

# TS3 preparatory meeting

A.Tauro



## Intervention on 400kV substation in Bois-Tollot

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On 11<sup>th</sup> October 2016 late evening, RTE (French transmission system operator) advised that they have an anomaly on one of the capacitive voltage transformers (TCT) of the incoming 400kV lines supplying CERN (internal crack that empty the oil from the upper to the lower level).

This anomaly is remotely monitored by RTE and site visits are organized every week.

On 21<sup>st</sup> October 2016, RTE advised that this TCT has to be replaced by end of November with the remaining two to be replaced during the EYETS.

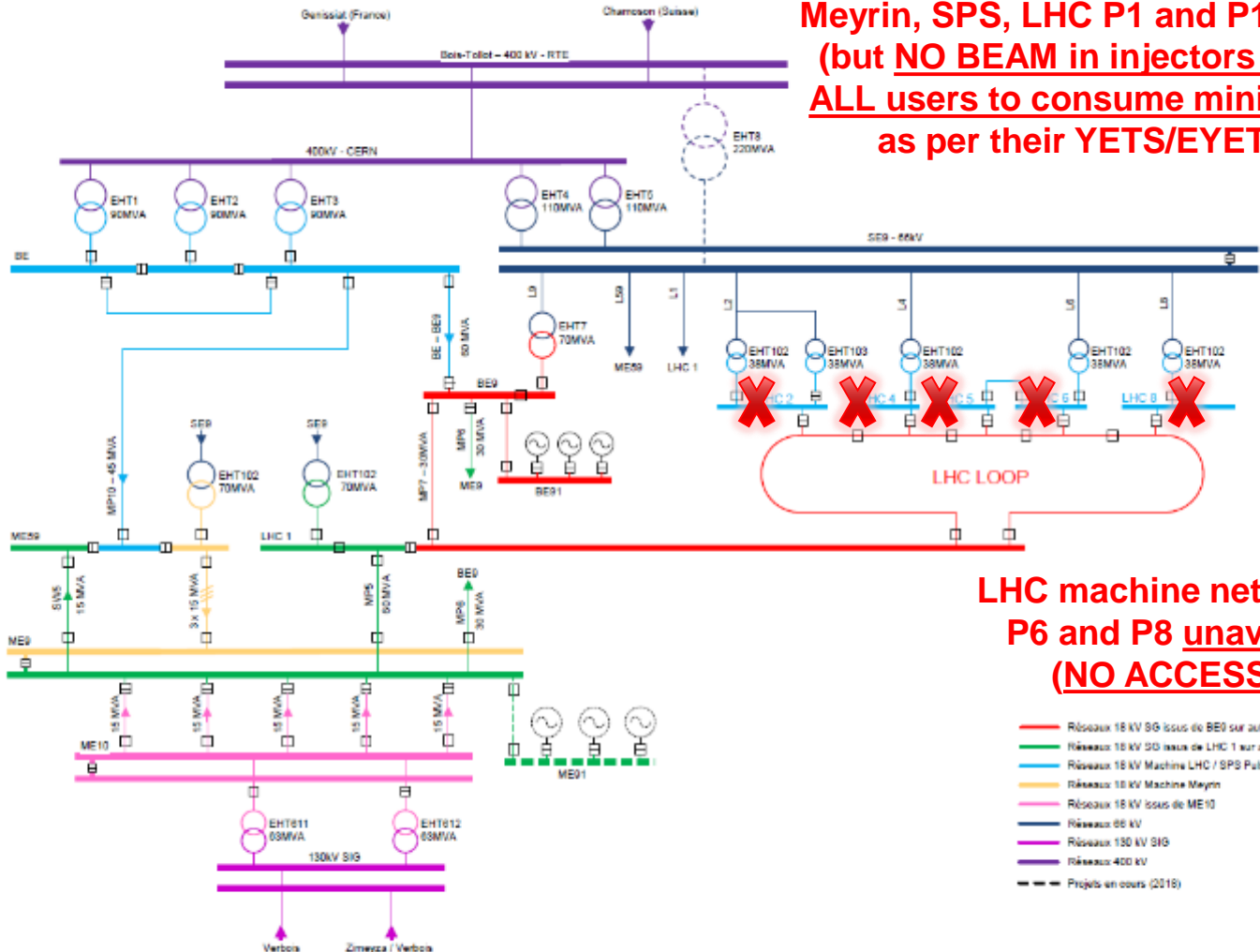
## Intervention date, planning and constraints

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As a result, the date of **Wednesday, 2<sup>nd</sup> November** has been retained for the intervention on the faulty TCT.

- Conditions applicable from 6am to the completion of the intervention:
  - **ALL users are expected to reduce their electrical consumption as per their YETS/EYETS configuration (there will be a 60 MVA limitation on the Swiss network)**
  - **No beam in the injectors and experiments (idle/stand-by mode)**
- Indicative planning (to be confirmed during the day of the intervention):
  - From 6am to 8am – Network reconfiguration by EN-EL (transfer from RTE to SIG)
  - From 8am to 2 pm – RTE intervention, including their own consignation
    - **Power cut on LHC machine networks (P2, P4, P5, P6, P8)**
    - **No access in the LHC tunnel**
  - From 2pm to 4pm – Network reconfiguration EN-EL (transfer from SIG to RTE)
  - From 4pm onwards – Stand-by service interventions as required

# Electrical network configuration during the intervention



**Meyrin, SPS, LHC P1 and P18 will remain supplied (but NO BEAM in injectors and experiments and ALL users to consume minimum electrical power as per their YETS/EYETS configurations)**

**LHC machine networks @ P2, P4, P5, P6 and P8 unavailable for 6 hours (NO ACCESS in LHC tunnel)**

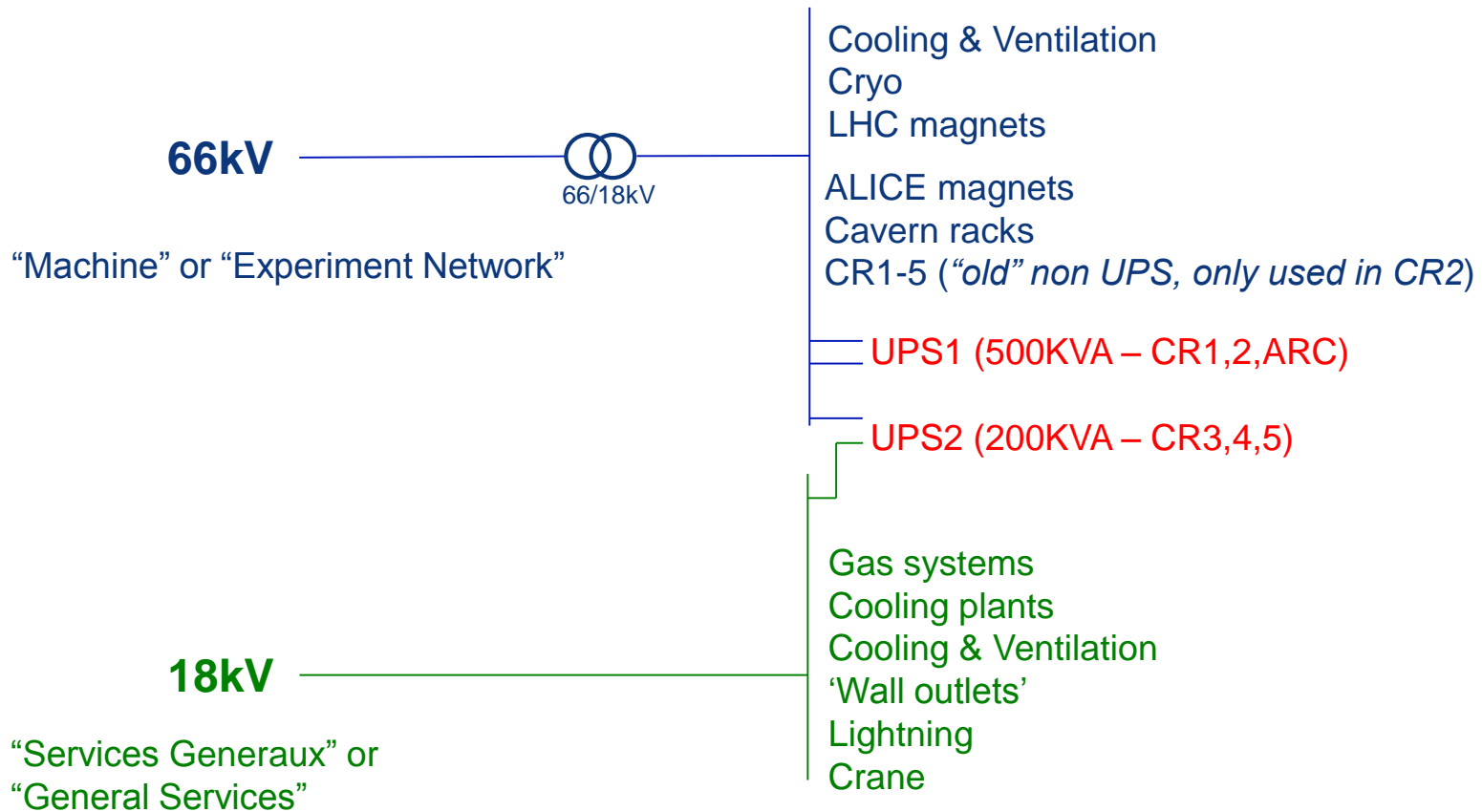
- Réseau 15 kV SG issus de BE0 sur autotransfert
- Réseau 15 kV SG issus de LHC 1 sur autotransfert
- Réseau 15 kV Machine LHC / SPS Pulsé
- Réseau 15 kV Machine Meyrin
- Réseau 15 kV issus de ME10
- Réseau 66 kV
- Réseau 130 kV SIG
- Réseau 400 kV
- Projets en cours (2018)

# Detailed action list on our side

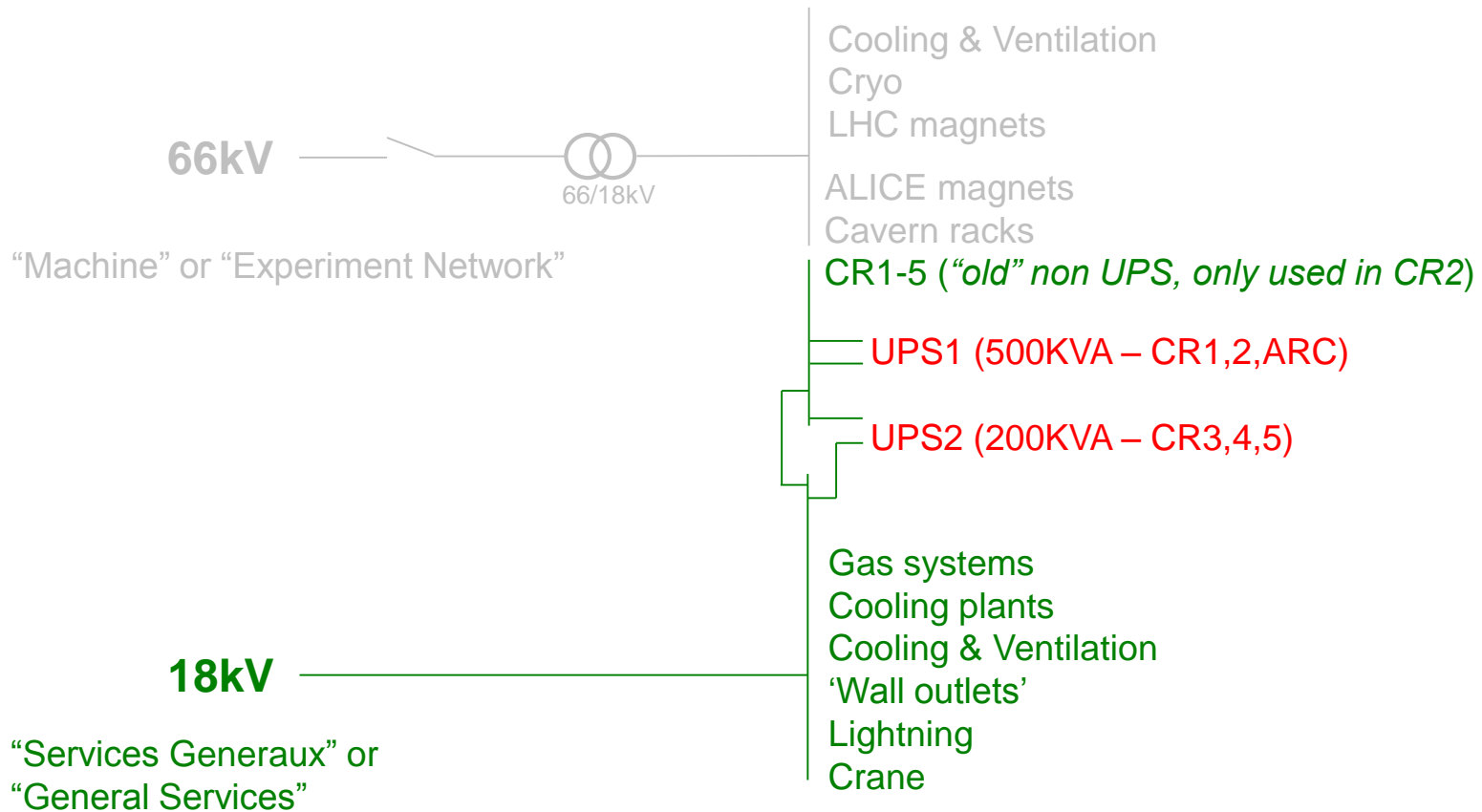
1. **Tue 15:00 latest. Repowering of EXD1/2X (the one that powers the UPS for CR1,CR2,ARC) from EBD1/2X. Switch off as much as possible in CR1-2 and ARC. The UPS500kVA won't be cut (DAQ/HLT/ARC). This intervention is without cut.**
  
2. **Tue 18:00:** detectors shall switch off all equipment as much as possible in the cavern racks. This means:
  - a. Switching off all channels (can be done remotely through DCS)
  - b. Switching off the device physically (green switch on front Wieners, power switches on CAENs etc.)
  - c. Switch off the power inside the racks by switching off the 4 big circuit breakers on the box in each rack (the small one, powering the turbine can be left on if it is on)

Detectors are advised to take note on what they did to switch off, in order to not forget anything when switching on again.
  
3. Although CR4 will remain powered, detectors are free to switch things off in CR4 if needed.
  
4. **Tue 19:00:** all power to the racks will be cut. Andre will come in to do this (and make a tour to see everything is really off). In case of justified exception (to be agreed by TC), racks can remain powered until **Wed early morning (6:00)**.
  
5. **Wed 16:00: once the intervention is over and power is declared stable again, the reverse can be done**
  - a. We will switch on the power to the cavern racks
  - b. Detectors can switch on their equipment
  
6. **Thu AM. The coupling between EXD1/2X and EBD1/2X will be removed.** This intervention is without cut

# Nominal ALICE configuration



# Situation during Wed intervention



# Things which won't be cut

Not even for 30''

- DAQ/HLT/DCS/CR4
- Lights, wall outlets
- Cranes
  
- Detector cooling plants
  
- Gas systems

Please note that we will be running in a very degraded mode with serious power limitation; a small perturbation or accidental switch on of a big consumer could make that we loose also these things



# General information

- LHC-TS3: from Mon Oct 31<sup>st</sup> at 6:00 AM to Friday 17:00 (possibility to extend the TS until Tue 8<sup>th</sup>, depending on cryo conditions during EL intervention)
- Planning:
  - Switch off both magnets Mon 6:00 AM → **SL** – take out interlock keys
  - RP check: Mon 8:30 - 9:00 → Klaus
  - Access starts Mon at 9:00
  - **Ramp up both magnets Fri 12:30 (noon)**  
**>>> no access in L3/FASS/Dipole afterwards <<<**
  - Cavern access stops Fri 12:00
- Access mode: automatic restricted (with token)

# Access restrictions

- No access UX25 on Wed between 6:00 AM and 16:00 PM
  - EL intervention 400kV
- No access UX25 on Thu between 6:00 AM and 8:00 AM
  - PX24 lift maintenance
- No access inside L3, Dipole, FASS after Fri 12:00
  - both magnets ON
- **NO access to triplets area (ADC)**

# Detector activities

# 1/4

- TPC GEM chamber:
  - Move ROC chamber in support frame (~70 kg) to position in Miniframe 'à bras d'homme', and connect HV and gas → chamber will arrive on Mon 14:00
  - **SPIE: continuity tests HV cables – Mon**
  - Connect gas bottles
  - Install scope in A rack
  - Pull 4 signal cables through MF (TPC team)
  - Debug
- TPC other:
  - LV power supply cooling: cleaning of some circuits in rack I25 (Philippe) → **Mon AM**
  - Check RCU2 cooling in A12-A13 → **Start Mon AM, access via Miniframe. If any cooling loop has to be opened wait RP check (Mon PM)**
  - Check Ethernet connection A12 RP2 → **Access via Miniframe**
  - Fix one branch of 5 FECs nor working properly (C16, RP2) → **Antoine available? ½ day**
  - Obsolete → Replace RCU2 in case of problems during firmware update
  - TPC laser maintenance: test new alignment TV monitor. This is a continuation of work during previous TS. General check of both lasers in view of the scheduled power cut – **Thu-Fri**

# Detector activities

# 2/4

- TOF:
  - Replace one DCDC converter in S07. Displace the supermodule by 15-20 cm.
  - Intervention will be performed on **Monday starting at 9:00** (Yannick, Samuel, Andrea)
  - New procedure finalized after the intervention
- TRD:
  - Inspection of optical fibers inside L3 (two persons, 0.5 days, any time)
  - Wiener PS inspection: cleaning, eventually replacements (I-/O-/C-area)
  - Inspection of Eth. switches and multiplexers (I-/O-/C-area)
  - HV hardware replacements (CR4)
- EMC/DCA:
  - Install 8 FECs in the PHOS region of DCAL long supermodels for fully recovering DCAL. ½ day needed

# L3 access

## Watcher in **bold**



	Mon	Tue	Wed	Thu	Fri
AM shift (9:00 – 12:30)	<b>TOF</b> TPC-A SPIE-MNF	EN-MME?	NO access	<b>TRD</b>	
PM shift (13:30 – 17:00)	<b>EMC</b> TPC-A/C TPC-MNF EN-MME	<b>EN-MME?</b>	NO access		NO access

## AD:

- Exchange 1 signal and 1 HV connector in C side for AD. **SPIE on Mon 9:00**
- Maintenance to the FEE of AD in C-Side

## • FIT:

- Unmount NIM module of FIT electronic (rack C33). We would like to use it during our PS test (26 October-2November). In last day of TS3 we will return it to P2. The access take ~ 30 min for remote and installation.

## MTR:

- One RPC tripped last night, cannot be recovered → check/replace the HV cable (nacelle needed side outside)

## MCH:

- Station 1: no work
- Station 2: fix few bus patches; need to open chamber 3 – start on Mon
- Stations 3-4-5 (slats): start Mon
  - Fix LV issue on CH10L: 4 top slats have bad noise and/or occupancy (probably connection issues at the bottom of the chamber)
  - Fix few bus patches on station 3
  - We do not need to open the chambers on stations 345
- Therefore, we need to access FASS and dipole: magnets OFF

# EN-CV-DC

- Possible clogging on primary filters of SSD/SDD & SPD cooling plants.
- Stop for a while the primary network and clean the filter, on Monday:
  - For SSD/SDD it will increase a bit the temperature but for me it could be done in run
  - For SPD it will be better if we can stop the system



# Other activities

- EN-MME: put 4 accelerometers on TPC inside L3 + cabling (Mon PM-Tue)
- EL/CO: 2 Nov (new date to be defined)
  - UPS battery test + DSS contact test
  - Test UPS interlock (during battery test)
  - Upload latest CIT FW in ESD3/2X et EOD1/2X
- EN-HE: maintenance UX25 crane – Tue
- BE-ICS-AS:
  - Gas detection maintenance (SG2/UX25), ½ day: Mon 31<sup>st</sup>
  - UX25 SNIFFER maintenance (rotation): Tue 1<sup>st</sup>
  - Maintenance fire detection systems: Mon-Tue and Thu
- BE-ICS-AC: maintenance PX24 access door
- TE-VSC: close manual valve Mon 9:00 and reopen it Fri 12:00
- EN-CV-OP: check MCH ST1-2 ventilation
- EN-STI-ECE: install RADMON cable + sensor close to MNF valve area (Mon 14:00)

# DCS

- DCS will do the usual backup of all WinCC systems on the Monday morning, starting at 9h. DCS will be unavailable for a while during this intervention. No other activity is planned, other than operational tests with available detectors. But this will be coordinated with run coordination.

# Visits

- Protocol: 28 EU Ambassadors from Bern, on Wed 2 Nov from 10:40 to 11:25 (guides: Paolo, Karel)
  - postponed to EYETS
  - Ambassador + 4 persons will come on **Thu from 10:30 till 11:30** (guide Karel)