Purpose: The first Italian hospital-based facility for hadrontherapy is the Centro Nazionale di Adroterapia Oncologica (CNAO) which started the clinical activity on September 2011 with protons beams. The control of the treatment is performed online by the Dose Delivery (DD) system which guides the whole treatment by measuring beam characteristics as number of delivered particles and beam position. The author will present the comparison between the required and delivered quantities.

Methods: The CNAO facility is based on a synchrotron designed to accelerate and deliver proton and carbon ion beams in the clinical ranges. Unlike most of the proton-therapy centres, the delivery technique adopted at CNAO is the "quasi-discrete" active scanning where dedicated magnets are used to drive a pencil beam through the target and the beam is normally not switched off during the transition between adjacent spots. These operations are performed by the DD system which, based on the treatment planning and the online analysis of dedicated beam monitor chambers, drives the scanning magnets. Spot by spot the DD records data which allow the comparison between the measured number of particles and position and the prescription.

Results: The data collected by the dose delivery during the treatments were analyzed in detail, each treatment consisting in more than 30 identical fractions. This allows checking the stability and the accuracy of the CNAO delivery over identical spot sequences. The comparison between the measured number of particles, the measured position of each spot, and the corresponding prescribed quantities will be presented in detail. Critical points will be discussed together with the proposed improvement of the system.

Conclusions: The results confirm the good performance of the CNAO beam delivery obtained during the commissioning phase.