Offshore Industry Leadership

Classification & Certification Services





The Future Role of Class Addressing New Offshore Challenges

The offshore industry is facing a next generation of technological challenges as it continues to move into new frontiers to explore and develop energy resources. ABS has collaborated with the industry since its early days and has consistently delivered quality services that the industry has come to rely on.

ABS engages with industry representatives, regulators and other key stakeholders on issues that can benefit from our professional guidance. These discussions are important as they help to promote operational efficiencies and support safety measures. ABS' vast experience can also highlight areas that would benefit from having an independent, third-party set of standards which address the new technologies being incorporated into the latest designs of drillships, semisubmersibles and jackups.

Another important challenge is the need to employ risk management practices during the operational phase of an offshore installation's life. The complexities on board rigs in service around the globe have given rise to issues never before experienced by past generation rigs. The increased sophistication of today's offshore facilities, combined with greater regulatory oversight, is calling for new standards to address issues such as software integration, drilling systems and subsea and associated technologies.

The offshore sector has been a leader in developing and adopting new technologies and novel concepts. There is a great deal of innovative thinking that goes into the development of the individual components that are brought together in a modern drilling unit. The key to safe and seamless operation of the unit is the ability of all the components and systems to function together in a manner that can be controlled by the operating team on board the unit. This is an important driver behind ABS' research and development for new notations.

ABS has developed a suite of classification Rules and Guides to address these issues, with enhanced standards and associated notations for the classification of drilling systems being a key component. In response to operators seeking more comprehensive approaches to asset maintenance, the new standards

formalize an integrated systems approach to classification. The associated notations can be used by operators to signify compliance with class requirements and demonstrate the effectiveness of their maintenance programs.

The latest notations developed by ABS for the drilling sector include: Integrated Software Quality Management (ISQM), Systems Verification (SV), DRILLSHIP, Asset Integrity Management (AIM) and Rapid Response Damage Assessment (RRDA). Existing notations that have been enhanced include: Classification of Drilling Systems (CDS), Hull Inspection and Maintenance Program (HIMP), Reliability Centered Maintenance (RCM) and Environmental Protection (ENVIRO-OS or ENVIRO-OS+).

Underlying the development of class notations is the proper management of risk during the life cycle of an asset. Fundamentally what ABS' offshore asset integrity management program represents is the evolution of class in response to industry demands. Structures, equipment, traditional survey regimes and prescriptive Rules are being complemented with overall risk management processes.

The bottom line is that owners and operators are looking for support with specific standards to address the safety and reliability of systems and asset integrity. It is important that surveys be less intrusive as they are required to operate their rigs in the most efficient and effective manner possible. As the leader in offshore classification, ABS is committed to helping them meet this challenge.

CDS

Demonstrates that the drilling system, associated equipment and well control systems are in compliance with the requirements specified in the ABS *Guide* for the Classification of Drilling Systems.

ENVIRO-OS or ENVIRO-OS+

Adherence to enhanced standards for environmental protection including procedures and requirements for ballast water and sewage management, anti-fouling applications, airborne pollutant discharges, fuel oil and the use of exhaust gas cleaning systems, refrigerants and the Green Passport for ship recycling.

ISQM

The ISQM process validates the software installation on the unit and then monitors for consistency when there are software updates or a change in hardware. ISQM provides a process to manage software over the offshore unit's life.

SV

Verifies that the software has been developed in a recognized process, meets the needs of the operator and performs as expected. Software upgrades and new releases are subject to verification prior to installation.





RCM

Addresses the manner in which the machinery and equipment on board the unit is maintained, including replacement and repair strategies that are preemptive in their approach.

AIM

Provides operators with a third-party confirmation that the day-to-day maintenance and management of their units conform to a clear, industry-accepted standard. The state-of-the-art loads and configuration approach helps operators better understand the operational loads of their units.

DRILLSHIP

Indicates that the vessel has been designed and constructed to the standards contained in the ABS *Guide for Building and Classing Drillships*.

HIMP

Signifies that the unit is enrolled in the ABS Hull Inspection and Maintenance Program. The hull condition is to be assessed and rated in accordance with general condition criteria coupled with targeted inspections of identified critical areas.

RRDA

Indicates enrollment in the ABS Rapid Response Damage Assessment program which includes a licensed copy of salvage engineering response software and a computer model of the unit for damage stability and residual strength analysis.

Excellence in Offshore Service

ABS provided the first classification services to the offshore industry in 1958 and has remained at the forefront of setting offshore industry standards and technical guidance ever since. As the leading provider of classification services to the international offshore energy industry, ABS classes the majority share of the offshore exploration and production units worldwide.

Demand for ABS engineering review has grown beyond traditional class services to meet the more sophisticated needs of the rapidly expanding offshore industry. This includes the increased application of risk and probabilistic analyses of the safety, viability and practicality of a design. Additionally, ABS offers risk-based inspection programs specifically calibrated to the facility which clearly identify areas of heightened interest. These efforts have led to greater recognition of the contribution that classification can make towards facilitating the safety and integrity of an installation.

ABS engineers and surveyors have demonstrated that they possess the practical work experience and technical knowledge to handle the most challenging offshore projects. ABS takes a collaborative approach toward addressing offshore technology issues by working in close cooperation with governments, universities and the industry. Research and development partnerships are formed whenever possible with shipyards, design agencies and other organizations to advance offshore technology innovation.

Leadership in Drilling Units

ABS has been providing classification services to the offshore industry longer than any other class society. Currently, ABS is the market leader in the classification of MODUs worldwide including self-elevating drilling units (SEDUs or jackups), column-stabilized drilling units (CSDUs or semisubmersibles) and drillships.

A HISTORY OF LEADERSHIP



The jackup has long been the workhorse of shallow water offshore drilling. As the needs of the offshore industry have increased, so have the capabilities of jackups. ABS has classed each new generation of jackups, supporting the innovation that is so prevalent in offshore exploration.

Semisubmersibles are frequently chosen by operators for deepwater drilling operations. ABS has classed these units from the beginning of the industry to today's sixth generation deepwater units. First generation units were able to drill in 600 foot water depth; sixth generation semisubmersibles are now capable of drilling in 10,000 feet of water.

ABS has classed every type of drillship and has been involved with the upgrade of existing units for service in deeper waters. ABS has classed many of the next generation newbuild drillships that are higher specification units rated for operation in water depths of 7,500 feet or greater. Many of these drillships are intended for ultra deepwater operation at water depths up to 12,000 feet.

Maturity in Floating Production

ABS is the market leader in the classification of floating production installations (FPIs) including floating production, storage and offloading (FPSO) units, spars, tension-leg platforms (TLPs) and semisubmersible production systems. More than 50 percent of the global orderbook for FPSOs are on order to ABS class.

ABS has been involved with TLP technology from the outset and has been instrumental in helping develop appropriate class standards and regulatory guidelines. ABS has classed TLPs in various versions including the conventional four-column installation as well as smaller mini-TLPs.

Since classing the first spar installed in the Gulf of Mexico, ABS has worked with the industry to improve the spar concept. Three generations of spar design improvements have enhanced the value of spars for deepwater developments. Increases in structural efficiency have led to the optimization of steel, resulting in the availability of additional deck loads. ABS has classed all three generations of spars: classic or caisson, truss and cell and is currently looking at new hybrid designs.



Deepwater exploration has resulted in increasingly complex designs for the subsea pipelines and risers supporting FPIs. ABS classes these complex and frequently novel design installations based on applicable Rules and industry standards. ABS developed guidance for reviewing and approving novel concepts. Risk assessment techniques are applied to better understand and anticipate structural and operational issues to determine if the concepts provide acceptable levels of safety in line with current industry practices.

ABS has provided its approval in principle (AIP) to numerous floating production concepts designed to produce oil and natural gas. ABS' evaluation of a floating production installation is based on the application of prescriptive requirements and advanced risk analysis to verify compliance.

Experience in Gas

ABS has more than 50 years of experience classing LPG and LNG carriers and has gained a reputation for its pioneering technical work with both the transportation and offshore storage of gas. It has been a leader in the development of technical standards for the design, construction and operational maintenance of liquefied and compressed natural gas units. ABS is committed to being at the forefront of technical solutions for these sophisticated vessels and installations.

Classing nearly a quarter of the existing LNG carrier fleet, and more than one-third of the vessels on order, ABS' experience covers LNG carriers of all sizes – up to and including the largest LNG carriers of 270,000 m³. ABS serves the LPG carrier market, classing both the traditional small ships and very large gas carriers (VLGCs).

In addition to the traditional LNG and LPG fleets, industry looks to ABS to validate new and novel ship and gas containment, transport and terminal designs. ABS has provided its AIP to numerous concepts for the transport and storage of natural gas. ABS guidance for building and classing offshore LNG terminals has facilitated industry development of both gravity-based and floating terminals contemplated for offshore installation.

ABS has provided class services for several floating LNG (FLNG) and floating storage and regasification unit (FSRU) concepts. The projects have ranged from the conversion of smaller, older LNG carriers to technically novel newbuild concepts that can handle both LNG and LPG.





Growing Sophistication for OSVs

ABS classes approximately one-third of the worldwide offshore support vessel (OSV) fleet, placing the society in a unique position to participate in the transformation in OSV design capabilities. Over the years ABS has evolved its Rules to anticipate and enable OSV design enhancements.

New generation OSVs have become more technically advanced in order to support the demands of deepwater drilling and subsea operations. Today's OSVs have increased cargo capacity, panoramic navigation bridge visibility, large accommodation spaces, enhanced crew amenities and state-of-the-art propulsion and automation systems.

The OSV fleet has evolved dramatically in terms of diversification, worldwide operation, water depth and capabilities. The number of recognized categories continues to grow along with the level of sophistication, size and number.

Innovation & Research in Offshore

ABS has established five offshore and energy technology centers around the globe. The ABS Singapore Offshore Technology Center (SOTC) was the first center and it has become a key research and development facility in Southeast Asia supporting the latest offshore developments.

Established in partnership with the Federal University of Rio de Janeiro (COPPE/UFRJ), the ABS Brazil Offshore Technology Center conducts research to support new technologies for offshore facilities. Although the research efforts will place a particular emphasis on facilities intended for use in Brazilian waters, broader challenges associated with offshore energy resource extraction will also be addressed.

The ABS Harsh Environment Technology Center, located at Memorial University in St. John's Newfoundland, Canada, supports the development of technologies for ships and offshore structures operating in harsh environments, particularly the Arctic.

The ABS China Offshore Technology Center, founded in partnership with Shanghai's Jiaotong University, focuses on technology research for offshore facilities largely in the Greater China region. Applied research is also conducted on a wide range of oil and gas development issues.

Researchers at the ABS Korea Energy Technology Center, located in Busan, South Korea, work independently and in partnership with local industry, universities and government to develop technology for the offshore and energy industries in Korea. Focus areas include offshore surface and subsea systems, oil and gas exploration and production, LNG technology, renewable energy development, alternative fuels and environmental efficiency.



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