

## CASE STUDY

### The customer and the project

The TSC Consortium (Technip France and Samsung Heavy Industries Co., Ltd) has been awarded by Shell Gas & Power Developments B.V. a contract for the execution of EPCI of the Prelude Floating LNG facility in offshore Australia.

It will be the world's first floating liquefied natural gas (FLNG) project of its kind.

GE Oil & Gas supplied the Mixed Refrigerant (MR) and the Pre-mixed Refrigerant (PMR) steam turbine driven centrifugal compressors. The single ply expansion joint between the compressors did not fulfill the design life cycle. The supply of a suitable replacement was very urgent and on the critical path for the project.

**Kompaflex was asked to redesign, manufacture and supply 2 metallic expansion joints fitted between these compressors within world record time (5 weeks).**



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### Main design and manufacturing challenges for Kompaflex

- Bellows life cycles : up to 122 million cycles. Can only be achieved with a multiply bellows
- Full vacuum on a rectangular shape of over 3.6 meters
- Short manufacturing time for two units: 5 weeks only

The high number of cycles of some load cases require a bellows in the elastic range. In this technical parameter only a rectangular multiply bellows solution without any weldings in the corner areas is possible. In addition FEA studies were conducted to demonstrate the suitability of this solution to the highly critical requirements and to guarantee the design lifetime of 25 years.



### The Kompaflex solution

Rectangular multi-ply expansion joints without any welding in the corners  
DN 3640x1140mm, building length 1500mm

- Multiply construction
- Bellows : Inconel 625
- Intermediate pipe : Inconel 825
- Reinforcing bars for vacuum stability
- Permanent leakage control of the bellows

