



Ingeniería Naval Consulting



## A B O U T   U S

INAVCO is a consulting firm created to provide engineering services of excellent quality for the maritime industry.

Our experience includes all types of offshore marine engineering projects such as Mobile Offshore Drilling Units –Jack-ups and semisubmersibles-, Offshore Supply Vessels OSV's and Offshore facilities.

## M I S S I O N

To provide engineering consulting services with an outline of solutions utilizing top of the line technological tools.

## V I S I O N

INAVCO is interested in maintaining a close relationship with its customers by providing engineering solutions for their project development and growth and as well as achieving lasting alliances for mutual commercial benefit.



## S E R V I C E S

INAVCO provides engineering services to the oil and gas industry as well as maritime industry. INAVCO staff has an extensive experience in all structural, maritime, mechanical and electrical systems in Offshore installations and facilities. INAVCO offers viable, innovative and efficient solutions to complex engineering projects.

Our services are listed:

- Consulting Services
- Engineering Services
- Design Services

Our solutions are a clear emblem of our philosophy, to provide engineering services of excellent quality.

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**Structural Engineering:**

- Basic structural design and detail design for drilling units, F.P.S.O, Drill ships and service vessels.
- Global Strength analysis.
- In-place analysis for Jack-ups.
- Mooring analysis.
- Analysis and design of spud cans for Jack-ups.
- Analysis and design of legs for Jack-ups.
- Analysis and design of drill floors for Semisubmersible and Jack-ups and cantilever beams for Jack-ups.
- Analysis and design of helidecks and living quarters.
- Analysis and design of equipment foundations, as well as cranes, winches and windlasses.
- Dynamic and vibration analysis.
- Lifting analysis.

**Naval Architecture and Marine Engineering:**

- Intact and damage stability.
- Loading conditions.
- Longitudinal strength.
- Freeboard and load lines analysis.
- Inclining tests.
- Launch analysis.
- Resistance calculations.
- Drydocking & field transport analysis.
- Weight estimating.

**Mechanical Engineering:**

- Piping systems design (Hydraulic, pneumatic, salt water, mud, fuel oil, etc.)
- HVAC systems.
- Fire resistance systems.
- PDMS modeling for mechanical systems.

**Electrical Engineering:**

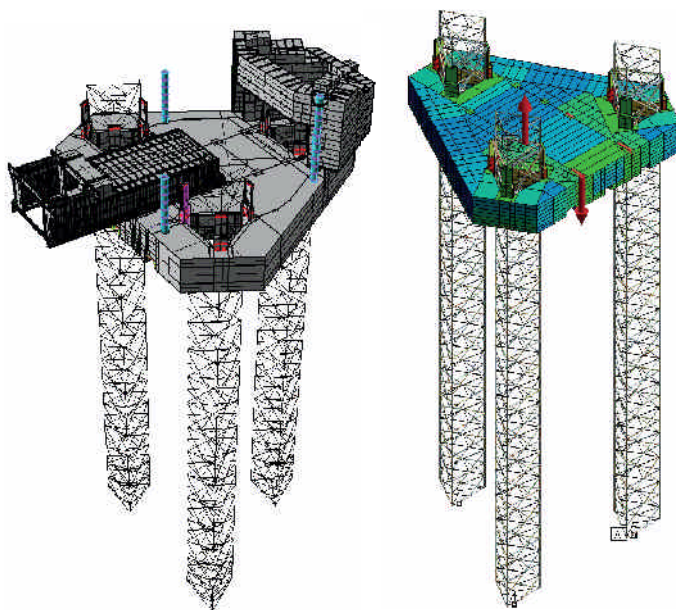
- AC/DC Electrical systems.
- Electrical load analysis and short circuit analysis
- Fire and gas detection systems.
- One line diagrams (low Voltage, medium voltage and High voltage).
- Emergency battery analysis

**CONSULTING SERVICES**

- Project management
- Project engineering
- Conceptual design, general arrangements, and preliminary geometry.
- Global strength analysis
- Bid packages for shipyards.
- Equipment selection and procurement
- Construction specifications
- Field engineering and shipyard support
- Construction inspections and surveying
- Naval Architecture software purchasing assistance and training.

**DESIGN SERVICES**

- Tug boats
- Platform supply vessels
- Fishing vessels



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INGENIERIA NAVAL  
CONSULTING



CNV  
NAVAL ARCHITECTS



|  |                    |
|--|--------------------|
| ESLORA TOTAL<br>LENGTH OVERALL               | 32.00 m            |
| MANGA DE TRAZADO<br>MOULDED BREADTH          | 10.60 m            |
| CAPACIDAD COMBUSTIBLE<br>GAS-OIL CAPACITY    | 225 m <sup>3</sup> |
| CAPACIDAD AGUA DULCE<br>FRESH WATER CAPACITY | 46 m <sup>3</sup>  |
| CAPACIDAD ACEITES<br>OILS CAPACITIES         | 19 m <sup>3</sup>  |
| CAPACIDAD ESPUMOGENO<br>FOAM CAPACITY        | 15 m <sup>3</sup>  |
| PESO MUERTO<br>DEAD WEIGHT                   | 312 Tn             |
| POTENCIA PROPULSORA<br>ENGINE POWER (MCR)    | 2x2000 Kw          |
| TIRO A PUNTO FIJO (BP)<br>BOLLARD PULL (BP)  | 64 Tons            |
| SOC. CLASIFICACION<br>CLASSIFICATION SOCIETY | BV                 |

**REMOLCADOR AZIMUTAL  
AZIMUTHAL TUG BOAT  
"KALAY"**

(Ref. "CNV": 152.07)

\* For a full catalog of designs please visit us at [www.inavco.net](http://www.inavco.net)

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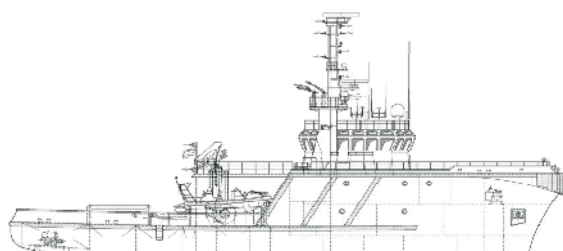




INGENIERIA NAVAL  
CONSULTING



CNV  
NAVAL ARCHITECTS



|  |                    |
|--|--------------------|
| ESLORA TOTAL<br>LENGTH OVERALL               | 42.00 m            |
| MANGA DE TRAZADO<br>MOULDED BREADTH          | 13.00 m            |
| CAPACIDAD COMBUSTIBLE<br>GAS-OIL CAPACITY    | 230 m <sup>3</sup> |
| CAPACIDAD AGUA DULCE<br>FRESH WATER CAPACITY | 50 m <sup>3</sup>  |
| CAPACIDAD ACEITES<br>OILS CAPACITIES         | 13 m <sup>3</sup>  |
| CAPACIDAD ESPUMOGENO<br>FOAM CAPACITY        | 8 m <sup>3</sup>   |
| CAPACIDAD RESIDUOS OL.<br>DIRTY OIL CAPACITY | 125 m <sup>3</sup> |
| CAPACIDAD BODEGA<br>HOLD CAPACITY            | 110 m <sup>3</sup> |
| PESO MUERTO<br>DEAD WEIGHT                   | 470 Tn             |
| POTENCIA PROPULSORA<br>ENGINE POWER (MCR)    | 2x1850 Kw          |
| TIRO A PUNTO FIJO (BP)<br>BOLLARD PULL (BP)  | 55 Tons            |
| SOC. CLASIFICACION<br>CLASSIFICATION SOCIETY | BV                 |

REMOLCADOR de SALVAMENTO, PATRULLA y LUCHA CONTRA la CONTAMINACIÓN  
RESCUE, OPEN SEAS, ANTIPOLLUTION TUG BOAT

**"SEBASTIAN de OCAMPO"**

(Ref. "CNV": 2085)

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## E 2009

# X P E R I E N C E

INAVCO was contracted by Marítima de Ecología S.A. de C.V. to provide structural engineering services required for the conversion of the ECO III vessel into an F.P.S.O. DP II.

INAVCO performed the following analyses obtaining the approval from the American Bureau of Shipping (ABS):

- Structural analysis of the new process deck along with its main deck interfaces.
- Structural analysis for the foundation of the hose reels
- Structural analysis of living quarters.
- Structural analysis for both foundations of Star board & Port Cranes.
- Structural analysis of the machinery room.
- Structural analysis of the flare boom.
- Structural analysis for the foundation of pumps.

INAVCO also provided structural engineering support to the shipyard during the conversion.

## 2012

INAVCO was contracted by Transportación Marítima Mexicana (TMM) to provide structural engineering services required for the conversion of the AHTS "ISLA SAN JOSE" vessel into a Fi-Fi II, S.S.B.V and DP II.

INAVCO performed the following analyses obtaining the approval from the American Bureau of Shipping (ABS):

- Structural analysis for the foundations of the Fi-Fi monitors.
- Structural analysis for the foundation of Pumps for the new Fi-Fi system
- Structural analysis of the modifications to the superstructure including the morgue, recovery area and new lifeboat cantilever platform.
- Structural analysis of the foundation for the tugger winches

INAVCO also provided structural drafting services for all the required modifications

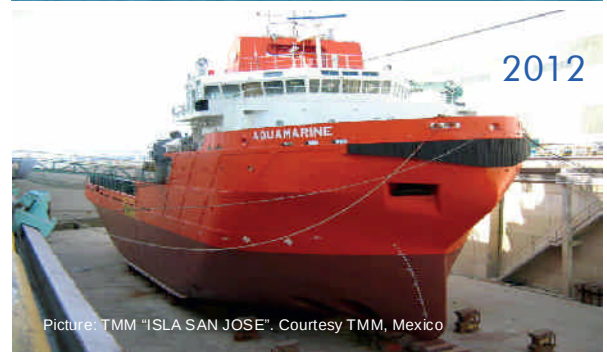
## 2013

INAVCO was contracted by Transportación Marítima Mexicana (TMM) to provide structural engineering services required for the Aft main deck extension of the AHTS "Subsea 88" vessel.

INAVCO performed the following analysis obtaining the approval from the American Bureau of Shipping (ABS):

- Structural analysis of the Aft Main deck extension.

INAVCO also provided Structural drafting services for the required modifications.



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# ANALYTICAL TOOLS

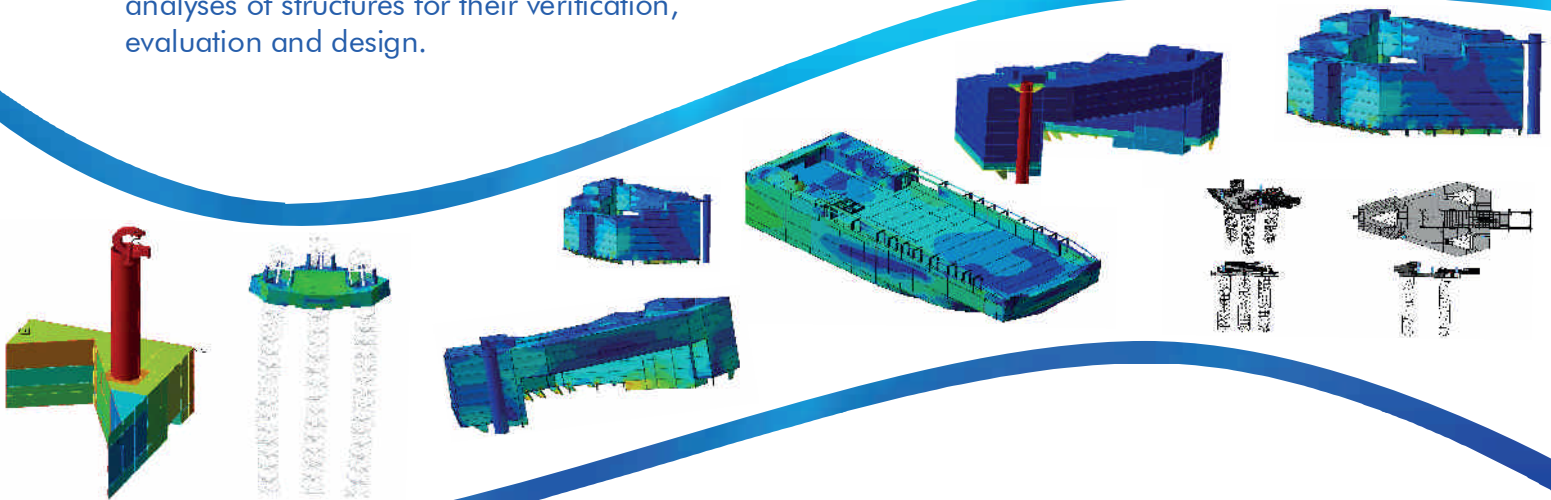
## Proprietary Software

INAVCO uses the latest state-of-the-art software available in the industry.

- INAVCO uses the popular ANSYS simulation software that enables us to perform any linear and non linear structural analysis.
- For our modeling requirements, INAVCO uses the popular commercial NURBS based 3-D modeling software Rhinoceros. Rhino enables us to model any existing or new floating structure for analysis purposes.
- INAVCO also uses the integrated structural analysis software SAFI which is equipped with a sophisticated, ergonomic and efficient graphical user interface. SAFI enables us to perform structural analyses of structures for their verification, evaluation and design.

## Third Party Software

- MAXSURF Naval Architectural analysis software.
- GHS Naval Architectural analysis software
- SOLID WORKS modeling software
- SHIP WORKS 3D fabrication software for shipyards



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