

# COMPOSITE REPAIR SPECIALIST



- **TYPE OF DEFECTS :** Leak & 3 external defects in subsea environment
- **PIPE DETAILS :** 48" OD – max. operating temp. 25°C – calculated pressure 259 psi
- **LOCATION :** SAUDI ARABIA, Dammam
- **3X PRODUCT :** REINFORCEKIT 4D SUBSEA (R4D-S)

## OVERVIEW

The objective of the repairs performed in August 2016 by 3X ENGINEERING and its local distributor ASSET PROTECTION CONTRACTING was to **reinforce a subsea pipe damaged by 4 defects: 1 leak and 3 external defects situated at 6-meter depth.**

## SCOPE OF WORK

- According to ISO 24.817 and 3X repair calculations, 30 composite layers of **REINFORCEKIT 4D SUBSEA (R4D-S)** product have been determined to repair the leak and 4 layers for each corroded defects.

- Underwater, several preliminary operations have been performed prior to surface preparation (gritblasting) to get a good surface roughness (60-micron surface profile).

- 3X wrapping reinforcements have been performed following several stages:

**1/** Primer (P3X32) application on the whole defect surface to provide a good adhesion of the composite materials.

**2/** One composite plate coated with F3XSS filler positioned over the hole and strongly fixed with ratchet belts during curing time of 24 hours (only for leak repair).

**3/** P3X32 applied on the whole pipe surface before wrapping.

**4/** Kevlar® tape pre-impregnated with R3X1050-S resin (using special 3X BOBIPREG device) wrapped around the pipe. Thirty layers were necessary to seal the leak (i.e. about 15 passes of 50% overlap) and 4 layers for the 3 following defects.

## RESULTS

After several repairs conducted underwater around the world, 3X ENGINEERING confirms its efficiency and capabilities in subsea pipeline maintenance. This job was a great challenge because of the large pipe diameter and the number of defects situated on 4 different locations for a total repair length of 21m. A special thanks to client representative and ZAMIL MERDAID company, which provided very competent divers and help us and our local distributor to deliver the repair successfully and on time.

