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RESEARCH PAPER PRESENTATION

by Prof. Parag K. Muley at NSCS-28, IIT KHARAGPUR

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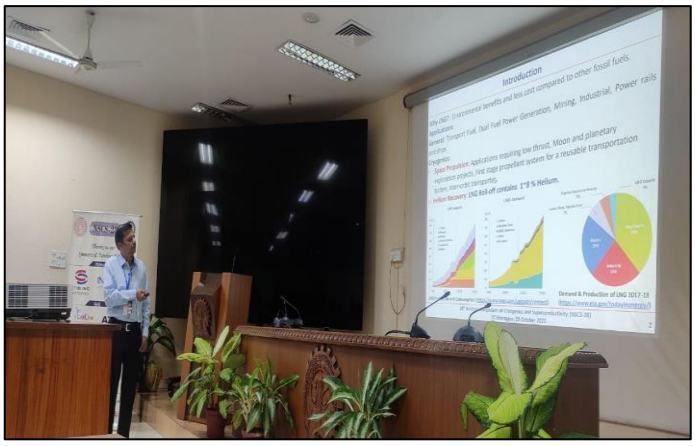
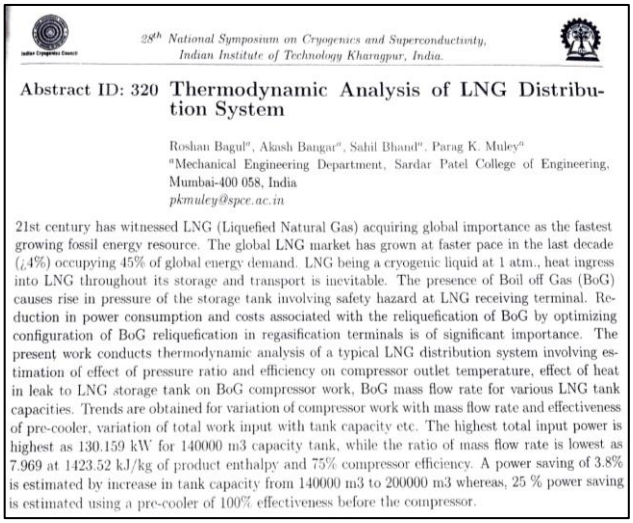
Title of Paper: **Thermodynamic Analysis of LNG Distribution System (Abstract ID: 320)**

Authors: **Madan Narayanan, Roshan Bagul, Akash Bangar, Sahil Bhand and Prof. Parag K. Muley, Mechanical Engineering Department, SPCE.**

Presenting Author and Guide: Prof. Parag K. Muley





28th National Symposium on Cryogenics and Superconductivity, Indian Institute of Technology Kharagpur, India.

Abstract ID: 320 **Thermodynamic Analysis of LNG Distribution System**

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21st century has witnessed LNG (Liquefied Natural Gas) acquiring global importance as the fastest growing fossil energy resource. The global LNG market has grown at faster pace in the last decade (¿4%) occupying 45% of global energy demand. LNG being a cryogenic liquid at 1 atm., heat ingress into LNG throughout its storage and transport is inevitable. The presence of Boil off Gas (BoG) causes rise in pressure of the storage tank involving safety hazard at LNG receiving terminal. Reduction in power consumption and costs associated with the reliquefication of BoG by optimizing configuration of BoG reliquefication in regasification terminals is of significant importance. The present work conducts thermodynamic analysis of a typical LNG distribution system involving estimation of effect of pressure ratio and efficiency on compressor outlet temperature, effect of heat in leak to LNG storage tank on BoG compressor work, BoG mass flow rate for various LNG tank capacities. Trends are obtained for variation of compressor work with mass flow rate and effectiveness of pre-cooler, variation of total work input with tank capacity etc. The highest total input power is highest as 130.159 kW for 140000 m3 capacity tank, while the ratio of mass flow rate is lowest as 7.969 at 1423.52 kJ/kg of product enthalpy and 75% compressor efficiency. A power saving of 3.8% is estimated by increase in tank capacity from 140000 m3 to 200000 m3 whereas, 25 % power saving is estimated using a pre-cooler of 100% effectiveness before the compressor.

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Certificate of participation

This is to certify that Prof. ~~/Dr./Mr./Ms.~~ Parag K. Muley from Sardar Patel College of Engineering participated in the 28th National Symposium on Cryogenics and Superconductivity (NSCS-28) held at IIT Kharagpur during 18th-21st October, 2022.

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