



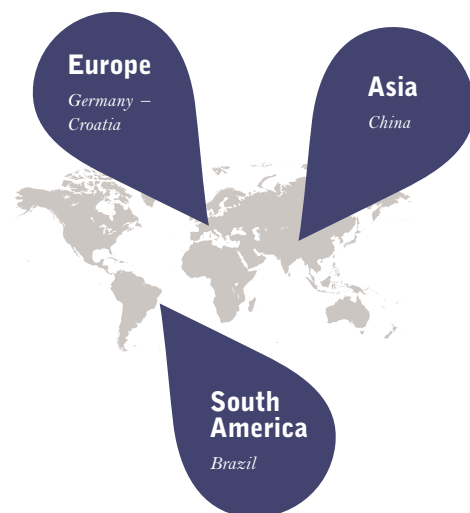
## FPSO conversion successfully completed – BW NISA now Petrobras P-63

*SAACKE Marine Systems provides a complete plant system and global project management for customer Bergesen Worldwide Offshore*

The oil-producing region Papa Terra near Rio de Janeiro is located some 110 kilometers off the Brazilian coast and up to 1,400 meters deep. 350 million barrels of oil are to be pumped here by 2030. For this purpose, Bergesen Worldwide Offshore (BWO) converted the supertanker BW Nisa into the FPSO unit P-63 in a joint project with SAACKE. SAACKE has completed several projects in the past for the second largest FPSO operator in the world, with which BWO was always extremely satisfied in terms of quality and plant emission levels.

### **Customer from Europe – refit in Asia – usage in South America**

Besides the operative modernization, global project management from a single source was crucial. How should the plant modules be designed? How should the material flows be arranged? These are questions that are particularly important given the lack of space on a ship. The international coordination, the engineering in Bremen, the production in China and Croatia, the assembly in the Chinese shipyard, and the commissioning in the Brazilian region of Rio Grande – the scope of the P-63 project required the involvement of the entire SAACKE group.



*“The completion of this very challenging international project is a joint success of the global SAACKE group.”*

*Matthias Flies – Project manager SAACKE Marine Systems*

**Bergesen Worldwide Offshore / Petrobras**

**Ships and offshore plants (FPSO)**

**Dual Fuel DDZG Burner**

## Task

Conversion of a supertanker into a FPSO unit using energy-efficient and low-emission equipment as well as global project management.

## Solution

Re-tubing two boilers from the existing propulsion system and three Dual Fuel DDZG burners including new fittings, controls and steam system instruments.

### The SAACKE solution in detail

SAACKE modernized the boiler system for the ship's existing propulsion system, to make it seaworthy for the two-month passage from the Chinese shipyard to Rio Grande, near the oil-producing region. For this purpose, the two existing 75 t/h boilers were stripped and re-tubed. To generate the process steam required for FPSO operation at the usage site, the boilers were equipped with three Dual Fuel DDZG burners each, including new fittings, steam system instruments and controls (fail safe PLC system). The SAACKE components are therefore able to generate both superheated steam for the turbine propulsion and the process steam needed for processing and stabilizing the heavy oil on board the ship.

### Conclusion

Thanks to state-of-the-art combustion equipment, the FPSO unit P-63 is now ready for 15 to 20 years of service at sea – without dry-docking. The conversion including international project coordination was performed by SAACKE in a close collaboration with the customer. After a transitional phase, the FPSO was handed over to Petrobras, the operator.

### Technical data

Boiler type	2 Foster Wheeler „Monowall“ ESD III
Burner type	3 x DDZG 10 per boiler
Burner capacity	3 x 22,7 MW per boiler
Fuel	MDO, heavy oil, fuel gas
Steam super-heater outlet	62,8 bar/g at 515 °C
Steam generation (after upgrade)	Max. 75 t/h per boiler
Design pressure	75,5 bar/g
Burner control range	1:6

### FPSO unit P-63

Length / Width	346 m / 57 m
Speed	Max. 12 knots
Anchor unit	20 anchor chains based on the spread mooring system
Oil processing capacity	Max. 140,000 barrels per day (Ø 50,000 barrels per day)
Oil tank capacity	1.4 million barrels
Gas compression capacity	1 Million m <sup>3</sup> per day
Power generating capacity	98 MW

### Emission levels

MDO	Heavy oil	Natural gas
N content 0,2% (weight)	N content 0,3% (weight)	
NO <sub>x</sub> : 590 mg/Nm <sup>3</sup>	NO <sub>x</sub> : 750 mg/Nm <sup>3</sup>	NO <sub>x</sub> : 260 mg/Nm <sup>3</sup>

All values based on 3% O<sub>2</sub>

## All benefits at a glance

- Global project management from a single source
- Reliable compliance with the applicable NO<sub>x</sub> threshold value
- Extremely efficient combustion technology for propulsion and heavy oil processing
- Use of different fuels
- Convenient operation and top availability
- Broad control range
- Extremely long lifespan and easy to maintain

