Proposed Thermodynamic Nomenclature of Cryogenic Refrigeration Cycles for Liquefaction of Natural Gas

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Classification of Refrigeration Cycles

Refrigeration Cycle for Natural Gas Liquefaction

<Refrigeration system> <Liquefaction system> <Refrigeration system for LNG>

Examples

<table>
<thead>
<tr>
<th>p3J+e'3J+m3J</th>
<th>M1J</th>
<th>M1J+M2J</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Cascade)</td>
<td>(SMR)</td>
<td>(DMR-I)</td>
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</tbody>
</table>

Nomenclature of Cycles

p2J+3/2J+M2J  
3-stage propane, 3-stage ethylene, 2-stage methane JT cycle

M1J, M2J  
1-stage MR, 2-stage MR JT cycle

M1J+M1J  
Dual 1-stage MR JT cycles

M2J+M2J  
Dual 2-stage MR JT cycles

p3J+M2J  
4-stage propane, 2-stage MR JT cycles

n1B (Nitrogen-Expander)  
C3-MR

n2B

Summary

- The refrigeration cycles - Classified in a systematic way
  - By the type of expansion processes: JT / Brayton / Combined cycles
  - By the type of refrigerants: Pure / Mixed refrigerants
- A newly proposed nomenclature - Effectively used to identify the thermodynamic structure of refrigeration cycles

Acknowledgments

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