Boskalis
Dredging & Marine Experts

PROJECT SHEET

NEW OFFSHORE CRUDE OIL UNLOADING FACILITIES PROJECT
SRI RACHA, THAILAND

BOSKALIS OFFSHORE: SKILLS, RESOURCES, EXPERIENCE

Boskalis Offshore brings together the offshore skills, resources and experience of Royal Boskalis Westminster. The group's offshore capabilities include seabed rectification works for pipeline/ cable and platform installation, construction of pipeline shore approaches and landfalls, offshore mineral mining, offshore supply and support services and decommissioning services. Boskalis provides clients with tailored, project-specific solutions for above dredge related offshore services, as illustrated by the following project summary.

PROJECT DESCRIPTION

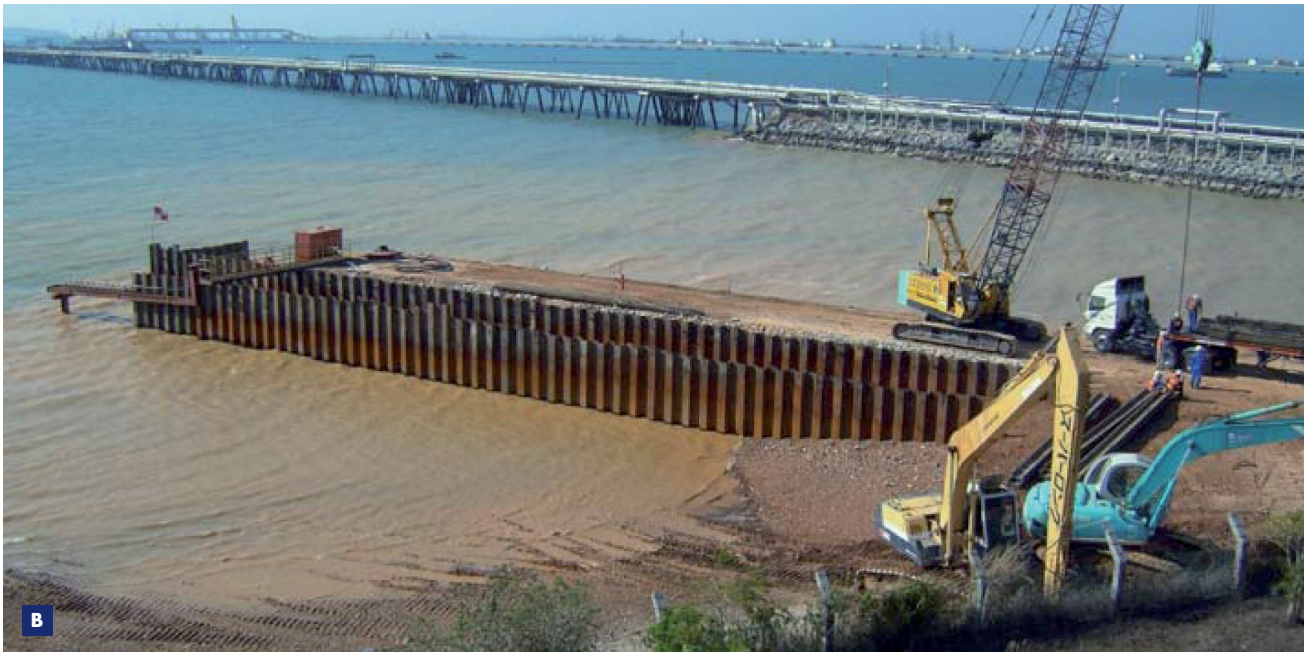
Thai Oil Public Company Limited is the largest petroleum oil refiner and supplier in Thailand. To enable Very Large Crude Carriers (VLCC) up to 320,000 DWT or a freight capacity of up to two million barrels to berth at Thai Oil's refinery in Sri Racha, Cholburi Province, a second Single Buoy Mooring (SBM) facility was installed approximately 14 km offshore, in water depths of around 30 m. From this buoy, a 52" diameter concrete coated steel pipeline had to be installed to the landfall location near the Thai Oil refinery.

Boskalis Offshore and Tideway formed a Joint Venture, which was awarded the contract for the pre-trenching and backfilling works. Boskalis Offshore provided the main equipment for the execution of the project.

FEATURES

Client	Thai Oil Public Company Limited
Location	Sri Racha, Thailand
Period	December 2006 - August 2007
Main contractor	Saipem Asia Sdn Bhd
Contractor	Tideway - Boskalis JV

A Location map
B Installation of cofferdam to enable trench excavation through surf zone



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The landfall point of the pipeline was located within the Thai Oil refinery premises and the pipeline route was designed to run close to operational jetties. Because of the JV's flexibility during project execution and extensive consultation with Thai Oil, interference of the daily operations at the refinery and jetties was kept to an acceptable minimum.

OFFSHORE TRENCH DREDGING

For the offshore trench dredging operations, Boskalis deployed the large Trailing Suction Hopper Dredger (TSHD) "Prins der Nederlanden". This vessel dredged the 12 km long trench in water depths varying from 10 to 30 metres. The trench depth for this section was 3.6 metres for the crossing of the shipping channel and 2.6 metres for the remaining parts. At trench bottom level, the trench width was 5.0 metres for all straight sections and 8.0 metres in curved sections. A total volume of approximately 550,000 cubic metres was dredged and transported to a designated disposal area at a distance of 4 kilometres from the offshore end of the trench, avoiding any disturbance of the busy traffic at the fairways to and from Laem Chabang port.

NEAR SHORE TRENCH DREDGING

The near shore trench section was dredged by Boskalis' Cutter Suction Dredger (CSD) "Orion". This section of the trench was dredged up to a depth of 4.6 metres, thus ensuring a cover on Top of Pipe of minimum 3.0 metres. The trench width at bottom level was 5.0 metres.

In order to dredge the trench through this shallow water area, a flotation channel with a length of 960 metres needed to be dredged. The total volume of approximately 236,000 cubic metres was temporarily placed in an underwater stockpile adjacent to the trench for later reuse during the backfill operations.

Upon completion of the pipeline installation, the near shore section of the trench and the entire flotation channel were backfilled to the original seabed level, again with the CSD "Orion".

ENVIRONMENTAL MITIGATION MEASURES

During the near shore dredging operations, the dredged material was pumped through a floating pipeline to the spreader pontoon at the temporary storage area. To minimize the effect of suspended solids on the aquatic life, this pontoon was equipped with a purposely built double silt screen arrangement. Suspended solids were contained inside the silt screen system, which was designed to be adjustable to different water depths.

COFFERDAM AND ONSHORE TRENCH

At the actual transition from water to land a 75 metre long sheet piled cofferdam, including wing walls, was installed. A rock causeway enabled the installation of the cofferdam. The trench inside the cofferdam was excavated to the required depth. At the onshore end of the cofferdam, a transition was excavated from the trench bottom level to the original ground level.

Before the actual pipe pull, the wire-lay operations were performed with the CSD "Orion".

Upon completion of the pipe pull, the trench inside the cofferdam and the onshore trench were backfilled and the cofferdam was removed.

The project was completed by mid August 2007, in accordance with Client's time schedule and to Client's full satisfaction.


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C CSD "Orion" and spreader pontoon "Calabar River" with double silt screen arrangement
D CSD "Orion" installing the pull wire in the dredged trench
E TSHD "Prins der Nederlanden" lowers its suction pipe to commence trench dredging

Royal Boskalis Westminster N.V.
PO Box 43
3350 AA Papendrecht
The Netherlands

T +31 78 69 69 000
F +31 78 69 69 555

royal@boskalis.com
www.boskalis.com