Contribution ID: **325** Type: **Poster**

C1Po1C-02: The static and dynamic characteristics of hydrostatic journal gas bearing lubricated by hydrogen in cryogenic turbine expander in large hydrogen liquefier

Monday 10 July 2023 09:15 (1h 45m)

With the large-scale development of hydrogen energy, liquid hydrogen is the only way to break through the bottleneck of the large-scale and commercial operation of the entire hydrogen energy system, and also the only way to achieve the goal of "carbon neutrality". The orifice-type hydrostatic gas bearing lubricated by hydrogen plays an important role in cryogenic turbo expander in large hydrogen liquefier. In the hydrogen turbine expander, a heavy rotor is used to support the expansion impeller for hydrogen liquefaction with large flow. The influence of low density lubricating gas on heavy rotors at high speed and the effect of these parameters such as gas film gap, rotating speed, supply gas pressure on the static and dynamic characteristics were studied in this paper.

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Session Classification: C1Po1C: Components II: Cold Compressors & Expanders