INTECSEA
WorleyParsons Group

Marine Terminals

Capability & Experience

Terminal projects worldwide

INTECSEA has been a leading provider of engineering and project/construction management services for marine terminal projects for over 30 years. Our broad experience in all aspects of marine terminal development and our independence from equipment suppliers make INTECSEA uniquely qualified to assist with the identification and development of safe and cost–effective solutions for offshore tanker berths.

Capability Overview

INTECSEA has participated in a significant number of terminal projects worldwide performing site surveys and system designs, preparing Invitation to Bid documents, inspecting component fabrication, supervising terminal installations and providing total project management services.

Projects have consisted of import and export facilities in all regions of the world, including Arctic and other harsh environments.

INTECSEA has extended expertise in Single Point Mooring (SPM) terminals, Conventional Buoy Mooring (CBM) or Multi Buoy Mooring (MBM) terminals, fixed tanker berths, and associated onshore facilities. This has created a capability for unbiased evaluation of alternate marine terminal options and subsequent implementation of total project services from concept through commissioning for the selected marine terminal type.

Services

- Feasibility and conceptual studies
- Terminal simulation studies
- Site and pipeline route selection
- Mooring system specifications
- Fluid Transfer System Specifications
- Pipeline system design
- Pipeline material specifications
- Invitation To Bid (ITB)
- SPM detailed design review/approval
- Project and construction management
- Fabrication and installation inspection
- Operation and maintenance manuals
- Start-up/commissioning assistance

Engineering Services

Terminal Simulation Studies

INTECSEA performs terminal simulation and throughput studies to determine the optimal location of a marine terminal and verify the terminal has the required throughput capacity. Using proprietary software, analyses are performed to determine the effect on terminal efficiency of tanker transit time as influenced by sea conditions and operating procedures. The outcome of these types of analyses is the number of berths or mooring systems, volume of storage required, and size and number of tankers.

Mooring Systems Selection Evaluation

Conceptually, a choice must be made between a compliant mooring or fixed berth. Moorings can be single point (SPM) or multi-point (CBM); whereas a fixed berth may be a jetty or sea island connected to onshore facilities by marine pipelines or pipe trestles. The choice depends mainly on exposure to wind, wave and current conditions, navigational aspects, water depth, and the range of tanker sizes and products to be handled. Evaluation and design are performed using commercial as well as INTECSEA proprietary software for analysis of the mooring system, underbuoy hoses, floating hoses, flexible pipe risers, and mooring hawsers.

Terminal Siting Studies

INTECSEA determines optimum marine terminal locations based on the results of hydrographic surveys and expected tanker size distribution to determine vessel draft, motions and maneuvering considerations to define the Mooring and Maneuvering Area (MMA), safety fairways, and anchorage areas. In addition, routing of the pipeline(s) and locating the Pipeline End Manifold (PLEM) are significant factors in siting offshore terminals. INTECSEA has established processes and procedures for these tasks to assure efficient and reliable results.

Special Studies

In addition to engineering design and construction management services, INTECSEA provides technical expertise in custody transfer, crude quality monitoring, leak detection, supervisory control, and the development of operating and maintenance procedures. INTECSEA has designed maintenance facilities which include hose handling facilities and small boat harbors.

Other specialized engineering support INTECSEA can offer includes assistance in permitting and compliance with regulatory requirements, risk and environmental impact studies, and HAZOP assessments. In addition to crude oil and petroleum products, INTECSEA has expertise in terminals for handling Liquid Petroleum Gas (LPG) and various types of slurries.

Project Experience

Lasmo Cohasset/Panuke SPM

CUSTOMER Lasmo Nova Scotia, Ltd. And Pan Canadian Nova Scotia, Ltd

LOCATION Nova Scotia

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

As part of the Lasmo Nova Scotia Ltd. Cohasset/Panuke Field Development located in 70 m water depth off the eastern coast of Canada, INTECSEA was responsible for the conversion and installation of an existing CALM SPM for use with a permanently moored FSO in very severe offshore weather conditions.

SPM Terminal Upgrade

CUSTOMER Petro Terminal de Panama, S.A

LOCATION Chiriqui Grande, Panama

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

PetroTerminal operates an SPM terminal for the import and export of crude oil. The terminal is located in a lagoon and comprises CALM type SPM. The system is designed for mooring vessels up to 150,000 DWT. To pursue new opportunities a terminal upgrade has been investigated and implemented to receive larger vessels of up to 320,000 DWT through the development of a hybrid configuration of existing SPM with a two buoy Multi Buoy Mooring system.

MRC PSR-12 SPM Terminal Project

CUSTOMER Star Petroleum, a subsidiary of Caltex

LOCATION Melaka, Malaysia

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

A single point mooring (SPM) terminal has been installed at Melaka, Malaysia in 36 m water depth to import crude oil. The terminal is designed to receive fully loaded 300,000 dwt VLCCs and partially loaded 400,000 dwt ULCCs. The SPM/PLEM system is connected to an onshore tank farm by a 48-inch offshore pipeline of 6.8 km in length, and a 36-inch onshore pipeline of 0.5 km in length. Onshore facilities included pig launching and receiving facilities, hose handling, inspection, and maintenance facilities, crude oil mixing and sampling units, all associated electrical and control system integration with the central control room, and tie-in to the onshore tank farm.

Tanzania SPM Project

CUSTOMER Tanzania Ports Authority

LOCATION Tanzania, East Africa

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

A 28-inch crude pipeline and a 24-inch white products pipeline extend from the SPM to the onshore tank farm. The offshore pipeline route is 3.6 km long with shore crossing followed by 4 km of onshore pipelines through a populated area up to the connection to the existing onshore facility.

Project Management Consultant scope included contract management and administration, design review for the pipelines and SPM system, subsea manifold (PLEM), supervision of fabrication, construction, installation and commissioning, and supporting services during the warranty period.

Crude Oil Receipt Facilities Project

CUSTOMER Kochi Refinery Ltd.

LOCATION Arabian Sea, Cochin India

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Kochi Refineries Limited (KRL), has proposed to set up crude oil import facilities comprising of an offshore Single Point Mooring (SPM) system in the Arabian Sea off Cochin, a tank farm and onshore / offshore pipeline. The shore tank farm is set up at Cochin, about 24 km away from KRL. The SPM is located at about 19.5 km from the shore tank farm. The tanker terminal and pipeline facilities basically consist of a Single Point Mooring (SPM) and a 48-inch nominal outside diameter submarine pipeline to handle offloading of tankers up to VLCCs of 300,000 DWT.

Port Sudan SPM Terminal Expansion

CUSTOMER Greater Nile Petroleum Operating Company (GNPOC)

LOCATION North-East Africa

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

GNPOC is operating a crude oil loading terminal at Marsha Bashayer, Port Sudan. The terminal consists of an onshore facility with an offshore pipeline and CALM type loading buoy. In view of the expected production increase INTECSEA investigated a terminal expansion by adding an additional loading buoy and pipeline. The terminal is located within an extensive reef area, with restricted access and maneuvering space.

Success Through Insight

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