SUBSEA CERTIFICATION IN BRAZIL

Bureau Veritas Brazil is expanding its activities in the certification of subsea equipment to meet a rise in demand from the Campos Basin fields and globally. Two teams of engineers in Rio de Janeiro and Macae are dedicated to independent third party studies providing design review services and conformity certificates for subsea equipment. They support suppliers in delivering main operators’ requirements for certification of equipment for sweet and sour services, in shallow, deep or ultra-deep waters.

The main demand is for independent design review of subsea equipment and drilling tools against the applicable international codes and standards. Bureau Veritas also provides services of qualification testing programs as independent certification authority and issuance of design review and conformity certificates.

More and more countries with oil want to increase the local content of equipment built to exploit their resources. Brazil leads this trend and Petrobras P-55 Floating Production Unit (FPSU), the largest semi-sub and the first of this kind entirely built in Brazil, has been installed in a water depth of 1,790 metres in the Roncador Field, Campos Basin. The column stabilized semi-submersible has a capacity of 180,000 bopd and 6,000,000 cu m of gas. The unit is classed by Bureau Veritas. BV group companies also provided a wide range of verification and support services during the project.

The P-55 project benefited from Bureau Veritas classification and statutory certification plus a wide range of services which included design review for the entire project including structure, mechanical systems, electrical and automation, process, safety, hydrodynamics and the mooring system. Independent Risk and Safety studies were performed during the FEED and detailed design phases, including PHA, HAZID, HAZOP, SIL/LOPA, dropped objects and collision studies, performed during the FEED and detailed design phases, including PHA, HAZID, HAZOP, SIL/LOPA, dropped objects and collision studies, gas dispersion, fire, explosion and flare CFD 3D simulations and noise studies. Independent structural studies were performed by Tectitas for the lifting of P-55 lower hull megablocks and design review and second party inspections on behalf of Petrobras were provided for the assembly and installation of the P-55 Steel Catenary Risers (SCR) export lines.

The P-55 project was designed by Petrobras R&D Department (CENPES) and Technip-Techint consortium has entrusted Bureau Veritas with the classification of the FPSO P-57, also to be installed and operated by Petrobras in the Santos Basin. These FPSOs are named Replicantes as they are a standard design used for the first eight units. In addition the P-67 and P-70 will be integrated by INTEGRA, the Mendes Jr. / OSX consortium and the P-68 and P-71 will be integrated by Jurong Brazil. All of them will be installed and operated by Petrobras, in association with BG, GALP and REPSOL, in the pre-salt fields offshore Brazil, in the area of Santos basin.

Five more FPSOs in Brazil will now also be Bureau Veritas class. The P-67 and P-70 will be integrated by INTEGRA, the Mendes Jr. / OSX consortium and the P-68 and P-71 will be integrated by Jurong Brazil. All of them will be installed and operated by Petrobras, in association with BG, GALP and REPSOL, in the pre-salt fields offshore Brazil, in the area of Santos basin. These FPSOs are named Replicantes as they are a standard design used for the first eight units. In addition the Technip-Techint consortium has entrusted Bureau Veritas with the classification of the FPSO P-76, also to be installed and operated by Petrobras in the Santos Basin.

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We are here in Houston and we are anywhere that offshore energy is expanding. Come and talk to Bureau Veritas at OTC to find out how we can help you move faster offshore with confidence. Stand No 4141.

There is growing demand for natural gas and the innovative ways in which it can be harnessed and utilised. This is being driven by a variety of factors, including the need to meet carbon emission reduction targets, the trend towards diversification in energy supplies in Europe and North America, and the increasing energy demands of buoyant national economies such as China, India and South America, as well as Asia.

In addition to the recent expansion of shale gas production in North America, and FLNG projects under construction for Australia and South-East Asia, new frontier markets such as Canada, Mozambique and the Eastern Mediterranean are emerging, and other projects are also expected to be confirmed in North and South America, Africa and the Middle East.

Experienced market observers predict a significant increase over the period to 2020 in capital expenditure on Floating Liquefied Natural Gas (FLNG) production and export operations, and on offshore regasification units (FSRU). The marine industry is also focusing on LNG bunkering facilities, and the propulsion of vessels by gas. FLNG and FSRU projects offer significant cost and flexibility advantages over onshore terminals. But there are important technical and operational challenges involved. These include LNG transfer, vessel motion and product sloshing, space limitation, safety considerations, and the application of liquefaction technology to the marine industry.

Participants in the offshore LNG sector need the support of experienced third parties throughout the entirety of projects, starting with pre-study assessments and continuing through qualification of new technology and risk analyses to on-site installation and commissioning.

Bureau Veritas is a leading player in the offshore sector. In 1976 it classed the first FPSO, and since then has been involved with more than 50% of the FPSO fleet. Today, it is engaged in a variety of significant projects such as the Shell Prelude FLNG, the EXMAR Caribbean FLNG as well as FSRUs and various FEEDs and Approvals. Independent Assessments (Slooshing, Mooring, Hydrodynamic, Structure and Spectral Fatigue) and Risk Analyses for different offshore LNG projects.

Bureau Veritas has also been involved in more than 32 LNG export and import onshore terminals around the world, providing technical and advice, support and third party services such as Classification, Certification and Verification or Qualification to Oil & Gas operators, EPC contractors, shippers, shipping companies and equipment manufacturers.

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FOREWORD

BT JAN SME
North & Central Europe and North America, Bureau Veritas

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BUREAU VERITAS OVERSEES DRILLING RIG UPGRADE

Bureau Veritas is overseeing the upgrade of semi-submersible drilling unit ENSCO 5004. The rig, which can drill to 25,000 ft in a water depth of 1,500 ft, is classed by Bureau Veritas. The upgrade, which is being carried out in Malta, is expected to be completed by June 2014, in preparation for a 100-year contract working offshore Libya. During the upgrade, Bureau Veritas carried out a major classification survey covering inspection of the internal structure of ballast tanks, columns, bracings and internal girders, as well as inspection of the drill floor, helideck support structure, crane pedestals, lifeboat platform supports and heavy deck equipment foundations. The work also included an underwater survey, in lieu of drydock, mooring chains measurements, design reviews and inspections of several modifications. It will conclude with an inclining test and approval of the new stability booklet.

Bureau Veritas’ survey centre in Malta is being supported in these surveys by the plan approval office in Houston and the marine centre in Miami, as well as by teams from the Paris head office and the equipment & materials certification unit in the UK. fredrick.thomas@bureauveritas.com

OSVs GO MULTI-PURPOSE

With the offshore oil and gas industry moving into deeper water and harsher environments, investment in the OSV market is directed towards large and sophisticated vessels with high operational flexibility. In particular the multi-purpose support vessel (MPSV) segment is growing fast. MPSVs can engage in a multitude of tasks, including transportation of deck cargoes and liquid bulk cargoes, subsea installation, IMR inspection, maintenance and repair support, diving and ROV support, heliport support, survey and rescue operations.

Where advanced OSVs are used to be custom built according to owner specifications, today there is a clear focus on commonality of designs. The idea is to develop a basic design platform with a range of available options which can be selected depending on customer needs, thereby creating operational flexibility and reduced Capex due to economy of scale effects. Good examples of this approach are the 4,800 dwt DP3 Guido Perla-designed Bourbon Evolution 980 series of 10 vessels (GDA 6% IMR) and the 3,600 dwt DP2 Sinopacific-SDA-designed Bourbon Explorer 500 series 20 vessels (SPP 35B SPS/IMR), which are all built to Bureau Veritas class. Singapore-based Pacific Radiance has ordered a 70 m MPSV to Bureau Veritas class at Wuhu Xianlan shipyard in China. The DP2 vessel has been designed by Focal Marine & Offshore OGD ROSS. A number of new MPSV projects based on the commonly concept are currently under discussion.

GTT is the global leader in LNG membrane containment systems. If you ask Philippe Bertertrotière, President and CEO, why this is, he has a clear answer. “GTT’s two main areas of expertise are cargo containment systems for LNG carriers and land storage of LNG. That’s what we do, we do it well and we will stick to this expertise which we master,” he explains. It is a wide field and getting wider as shipping turns to the use of LNG as a fuel and energy companies increasingly look offshore for opportunities to exploit LNG reserves or deliver LNG to users ashore.

“The new area of offshore LNG, we have looked very carefully at the particular needs of operators in these environments and perhaps because of that attention to detail, all the FSRUUs and large FLNGs now under development are using GTT membrane containment systems,” says Mr. Bertertrotière. “We are also now looking closely at applying what we know to fuel tanks for ocean-going ships and for small scale LNG for bunkering.”

The distribution and storage of smaller volumes of LNG intended for use as fuel on ships is only in its infancy but GTT membrane technologies are already available for building storage facilities of small to medium size, typically 5,000 cu m to 30,000 cu m. GTT offers very competitive storage and handling solutions for the complete LNG supply chain from the liquefaction export terminal in gas producing countries down to the propulsion engine, generator set or boiler onboard a merchant vessel.

“The new very large LNG carriers for harsh Arctic ice will also use GTT systems,” says Mr Bertertrotière. “We had to work a lot on the ice loads and for that working with Bureau Veritas was important. We work with different class societies but we particularly appreciate BV’s deep knowledge of membrane systems and their development. BV does a lot of independent research that allows them to challenge us intelligently. We are very happy to be challenged by BV’s experts because that really helps the process of innovation.”

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STICKING TO WHAT WE DO WELL

Global hull structural strength analyses using direct calculations on a full ship FE mesh analysis were then performed. The full-ship verification, including turret and process module interface structures, was sufficiently detailed to capture all global effects throughout all stages from transportation to site, in-site operation, extreme conditions, tank inspection and repair conditions, as well as transport conditions after disconnection from the mooring system.

In the Superporto do Açu in the northeast region of Rio de Janeiro state, Bureau Veritas Brazil has consolidated its position as the main classification authority for flexible line vessels in Brazil and worldwide, being responsible for the type approval certification of the major players in the market, the suppliers in providing certified products to the main operators in the O&G industry.

China-based Xiamen shipyard has entrusted BUREAU VERITAS WITH THE CLASSIFICATION OF 14 PSVs OF 4,000 DWT CAPACITY. The 78 m long DP2 vessels are built by the Focal Marine & Offshore SPP2 PSV design and are due for delivery in 2014 and 2015 to South-East Asian OSV owners including Pacific Radiance, Nam Cheong and Sentinel Marine.

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in the Superporto do Açu in the northeast region of Rio de Janeiro. Bureau Veritas’ survey centre in Malta is being supported in these measurements, design reviews and inspections of several structures, including the drill floor, helideck support structure, crane pedestals, lifeboat columns, bracings and internal girders, as well as inspection of the internal structure of ballast tanks. During the upgrade, Bureau Veritas carried out a major classification study and a total support project for a 900-day contract working offshore Libya. Carried out in Malta, is expected to be completed by June 2014, in time for the Da Vinci FPSO to be ready for operations on site and after disconnection procedure.”

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## STONES FPSO HULL VERIFICATION

Bureau Veritas has provided a third party independent analysis of the Stones FPSO hull and supported, SBM Atlanticia, through the design phase of the FPSO hull conversion work. This ensures the structural safety from transit voyage from the shipyard to the site, during normal operations on site and after disconnection procedure when sailing away from hurricanes. The Stones FPSO is a disconnectable turret-moored FPSO based on the conversion of a seacat double hull tanker to be operated for Shell in the deep water Gulf of Mexico.

Several hydrodynamic analyses were carried out to evaluate the ship response to environmental conditions. A 3D oftactic radiation analysis was performed to get the Response Amplitude Operators (RAOs) in term of motions, accelerations, sea and liquid in tanks dynamic pressure. A bow flap slamming analysis gave the impact occurrences and magnitude through time domain simulations. Green water maximum pressure was determined to ensure that the protection structures/walls were adequately designed. Numerical simulations were done to evaluate the sloshing phenomena in cargo tanks as well as to evaluate dynamic and impact loads on the structure.

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Bureau Veritas is overseeing the upgrade of semi-submersible drilling rig ENSCO 504. The rig, which can drill to 25,000 ft in a water depth of 1,500 ft, is classed by Bureau Veritas. The upgrade, which is being carried out in Malta, is expected to be completed by June 2014, in preparation for a 10-year contract working offshore Libya.

During the upgrade, Bureau Veritas carried out a major classification survey covering inspection of the internal structure of ballast tanks, columns, bracings and internal girders, as well as inspection of the drill floor, helideck support structure, crane pedestals, lifeboat platform supports and heavy deck equipment foundations. This work also included an underwater survey, in lieu of drydock, mooring chains measurements, design reviews and inspections of several modifications. It will conclude with an inclining test and approval of the new stability booklet.

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BUREAU VERITAS OVERSEES DRILLING RIG UPGRADE

Bureau Veritas has been selected for the class of the 45 m MPSV Deep Helder for Netherlands based SeaMar, currently under construction at Dutch shipbuilder De Hoop and committed on a 5-year charter to DeepOcean, as well as the 80 m walk-to-work maintenance support vessel (MSV) for Dutch Royal Wagenborg which is being built by Niestern Sander, also in the Netherlands.

The DP2 vessel is equipped with a heave-compensated gangway to provide safe access for maintenance crews to the offshore gas platforms in the North Sea operated by the NAM on a 10-year contract.

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P-55 LEADS LOCAL CONTENT TREND

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BUREAU VERITAS MEETS GROWING DEMAND FOR GAS EXPERTISE

SUBSEA CERTIFICATION IN BRAZIL

The International Sub Committee (ISC) of the Technical Committee (TCo) of the Oil and Gas Industries, charged with the development of standards for Arctic operations, held its 4th plenary meeting at Bureau Veritas headquarter in France from the 1st to the 3rd of April, 2014, under the chairmanship of Antón Shisikawa.

More than 80 delegates, from all 14 Arctic countries, attended the meeting. They included a large delegation from Russia and comprised the leading international experts on Arctic operations. The meeting was convened to discuss the creation of six ISO standards for Arctic operations. Bureau Veritas has the chairmanship of the French commission through Philippe Cambos.

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May 2014
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