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C2Or4C-04: Enhanced Power Control and Maintenance-Free Turbine Retrofit in a Cryogenic Hydrogen Process for Tritium Removal

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Linde replaces an oil-bearing turboexpander, prone to oil contamination and component damage, with a maintenance-free dynamic gas-bearing turboexpander while adding a new cooling power control system to an existing cold box in a hydrogen process within a cryogenic tritium removal facility.
The dynamic gas-bearing turboexpander with proven technology, successfully used for years, significantly enhances efficiency, reduces energy consumption while boosting the cooling power output. Moreover, its superior reliability surpasses that of its oil-bearing predecessor and will allow more reliable operation of the cryogenic tritium removal facility.
The new cooling power control system allows the use of the new more efficient turboexpander at the specific original operating conditions and at potentially new optimized operating conditions for the tritium removal process. The power control diverts mass flow from the turboexpander to allow load adaption at constant process mass flow.
The presentation covers the design and the control strategies for load adaption.

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