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ILL liquid helium station

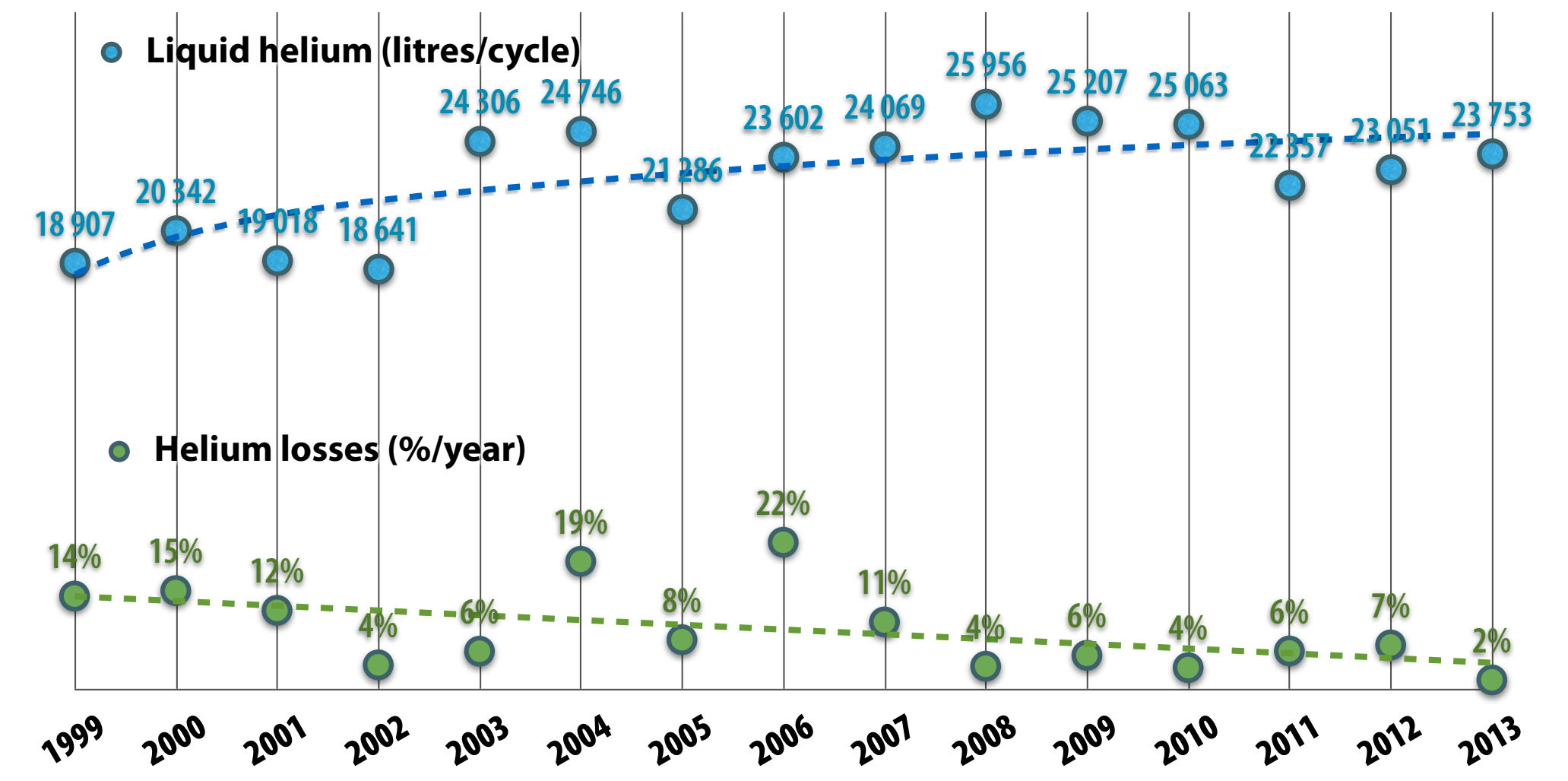
In Grenoble, the research community shares four He liquefiers managed by CEA and CNRS and producing about 500.000 litres per year. Liquid helium is shipped to ILL in 100L and 250L dewars for immediate consumption and emptied dewars are returned for refill.

We record the weights of the dewars and the volumes measured by gasometers located on the instruments to detect individual losses.

Recently, we connected the new Institut de Biologie

Structurale (IBS) to our recovery line with a 460 m long pipeline. We now collect, compress and return to liquefiers about 14.000 m³ of helium per month for ESRF, IBS and ILL.

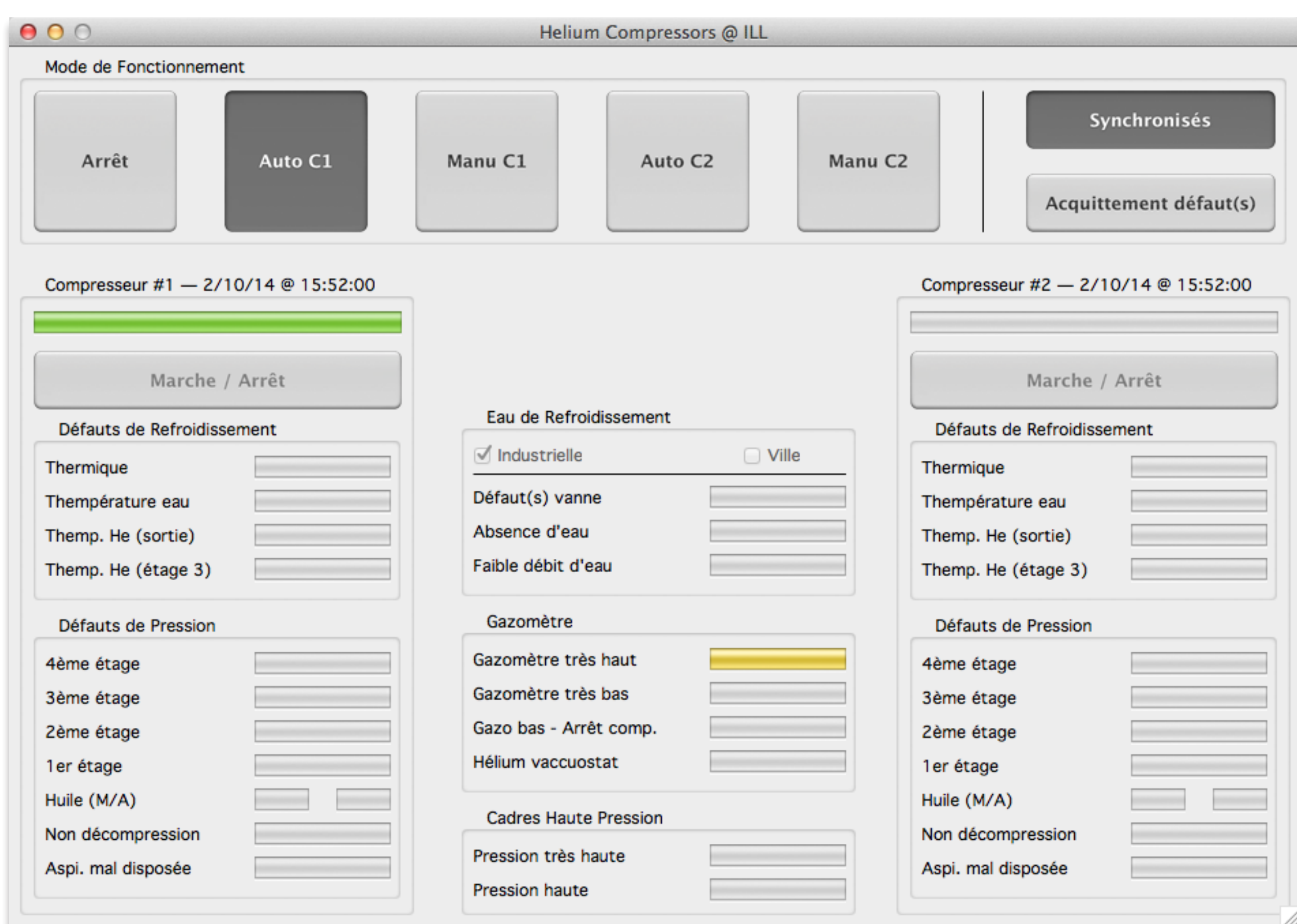
The gas is collected in a 20 m³ balloon which ensures a relative stability of the pressure in the He recovery line (a few mbar above atmospheric pressure). The balloon is evacuated by compressors filling racks of bottles at a maximum rate of 2x77 m³/hour (max pressure of 200 bar). When a rack is full, the gas is returned to one of the liquefiers through a kilometre-long capillary by pressure equilibrium.



ILL consumption of liquid helium per cycle (49 days)



Helium compressors



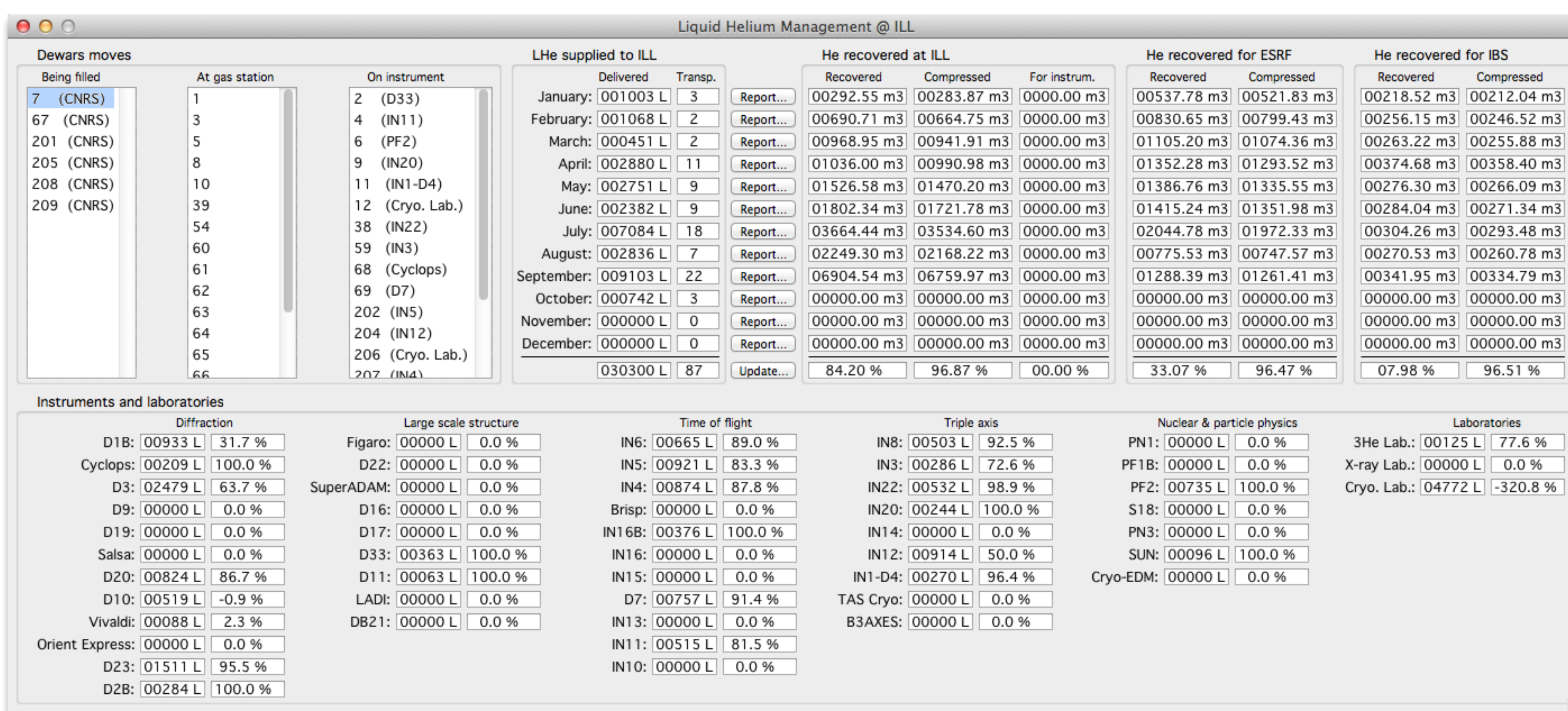
Compressors monitoring panel

We use counters installed at strategic locations to speed up the location of leaks. Recently, we added mass spectrometer plugs at the same locations to identify equipment polluting the recovery line.

To cope with flow rates greater than 77 m³/hour, we replaced the 30-year old PLCs with modern and redundant PLCs: automatically, they decide if the compressors must be operated in parallel; they switch to the most appropriate water-cooling circuit and they report alarms whenever needed.

The distribution of liquid helium to 40 instruments and the recovery of about 14.000 m³ of gas per month require a rigorous day-to-day management. In order

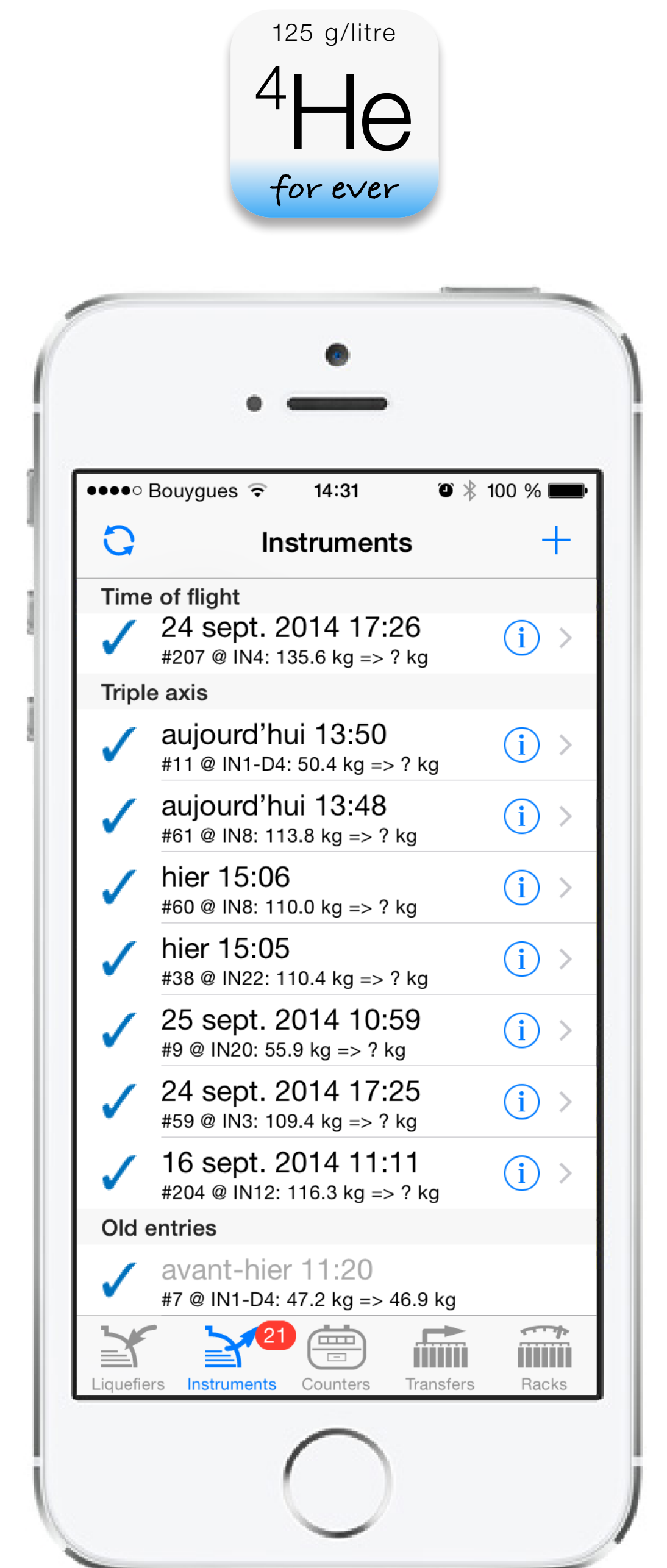
to ease this task, we have developed a new version of our iOS application featuring automatic synchronisation: the data are still collected remotely in the guide halls and at the gas station, but this can now be done simultaneously by several teammates using synchronised iPods and iPhones.



Application used to manage the gas at ILL, ESRF and IBS

Few years ago, we developed a desktop application for managing the volumes used and recovered on the instruments.

Today, this application also takes into account the volumes returned by the ESRF and the IBS, produces automatically monthly and yearly reports and displays remotely the real-time status of the He compressors.



He4Ever 2



More about He4Ever

Thanks to the efforts made by the staff and our visiting scientists, we save 500 k€ per year and recycle 95% of natural helium gas.