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LNG Trials of a New 16'' Flexible Hose Based LNG Transfer System

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Abstract

The development of offshore LNG projects, whether for sheltered or harsh environments, represents a vehicle for progress consistent with the LNG market growth and it opens new perspectives and new challenges for the whole LNG Industry. In order to ensure that these new LNG chains will operate correctly and at an optimum rate, the development of an efficient and safe LNG transfer system is a key link, which is still challenging the actors involved in this field.

Since there are several offshore LNG transfer solutions in development, cryogenic flexible hose based LNG transfer systems appear to be able to meet the LNG Industry requirements.

However, in order to demonstrate that a new technology will operate reliably within specific limits, LNG operators generally deem necessary to have either the evidence of such performances through a structured qualification process or to be convinced by significant scale trials in real conditions or close to the ones the system will be used in.

This paper deals with full-scale LNG trials performed in the context of an exiting LNG receiving terminal of a new 16'' flexible hose based LNG transfer system designed for onshore and offshore conditions. These trials were the ultimate stage of an industrial qualification of this transfer system and they have been carried out on a unique dynamic test bench able to reproduce open sea conditions in terms of heave amplitude and acceleration.

Introduction

The development of offshore LNG projects is partly based on the ability of LNG industry actors to bring innovative solutions capable of meeting the new technical requirements related to the marine environment. Whether for LNG export or receiving facilities, it appears that the "transfer system" link is a key element, whose ability to fulfil its role in open sea conditions must contribute to guarantee the availability and flexibility of these new offshore LNG chains.

Gaz de France has undertaken, in partnership with Technip France, KSB and Eurodim, the last stage of industrial qualification of a new LNG transfer system called Amplitude-LNG Loading System (ALLS). This system, based on flexible hose technology and suitable for offshore and onshore conditions, was developed through industrial partnerships involving major oil and gas companies and international certification organizations.

After completion of the technical certification of ALLS main equipment, the requirement to carry out full-scale dynamic testing, with circulation of LNG, was deemed necessary by the LNG operators to demonstrate the performances, operability and safety of this innovative LNG transfer system.

A structured qualification process, managed by Det Norske Veritas (DNV), was then engaged and a full-scale testing programme elaborated with the aim to operate the transfer system in operational conditions with a facility able to reproduce open sea conditions.