

## CPPI inspects pipeline with triaxial MFL tool in Thailand

China Petroleum Pipeline Inspection Technologies Co., Ltd (CPPI) team successfully inspected a 11.5 km-long, 10 inch diameter gas pipeline in mid August for PTT company, Thailand with a triaxial magnetic flux leakage (MFL) inspection tool.

The downstream of this pipeline are Thailand National Plant users, A key challenge was the operation speed of 5m/s. As a result, the proposed window time for pigging was only 1 day. To achieve this unique task, CPPI efficiently arranged the tool calibration, mobilization and customs clearance. The successful and safe execution of this project is an important milestone for CPPI to enter Southeast Asia.



CPPI's triaxial magnetic flux leakage (MFL) inspection tool. ●

## 3X Engineering repairs subsea dent damage in Vietnam

### Overview

The objective of the repair performed in June/July 2016 by 3X ENGINEERING (3X) and its local distributor PETROENERTECH was to reinforce a damaged subsea pipe section over 1.5 meter length, due to dent defect situated at 48-meter depth (3.8 % dented depth). The pipeline had a 18 inch OD, a temperature of 60 degree and operating at a pressure of 138 barg.

### Scope of work

Finite Elements Analysis (FEA) simulation was performed by 3X to determine the number of layers necessary to perform the reinforcement showing that 60 composite layers of REINFORCEKIT 4D SUBSEA (R4D-S) product had to be implemented.

Underwater, several preliminary operations were performed (identification of the defected area, removal of concrete and existing concrete). Then surface preparation by sandblasting was undertaken by divers to get a good surface roughness (60-micron surface profile).

3X wrapping reinforcement was performed following several stages :

1/ Primer (P3X32) application on the whole defect to provide a good adhesion of the filler.

2/ A rigid composite plate coated with F3XSS filler to rebuild the pipe shape was positioned over the dent and strongly fixed with ratchet belts during few hours.

3/ Second P3X32 application performed on the whole pipe surface to be repaired before wrapping.

4/ Kevlar® tape pre-impregnated with R3X1050-S resin (using special 3X device called BOBIPREG) wrapped around the pipe. Sixty layers of composite materials were applied over the dent (i.e. 30 passes of 50% overlap).

Finally, various measurements (total length of the repair, repair circumference and hardness measurements) were made to make sure the repair was performed as required.

### Results

The 18" gas sea line repair was successfully completed within 4 days. The total length of the repair was 1.53m. This project was a big challenge because of the 48-meter depth and the huge number of layers of composite to be applied. Thanks to 3X's experience in subsea repairs, added to the efficient collaboration between PETROENERTECH, PV GAS representatives and PVMTC divers, this subsea repair was a big success. ●



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