CASE STUDY

ZICO BEVERAGES (THAILAND) - A NEW SOLUTION FOR MORE EFFICIENCY AND TOP RELIABILITY

ZICO Beverages has chosen a new cooling solution for all processes with the best overall efficiency and the required high-level of reliability.

BACKGROUND

ZICO Beverages is an American beverage company that manufactures coconut water and other beverages. In 2013, ZICO was acquired by *The Coca-cola Company*.

Zico has recently chosen Frigel Intelligent Cooling Systems for its coconut water manufacturing facility in Thailand.

REQUIREMENTS

During the process, coconut water is gently pasteurized and blended to achieve desired sweetness before being filled into cartons and PET bottles and shipped to the United States.

A variety of different processes require cooling in coconut water processing, from product pasteurization to storage tanks and pre-filling stage.

In this case the specific requirements were:

- Production Line 1: cooling of coconut water supplying chilled water at +1 °C with a cooling demand of 200 kW.
- Production Line 2: cooling of coconut water supplying chilled water at +1 °C with a cooling demand of 200 kW.
- Prior-to-filling cooling: cooling of coconut water supplying cooling water at -2 °C with a cooling demand of about 65 kW.

CHALLENGES

The customer wanted **a cooling solution for all processes with the best overall efficiency and the required level of reliability**.

Taking into account the characteristics of the process, the extreme environmental conditions and the technical-economic constraints of the application, **air-cooled chiller units** from the Frigel **3HM range** were selected for this project.

SOLUTION

Our 3HM industrial grade air-cooled chillers were then chosen, to be installed in two separated circuits.

Equipped with hermetic scroll compressors, electronic expansion valve and oversized heat exchangers, **this units can deliver industry leading efficiency values (EERs)**.

The units were designed to operate in ambient temperatures up to 43 °C and are therefore **suitable for the demanding tropical Thai climate** (models for ambient temperatures up to 55 ° C are also available).

Line 1 and Line 2
A central air-cooled chiller system, composed of 3 units of the 3HM range, takes care of both the lines, in order to guarantee chilled water at the required temperature and adequate back-up capability in case of failure of one of the units.

The number of chillers was chosen on the basis both of redundancy and the constrain of a **gradual expansion of the installed power**.

Also, the pumping station (GPP), as a standard, is equipped with a “spare” pump which is automatically activated in the event of a failure of one of the others. The “spare” pump is automatically cycled to balance the running time of all pumps.

Prior-to-filling cooling

Due to the lower temperature required by this stage of the process, one dedicated **3HM air-cooled chiller unit** was selected. The use of a dedicated chiller, in fact, allows **significant annual energy savings** compared to a single central system operating at the lowest temperature required by the process plant.

Here below, the 3HM industrial grade air-cooled chiller system.

The Frigel "3PR" remote control panel (PLC) is connected via Modbus to all equipment and, when connected to the Internet via the local network (LAN) or a common router, it can allow Frigel technicians to remotely monitor system operation in real time.

The **3PR** is equipped with a touchscreen interface (HMI) and **it's designed to manage the centralized refrigeration system**: all the main variables and functions are integrated in a single control to ensure the best performance and reliability of the system.

Frigel, founded in 1960, is today global manufacturer of cooling and temperature control systems but also the ideal partner, technical advisor, with ability to identify the best solution, in terms of performance, efficiency and environmental impact.