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INDIGENOUS DEVELOPMENT OF kW CLASS HELIUM REFRIGERATOR-CUM-LIQUEFIER: PRESENT STATUS AND FUTURE PLAN

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Content :

The indigenous large scale (1 kW refrigeration capacity at 4.5 K) helium refrigerator-cum-liquefier plant development activity has been taken up by IPR in the 12th 5-year plan starting from Apr-2012. Its detailed design is nearly completed. It involves many R intensive cryogenic as well as room temperature components of large scale. Such helium plant is operated in automatic mode. For the success of such complex and automated helium plant, it is necessary to have components of high quality and reliability. This will involve thermodynamic cycle analysis, vacuum brazed aluminum plate-fin heat exchangers, cryogenic helium purifiers up to PPM level, helium turbo-expanders, helium screw compressors, oil removal system up to PPB level, LHe Dewar, LHe transfer lines, LN2 transfer lines, Cryogenic valves, Large scale vaccum chamber. This plant will boost cryo-industry in India to a higher technological maturity and standard. Few critical components are planned to purchase from foreign and others to be developed in India in phase-A and these foreign components will be replaced by indigenous ones in phase-B. In phase-A, design of major indigenous components have been done. Establishing the dedicated cryogenic test facility for testing of these prototype components needs significant attention. This paper will discuss about the status and future plan of this cryogenic project.

Summary :

This abstract is related to development of large scale helium refrigerator/liquefier in India. It will give information of present status and future plan.

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