POSEIDON OFFSHORE

DESIGNING A NEW ACCOMMODATION UNIT TO MEET THE NEEDS IN A CHANGING MARKET

POSEIDON OFFSHORE

SUMMARY

1. Introduction to Poseidon group of companies
2. Simulation methods and model testing to assist in ship design
3. Improving the "platform" (ship) configuration
4. Identifying the challenges and solutions
5. Main characteristics of the final design

POSEIDON Group of Companies

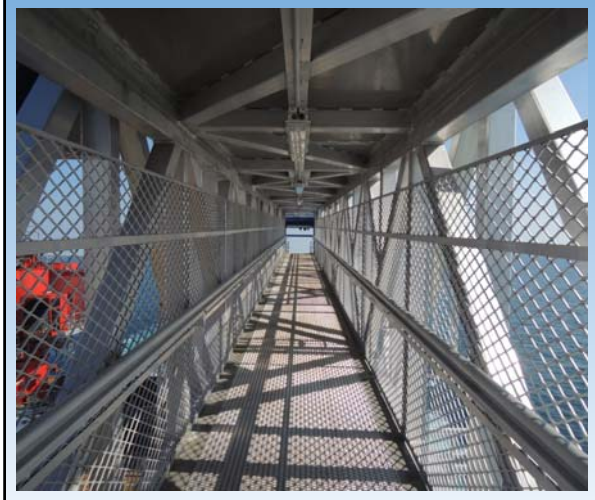
- POSEIDON OFFSHORE PTE LTD – incorporated in Singapore providing high level consultancy services in conceptual vessel design, engineering, surveys and Owner representation (in the various phases of the vessel lifecycle from design to operation);
- POSEIDON MARITIME SERVICES PTE LTD – incorporated in Singapore providing ship management services for high value assets;
- POSEIDON SERVIÇOS MARÍTIMOS LDA – incorporated in Brazil and providing, among others, support services to the operation of AQUARIUS BRASIL in the charter contract with Petrobras.

Introduction (1)

- In July 2013 the DP2 accommodation ship AQUARIUS BRASIL was delivered to Petrobras for a 5 year charter supporting their maintenance campaigns in Campos Basin (Brazil);
- Since then the ship has been operating permanently connected, on DP, to semisubmersible moored units accommodating an average of 400 client personnel and 85 crew;
- Besides accommodation the ship also provides storage and workshops to support the maintenance work on the connected unit;
- All personnel rotation done by helicopter and all ship supplies by OSV/PSV;

Introduction (2)

Introduction (3)



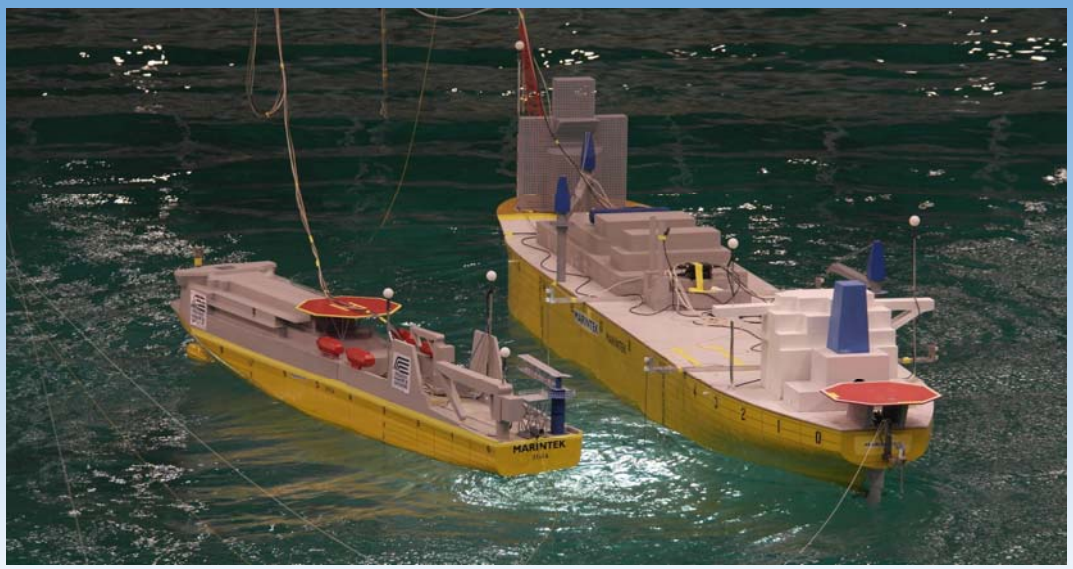
Introduction (4)

- Based on the successful performance of AQUARIUS BRASIL, and the lessons learned of the operation, a new design was developed;
- The new unit should be able to competitively connect to turret moored FPSO's in moderate environments;
- There should be an increase on the number of client personnel to around 500 with corresponding increase in hotel crew;
- The logistics for the project cargo and vessel's supplies to be improved;
- Project management and social spaces to be improved

Simulation methods and model testing to assist in ship design (1)

- To evaluate the connection to turret moored FPSO's a technical study has been carried out by TECNITAS (Bureau Veritas consultancy services);
- This technical study considered a ship model based on AQUARIUS BRASIL and a FPSO model typical of the units used by PETROBRAS operating in Campos Basin;
- Technical study consisted of 3 phases:
  - Numerical simulation of the multibody system considering station keeping and gangway limitations;
  - Basin tests for selected cases of the numerical simulation;
  - Evaluation of results and fine tuning of the numerical model.

Simulation methods and model testing to assist in ship design (2)



Improving the "platform" (ship) configuration (1)

- The study demonstrated feasibility of the joint operation with an uptime estimated in excess of 95%;
- Based on the tests 2 major improvements where recommended and implemented in the new design:
  - DP capability for worst single failure to be improved – available thrust forward to be increased;
  - Speed limitations for the gangway (linear extension and angular elevation)

Improving the "platform" (ship) configuration (2)

- The vessel was designed to be certified as Passenger Ship for 500 passengers on international voyages and, thus, complying with the Safe Return to Port requirements;
- DP3 diesel-electric unit with 3 azimuthal thusters aft, 3 retractable azimuthal thrusters and 1 tunnel thruster forward.

Identifying the logistic and solutions (1)

CHALLENGE: Large number of people being transferred by helicopter generating congestion at check-in/check-out (including safety induction)

SOLUTION: Two fully equipped inter-connected helicopter lounges, one for arrival and one for departure) with direct access to the helideck area and sufficient capacity to accommodate the maximum number of persons in each flight

Identifying the challenges and solutions (2)

CHALLENGE: All supply being made by PSV/OSV the vessel is heavily dependent on the crane capacity

SOLUTION: One 50t crane, on SB, and 2x15t cranes, one on each side, providing enough capacity even if one is out of operation and the ship is connected (gangway is on PS)

Full visibility, from the DP operator position to the working deck and OSV/PSV

Lower bulwark on SB to facilitate trans-shipment.

Identifying the challenges and solutions (3)

CHALLENGE: Difficulty in moving the cargoes between decks through the hatch, in heavy weather, due to the swinging of the suspended cargo

SOLUTION: 20t cargo platform lift serving decks 3 (warehouse), 4 (client stores) and 5 (open working deck)

Identifying the challenges and solutions (4)

CHALLENGE: Easily move cargo on exposed working deck

SOLUTION: One 50t crane, on SB, and 2x15t cranes, one on each side,

Identifying the challenges and solutions (5)

CHALLENGE: Easily move cargo inside covered warehouse

SOLUTION: 2x10t bridge cranes covering the all warehouse with possibility of working in tandem or individually

Identifying the challenges and solutions (6)

CHALLENGE: Waste management

SOLUTION: Fully equipped waste management plant with store room, compactors, glass crushers and cold room for organic contaminated waste;

Identifying the challenges and solutions (7)

CHALLENGE: Provide high quality technical water to the connected platform for hidroblasting.

SOLUTION: RO desalinization plant with capacity 2 x 140 m^3/day

Identifying the challenges and solutions (8)

CHALLENGE: Improve the living conditions on board for both client personnel and crew.

SOLUTION: Work, recreation and sleeping areas properly segregated; Open areas also available for leisure activities;

A diversity of recreation spaces have been provided – fully equipped fitness center, 4 TV lounges, music lounges, sports lounge, karaoke lounge, cinema, cinema/briefing room, internet café, multipurpose lounge, etc.;

Fully equipped hospital facility with ward, consultation room and emergency treatment room.

Identifying the challenges and solutions (9)

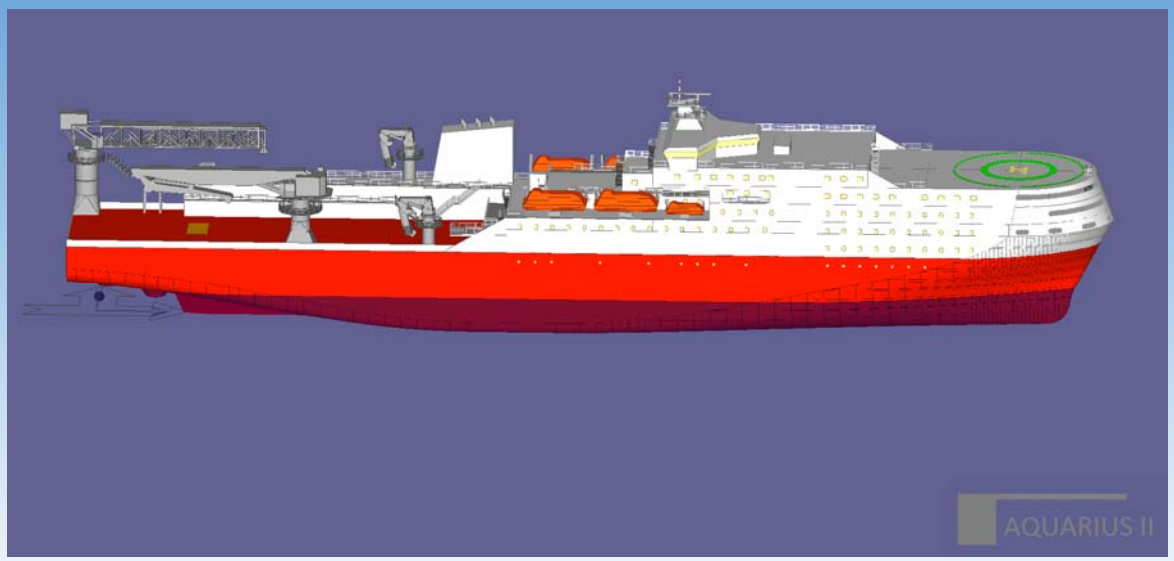
CHALLENGE: Improve project management and execution facilities.

SOLUTION: the ship is provided with a variety of spaces for the proper project management – Foremen project office, meeting rooms, video conference room, individual offices and open space office;

Large storage areas and proper project cargo management;

Spacious changing rooms.

Characteristics of the Final Design



Characteristics of the Final Design

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Main Dimensions

Length OA	180.45 m
Length PP	168.70 m
Breadth, mld.	25.40 m
Breadth, max.	26.30 m
Draft (scantling)	6.70 m
Draft (design)	6.50 m
Number of client personnel	500
POB	590

Characteristics of the Final Design
Capacities (min)

Diesel Oil	1500 m^3
Lub Oil	60 m^3
Fresh Water	700 m^3
Technical Fresh Water (hydro blasting)	300 m^3
Work deck area (exposed)	1 300 m^2
Warehouse area (covered 5.0m free height)	1 200 m^2
Client stores	400 m^2

Characteristics of the Final Design
Power Generation/Propulsion/DP

Main Generators	6 x 4 480kW
Emergency Generator	1 000kW
Stern Thrusters (propulsion + DP)	3 x 2 800kW
Retractable Thrusters	3 x 2 500kW
Tunnel Thruster	2 800kW