

## **Cooling Plant, for SPIDER and MITICA experiments**

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The Cooling System designed for the Neutral Beam experiments called MITICA and SPIDER has to remove a large amount of power (up to 70 MW) from the vessel components and auxiliary systems.

The components of the two experiments, i.e.acceleration grids, calorimeters, etc, are cooled down by Primary Circuits (PCs) where fine temperature regulation, water quality monitoring and calorimetric measurements are carried out by in line sensors and controllers. Each PCs is connected to Secondary Circuits (SCs) that allow heat dissipation from PCs to Tertiary Circuits (TCs) via two large basins. TCs are characterized by cooling towers and air coolers that cool down water basins.

Integrated commissioning between cooling plant and the overall Control and Data Acquisition System (CODAS), used to interface electrical, vacuum and cooling control system with each other's, underlined several bugs that required to modify the software and even some cooling plant logics.

First operations with MITICA PCs were performed after the cooling plant acceptance test in 2019 and issues have been encountered with some components that were opened and checked revealing the presence of red impurities. Incompatible materials with cooling plant requirements that might induce corrosion were found and substituted.

Furthermore, first all day operation regime at reduced power have been tested with one MITICA PC.