

Enhanced Liquefaction Technology for FLNG

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Samsung Heavy Industries(SHI) has developed the high-efficiency LNG liquefaction technology and completed its performance by own pilot plant for enhancing the competitiveness of offshore production.

This liquefaction technology use two single gas component refrigerants which are pure nitrogen and methane. Each refrigerant operates in two dedicated reverse Bryton cycles that consist of refrigerant compressor and turbo-expanders.

In the methane loop, there are two turbo-expander to split the cooling temperature zone and nitrogen loop has single turbo-expander. So, there are total 3 gas expansion loop in system.

- C1 Warm Expansion Loop takes care of precooling and partial liquefaction zone
- C1 Cold Expansion Loop takes care of most liquefaction zone
- N2 Expansion Loop takes care of most sub cooling zone

Using these three expansion loop, the cold box is cooled down, then the natural gas can be liquefied. With this configuration, this technology appears many benefits once it applied offshore facility such as availability, efficiency and stability.

Design approval of this liquefaction system was completed by 3rd party class(ABS).

To make the verification of the results calculated by process simulation and a more practical and feasible proposal for actual operation, the pilot plant was constructed in SHI shipyard with 1/42 scale of commercial plant.

Liquefaction technology has been performed two kinds of tests with this pilot plant. The first test was full capacity operation test, the second test was availability test.

The results were very successful, and the pilot plant operation statement of fact was approved by ABS to make sure the test result.

In short, it is expected that SHI LNG Liquefaction Process can be a solution to provide the optimized results for all production facilities that require LNG production under offshore operating conditions.