



SIKA AT WORK

STRUCTURAL REPAIR OF BERTHING DOLPHIN AT NGL BERTH 51, JU'AYMAH

OFFSHORE & MARINE CONSTRUCTION
MARINE INFRASTRUCTURE

BUILDING TRUST



STRUCTURAL REPAIR OF BERTHING DOLPHIN AT NGL BERTH 51, JU'AYMAH



PROJECT DESCRIPTION

In 2016, Sika completed the structural repair and strengthening of a breasting dolphin pile at Berth 51 within the Ju'aymah Field, Kingdom of Saudi Arabia. The repair works were carried out for a major offshore gas facility operated by Saudi Aramco.

During underwater inspection activities performed by a dive team, the south leg pile of the breasting dolphin structure was found to have sustained significant damage, resulting in misalignment between the upper and lower sections of the pile. Due to the critical operational importance of the terminal and the extreme berthing loads imposed by large tankers, a robust structural rehabilitation solution was required to restore the integrity and long-term performance of the structure.

Sika was engaged by the Ju'aymah Gas Plant Offshore Unit to develop and execute a high-strength grouted clamp repair solution supported by detailed engineering analysis and offshore grouting services.

Project name: Structural Repair of Berthing Dolphin at NGL Berth 51, Ju'aymah
Location: Ju'aymah Field, Kingdom of Saudi Arabia
Year: 2016
Customer: Ju'aymah Gas Plant Offshore Unit
Application: Repair & maintenance
Product: SikaGrout®-9550

PROJECT REQUIREMENTS

The project required the structural rehabilitation of a damaged breasting dolphin pile operating within a heavily utilized offshore terminal environment. The repair methodology needed to restore pile alignment and structural performance while accommodating the high cyclic loading generated by large tanker berthing operations.

Given the operational importance of the facility, the repair solution also needed to minimize offshore disruption and provide rapid installation and early strength development. In addition, all engineering designs

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and strengthening methodologies required independent verification to ensure compliance with offshore structural integrity requirements.

SIKA SOLUTIONS

Sika delivered a complete engineering and offshore structural repair solution encompassing inspection support, detailed engineering, clamp design verification, offshore grouting execution, and subsea installation services.

The engineering scope included structural inspection support, damage assessment, analysis and design reporting, and development of the pile strengthening methodology. All repair designs and clamp configurations were independently verified by DNV Singapore prior to offshore execution.

The offshore works included removal of marine growth using ultra-high-pressure water jetting, mobilization of specialist grouting equipment and materials, clamp installation with diver assistance, and subsea grouting operations using SikaGrout®-9550, an ultra-high-strength cementitious grout developed for offshore structural repair applications.

Sika supplied a compact offshore grouting spread together with proprietary grout materials, accessories, and experienced offshore engineering personnel to execute the works efficiently within the constrained offshore environment. Supervisors were also deployed to oversee local clamp fabrication activities and ensure compliance with engineering requirements throughout the project.

CUSTOMER BENEFITS

The high-strength grouted clamp repair methodology enabled the structural rehabilitation of the damaged breasting dolphin pile while minimizing operational disruption to a critical offshore terminal facility.

SikaGrout®-9550 provided rapid strength development and high elastic modulus properties, allowing accelerated installation and earlier offshore demobilization compared to conventional grout systems. Approximately 40% of the design compressive strength and 75% of the elastic modulus were achieved within 24 hours, contributing to reduced offshore installation time and associated vessel costs.

The grout system also delivered exceptional fatigue resistance under cyclic berthing loads, with significantly improved stress cycle performance compared to conventional cementitious grouts. Its dense and stable microstructure provided high impermeability and long-term durability in the aggressive marine environment.

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