Main Cryogenic Heat Exchangers Technology & Trends

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Challenges of core cryogenic equipment in LNG

• Decentralized, small scale plants, technically lean operator
• Large scale plants, maximum equipment sizes, technically savvy operator

• Core cryogenic equipment to support maximum load and availability, flexible operations, varying feed gas conditions
• Typically two different kinds of equipment used
  → PFHE & CWHE
Plate Fin Heat Exchangers

- Compact and light weight
- Co-current or cross-flow possible
- No limits for low design temperatures (-269 °C)

Limitations:
- Sensitive to rapid changes in load (thermal stress)
Plate Fin Heat Exchangers

→ Consumed lifetime
Coil Wound Heat Exchangers

- Mechanically very robust
- Wide temperature range (-270°C to 650°C)
- High pressures possible (shell 150 bar, tube 300 bar)

Limitations:
- Few manufacturers
- Tube leakages
- Shell side and tube side mal distribution
Coil Wound Heat Exchangers

- Robust design to eliminate tube side leakages
- CFD modelling of tube side and shell side flow pattern and liquid distribution
- Shell side and/or tube side control of flow