thead>
<tr>
<th>Begin Date</th>
<th>End Date</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/1/20</td>
<td>22/1/20</td>
<td>3</td>
</tr>
<tr>
<td>23/1/20</td>
<td>26/1/20</td>
<td>4</td>
</tr>
<tr>
<td>27/1/20</td>
<td>27/1/20</td>
<td>1</td>
</tr>
<tr>
<td>23/1/20</td>
<td>3/2/20</td>
<td>12</td>
</tr>
<tr>
<td>28/1/20</td>
<td>31/1/20</td>
<td>4</td>
</tr>
<tr>
<td>4/2/20</td>
<td>4/2/20</td>
<td>1</td>
</tr>
<tr>
<td>4/2/20</td>
<td>6/2/20</td>
<td>3</td>
</tr>
<tr>
<td>5/2/20</td>
<td>5/2/20</td>
<td>1</td>
</tr>
<tr>
<td>7/2/20</td>
<td>7/2/20</td>
<td>1</td>
</tr>
<tr>
<td>10/2/20</td>
<td>21/2/20</td>
<td>10</td>
</tr>
<tr>
<td>10/2/20</td>
<td>10/2/20</td>
<td>1</td>
</tr>
<tr>
<td>11/2/20</td>
<td>21/2/20</td>
<td>9</td>
</tr>
<tr>
<td>24/2/20</td>
<td>3/3/20</td>
<td>7</td>
</tr>
<tr>
<td>4/3/20</td>
<td>4/3/20</td>
<td>1</td>
</tr>
<tr>
<td>5/3/20</td>
<td>6/3/20</td>
<td>2</td>
</tr>
<tr>
<td>9/3/20</td>
<td>13/3/20</td>
<td>5</td>
</tr>
<tr>
<td>11/2/20</td>
<td>21/2/20</td>
<td>9</td>
</tr>
<tr>
<td>24/2/20</td>
<td>25/2/20</td>
<td>2</td>
</tr>
</tbody>
</table>

- **18kV and 33kV maintenance (gen.services) – no access P2**
- **LV network maintenance (exp.network) – limited access P2**
- **AUG test 2020 – no access P2**
- **On C side: Sector tests, 2 sectors at time (cont)**
- **Prepare 6 sectors for IROC exchange (A01, A02, A03, A06, A07, A08)**
- **Open roof: Prepare for IROC exchange, remove scaffolding and close roof**
- **Replace gas mixture with air**
- **Clean cleanroom**
- **ROC replacement: A02, A07**
- **Fill TPC with Ne CO2 N2**
- **Open roof: Remove tooling. Put 2 nacelles on A side**
- **Reinstall FEC frames, FECs, services in A06, A07, A08**
- **Test A01, A02, A03, A06, A07, A08**
- **Disconnect gas system**
- **Finalize: Put covers, cooling connections, test for leaks, secure fibers and cables**
- **Contingency**
- **HS insertion test**
- **Adjust TPC position**

**31.1.2020**

LS2 preparatory meeting
TPC upgrade sequence

- **Remove Services and FEE (outside cleanroom)**
  - 7 Mar

- **Uninstall MWPC ROC**
  - 11 Apr

- **Install GEM ROC**
  - 13 May (A)
  - 16 Aug (C)

- **Install new FEC + test**
  - 5 Jul (A)
  - 14 Oct (A)
  - 31 Oct (C)
  - 25 Aug (C)

- **TPC in cleanroom. Cleaning & irradiation tests**
  - 7 Mar
  - 11 Apr

- **FC HV infrastructure modification**
  - 25 Apr (A)
  - 5 Aug (C)

- **Survey, shimming, sealing**
  - 14 Jun (A)
  - 25 Aug (C)
  - 5 Jul (A)
  - 16 Sep (C)

- **Pre-commissioning with cosmic, Laser, pulser, Xray**
  - 14 Oct (A)
  - 31 Oct (C)
  - 25 Nov (A)
  - 7 Jan (C)
  - 12 Mar 2020

---

**TPC schedule v38**

- 31.1.2020
- LS2 preparatory meeting
Cage insertion test

- **Goal:** test cage insertion and interface with TPC

- Cage will be inserted from A-side, using ITS table and final rails

- Survey needed

- Open cleanroom roof and back wall – close cleanroom with plastic sheet

- Allow TPC laser operation during C-side test

- Test planned in weeks 7-8, after TPC ROC exchange
Copper cables (EN-EA)
Copper cables (EN-EA)

Progress pulling: 90%
Progress connectors: 45%
Progress test: 20%
### Optical fibers (EN-EL)

<table>
<thead>
<tr>
<th>Description</th>
<th>December</th>
<th>January 2020</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPC C &amp; TOP (full), FASS (on-Side) (10-20)</td>
<td>555</td>
<td>551</td>
<td>552</td>
</tr>
<tr>
<td>00 TRUNK 144 OF 27m (SURFACE)</td>
<td>POSE</td>
<td>TERMINATION</td>
<td>MATERIAL</td>
</tr>
<tr>
<td>MFT (left), FASS (on-Side) (80)</td>
<td>POSE</td>
<td>TERMINATION</td>
<td>MATERIAL</td>
</tr>
<tr>
<td>INSTALLATION D'UN DUCT ET SOUFFLAGE D'UN CABLE</td>
<td>POSE</td>
<td>TERMINATION</td>
<td>MATERIAL</td>
</tr>
</tbody>
</table>
EN-CV interventions

- **Big maintenance:**
  - SF: from Nov 2019 to mid Jan 2020. NO impact on ALICE as both magnets will be OFF – done
  - UW: **stop UX mixed water** for 2 days in week 41/2019 (October) – Tue 8 and Wed 9 Oct – done
  - SU: various small perturbations + 1 day **stop all cooling UX** + 1 day **stop all cooling SXL2** in week 16/2020 (April).

- **Small maintenance:**
  - UW: from mid Aug 2020 to mid Sep 2020. **Stop mixed water UX** for 1 day in week 37/2020 (September).
  - SF+SU: weeks 45-47/2020: cleaning towers (stop SF 1 week) + 1 day **stop all cooling UX**.

- Renovation transformer UIAC220 in w10/2020 → transparent but need to reduce mixed-water consumption

- **Stop demineralized water from 17 to 20 December 2019**

- **Ventilation:**
  - Gas extraction: w8/2019
  - UX25 cavern: w2/2020
  - MCH and MTG: Mon-Thu - w3/2020 – DONE
  - L3: to be done
  - ITS: → will be done before end June

- **Raw water:**
  - Test after Apr 2019. Short interruption (1 day), can be used tap water during the test.
Day-by-day sequence w4
UX25 activities w4 – Mon 20 Jan 2020

**EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2**

**CR3: install TA valves, redo flexible hoses distribution (Philippe + Bruno) – whole week**

**CR0: open 1 roxtec IT2 (Philippe)**
UX25 activities w4 – Tue 21 Jan 2020

EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2
UX25 activities w4 – Wed 22 Jan 2020

EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2
UX25 activities w4 – Thu 23 Jan 2020

EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2
UX25 activities w4 – Fri 24 Jan 2020

EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2
EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2
SXL2 activities w4 – Tue 21 Jan 2020

EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2

31.1.2020
LS2 preparatory meeting
SXL2 activities w4 – Wed 22 Jan 2020

EN-EL: 18kV, 3.3kV and LV network maintenance → NO access to P2
SXL2 activities w4 – Thu 23 Jan 2020

Blocks for cage insertion test

A-side
C-side
Sector test

31.1.2020 LS2 preparatory meeting
SXL2 activities w4 – Fri 24 Jan 2020

LS2 preparatory meeting
Miniframe activities w4 – Mon 20 Jan 2020

- Produce and install steps to protect FO boxes; finish ITS rack supports; build ITS rack trap (Cedric)
- Test ITS cooling hoses in b.167 (Philippe)
- Cut ITS crates cooling lines (Philippe)
- ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)
- ITS insertion test
- TPC connectors
- Cut ITS crates cooling lines (Philippe)
- Produce and install steps to protect FO boxes; finish ITS rack supports; build ITS rack trap (Cedric)
- Test ITS cooling hoses in b.167 (Philippe)
- Cut ITS crates cooling lines (Philippe)
Miniframe activities w4 – Tue 21 Jan 2020

- ITS insertion test
- ITS PP1-PP2 mockup cables (Antoine, Mimmo)
- PP1 cooling (Philippe)
- TPC connectors
Miniframe activities w4 – Wed 22 Jan 2020

ITS insertion test

ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe), TPC connectors
Miniframe activities w4 – Thu 23 Jan 2020

ITS insertion test

ITS PP1-PP2 mockup cables (Antoine, Mimmo),
PP1 cooling (Philippe)

TPC connectors
Miniframe activities w4 – Fri 24 Jan 2020

- ITS insertion test
- PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)
- TPC connectors
Day-by-day sequence w5
UX25 activities w5 – Mon 27 Jan 2020

EN-EL: AUG test → NO access to P2

ALTEAD: bring its inox pipes to SX2

ALTEAD: open 2 blocks CR0
UX25 activities w5 – Tue 28 Jan 2020

- Cleaning cavern (Topnet): 13:00 to 15:00
- EN-CV: restart TRD cooling plant
- Annual maintenance 2020 fire detection and gas detection (until February 11th)
- Install TA valves CR3 – whole week (Bruno, Philippe)
- Restart isobutane (MID)
- ALTEAD: modify crane speed (Manu+Filippo) (PM)

Cleaning under A-side false floor
Fix Delphi Frame base to concrete blocks
Displace scaffolding I→O
Open false floor: Didier

MCH tables
UX25 activities w5 – Wed 29 Jan 2020

- CR0: close 2 blocks (ALTEAD)
- CR0: close 1 roxtec IT2 (Philippe)
- SMB: open trench in front of SXL2 (inspection evacuation network)

**Diagram Details**

- Scaffolding Delphi Frame feet
- HMPID scaffolding (M3&4) at 13:30
- Supervision Mimmo
UX25 activities w5 – Thu 30 Jan 2020

- Install 2 beams
- Move comp. magnet to I-side
- Open HMPID M3
- Inform CV before starting.
  Displace M3 cover 40cm to the C-side
UX25 activities w5 – Fri 31 Jan 2020
EN-EL: AUG test → NO access to P2
SXL2 activities w5 – Tue 28 Jan 2020

Preparation TPC tool for the ROC exchange (weld fences, Evgeny)

ALTEAD+TPC: dry installation TPC infrastructure

TPC: irradiate TPC with X-ray tests (17:00 PM to 6:00 AM) – NO access to SXL2
SXL2 activities w5 – Wed 29 Jan 2020

ALTEAD+TPC: dry installation TPC infrastructure

31.1.2020

LS2 preparatory meeting
SXL2 activities w5 – Thu 30 Jan 2020

- Prepare ROC exchange
- A-side
- C-side
- Sector test

31.1.2020

LS2 preparatory meeting
Miniframe activities w5 – Mon 27 Jan 2020

EN-EL: AUG test → NO access to P2
Miniframe activities w5 – Tue 28 Jan 2020

- Produce and install steps to protect FO boxes; finish ITS rack supports; build ITS rack trap (Cedric)
- Produce and install ITS crates cooling hoses (Philippe)
- Weld ITS-PP2 cable trays (Cedric)
- Cut ITS crates cooling lines (Philippe)
- ITS insertion test
- TPC connectors
- ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)
- Cut ITS crates cooling lines (Philippe)
- Produce and install ITS crates cooling hoses (Philippe)
Miniframe activities w5 – Wed 29 Jan 2020

- ITS PP1-PP2 mockup cables (Antoine, Mimmo)
- PP1 cooling (Philippe)
- TPC connectors
- ITS insertion test (PM)
- Cut ITS crates cooling lines (Philippe)
Miniframe activities w5 – Thu 30 Jan 2020

- ITS insertion test (Antoine, Mimmo)
- PP1 cooling (Philippe)
- TPC connectors
Miniframe activities w5 – Fri 31 Jan 2020

- ITS insertion test
  - ITS PP1-PP2 mockup cables (Antoine, Mimmo)
  - PP1 cooling (Philippe)
- TPC connectors
Day-by-day sequence w6
UX25 activities w6 – Mon 3 Feb 2020

Install TA valves CR4 – whole week (Bruno, Philippe) - tbc

- Install TA valves CR4 – whole week (Bruno, Philippe) - tbc
- Close HMPID M3 (after 10:00)
- Fix electronics HMPID M3 (8:00 to 10:00)
- Re-route ITS/MFT cooling pipes
- Install TOF DCDC
- Move TOF SM7,8,9,10
UX25 activities w6 – Tue 4 Feb 2020

Cleaning cavern (Topnet): 13:00 to 15:00

Cleaning cavern (Topnet): 13:00 to 15:00

Install TOF DCDC

Open HMPID M4

Re-route ITS/MFT cooling pipes

Move cover first 40cm top and then 40 cm bottom

31.1.2020

LS2 preparatory meeting
UX25 activities w6 – Wed 5 Feb 2020

Cavern lift maintenance: no access to UX25 from 6:00 AM to 8:00 AM

IT: intervention on TN network of point 2, will generate a network cut of few minutes between 8:30 and 12:00

ALTEAD: zoning SX2 crane (MELONI) (from 14:30)
UX25 activities w6 – Thu 6 Feb 2020

- Fix electronics HMPID M4/M5
- Re-route ITS/MFT cooling pipes
- Install TOF DCDC
- MFT trunks
UX25 activities w6 – Fri 7 Feb 2020

TPC/TOF trunks

Install TOF DCDC

Close HMPID M4

Re-route ITS/MFT cooling pipes
SXL2 activities w6 – Mon 3 Feb 2020

Start at 8:30

Remove scaffolding (Alu It)
SXL2 activities w6 – Tue 4 Feb 2020

TPC, ALTEAD: open roof, install tooling to replace A02 and A07, put access staircase and fences, close roof
TPC: replace gas mixture with air
TPC: replace gas mixture with air
SXL2 activities w6 – Fri 7 Feb 2020
Miniframe activities w6 – Mon 3 Feb 2020

- EN-EL: install 220V outlets inside Miniframe

- ITS PP1-PP2 mockup cables (Antoine, Mimmo)
- PP1 cooling (Philippe)

- ITS insertion test

- Install lights (Philippe)

- TPC connectors
Miniframe activities w6 – Tue 4 Feb 2020

ITS insertion test

- ITS connectors

ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)
Miniframe activities w6 – Wed 5 Feb 2020

- ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)
- ITS connectors
- Install BCM box
- ITS connectors
Miniframe activities w6 – Thu 6 Feb 2020

- ITS PP1-PP2 mockup cables (Antoine, Mimmo)
- PP1 cooling (Philippe)
- ITS connectors
- Install FIT signal PP

ITS connectors

ITS connectors

ITS connectors
Miniframe activities w6 – Fri 7 Feb 2020

ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)

Install ITS access platforms

ITS connectors

ITS connectors

ITS connectors
Day-by-day sequence w7
UX25 activities w7 – Mon 10 Feb 2020

- TPC/TOF trunks
- Re-route ITS/MFT cooling pipes
- Remove HMPID scaffolding after 10:00
- Supervision Mimmo
- Weld MID gas pipes
- VIC needed

UPX25 - 3225
P/X24 - 2122
ZONE A

ZONE C
DIPOLER FASS

TPC/TO trunks

AREA B INSIDE L3 MAGNET

U1-206
19 Bm2

U1-207
4 Bm2

U1-209
12 Bm2
UX25 activities w7 – Tue 11 Feb 2020

Cleaning cavern (Topnet): 13:00 to 15:00

- TPC/TOF trunks
- Weld MID gas pipes
- Re-route ITS/MFT cooling pipes
UX25 activities w7 – Wed 12 Feb 2020

TPC/TOF trunks

Weld MID gas pipes

Re-route ITS/MFT cooling pipes

31.1.2020 LS2 preparatory meeting
UX25 activities w7 – Thu 13 Feb 2020

TPC/TOF trunks

Re-route ITS/MFT cooling pipes

31.1.2020
LS2 preparatory meeting
UX25 activities w7 – Fri 14 Feb 2020

TPC/TOF trunks

Re-route ITS/MFT cooling pipes

LS2 preparatory meeting
TPC, ALTEAD & P2tech: open roof, remove tooling, put blocks and nacelles, start preparing blocks for cage insertion test.
SXL2 activities w7 – Tue 11 Feb 2020

31.1.2020

Cage insertion test
FEC install.
A-side
C-side

LS2 preparatory meeting
SXL2 activities w7 – Wed 12 Feb 2020

31.1.2020

LS2 preparatory meeting
SXL2 activities w7 – Thu 13 Feb 2020

31.1.2020
LS2 preparatory meeting
SXL2 activities w7 – Fri 14 Feb 2020

- Cage insertion test
- FEC install.

LS2 preparatory meeting
Miniframe activities w7 – Mon 10 Feb 2020

ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)
Miniframe activities w7 – Tue 11 Feb 2020

- ITS PP1-PP2 mockup cables (Antoine, Mimmo)
- PP1 cooling (Philippe)
- ITS connectors
- ITS connectors
- ITS connectors
Miniframe activities w7 – Wed 12 Feb 2020

ITS PP1-PP2 mockup cables (Antoine, Mimmo), PP1 cooling (Philippe)

ITS connectors

ITS connectors
Miniframe activities w7 – Thu 13 Feb 2020

- ITS PP1-PP2 mockup cables (Antoine, Mimmo)
- PP1 cooling (Philippe)

ITS connectors

31.1.2020 LS2 preparatory meeting
Miniframe activities w7 – Fri 14 Feb 2020

ITS PP1-PP2 mockup cables
(Anthony, Mimmo)
Pp1-cooling (Philippe)

ITS connectors

ITS connectors

ITS connectors