as carrier technology and development has been running ahead of terminal design and installation. Increasingly the industry is looking towards offshore LNG terminals to provide a quick, safe and uncontroversial method of discharging LNG from ships and into the energy grid. This is an area of new technology with few existing standards, and one where Bureau Veritas is a world leader. BV has addressed the needs of terminal developer by encapsulating its experience with LNG Offshore terminals into a new set of Offshore LNG Terminals Guidelines.

The new guidance note summarizes a set of recommendations and guidelines applicable to the classification and/or certification of Offshore Liquefied Natural Gas (LNG) terminals and provides additional advice based on experience.

Two distinct families of offshore LNG terminals are considered in the guidance note: Gravity-Based offshore LNG terminals (GB LNG units) and Floating LNG terminals (FLNG installations). It incorporates the requirements of Bureau Veritas Rules for the Classification of Offshore Units (NIR 445), Bureau Veritas Rules for the Classification of Steel Ships, API Recommended Practice 2A - WSD - for the Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design, IMO GEC code (including 1991, 1986 and 2000 amendments), and NFPA 59A, the National Fire Protection Association Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG).

Bureau Veritas classes the first ever LNG Regasification Vessels for the Energy Bridge deepwater port in Gulf of Mexico (3 vessels of 138,000 m3 and 2 of 191,000m³) operated by Emar. The vessels are purpose built LNG carriers that incorporate onboard equipment for the vaporization of LNG and delivery of high pressure natural gas. Those vessels are capable of loading in the same manner as standard LNG tankers at traditional liquefaction terminals. They have the flexibility to discharge in three different ways: offshore as vapour through an STL Buoy, onshore as liquid at a conventional LNG接收 terminal, or onshore as vapour through a high-pressure manifold located mid-ship.

BV’s unique experience with these ships is shared with terminal developers in these guidelines.

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SHALLOW WATER TERMINAL STUDIES

In the last decade the focus of hydrodynamic research has been on ultra deep water developments. However, recent experience with the development of offshore LNG terminals has shown that the issues related to shallow water hydrodynamics are at least of similar complexity. Low frequency wave effects such as set-down and shoaling can result in significant excitation. Streamlined LNG carrier hulls have a very low damping against low frequency motions. The combination of excitation and low damping can result in significant resonant motions and related mooring loads. Therefore, the development of reliable offshore terminals in shallow water requires an improved insight into the related shallow water problems.

In this context, the objective of the JIP is to improve the reliability of the motion and mooring prediction methods for the development of offshore LNG terminals in shallow water by investigation of key hydrodynamic issues. HAWAI is investigating not only wave and current conditions at a number of key representative locations but also ship motions and mooring structure loads that could be expected in such environments. Variables such as water depths, ship draughts, seabed contours and wave frequencies will also be accommodated and, in addition, the project will entail the development of model testing techniques for shallow water operational scenarios.

The project is currently sponsored by 24 organizations including major offshore operators and engineering companies. For more information contact:

pierre.besse@bureauveritas.com

FPSO DALIA BEGINS CLASS ACT

OTAL’s newbuilding FPSO DALIA will soon start its planned twenty-year operating life on Block 17 in the deep water fields off Angola. Building on the success of GIARRASON PSPS, DALIA will be fed by 67 planned wells with another four optional, almost twice that of GIARRASON, in water depths of 1,350 to 1,400 metres. The storage capacity is two million barrels and the topsides processing plant will deal with water injection, water treatment, special treatment and gas compression.

The DALIA and the connected offloading buoy are classed by Bureau Veritas. Bureau Veritas has been working on this project since 2001, delivering classification, verification and certification. It is the first in a series of large scale projects led by the recently introduced BV Marine Offshore Project Department. Special attention has been paid to clearly defining the scope of classification, and the development of communication lines to assure the flow of services for each contractor, whether concerned with classification, verification or certification. With design and construction spread all over the world, efficient project management has been a key factor in delivering the best technical services to the project, on time and where needed.

The classification services include issuance of required statutory certificates for the towing phases. When the unit has been hooked-up, the classification notation will include service as an Offshore Service Barge, Production / Oil Storage (PSOS) and include the latest automation and comfort standards.

CONTACT FOR VERISTAR NEWS:
Philippe Boisson 33 (0) 1 42 91 52 71
Annie Lawrence 33 (0) 1 42 91 31 40

Bureau Veritas, 17 bis, Place des Reflets, La Défense 2, 92800 Courbevoie, France - Fax: 33 (0) 1 42 91 52 98

For the benefit of businesses and people
MAINTAINING INTEGRITY

Take a look at the business card of Bertrand Lanquevin and it simply says “Floating Units and Marine Terminal Expert.” Look beyond the card and you find that the expertise on which his title is based comes from thirty years of working across Total’s offshore developments. “I trained as a marine engineer,” he explains. “I joined Total shortly after the introduction of our first offshore loading buoy in 1972 and our first storage tanker in 1973. Since then I have worked all over the world in this business. We have been continually growing, developing and extending the boundaries of offshore energy exploitation. Today we have a wide range of activities, products and geographical spread, with much bigger and more complex projects than I ever dreamt of when we began.”

Bertrand is part of a multi-disciplinary team with cradle to graving involvement in all offshore projects. “We are involved from contracting through design and operation to maintenance,” he explains. “We have ten very large key floating assets, involved in production, storage and offloading, plus numerous other units in operation and at the project stages, and we have to keep those in operation for their full lifetime. Our big enemies are corrosion and fatigue. These FPSOs may be ship or box shaped but they are not ships and they cannot be dry-docked and inspected easily like ships. We have to work at sea during production within the safety framework and we have to achieve life cycle maintenance without compromising production. And of course all the time a key objective is to avoid pollution and to keep everyone safe.”

He says that although all Total’s big floating units are classified, and are designed for their full life, this is “not an exact science.”

“Classification society rules are of course at the heart of our designs and our inspection programmes,” he says. “But we have to go beyond class, and we also have to recognise that this is as much a new area for class as it is for us. Their two hundred years experience with ships goes only so far when you are dealing with these very complex engineering projects. These projects demand a multi-disciplinary approach at all stages, and especially for the lifetime maintenance of the structure and the moorings.”

Total works with a number of classification societies and also with third party technical experts. Within the BV group, it classes a number of its units with Bureau Veritas, and it also turns to Tecnitas for specialist expertise. It was with Tecnitas that Total developed the AIMS system. “The Asset Integrity Management System (AIMS) being implemented for several programmes,” he says. “But we have to go beyond class, and we also have to recognise that this is not an exact science.”

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For information on Veristar AIMS, contact marie-francoise.mont@bureauveritas.com