A Case Study of LNG Unloading Arm Installation at Kochi Seashore

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ABSTRACT

This study introduces the construction practice for the LNG (Liquefied Natural Gas) unloading arm installation at Kochi Vypeen Island in south India. The difficulties faced and solutions implemented provide a very practical reference to any similar maritime projects. The first attempt to install unloading arms was suspended for 5.5 months due to unsteady sea condition when southwest monsoon swept the project site. Through a multi-companies teamwork building and brainstorming, an effective solution using a spudded tidal barge was proposed and implemented resulting in the installation being successfully completed.

KEY WORDS: LNG; unloading arm; maritime; southwest monsoon; spudded tidal barge.

INTRODUCTION

The project site, LNG (Liquefied Natural Gas) receiving and regas (re-gasify) terminal, is a part of newly created Special Economic Zone located on the sea shore of southwestern India as shown in Fig. 1. To meet the civil and industrial demand of natural gas in this deficit area where no piped natural gas is available, the first LNG terminal in south India was formed in 2007 using reclaimed land with dimensions of 840 m X 400 m and a 330m long x 5m wide jetty trestle extending from the land at the south side. At the end of the trestle, a reinforced concrete unloading platform was built to accommodate four sets of Unloading Arms (ULA) which serve to unload the LNG from the cargo ship to the LNG storage tank via cryogenic pipelines. Fig. 2 indicates the project plot plan of the LNG receiving terminal. The unloading arms are the most important and critical units installed in the LNG receiving terminal, which require a higher stability for their installation to avoid any potential damages or leakage during the unloading of LNG from ship. Fig. 3 shows the 3-D model of the four sets of unloading arms which are mainly composed of risers and unloading units.

It was planned to finish the unloading arms installation from the landside using a temporary bund before arrival of the summer monsoon, however it didn’t happen due to logistic reasons. To meet the schedule it was decided to install the unloading arms using a floating barge with a mounted crane, trying to finish the installation by the end of May 2011.

However, when the ULA risers were installed on 27 May 2011, the summer monsoon (southwest monsoon) arrived from the INDIAN OCEAN, sweeping the south of India with abundant rainfall and wind. The floating barge was hit by the waves and winds, and the 250 ton crane could not be kept steady to install the ULA main units. To secure the ULA, the management decided to suspend the installation and transport the ULA to the safe place for temporary storage.