



**Location:**  
Gulf of Mexico  
**Client:**  
Grupo Diavaz for PEMEX  
**Materials:**  
14 mT NaX® Q110  
UHPC Grout  
**Offshore days:**  
3 days  
**Project date:**  
January 2014

## PLATFORM VERTICAL DIAGONAL MEMBER STRENGTHENING, MEXICO

### DISCIPLINES:

- Offshore Contracting Services
- Strengthening and Repair of Subsea Structures

In January 2014 Nautec was contracted by DIAVAZ for the provision of grouting services as part of the strengthening of the PB-AJ-1 Platform located in AKAL J, part of the KU-MALOOB-ZAAP field, Gulf of Mexico on the DSV TOISA PROTEUS vessel.

### SCOPE

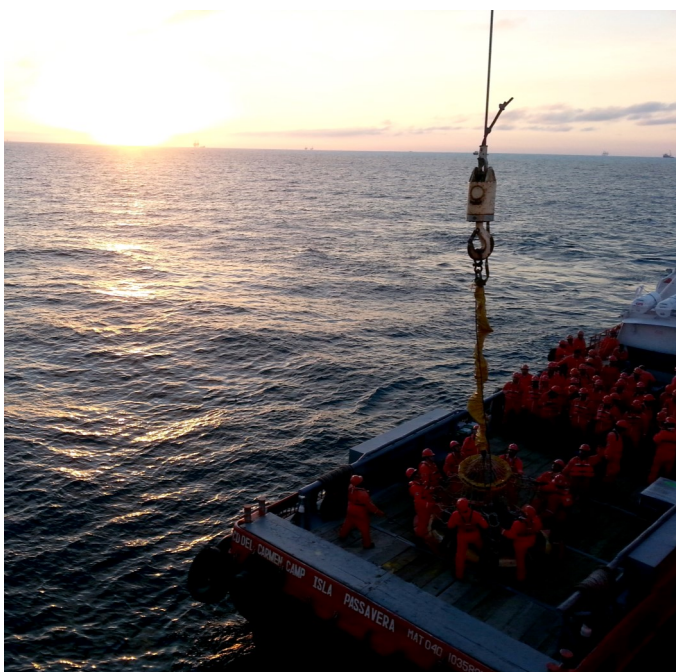
- Offshore mobilisation of grouting equipment and personnel
- Supply of grouting materials and infill grouting of two diagonal members via subsea injection of Nautec's HPC (High Performance Cementitious) grout, NaX® Q110

### CHALLENGES

- As some of the prerequisites for Nautec to carry out its job were not in place and bad weather closed in on the area there was a slight delay in the grouting works. Once conditions improved the team carried out the grouting works within the agreed 3-day schedule.

### SERVICES

- Nautec injected a total of 14 mT of NaX® Q110 grouting materials, 7 tons in each diagonal member. The grout was injected using a compact offshore grouting spread comprising of two custom-made mixers and a pump in combination with 2"-3" grout hoses.





**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.

### SERVICES (continued)

- A team of divers assisted with the connection of the grout hoses on the inlet ports preinstalled on each diagonal member.

### CLIENT BENEFITS

- NaX® Q110 is a ready to use cement-based dry powder system developed for this type of application.
- It is a highly flowable grout with a minimum mean strength of 50 MPa (i.e. approximately 510 kg/cm<sup>2</sup>) after 24 hours at 25 °C.
- It has been shown that infill grouting using HPC grout increases the capacity of a member by a factor of 2 to 3 to resist axial compression and bending moments, and prevent local buckling.

