

## Accelerator complex status

### End week 17 (Sunday 26<sup>th</sup> April 2015)

#### TI (Jesper Nielsen)

<https://wikis/display/DC/2015/04/20/TI+summary+week+17%2C+2015>

#### Linacs (Michael O'Neil)

##### Linac 2:

No serious problems this week. On Wednesday (12h43) and again on Saturday (0h55) the RF system tripped and was reset within 5 minutes. The RF team have checked the system again following last week's repairs and all available diagnostic signals appear normal.

The source arc current has been increased by 2A (4%) to its nominal value and results in approximately 4% more intensity from the Linac. The arc current had been kept low following the cathode replacement earlier this year.

##### Linac 3:

Not operational. Preparations are ongoing for the Lead ion run.

#### Booster (Klaus Hanke)

A week or more or less smooth running with very little down time. Throughout the week staggered beam was delivered to ISOLDE with high availability, as well as the beams to the downstream machines. In particular AD beam was delivered to the PS for setting up on their side. A number of MDs were also performed, among others on the Finemet RF system.

A lot of work was done to set up the beam for Multi-turn extraction and the BCMS beam.

In terms of problems there were a few stops of Linac2, and a few faults of the CO2 cavity in Ring2. This caused a 45min stop on Friday, the other faults were resettable by the operator.

#### PS (Rende Steerenberg)

The PS had a reasonable week, despite a few prolonged stops due to problems.

On Monday during the breakdown of the LINAC2 more detailed measurements were carried out on the PFW circuit in order to diagnose further the source of the 5 kHz ripple that make the MTE capture efficiency fluctuate. Following this an error in the connection of the FW and DW PFW circuits was found that could contribute to the ripple.

On Wednesday early morning (02:00) there was a long stop due to a CPU related problem on POPS that could not be solved by the piquet and required specialist intervention. This caused in total nearly 10 hours beam down time.

Wednesday afternoon an access was required in the PS underground for a leak on the East Area beam line, in the shadow of this access the connection error on the FW and DW PFW circuit was

corrected, with as result a dramatic decrease in the 5 kHz ripple. A much more stable MTE capture process was also measured. This access caused in total 1 hour and 30 minutes beam downtime.

The MTE kicker still suffer from missing pulses, but the source of the problem, a bad transmission of serial data, has been identified. Further investigations are required before a solution can be deployed.

Throughout the week the nTOF beam was delivered at various intensities on the request of the nTOF team that performs background measurements in the experimental area. When nTOF requests nominal beam often the maximum flux of  $1.6E12$  p/s with sometime more than  $8E12$  ppp is delivered. The high intensity/doublet LHC beams were delivered to the SPS for the scrubbing and the LHCPROBE and later the LHCINDIV were delivered to the SPS for the LHC. The SFTPRO beam with CT extraction was also delivered to the SPS for setting up on the SPS side.

The East Area beam has been setup with slow and fast extraction. The latter will be used to attempt the cross calibration of the secondary emission chamber in the East Area beam lines, using a self-calibrating BCT in the first part of the beam line. The coming week the different topics for the IRRAD and CHARM will be commissioned with the slow extracted beam and on the 4th of May physics in the East Area will start. This year we suffered again from the shared responsibility for the non-renovated marguerites, which initially could not be controlled. The system will be replaced by BI during the YETS 2015-2016.

The AD beam has been received from the PSB and setting up in the PS has started. In the coming week we expect the PSB to deliver the BCMS beam for setting up of the the BCMS beam in the PS.

## SPS (Verana Kain)

Monday to Wednesday were mainly dedicated to scrubbing the SPS and occasionally delivering pilot and also single nominal LHC bunches to the LHC. LHC filling was impacted by a problem with the BQM attenuator due to a router problem in the tunnel. The issue was repaired Wednesday morning during an access.

Due to the significant amount of downtime with the LINAC2 issue (total downtime  $\sim 35$  h), PS POPS issues ( $\sim 8$  h), 800 MHz and others and the reduced efficiency of scrubbing with the MKP4 heating and vacuum pressure limitation, it was decided to continue scrubbing also on the weekend of week 17. The goal of this scrubbing week was to characterize the efficiency of scrubbing for the  $2e+11$  ppp beams.

On Thursday the proton fixed target beam was set up in the SPS and the transfer lines to the targets with low intensity. The spill structure can now be controlled via feed forward using the main quadrupoles as alternative to the servo spill quadrupole feedback. The spill quality of the new technique will have to be compared with the results from the conventional method.

On Thursday and Friday the main power converters tripped several times due to a water cooling interlock in BA2. Since a relay was removed connected to a CV card for the status of a pump Friday evening, the fault has not re-occurred.

On Friday during day time the fixed target beam was set up in the north area to be ready for physics start next Monday. In parallel an aperture scan was carried in LSS4 with LHC pilot beam after the coldex vacuum chamber replacement. The aperture was found to be sufficient for high intensity beams.

Friday evening the machine was put back into scrubbing mode.

#### **Issues to be followed up:**

We now have 2 BLM channels out of 5 not working on the ZS. BI was contacted to possibly repair these before the proton fixed target physics run next Monday. So far it is not clear whether this can be done on Monday.

### **ISOLDE (Lefteris Fadakis)**

Another week of physics at ISOLDE for GPS, with users taking up to 68% of pulses from the PSB. RILIS and Windmill were working with Mercury(Hg) since Wednesday. A lot of work on the RFQ which now seems ready to accommodate users. A successful commissioning of the fire detection for the building 198, 199 and 170 tunnel on Thursday afternoon.

For more detailed description please see below. For a controls & applications update please go to the end.

#### **Tuesday 21/04/15**

##### **GPS**

RILIS afternoon intervention to CBO to introduce a faraday cup and Ions counter.

Ahead of schedule, tried to do a proton scan on target #511 Pb but we had problem with 3 power supplies in CA0 due to a vacuum interlock. The interlock was wrongly connected to CBO.

One of the PS was for the deflector YCA0.DE0600 which is responsible to take the beam to the tapestation. Gave stable beam to ISOLTRAP for the night.

##### **HRS**

Carla Babcock working with RFQ. Stable beam set up with 20Ne.

#### **Wednesday 22/04/15**

##### **GPS**

Fixed the wrongly connected vacuum interlock cables.

Started the p scan with  $^{132}\text{Xe}$  but there was an issue with the threshold of the watchdog in the BTY line and the beam was being lost. Fabrice correctly configured the watchdog for STAGISO beam and everything went well after. Also the vistar configuration application was not able to connect to the database. We had to increase the temperature of the target to see radioactive beam on the tapestation. Then TISD tried to change the value of YCA0.DE0600 from 2300 and discovered that by changing the value increases the counts in the tapestation.

Problem with a valve that was stuck. Called the vacuum piquet. It seems that the users tried to close and open the valve very fast and it got stuck in the middle. Piquet said that: When we change mass we should close LAX10-VVS2 instead.

GHM

BI was contacted due to loud noise when taking out a Faraday cup. Gerrit Jan Focker said that the noise is no concern but he found a small leak and notified William Andrezza.

*HRS*

Carla working with RFQ. Setting up 40Ar beam for energy loss measurements. Electrodes for ISCOOL replacement are finished.

**Thursday 23/04/15**

Note from Ana-Paula(Safety):

We did the commissioning of the fire detection for the building 198, 199 and 170 tunnel.

Minor modification have to be done but everything went well. The système is operational and commissioned.

PSB problem with a kicker, no protons for ~10' (15:30-15:45)

*GPS*

Continuing with protons on Hg for IS598, Windmill and MR-TOF. The GPS HV tripped causing a vacuum interlock that stopped several power supplies and closed the valve between GPS10 and GPS20. After two hours the HV tripped again.

*HRS*

Put back in place the Injection and Extraction electrodes. INJ1, INJ2, EXT1 and inj/ext irises replaced, along with HV insulators and rigid wires connecting INJ and EXT electrodes. Inj/ext ground electrodes and EXT2 cleaned and put back in. Flange with plate for laser alignment replaced. Pumping down over night.

**Friday 24/04/15**

The Beta-gamma detector in ISOLDE close to LA2, was getting a threshold reached alarm. RP was contacted and they raised the threshold by 50%.

*GPS*

Yield measurements on 179Hg and 180Hg.

With RILIS people we attempted to optimize the proton beam steering to the target. We were using FC490 and mass 188Hg in RILIS mode. Continuing with protons on Hg for IS598, Windmill and MR-TOF.

*HRS*

RFQ RF frontend crashed, fixed by a power cycle. Carla continuing the work with RFQ.

## Saturday 25/04/15

### *GPS*

RILIS mode with 177Hg. The target temperature was increased to 390A (around 670deg C). ISOLTRAP takes beam in the afternoon 208Pb in VADIS mode.

### *HRS*

Setting up 20Ne beam. Faced a few issues that are being investigated

## Sunday 26/04/15

### *GPS*

scans on Mercury(Hg), 183, 185, 198, 202, 203, 206, 208. RILIS releases the beam to windmill with 198Hg.

### *HRS*

20Ne beam running overnight at 40kV is stable - ready for users

### **Controls & Applications Update:**

- Added acq2 for anode, oven and srcmag on Timber for both HRS and GPS.
- Removed the pop up message from the tape station application.
- Updated the super cycle so now we can write in the logbook. Needed to update the elogbook libraries.
- Increased the Stop Limit of the mass scan application from 238 to 300, after a request from TISD.
- VISTAR: There was a problem with the creation of selector for some parameters of the VISTAR when using STAGISO. Marcin from Fixed display support managed to solve the issue.