Status report of the AN2000 and CN7 MeV accelerators

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INTRODUCTION

During the 2014 the AN2000 and CN machine delivered beam to users for less hours than the average. This was due to:
- a major accident happened to the AN2000 that forced the substitution of the accelerating tube
- a special maintenance to the apparatuses on the high voltage terminal for the CN7 MeV.

THE AN2000 ACCELERATOR

The AN2000 (layout in fig.1) during 2014 delivered beam for 1219 hours with a preparation time of 190 hours.

Fig. 1. The AN2000 laboratory footprint.

The unusual low operation time of the AN accelerator was due to the perforation of the accelerating tube due to beam impinging on the glass insulator (see fig. 2). This accident happened following the long operation at very low voltage and high beam intensity. Fortunately, there was a replacement tube in house and it was assembled in a relative short time.

Fig2. The Damaged accelerating tube on the right hand side and the vacuum tests on the new one on the left.

During this forced machine stop, we performed a deep maintenance and refurbishment of the whole machine and part of the charging belt because we do not have a spare in house and it is not easy to acquire a new one. A new beam stopper with the magnetic actuator was installed in order to have less vacuum losses during its frequent insertion in the beam line.

We did the maintenance of the motor, the cleaning of the column, the check of the resistor chain, the check of the alternator on the high voltage terminal, the realignment of the accelerator with respect of the existing beam lines and the final commissioning of the facility.

THE CN 7 MEV ACCELERATOR

The CN 7 MeV accelerator (fig. 2) during the 2014 run for 1408 hours: 289 hours for machine conditioning and 1119 beam on target. The machine needed 300 hours of maintenance.

Fig. 2. The CN 7 MeV laboratory footprint.

The major work for machine maintenance was done on the terminal consisting in:
- The cleaning and the refurbishing of the magnetic triplet;
- The substitution of the insulator for the electrical deflector for the pulsing system;
- the refurbishing of the bunching system;
- the substitution of the centering electrode for the electrostatic focusing;
- the cleaning of the charging plates for the charging belt.
- The refurbishing of the RF system for the pulsed beam
- The tuning of the oscillator and the compressor

For the machine upgrading more work was done on the on line pulsing system.

Fig. 3. On the left hand side: the new connection and cable shielding for the pick-up; on the right hand side: the detail of the new electrode and new connection.