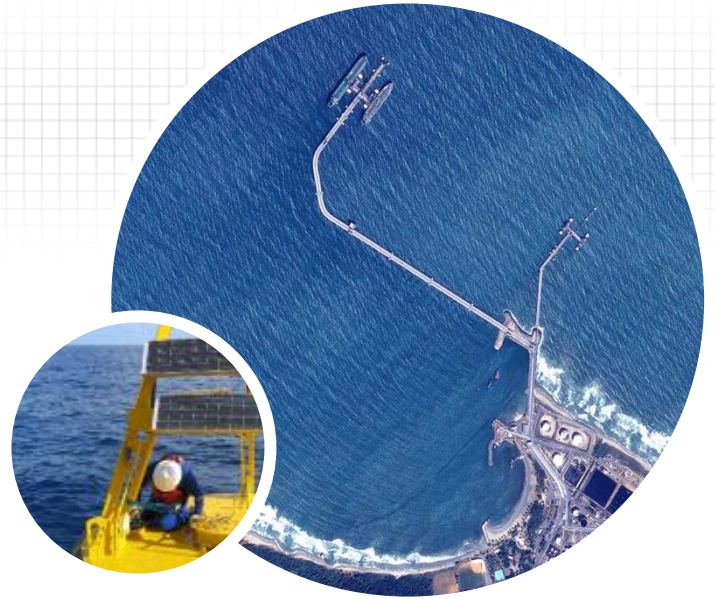




CREDENTIAL MARITIME WORKS  
Multibuoy, Monobuoy and Submarine Pipelines

# INCOSTAS NOUEL COSTAL & MARITIME- ENVIRONMENT ESPECIALISTS



We accumulate a wide technical knowledge and extensive experience of more than 70 years that allows us to provide services to our clients with a focus on quality, efficiency and cost-effectiveness approach.

## INTEGRATED MANAGEMENT SYSTEM (IMS)

Our IMS is certified according to the **ISO 45001** and **ISO 14001** standards. We manage, assure and control the Quality of our services, as well as the proper management of the Occupational Safety and Health of our personnel, subcontractors and third parties, and the Protection of the Environment.



## WHAT WE DO

- Ports & Terminals
- Oil, Gas and Petrochemical
- Dry bulk
- General Cargo/Multipurpose
- Ferry/RO-RO/Cruise
- Containers
- Conventional Buoy Moorings (CBM)
- Single Point Moorings (SBM, CALM)
- Subsea Pipelines
- Master Plans
- Navigation Channels
- Touristic Facilities
- Operations Simulation
- Port Security

## OUR EXPERIENCE

### Submarine Pipelines

#### **Design, Inspection and Submarine Pipeline Installation.**

**We count with qualified professional hydrographers, geophysicists, geotechnics and technical support staff as well as the latest state-of-the-art technology equipment, capable of carrying out studies and measurements of the highest quality and reliability. Routes Feasibility Studies, Hydrographic Surveys, Marine Bottom Samples, Design of Submarine Pipelines, Valves, Submarine Hoses and Connections, Mooring Buoys, Anchorage and Beacon Systems, Pipeline Installation.**



**Technical supervision of the submarine pipeline laying. Fuel Receipt, Plant of Fuel Storage, Receipt and Distribution of Miramar, Nicaragua**

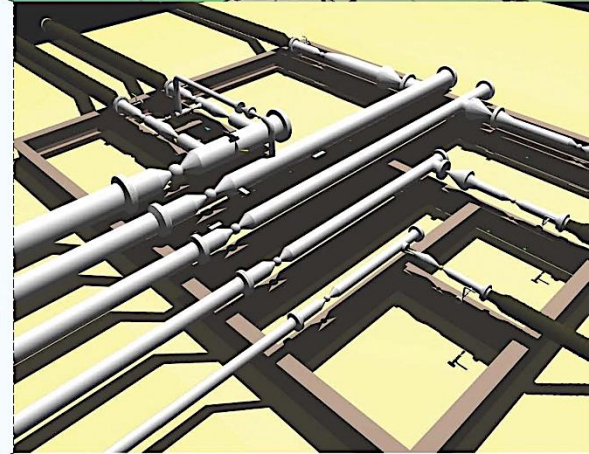
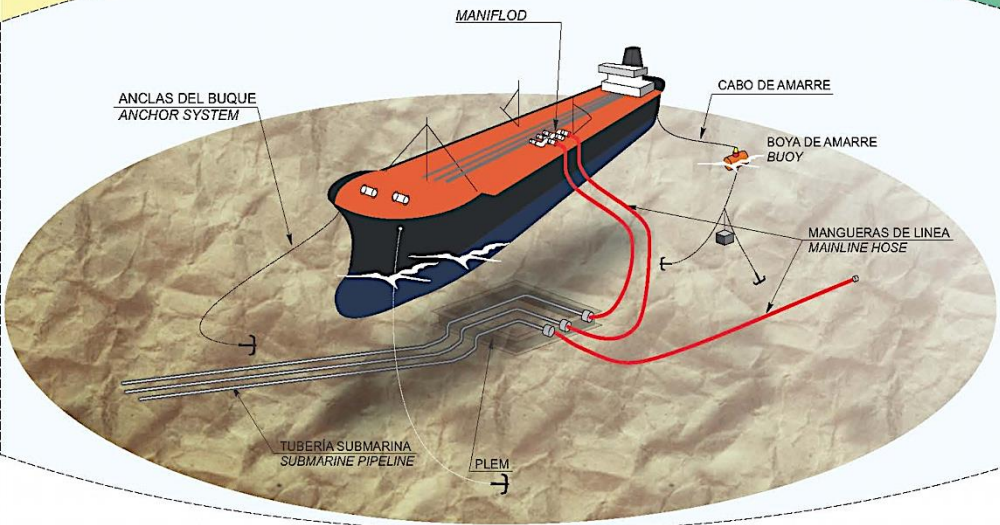
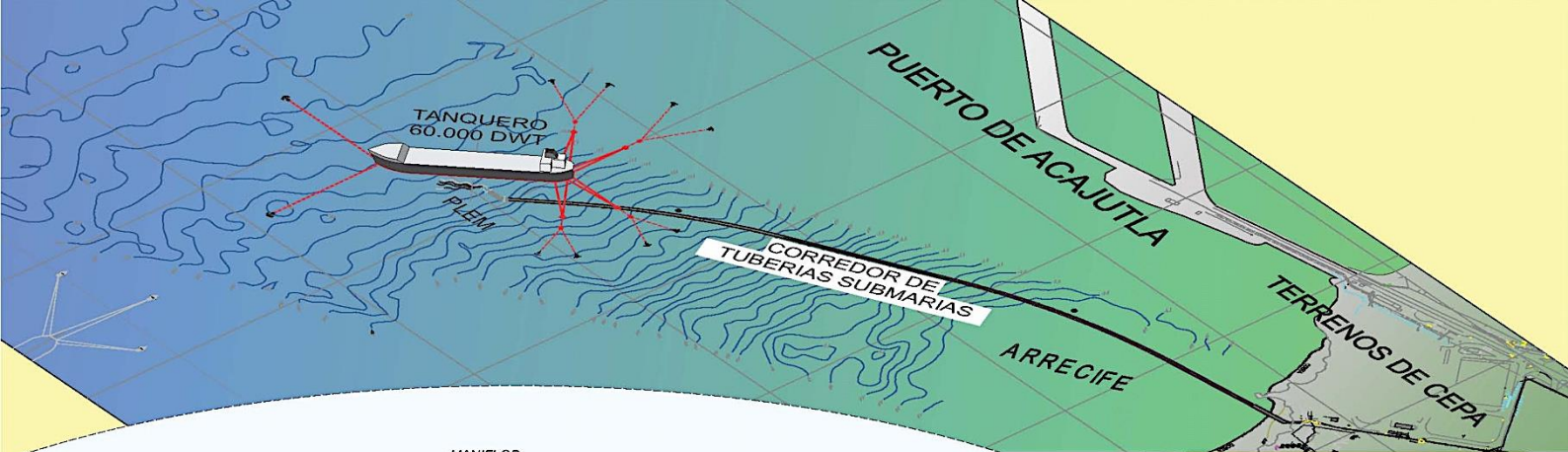
**Technical supervision for the laying of 5 pipelines for reception and dispatch of refined petroleum products. Each pipeline has a length of 3.8 Km, with diameters of 8, 12, 16, 20 and 26" ranging from the land valve station to a PLEM (PipeLine End Manifold) located at a depth of 20 m. To guarantee at a safe and quality level the process of pipeline laying, we counted with a team of field engineers specializing in pipelines and marine hydraulics, specializing in marine works for the supervision of the labors on the vessels, divers with extensive experience in pipeline laying as well as Safety, Hygiene and Environmental personnel (SHE)**



## **Natural Gas Submarine Pipelines and Submarine Valves for Gas Exportation.**

**TIPIEL. Gulf of Marroquillo. Colombia**

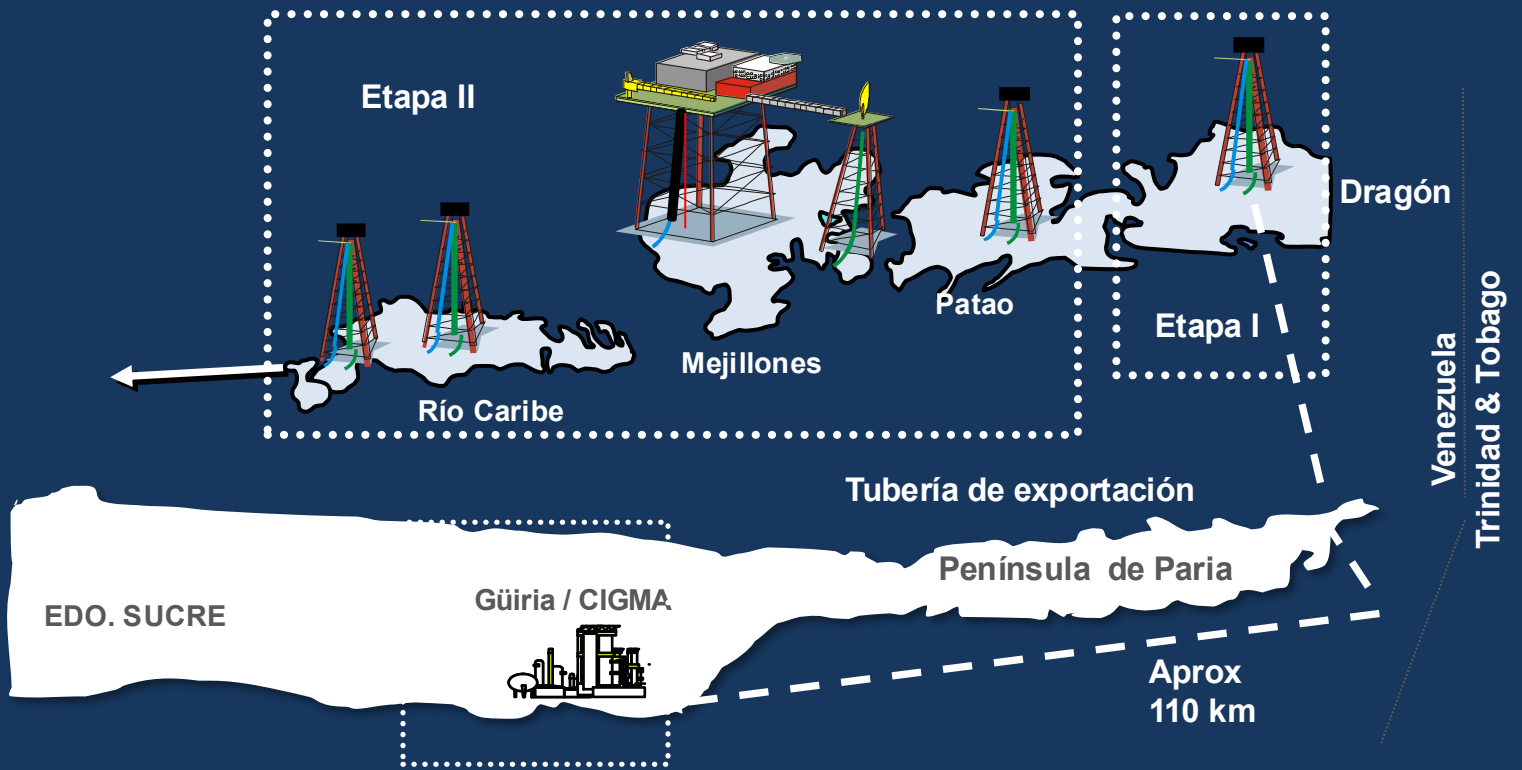
**Detail Engineering of the submarine section of the gas pipeline for the transportation of natural gas (100 MMSCFD) from the Camp La Creciente (Sucre, Colombia) to the liquefaction barge loading terminal (LNG production) in the Tolu coast (Sucre, Colombia). The design was made for two pipes diameters 18 "and 24"; as well as that of an underwater isolating valve.**



**Marine terminal with conventional buoy mooring and subsea pipelines.  
PDV CARIBE. Acajutla. El Salvador**

The Project comprised basic and detailed design of Marine Facilities for the "Petroleum-Derived Fuels' Distribution Plant" in Acajutla, Republic of El Salvador; the Plant allows handling (import by sea and ground distribution) of 91 and 95 Octane Gasoline, Diesel, Jet A-1 and LPG (Propane and Butane).

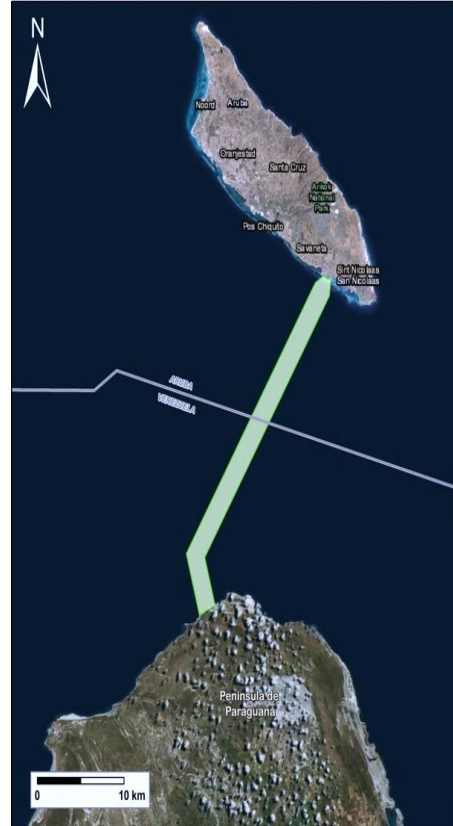
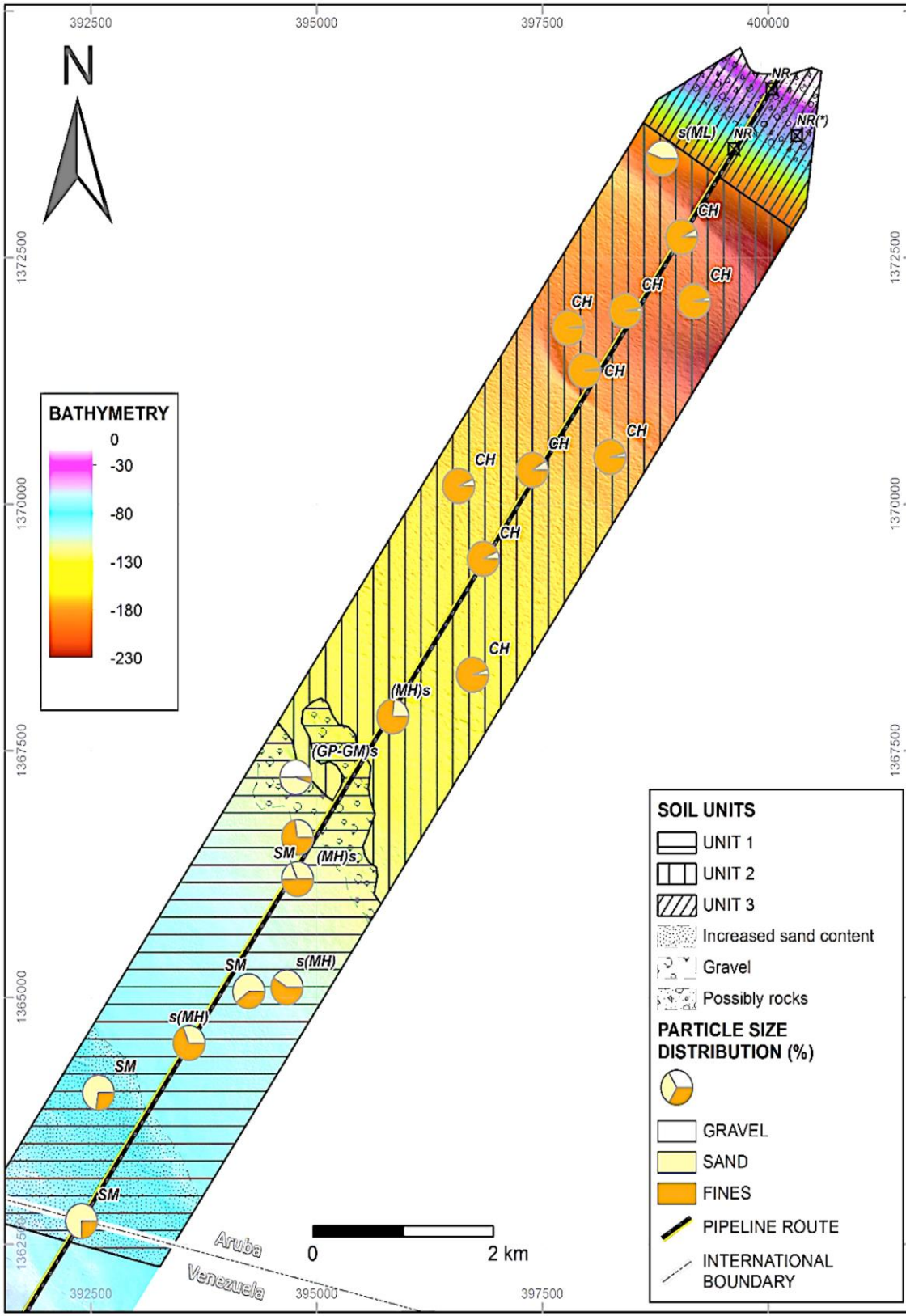
Tankers anchored at 1,100 m off the coastline pump fuels to on-land storage tanks at the Tank Farm, through a system of four (4) 1,000 m long subsea pipelines and 2,800 m long ground pipelines.



### Dragon Fiel - CIGMA subsea gas pipeline. Sucre State. Venezuela

The Project covered Conceptual Design of a Subsea Gas Pipeline between the offshore Dragon Platform at north of Paria Peninsula and Grand Mariscal de Ayacucho Industrial Complex (CIGMA).

In order to carry out the Project, mechanical, process, civil, instrumentation and electrical conceptual design concepts for Gas Pipelines were reviewed, updated and developed, standing out among them: philosophy of operation, hydraulic assessment, pipe diameter and wall thickness selection, assessment of construction methods, hydrodynamic stability, seismic aspects, revision of bathymetric inputs, geological faults, pipeline routes and cathodic protection.



**Route selection for the gas pipeline and conceptual engineering.**

Project: Natural Gas Supply to Aruba from Venezuela.  
CITGO  
Caribbean Sea.  
Venezuela

N

GOLFO DE VENEZUELA

1

2

### Site and pipeline surveys

#### Cardón IV Block.

Theoretical route and route of the gas pipeline, adjusted based on the depth model obtained with multibeam bathymetry.

CARDÓN IV - ENI - REPSOL  
Gulf of Venezuela





**EPC for the stabilization system of the underwater pipeline.  
Plant of Fuel Storage, Receipt and Distribution of Miramar, Nicaragua**

**Engineering, Procurement, Construction and underwater installation of 240 complementary elements necessary to ensure the stability of the underwater pipes of the Miramar Fuel Distribution Plant. Bathymetries were performed before and after stabilization.**



**LS CABLE. Laying and protection of 230 KV cable.**

Chacopata / Margarita.

KOREA OCEAN

ENGINEERING &

CONSULTANTS. CO

KOCECO

Caribbean Sea.

Venezuela

## OUR EXPERIENCE Multibuoy & Monobuoys

For operators that develop oil and gas fields, uninterrupted and efficient transportation of unprocessed hydrocarbons for offshore long distances or by the marine bottom is a necessity.

In the Incostas Nouel Group, the developing of systems whose main function is that the vessel receives the crude with great speed and efficiency.

Studies for the location, design and calculation of single point mooring systems, Monobuoy, CALM (Catenary Anchor Leg Mooring) and multiple mooring systems, Multibuoy, CBM (Conventional Buoy Moorings) Underwater Lines Routing, Protection of the Marine Bottom Rock. PLEM Mount, Anchor Mounting.



**Multibuoy System (CBM), PLEM, hoses and submarine pipes  
Cabinda Oil Refinery, OECI S.A. Cabinda, República de Angola.**

**Basic and detailed engineering for the design of a Multibuoy System (CBM) where the ships to be loaded with Crude Oil, Nafta, Jet Fuel, HFO/Fuel Oil will dock, which will be sent by underwater pipelines from land.**

**The piping system from the coast to the Multibuoy System (CBM) consists of 8" or 16" submarine lines for the three exported products (Jet-A1, Nafta and HFO), it is also included in the piping design. submarines for crossing the coastline and arriving at the PLEM, as well as the underwater hoses that will be used to carry liquid products from the PLEM to the multiples (Manifolds) of the ships, which will be serviced at the terminal.**



**Single point mooring and  
crude oil subsea pipelines.**

**WEEKS MARINE-  
PETROZUATA**

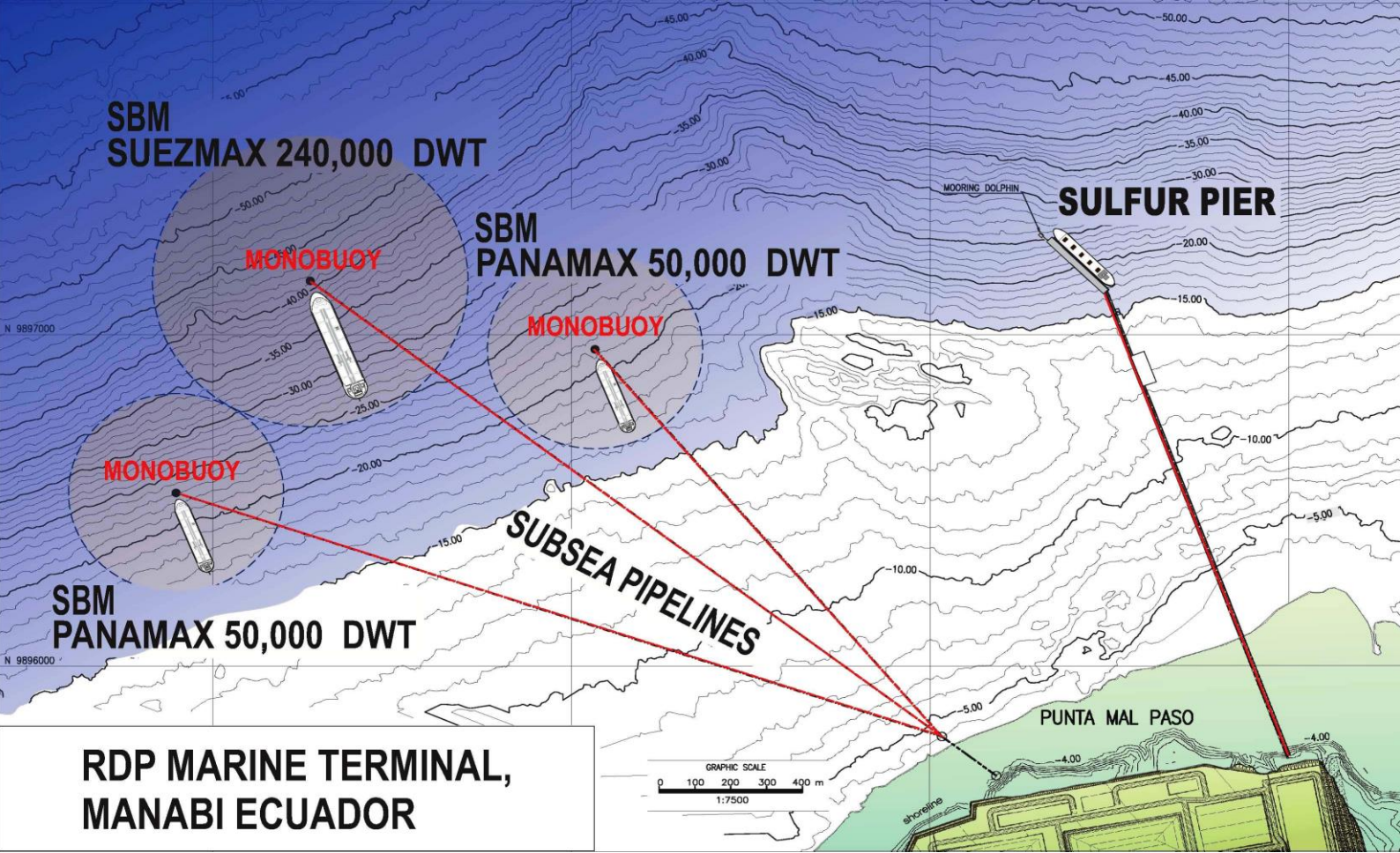
**Jose Terminal  
Anzoategui State.  
Venezuela**

**Detail engineering to locate a single point mooring buoy in Jose to moor 80,000 DWT tankers and optimize the route of the crude oil subsea pipelines.**

**The project comprised the following activities:**

**Location study for SPM Buoy. Subsea pipelines' route study. Protection against rocky outcrops on the seabed.**

**PLEM framing and installation. Installation of anchors. Drawings of Subsea Pipelines between SPM Buoy and shoreline, including PLEM connection details.**



**RDP MARINE TERMINAL,  
MANABI ECUADOR**

Design of 3 monobuoys, submarine pipes and sulfur dock.  
TECNOCONSULT-SK-RDP. Manabi, Ecuador.

Basic engineering of the marine works adjacent to the tank farm of the expansion project of the Pacífico Refinery.

It included: Design of the Sulfur Dispatch dock, for vessels between 10,000 DWT and 58,000 DWT (average 20,000 DWT).

Design of 3 Mooring Monobuoys (SBM) includes the pipe connection. Submarine Pipes: It included the layout and design of 12 pipes (6 for reception and 6 for return).



## Modification of routing of underwater fuel pipelines. Nicaragua

Detail Engineering for the adaptation of the routing of the submarine pipes during the Construction of the Marine Terminal of Mooring Buoys (CBM Type) for the berthing of tankers of 300,000 to 490,000 barrels (45,000 to 73,000 Dwt), in the lower scale of Gas Carriers of 10,000 Dwt.

Scope: Adjustment of the laying geometry. Elimination of the 'Elbows' of Progressives 3+644 and 3+695. Modification of the PLEM. Modification of PLEM support structure. Increase in the length of submarine pipelines. Reorientation of the berth. Review of the anchor system for mooring buoys. Two bow buoys. Pipe ballast simplification.

+ I N F O

## OUR BRANCH OFFICES & CONTACTS



### CERTIFICADOS

