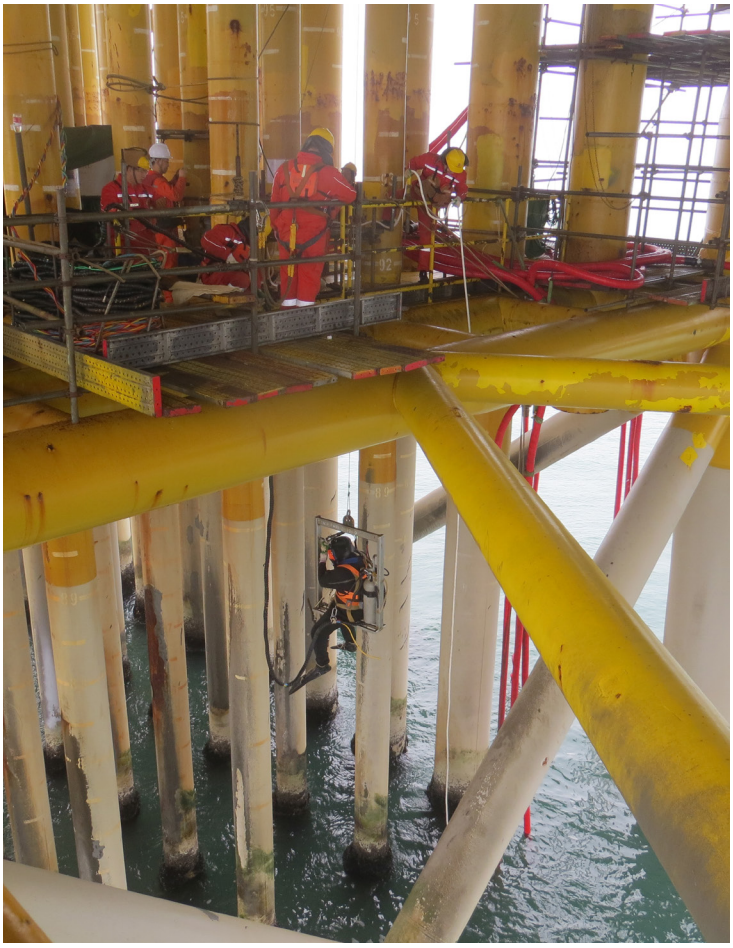
SIKA AT WORK

PENGLAI 19-3 OIL FIELD WHPC PLATFORM JACKET, CRACK REPAIR AND STRENGTHENING, BOHAI SEA, CHINA

OFFSHORE & MARINE CONSTRUCTION
CONVENTIONAL ENERGY

BUILDING TRUST

PENGLAI 19-3 OIL FIELD WHPC BOHAI SEA, CHINA



PROJECT DESCRIPTION

In September 2017, during a five-year inspection of the WHPC jacket, nine cracks were identified including five suspected weld defects under 5 mm deep that required sanding. An independent investigation by DNVGL took place in 2018, followed by a comparative study of repair options for two deep cracks at nodes N220 and N214. By late 2019, an expert review assessed two repair approaches: The dry cabin method and the unstressed grout clamp scheme, where ultimately the grout-clamp repair was selected.

Project name:	Penglai 19-3 Oil Field WHPC Platform Jacket Crack Repair and Strengthening
Location:	Southern waters of Bohai Sea, China
Year:	2022
Application:	Structural strengthening
Product:	SikaGrout®-9550

PROJECT REQUIREMENTS

The intricate geometry of the structure requiring repair and strengthening involved filling up to six separate steel clamp components in a single grouting operation. To ensure proper filling of the clamps, multiple grouting inlets were strategically installed at key locations.

SIKA SOLUTIONS

A successful onshore grouting trial, conducted at a 2:1 reduced scale, served as a proof-of-concept to demonstrate the infill capability and strength development of Sika's ultra-high-performance cementitious (UHPC) grout, SikaGrout®-9550.

This trial was followed by the full-scale site installation and grouting work, carried out in late 2022, with Sika providing 78 MT of SikaGrout®-9550 and offering technical consultancy throughout the implementation process.

CUSTOMER BENEFITS

- Onshore grouting trial on mock-up scale reduction 2:1 for proof-of-concept on proposed grouting inlet locations and subsequent post-trial inspection confirmed 100% in-filled clamp.
- The successful implementation of the grouting solution was achieved through close collaboration between the client and Sika, supported by Sika's dedicated technical expertise.
- SikaGrout®-9550 demonstrates exceptional early strength development, achieving a one-day strength that is 10 times higher than the market average under cold temperature conditions. Its fatigue performance has been rigorously validated through a comprehensive testing campaign with Leibniz Universität Hannover, confirming that DNV-OS-C502 standards can be conservatively applied for fatigue life predictions of grouted connections using SikaGrout®-9550.
- Sika's Ultra High Performance Concrete (UHPC) and composites undergo extensive testing at MPA in Germany, including creep and fatigue assessments. Additionally, large-scale trials have been conducted under both low-temperature European conditions and high-temperature tropical environments to validate the materials' performance in extreme weather conditions. Sika's grout portfolio offers ultra-high-performance concrete and composites with strength and durability up to ten times greater than conventional cement products.

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