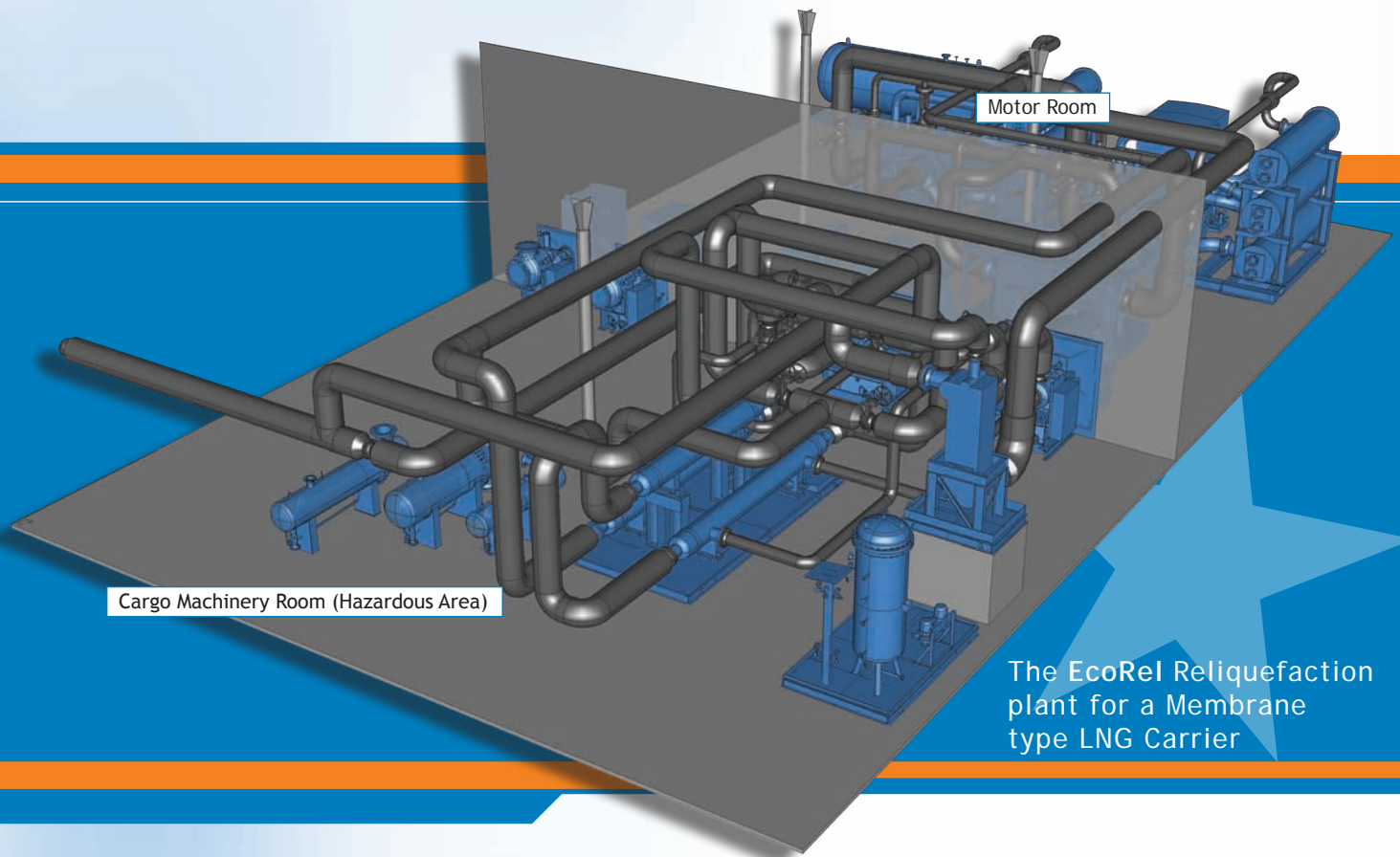


★ EcoRel

★ Economic ★ Reliable ★ Ecologically friendly

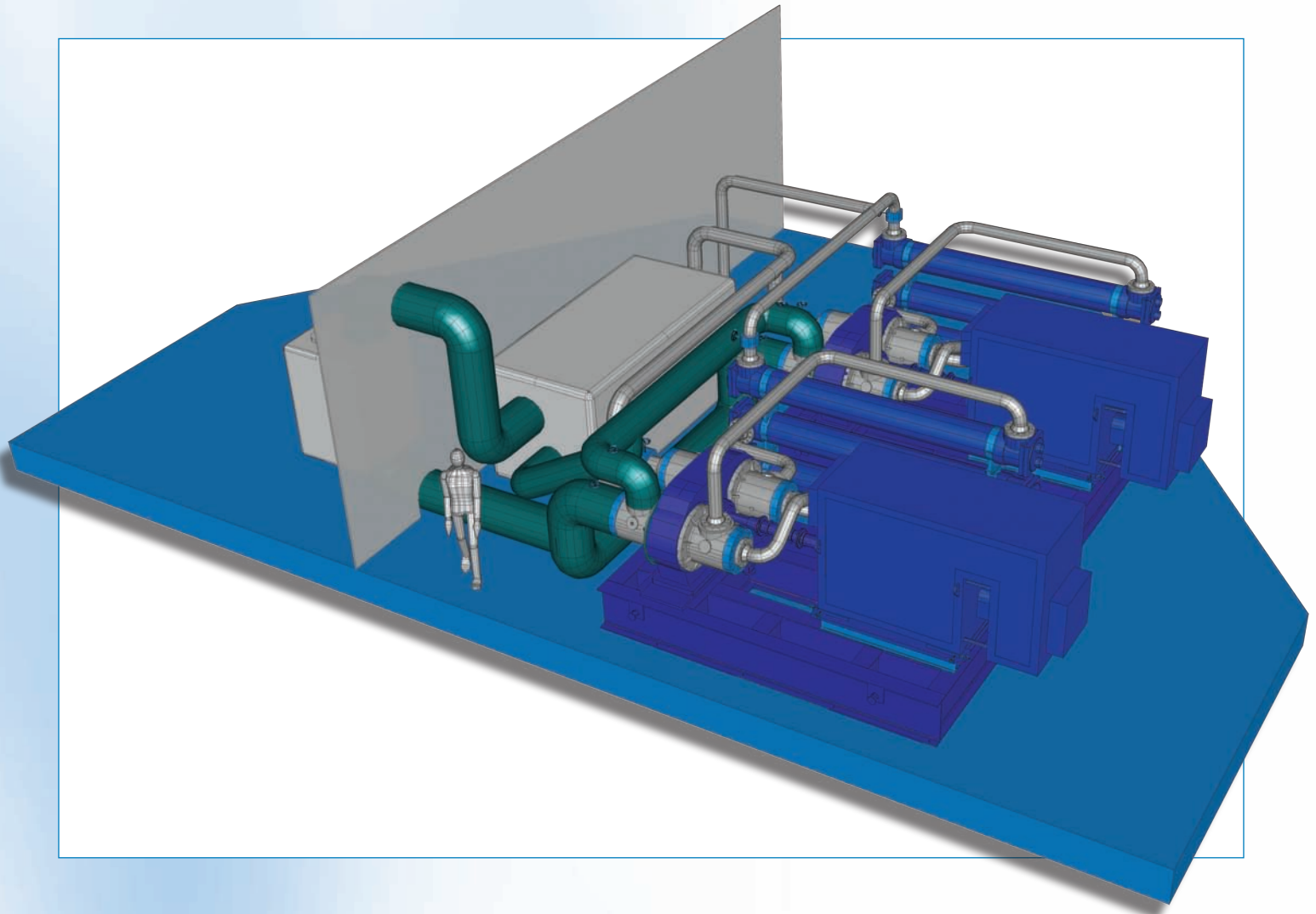
Shipboard Reliquefaction Plant for LNG Carriers



The EcoRel Reliquefaction plant for a Membrane type LNG Carrier

★ Key advantages of the EcoRel LNG Reliquefaction System:

- ★ **Space-saving, compact arrangement.**
Nitrogen Recycle Compressors and the Expander/Booster Compressor combined into one machine ("Compander") with a common lube oil system, installed in the safe area
- ★ **Economic operation assured**
No methane/energy loss by venting or gas burning
- ★ **Most ecologically friendly ship operation**
Total reliquefaction - no methane-contaminated waste gas burned or vented
- ★ **Increased process reliability and performance**
Redundancy of rotating equipment and fall-back provisions assure reliable, high performance and safe re-liquefaction
- ★ **Safe operation and simple class approval**
Simple concept and good protection of critical heat exchanger is assured.
- ★ **Outstanding experience**
Two thirds of the existing LNG Carrier fleet have our Cargo Handling equipment on board



★ **Main characteristics of the EcoRel LNG Reliquefaction System:**

- ★ Cryogenic refrigeration process based on Brayton cycle using nitrogen as inexpensive and safe cooling medium.
- ★ Refrigeration machinery skid located in the safe motor room, including 3-stage nitrogen compressor and single-stage expansion turbine on one gearbox, with cooler rack and counter-current heat exchanger.
- ★ BOG condenser located in cargo machinery room.
- ★ Two stage boil-off compressor in cargo machinery room with proven bulkhead seal. Drive motors are located in the motor room.
- ★ Process connection to refrigeration skid in motor room by only two cold pipes through bulkhead.

Subject to changes due to progress. International patents pending. © Cryostar S.A.S.