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Industry talk: Development, optimization and industrial production of Transportable Refrigeration Apparatus for CO2 Investigation (TRACI)

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In the context of its High Energy Physics related activities, CERN in collaboration with NIKHEF has developed the Transportable Refrigeration Apparatus for CO2 Investigation (TRACI). TRACI is an evaporative CO2 cooling system for scientific and industrial R&D equipment based on I-2PACL (Integrated 2 Phase Accumulator Controlled Loop) technology. The I-2PACL is the method that can instantly control the evaporative conditions in an experimental set-up vary from room temperature down to -35 °C. This technology is therefore an ideal way of controlling set-ups with a high demand on thermal stability and flexibility with a minimum of added hardware. It is considered a disruptive technology compared to the traditional methods used in commercial refrigeration. Cracow University of Technology (CUT) in collaboration with industrial partners: PONAR Silesia S.A. and CEBEA Bochnia have undertaken mission of production and development of a new optimized version of TRACI. The current prototype of TRACI is currently in redesign phase with the aim of reduction of the production costs to offer this technology for a broader field of use. The CO2 laboratory coolers will be characterized by more efficient and environmental friendly technology than the traditional systems. Optimization will be found in power consumption, applicable range of temperature and cooling power. Cracow University of Technology (CUT) is a multi-profile school of higher education and research in the fields of basic sciences, engineering technologies, and architecture, has expertise in the domains of Mechanical Engineering, Computer Science and Information Technology, Materials Science, Technical Physics, Mathematics, Electrical as well as Chemical, Civil, and Environmental Engineering technologies. CEBEA Bochnia is a manufacturing company specialized in cooling technology for food industry, particularly in production of refrigerating equipment used for storage and direct selling of food. PONAR Silesia S.A. is the largest Polish producer of oil hydraulics elements and systems, offering a full range of services from design, production, maintenance and repairs –up to complete, final products. Many applications of hydraulic systems contain advanced cooling systems and complex high pressure liquid distribution systems. CUT, CEBEA and PONAR have created a consortium in order to facilitate their relationship with CERN, particularly in the TRACI development and production project. In the presentation the new optimized system based on TRACI concept as well as production schedule and plans of development will be shown.

Summary

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