ABSTRACT

The Lima Flow Station as part of Lima Complex, located in the Java Sea approximately 45 nautical miles North East of Jakarta, Indonesia, comprises four bridge linked platforms and a bridge linked flare structure (figure no 1). Seabed subsidence, due to compaction in reservoir along with its production, has reduced the air gap between the topside’s cellar decks and mean sea level.

The VERSABUILD deck raising system has been assessed and evaluated among other options as the most economically and technically sound to be used to increase the air gap by raising three of the four platforms, bridges, and flare structure approximately 4 meters.

Deck Raising by Synchronized Hydraulic Jacking is unique and literature for methodology is rare. A precedence project utilizing similar hydraulic jacking system for single platform was performed at Devon Energy in Gulf Mexico. Hence assurance process became critical and challenging factor before execution. Various assurance processes were conducted to elevate confidence level by lowering risk.

In September 2013 three platforms with interconnecting bridges and flare bridges [Lima Flow Station] were successfully raised in two stages by means of Synchronized Hydraulic Jacking with The execution of this deck raising was performed safely and ahead of schedule.

This paper describes the long journey of this project starting from technology selection and assurance process to support for a successful execution.

INTRODUCTION

Lima Complex operated by Pertamina Hulu Energi Offshore Northwest Java (PHE ONWJ), is located 45 nautical miles from Tanjung Priok port of Jakarta.

The Complex comprises 1 Flow Station (1 processing platform-LPRO, 1 Compression platform-LCOM & 1 Living quarter-LSER with interconnecting bridges and flare) and 19 wellhead platforms. LPRO & LSER were installed in 1973 while LCOM was in 1975.

An intensive Subsidence monitoring program by field measurements has been developed since 1999 following the 1st measurement and underwater inspection in 1997.

Three measurement methods have been implemented; they are:

1. MSL Measurement using Altimetric Detector (see table no.1)
2. GPS Measurement. Starting in 1997
3. Tilt Measurement (initiated in 2007)

Base on this study, the average subsidence rate is 15 cm/year and air gap (distance between MSL to below Cellar deck) decreased by 3-4 meters from original installation, figure no. 2 shows prediction of surface subsidence up to June 2031.

LIMA COMPLEX REMEDIATION PROGRAM

Remediation of Lima Complex has been performed as a key element in the Continuous Reduction Program (CRR) to ensure the PHE ONWJ facilities are safe for offshore operation with emphasis on prevention and detection programs. CRR program will focus on the top four highest risk flow stations (Lima, Echo, Bravo and MM), while other flow stations will be maintained within risk criteria.

The remediation program for Lima Flow Station was conducted in the following phases:

1. Short Term Remediation

While defining the long term solution, short term programs were performed to anticipate for immediate response that covered: