

**Type of work:**

Well integrity services

**Client:**

Sarawak Shell Berhad

**Location:**

Offshore Sarawak, East Malaysia

**Materials:**

4 tons NaX® Q140

**Project date:**

June-July 2017

## STRENGTHENING AND CORROSION PROTECTION OF STRUCTURAL CASING OF WELLS

**DISCIPLINES:**

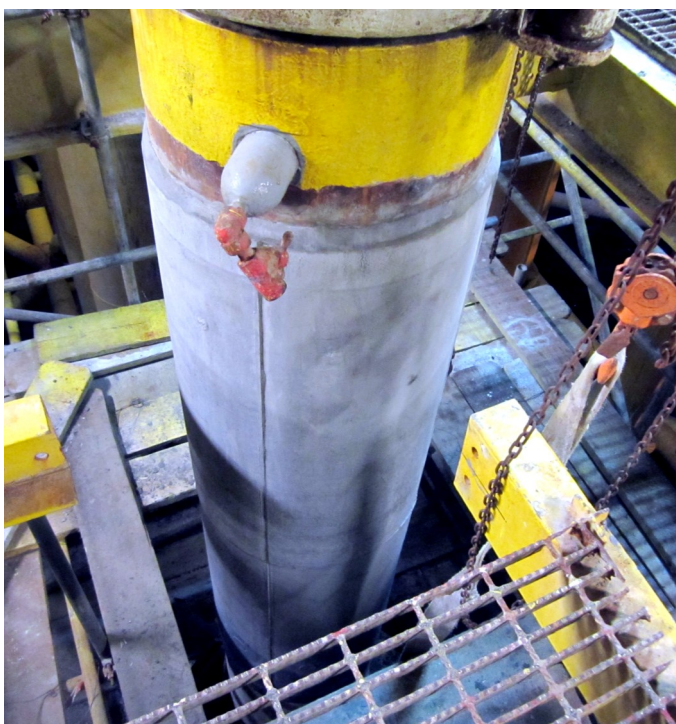
- Offshore Contracting Services
- Well Integrity Solutions
- Annulus Grouting

Nautec provided the strengthening method to repair corroded surface casings of well heads at a platform offshore Sarawak.

Upon the visual inspection of one of Shell's platforms, 2 wells were found to be corroded and immediate measures were taken to arrest further corrosion and repair the damaged areas of the well conductors and structural casings of the platform.

**SERVICES**

- Pre-job visual inspection of the 2 well conductors and structural casings to determine the level of existing concrete, rust, perforations and blockages of the annulus.
- Breaking and removing existing concrete inside the annulus prior to grouting.
- Provision of all materials, equipment and accessories required to carry out the strengthening of the wellhead casing.
- Provision of engineer and offshore crew to perform the installation of rebars, mould sections and grouting services.
- Grouting of wellhead annulus using NaX® Q140 Ultra High Performance Cementitious (UHPC) materials.
- Grout Strength Verification using accredited 3rd party laboratory.







**UHPC, or Ultra High Performance Concrete and Composites** are our business. We develop and produce UHPC products and we offer UHPC based solutions for multiple industries including the Renewable, Civil Construction, Ports, Offshore and Energy Industries.

We have documented the technical performance of our UHPC products through a large test program at MPA (Germany) which included creep and fatigue testing and we have carried out large-scale trials at low (European conditions) and high temperatures (Tropical conditions) to demonstrate the performance of our materials under severe weather conditions.

Our NaX® Premix Grouts are a portfolio of ultra high performance concrete and composites with strength and durability 10 times better than that of ordinary cement products.

## CLIENT BENEFITS

- Nautech uses its proprietary NaX® UHPC materials to carry out its subsea repair and strengthening applications. The materials are composed of selected blends of silica sand and special high performance aggregates with an optimised grading. In combination with Nautech's advance binder technology based on nanotechnology the NaX® products have obtained unique performance qualities.
- The unique material technology gives ultra high dense materials with results in materials with extreme low permeability and thereby high resistance to ingress of chlorides, sulphate and other types of chemical degradation. NaX® materials dense nanostructure further more reveals a series of unique mechanical behaviour such as extreme high compressive and flexural strength, up to 10 times stronger than normal concrete, and an E-modulus of more than 60 GPa.
- In general cementitious materials shrink over time, which can result in reduced or no adhesion to a steel structure. In order to overcome this issue all NaX® materials have been shrinkages compensated and have a long-time unique high adhesion to steel. This is essential in connection with structural repair solutions.

