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## C1Po1D-02: Commissioning results for the MITICA cryogenic plant project

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The ITER Neutral Beam Test Facility (NBTF), is hosted in Padova, Italy and includes the MITICA experiment –a full-scale prototype of the ITER heating neutral beam injector (HNB). The large cryopump is intended to absorb the gas used to neutralize the high energy beams of the MITICA experiment. The cryopump is cooled by a dedicated cryogenic plant which was procured by Fusion for Energy (F4E) in 2016.

AL-AT (Air Liquide Advanced Technologies) has taken part to the project by supplying the cryogenic plant. The plant includes the refrigerator associated to its compressor station, oil removal system, auxiliary cold box, dedicated for supply of SHe flow for the cryopanel and GHe flow for thermal shields and equipped with magnetic bearing cold circulators, cryogenic transfer lines, storage tank for helium gas, analysers, atmospheric heater, water cooling system and LN<sub>2</sub> phase separator.

The aim of this paper is to present the main technical features of the overall cryogenic system and the main results of the commissioning phase of the refrigerator. The commissioning and testing results are reported detailing the simulated stand-by operational mode. AL-AT faced some issues with thermo-acoustic oscillations during the commissioning. This paper will introduce the state-of-the-art on this issue, and detail the implemented solutions to identify the source of the vibration and to solve the problems so that the required performance was fully demonstrated.

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