



SIKA AT WORK

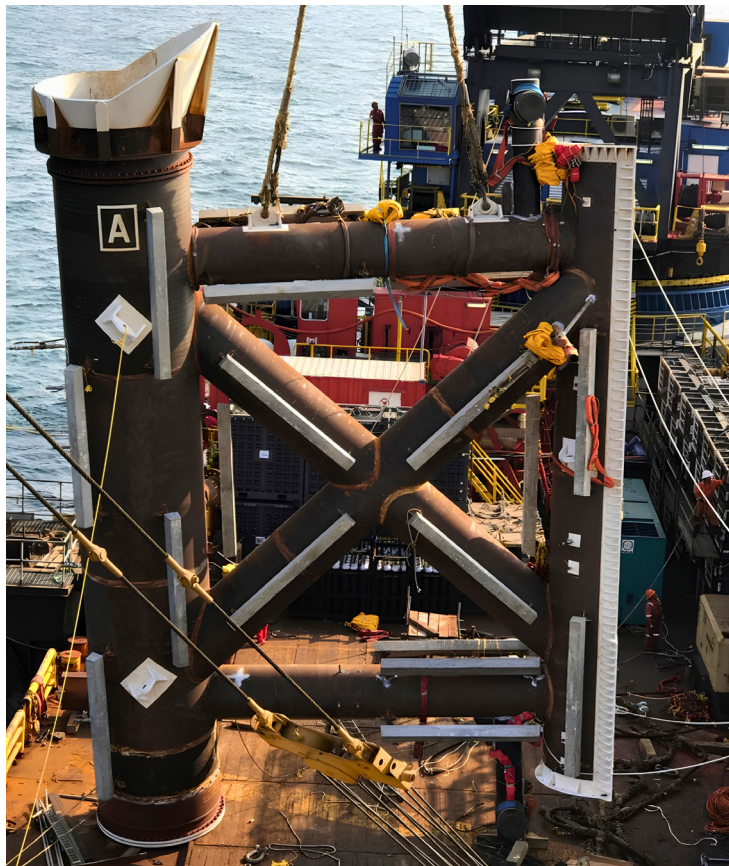
UNDERWATER STRENGTHENING AND REPAIR FOR MHSRD III PROJECT

OFFSHORE & MARINE CONSTRUCTION
CONVENTIONAL ENERGY

BUILDING TRUST



UNDERWATER STRENGTHENING AND REPAIR FOR MHSRD III PROJECT



PROJECT DESCRIPTION

As part of the Mumbai High South Redevelopment Phase III (MHSRD III) Project, Sika carried out underwater structural strengthening and repair works for multiple offshore platforms located in the Mumbai High South Field in the Arabian Sea. The redevelopment program, led by Oil and Natural Gas Corporation Limited, involved the rehabilitation and strengthening of aging offshore infrastructure, including wellhead platforms, process platforms, and subsea structural members.

Sika was engaged by SapuraKencana HL Sdn Bhd to provide engineering, grouting, and offshore execution services for remedial and strengthening works on the NU, SJ, WI-9, D1C, and SCA platforms.

The scope included pre-engineering surveys, structural analysis, detailed engineering, offshore grouting installation, and underwater repair works using high-performance cementitious grouting materials.

Project name: Underwater Strengthening and Repair for MHSRD III Project
Location: Mumbai High South Field, Arabian Sea, India
Year: 2017
Customer: SapuraKencana HL Sdn Bhd
Application: Repair & maintenance
Product: SikaGrout®-9110 and SikaGrout®-9550

PROJECT REQUIREMENTS

The project required the strengthening and rehabilitation of multiple underwater jacket members, joints, and pile structures across several offshore platforms operating within a mature offshore field. Structural assessments identified the need for remedial strengthening works, including infill grouting, grouted clamp connections, skirt pile integration, and underwater structural repairs.

In addition to offshore repair execution, the scope required detailed pre-engineering surveys, structural analysis, finite element analysis (FEA), and the development of strengthening solutions capable of being installed subsea under operational constraints.

One of the primary engineering challenges emerged during the design stage, when it was identified that the helideck on one platform would obstruct piling operations. The repair methodology therefore needed to accommodate restricted installation clearances while still ensuring sufficient load transfer between new skirt piles and the existing jacket structure.

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SIKA SOLUTIONS

Sika delivered a fully integrated engineering and offshore repair solution encompassing inspection support, structural analysis, detailed engineering, offshore grouting services, and execution management. The pre-engineering phase included development of survey procedures and inspection support for the NU, SJ, WI-9, and D1C platforms. Detailed structural strengthening analyses were subsequently carried out using in-place re-analysis methodologies and finite element analysis to determine suitable repair and reinforcement solutions based on field inspection data. For the D1C platform, Sika designed a grouted clamp system to facilitate the installation and integration of two new 84-inch skirt piles with a pile penetration depth of approximately 55 meters. The grouted clamp configuration enabled effective load transfer between the added skirt piles and the existing jacket structure while accommodating the restricted installation clearances caused by the platform helideck. The solution eliminated the need for underwater welding operations during installation.

Offshore strengthening works were then carried out across multiple platforms using high-performance cementitious grout systems. At the NU platform, underwater strengthening works were completed on a horizontal bracing member at approximately EL (-) 7.0 m using SikaGrout®-9110. Similar strengthening works were performed at the SJ platform, including reinforcement of members and joints between elevations EL (-) 7.0 m and EL (-) 57.0 m.

At the WI-9 platform, strengthening works were undertaken on two underwater joints between elevations EL (-) 78.495 m and EL (-) 57.0 m. At the D1C platform, grouting operations included pile sleeve annulus grouting together with grouting of the leg clamp and inline clamp systems using SikaGrout®-9110.

Additional underwater strengthening works were carried out at the SCA platform, where five structural members were rehabilitated using infill grouting techniques and high-performance cementitious grout materials.

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CUSTOMER BENEFITS

Sika's engineering-led repair methodology enabled the underwater strengthening of critical offshore jacket members and joints without removal of the existing structural elements, minimizing operational disruption and offshore intervention requirements.

The grouted clamp and skirt pile integration concept developed for the D1C platform provided a safe and cost-effective alternative to conventional underwater welding techniques. By eliminating hot works subsea and accommodating restricted installation clearances, the solution reduced execution risk while maintaining structural performance requirements.



Any product name or reference reflects the Sika product name at the time of creation of this document and may differ from the product name or reference during past events.

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



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