VISUALIZING NEW HORIZONS

Offshore Safety & Innovation

Groundbreaking Drillships

Deepwater Gulf of Mexico
Offshore exploration in deeper, colder, harsher and more remote areas has increased the overall complexity of well designs and pushed the upper boundaries of equipment performance beyond existing maximum limits.

Drilling high-pressure/high-temperature (HP/HT) wells places new demands on existing equipment, such as subsea blowout preventers (BOPs) and piping and fluid circulating systems. New technology qualification standards for HP/HT discoveries — those rated at more than 15,000 pounds per square inch (psi) and higher than 350°F — must be applied.

The development of offshore equipment design qualification standards is under way to help designers and manufacturers developing and constructing HP/HT subsea BOP stacks and related systems that can be used in 20,000-psi and 350°F load conditions.
COVER:

Industry horizons are expanding as the offshore industry has moved beyond what was once considered possible. Advancing technology, knowledge and experience and the availability of performance data are charting the course for a new, more effective approach to safety.

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In most of the world, computer crimes are acts of intellectual property or financial theft, but in the oil and gas sector, particularly when they interfere with operations aboard offshore assets, they take on dimensions of industrial sabotage. Although no reported cyber-attacks have resulted in disaster, some incidents have been serious.

Five years ago, a newly built drilling rig had barely begun its move from Korea to Brazil when its control and business networks were suddenly overwhelmed by a malware infection, which, according to reports, was so effective that it infected the blowout preventer’s control system. Nineteen days were lost while the technicians removed the malware and restored the systems.

Although attacks like that are not commonplace, they raise concerns about software security.

Awareness of such issues has spurred some service providers to see software security as a key piece of lifetime asset integrity. ABS Americas COO Jim Watson recently noted in an industry address that, because cybersecurity is critical to software integrity – itself one of the pillars of overall safe operation of assets – many companies will need to change their approach to software and develop long-term maintenance and management programs for their onboard systems.

Calling for a common approach to cybersecurity, Watson said, “In our industry, when we discuss cybersecurity, we are really talking about the long-term maintenance and security of our systems. Failure to institute a proper management program, or allowing good systems to degrade, means a loss of performance and development of potentially unsafe operational conditions.”
Because cybersecurity is critical to software integrity, many companies will need to change their approach to software and develop long-term maintenance and management programs for their onboard systems.

They manufacture but are not necessarily experts when it comes to how those pieces of connected equipment function together. For operations to be carried out safely, software has to communicate seamlessly because the consequences of software incompatibilities can be severe.

Integrating the discrete software products and making sure upgrades do not disrupt operations is extremely important to asset owners. ABS recognized this problem several years ago and developed its Integrated Software Quality Management (ISQM) and Systems Verification (SV) processes to address the problems introduced when software from multiple vendors has to be integrated. ISQM provides a framework for coordinating and controlling software development, integration and maintenance throughout the life of an asset. Both ISQM and SV utilize methods of assessing whether the functionality of the installed software matches the manufacturer’s detailed description, and the SV class notation allows for an independent third party to perform verification activities.

The flow of digital information aboard a rig is important not only in terms of operational uptime, but in regard to personnel safety and decision-making. As more automation is introduced to offshore operations and more software is required to make automated functions possible, software integrity will become an even more significant component of safe offshore operations.
Drillships have been evolving since the first units appeared more than 50 years ago, and continue to be a platform for innovation today. Advances expected over the next few years include the ability to accommodate a 20,000-psi blowout preventer (BOP) and the capability to use liquefied natural gas (LNG) as fuel.

One important aide to innovation is ABS’ Approval-In-Principle (AIP) process. AIP addresses novel and unprecedented concepts by applying prescriptive requirements and advanced risk analysis to verify the design’s compliance with accepted safety standards.

Recently, ABS awarded AIP to Hyundai Heavy Industries for its innovative HD12000 heavy duty, wide-beam drillship design. The drillship will be able to operate in 12,000 ft (3,658 m) water depth and drill to 40,000 ft (12,192 m). HHI describes the next-generation drillship design as ‘ready for 20,000 psi’ because it will be able to accept installation of a 20,000-psi deepwater BOP stack when such units become available.

Design features include a high-capacity derrick and derrick pipe setback; storage, handling and piping systems that can support deepwater 20,000-psi operation; a heavier riser joint and associated buoyancy to accommodate the heavier BOP stack; and well control systems – cementing, choke and kill, well testing and so on – designed for high pressures. The HD12000 design was prepared in full compliance with the ABS Guide for the Classification of Drilling Systems (CDS Guide) and other applicable ABS Rules and industry standards.

According to HHI, the drillship's refined hullform will enable the vessel to attain a transit speed of 11.5 knots. Additional efficiency-enhancing hull features include integrated, high-efficiency thruster pods and a moonpool designed to reduce internal fluid motions and resistance. The new hullform, in combination with carefully chosen locations for the vessel’s thrusters, will result in superior powering and stationkeeping performance over previous units, says HHI. Fuel consumption of the HD12000 is expected to be 40% lower than that of similar conventional units.

“This is an important milestone for the latest generation of drillships,” says Mr. Yun-Sik Lee, Senior Vice President, Initial Design Team at HHI. “The
award of an AIP by ABS verifies that the HD12000 design offers improved versatility and strength. It is essential to verify new design concepts through an independent party," he adds.

According to Mr. Lee, dynamic positioning (DP) is among the most important of the vessel’s capabilities. "For IMO DP Class 3, the vessel should keep position in the event of a single failure of any active or static component or system or all components in any one compartment. All components should have redundancy and physical separation," Mr. Lee explains. Through the AIP, ABS verified that the HD12000 satisfies IMO’s DP Class 3 rules."

Another way of addressing innovation is through joint development projects (JDPs). Last year, ABS and Daewoo Shipbuilding & Marine Engineering (DSME) embarked on a JDP to bring about the world’s first drillship fueled by LNG.

The project will address challenges associated with safe storage and handling of LNG, bringing DSME’s experience in LNG vessels together with ABS’ technical standards and long experience as a pioneer in both drillship and LNG technologies.

DSME’s part of the JDP includes concept design, comparison between two types of LNG containment technologies and analysis of the vessel’s fuel gas supply system, while ABS’ role includes concept design review, basic engineering review and a risk assessment of tank spaces, access areas, fuel gas supply system and machinery spaces.

According to Dr. Hoseong Lee, ABS Vice President, Global Korea Business Development and ABS Korea Energy Technology Center in Busan, the project team sees the Gulf of Mexico as a key market for such a unit because lower-priced US gas would allow operators to reduce running costs as well as emissions, meeting strict sulfur requirements in the North American Emissions Control Area.

ABS also has partnered with designers to develop vessels that can work in high-pressure/high-temperature environments.

In 2013, ABS was selected to work alongside Keppel Offshore & Marine (O&M) on the Can Do drillship, a novel deepwater exploration, development and completion drilling vessel. The design was developed jointly by KOMtech, Keppel O&M’s R&D arm and technology center, and partner GustoMSC. ABS’ scope of work included plan approval for basic and detail design and assessments of structure and stability.

In discussing the project, Mr. Chow Yew Yuen, CEO of Keppel O&M remarked, "As with all our established proprietary designs, our new Can Do drillship design was developed in close consultation with customers, major oil companies and vendors. Most drillships currently in operation were designed for exploration drilling," he said, "but industry feedback has revealed a need for vessels capable of also performing development and completion drilling."

Encouraging market response to the design led to a decision to build a unit on speculation. When completed in 2016, Can Do is expected to be the first drillship able to handle 20,000-psi BOPs. According to Keppel, the versatile vessel will accommodate installation of the third-party equipment required for development and completion drilling. Design features include a large functional deck space and a riser hold that can store 75-foot- or 90-foot risers.

ABS has supported offshore innovation for 70 years, beginning with classification of the world’s first drilling tender (which supported the world’s first MODU) in 1945 and, soon after, assistance with construction of the first jackup rigs. As innovation continues to spur the offshore energy sector forward, services such as approving next-generation vessel concepts and engaging industry in JDPs will help class keep pace with technology evolution.
Unlocking the HP/HT Treasure Chest

Advancing technology promises to bring once-unobtainable reservoirs within reach.

The oil and gas sector has waited a long time for production from high-pressure, high-temperature (HP/HT) wells to become an everyday reality. With the technologies now in development, many operators with undeveloped HP/HT assets are looking forward to converting them from reservoirs into reserves.

Some operators will build new solutions for old discoveries, like Statoil, which just last year began production from its Gudrun field in the North Sea. With 12,473-psi well pressures and 302°F reservoir temperatures, Gudrun was discovered in 1974 but had to wait decades for the technology that could drill, complete and produce it. Other operators will enter into new HP/HT territory, following oil majors like Chevron – which in 2008 began producing from Blind Faith in the Gulf of Mexico, using equipment rated at 15,000 psi/280-300°F.

Several notable industry initiatives are focused on getting exploration and production technologies past the 20,000-psi/350°F barrier – among them Project 20K™ from BP and the Ultra-Deepwater Program run by the Research Partnership to Secure Energy for America (RPSEA). These and other efforts are spurring development of the sensors, materials and equipment that will make HT/HP production a reality.

RPSEA, active since 2007, is sponsoring a number of HP/HT research projects in areas ranging from well testing to drilling and completion, and has investigators looking into development of a hybrid riser for 20,000-psi pressures, high-pressure flexible pipe and downhole safety valves capable of 30,000 psi. Project 20K™, which started up in 2012, recently ordered 20,000-psi rated blowout preventers from GE Oil & Gas, an innovative unit based on existing technologies that debuted at last year’s OTC.

Developing revolutionary equipment is only one piece of solving the HP/HT puzzle. Critical to permanently breaking the 20,000 psi barrier is having the design and safety standards that will help technology innovators develop, manufacture and qualify solutions that will safely and reliably overcome these extremely challenging operating conditions.

Because HP/HT technology pushes beyond the boundaries of most current equipment and systems, it needs to be properly vetted for acceptance by industry and regulators. ABS has been requested to evaluate HP/HT well control equipment by all three major manufacturers, several major operators, and several major drilling contractors.
The first class society to service the offshore energy sector, ABS has a long history of assisting the industry through systematic technology qualification that both verifies and validates the alignment of proposed innovations that transcend the boundaries of existing technology with current sound engineering principles and standards.

Recently, ABS began working with industry on developing a systematic technology qualification process for HP/HT subsea blowout preventer (BOP) stack equipment and systems, with the goal of improving safety, reliability and availability of the technology. Requirements for HP/HT operations stretch the existing BOP performance envelope in terms of both design and manufacturing. For example, the need for higher pressure containment requires much thicker wall sections compared with current BOPs, pushing current design practices to theoretical limits and beyond.

Mindful of these challenges, ABS has developed a method of technology qualification for HP/HT equipment, key elements of which have been adapted from API standards and the ABS Guidance Notes for Novel Concepts. Taking into consideration all currently applicable API standards, the process will help to confirm that equipment functions in line with current offshore and marine industry practices.

Risk assessments and reliability studies form an integral part of the technology qualification process to assess hazards related to novel aspects of the technology and the ability of the system to reliably meet its functional requirements and defined goals. They supplement any existing prescriptive requirements and help verify that the new technology meets the design principles of applicable ABS Guides, thereby providing an equivalent level of safety.

During the initial evolution of an HP/HT concept, a risk assessment will be conducted to identify the hazards and evaluate subsequent risks related to the proposed technology. These are then managed during verification phases to maintain an acceptable risk level in the completed design.

ABS’ approach to technology qualification also adopts the technology readiness level concepts as set forth in API Recommended Practice RP17 N as an assessment method for determining qualification requirements. It uses a combination of methods to demonstrate subsea HP/HT BOP stack equipment and systems’ compliance with the intent of applicable ABS Rules and Guides.

The design verification needs of this evolving technology are also pushing equipment manufacturers into new territory, calling for use of elastic-plastic, fatigue and fracture mechanics and other advanced analyses in accordance with ASME and API standards – for example, ASME instructions on the use of finite element analysis. Such needs, in turn, demand that verification be done with greater scrutiny and accuracy than ever before.

Altogether, as novel technology qualification processes take their place in the industry and the amount of engineering, prototype testing, and risk assessment for HP/HT BOPs and other systems increases, so will the level of confidence increase as to the capabilities of these new technologies for maintaining the levels of reliability, functionality and safety that the offshore energy sector has labored for decades to establish.
Leading Arctic R&D Efforts

Taking an active role, ABS is guiding discussions about some of the most pressing arctic challenges.
The oil and gas industry has been carrying out Arctic research for decades, incrementally advancing technical standards and capabilities. Significant reserves estimates make the region attractive, and the recent resurgence of interest has pushed harsh-environment operations to the forefront. It is a high-consequence environment that continues to pose challenges that must be resolved before wide-scale operations in ice and low temperatures can begin.

**Winterization**

Winterization is a broad subject that covers risks associated with low air temperatures and ice accretion. Low temperature can have negative effects on material behavior, can increase viscosity of liquids or lubricants, and can cause freezing of certain fluids. Low air temperature can also affect exposed machinery or electronic systems and can introduce safety hazards or reduce the performance of onboard personnel. When combined with wind and wave action, low temperature can result in ice accretion, which introduces risks related to vessel stability, escape route accessibility, blockage of air ducts, and mechanical interference of deck machinery and equipment.

ABS published the *Guide for Vessels Operating in Low Temperature Environments* (LTE Guide) in 2006 to provide guidance on practical winterization solutions for the marine industry. The ABS LTE Guide has been an effective resource for industry and is under continuous development as new technologies and solutions are introduced. ABS Arctic specialists are currently updating the Guide, incorporating alternative technologies and expanding coverage to include additional components such as the impact on personnel and operational elements of winterization solutions.

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The ABS Harsh Environment Technology Center (HETC) in St. John’s, NL, Canada, continues to conduct research on winterization including the prospect of a risk-based approach. These research activities are aimed at producing guidance that will be practical and effective and easy to understand and apply.

**Logistics**

Designers of rigs intended for the Arctic have to be conscious of the great distances between rigs and supply centers. Unlike North Sea and Gulf of Mexico operations, developments in the Arctic frontier will not have an expansive resupply chain close at hand. New rig designs will have to incorporate larger tank capacities, stores capacity and room to carry more spares in order to reduce supply demands and frequencies. For some designs, the drilling window may be the short ice-free summer. Others will have extended light-ice capability. And a few might be designed for year-round operation.

Downtime for repair or parts replacement for a drilling program is always costly, but that cost is compounded if the supply line is long. This consideration could lead to equipment redesign that will increase robustness, extending operation time between scheduled maintenance.

Research for the Sustainable Technology for Polar Ships and Structures (STePS?) project is improving the understanding of high-energy collisions between ice and steel structures, and increasing knowledge of the resistance and failure characteristics of man-made structures under extreme ice loads.
Human factors
All companies know that their most important asset is the people they employ. Meeting the needs of this workforce in the Arctic will be expensive because of the long-distance crew changes and supply lines. An additional challenge for the designers of new rigs is to reduce the number of people required for individual operations, ultimately resulting in a lower number of persons on board count.

New winterized rig designs will incorporate more enclosed spaces, which brings about the need for air quality monitoring for personnel safety and explosive gas detection that exceeds what is needed for a rig intended for use in a more temperate climate. In addition to climate and quality control, air humidity levels need to be maintained in a range that keeps people comfortable without resulting in frost on surfaces that become cold.

Because weather unpredictability is a factor, it is likely that onboard personnel could be caught with a landing helicopter unable to return with the off-duty crew; so the ability to house an extra 30 people will be necessary on Arctic rigs. And the distance involved to transport injured personnel could mean the need for extra medical capability on board. To provide the necessary accommodations for personnel, it is likely that new Arctic rigs will be larger than those used in temperate climates.

Adequate understanding of ice loads
The industry as a whole has a relatively good understanding of local ice loads on structures (peak pressures and design structure of sufficient strength). Global ice loads, especially on floating structures, however, are not understood as well.

As Arctic offshore developments venture into deeper water, the industry will face new challenges related to the safety and stationkeeping capabilities of floating structures subjected to global ice loads. HETC is leading a joint industry project (JIP) aimed at closing knowledge gaps that exist in understanding ice loads on floating structures.

Efforts hosted by ABS through the HETC in St. John’s have facilitated a comprehensive review of the subject, addressing different structural configurations, interaction scenarios, ice management, stationkeeping systems, numerical models, model testing procedures, design codes, full-scale data and operational experience. In the process, participants identified a number of areas of uncertainty and prioritized recommendations for further work. A plan is underway for a dedicated
Recognizing the benefit of convening experts and encouraging discussion could lead to the solutions that will allow industry to break technology barriers in the Arctic.

full-scale measurement campaign in Phase 2 of the JIP aimed at calibrating and validating modern numerical methods for estimated ice loads on floating structures.

Ice management
Almost every offshore drilling operation in ice conditions to date has been supported by some level of ice management. Traditionally, ice management has been an operational issue and outside the scope of class and regulatory authorities. With ISO 19906, published in 2010, industry began to take a broader view of ice management, establishing the first comprehensive treatment of the subject in a standard with requirements for overall system reliability.

Ice management systems typically consist of a series of processes and procedures, such as detection/tracking/forecasting of ice conditions, threat evaluation, physical ice management, ice alert procedure, and disconnection/move-off from the site. For floating drilling systems – and potentially for production systems – physical ice management could include icebreaking, ice clearing or iceberg towing to reduce the stationkeeping loads on a unit. ABS is investing in the development of simulation tools for modeling ice management with engineering accuracy that will allow exceedingly faster than real time scenario investigation. Vessels of specific characteristics can run varying icebreaking patterns to reduce floe sizes and modify floe trajectories all while the loads on the drilling/producing asset are being monitored. Subsequent parametric studies may refine and enhance the understanding of the ice environment that will evolve into the load limit, thereby improving the reliability of T-time and better informing the decision to disconnect.

Progressing into the Arctic
While industry has made significant headway in Arctic research, it is clear that there are many more questions to answer. Continuing the conversation with industry and academia will provide invaluable input for identifying the critical needs for safely developing Arctic reserves. ABS has recognized the benefit of convening experts and encouraging discussion that could lead to the solutions that will allow industry to break technology barriers in the Arctic. The goal is to develop good guidance that will safely facilitate industry efforts to open this vital hydrocarbon frontier.
Safety Critical in Deep Water

_over the decades since the first mobile offshore drilling unit (MODU) began working in the Gulf of Mexico (GOM), class requirements have evolved to address industry needs and the changing regulatory landscape.

As independent, externally audited third parties, class societies are integral to the compliance verification process for new technologies and floating structures used for offshore oil and gas operations in many global offshore safety regimes. By reviewing plans and conducting surveys during construction, class societies verify that offshore structures and their principal machinery and equipment have been designed and built in accordance with technical rules and standards developed by the class society.

The move toward risk-based facility inspection programs and more specialized services has led to greater recognition of the contribution a class society can make to facilitate installation safety and integrity. Knowledge-sharing among industry and regulators provide a foundation for performing the Certification Verification Agent (CVA) scope of work and classification. It also allows the class society and operator to establish the proper standard that must be met while certifying new technology and, ultimately, can provide the framework for developing new rules and requirements addressing this type of technology.

Industry can only continue pushing the boundaries of what is possible if the new and enhanced offshore technologies applied in areas such as the GOM are safe and reliable, particularly in deep water where risk and operational complexity are compounded. While owners and operators elect to maintain offshore vessels and facilities in class as part of asset integrity management, the classification process ultimately helps to keep units in compliance with technical and regulatory requirements.

The GULFSTAR 1 classic spar was installed in MC724 in the deepwater Gulf of Mexico in March 2014. The ABS-classed unit is the first spar-based floating production system with major components built in the US. Fabrication of the hull was completed in Port Aransas, Texas, and topsides fabrication was completed in Houma, LA.
Deepwater Gulf of Mexico

Recent deepwater installations that ABS was selected to class are on track to significantly contribute to rising production in the GOM. According to the US Energy Information Administration, GOM production is projected to reach 1.52 million barrels per day (b/d) in 2015 and 1.61 million b/d, or 16% and 17% of total US crude oil production.
A Shipyard Transforms

Improvements in HSE reflect a nation’s plan for oil and gas-based modernization.

One of Malaysia’s leading shipyards is undergoing an evolution, upgrading facilities, improving organizational capabilities and building employee competence. This effort reflects the Malaysian government’s vision of using the country’s energy wealth to fuel positive economic and social change for its population.

Energy resources have been a mainstay of the Malaysian economy since the country’s first oil well was drilled more than 100 years ago. Nearly all the country’s oil and gas resources are offshore. Although national oil production has fallen since 2003, new discoveries give increasing hope of a productive energy future.

Vision for progress

Deepwater oil and gas developments are key elements of that vision, and the complexity and inherent risk in offshore construction has spurred evolution of HSE at the Malaysia Marine and Heavy Engineering (MMHE) shipyard.

MMHE completed its first offshore project, an FPSO, in 1999, but its transformation into a world-scale offshore fabricator began through facilities upgrades and technical tie-ups in 2005 with offshore companies, including SBM (for the ABS-classed Kikeh FPSO) and Technip (on a production spar for Kikeh).

MMHE has enjoyed a strong relationship with Technip. In 2010, Technip became a minority investor in MHB, the holding company of MMHE, and a year later formed a joint venture, the Technip-MMHE Joint Venture company (TMJV), which was awarded its first contracts in 2014. The contracts included a tension-leg platform (TLP) to be built to ABS class for the Malikai deepwater field and an engineering, procurement, construction, installation and commissioning (EPCIC) contract for a gas field.

Gearing up for these projects, MMHE upgraded and expanded its facilities, acquired the competing Sime Darby fabrication yard in 2012 (now MMHE’s East Yard), and undertook a far-reaching shipyard optimization program. Today, MMHE has 197.5 hectares (488 acres) in its East and West yards that can be used for ship repair and conversion and offshore asset fabrication.

MMHE supplemented its physical makeover with a broad rebuild of its HSE programs and practices under the slogan “Hand in Hand, No One Gets Hurt.”
**The basis of this transformation is MMHE’s belief that no task should ever exceed safety in importance.**

“Over the past three years, we have transformed our approach to HSE and the entire safety culture of our shipyard,” says Khairol Afandi bin Mosmin, HSE Division Manager for MMHE. “The basis of this transformation is our belief that no task should ever exceed safety in importance – all employees have the right to stop any activity that poses a threat to health, safety or the environment.”

One component of the company’s HSE system is a training program that, in addition to covering work-related skills, also gets employees involved in safety services. Recent initiatives include training in the use of the body harness, awareness programs for hazardous situations – such as working at heights or in confined spaces – and the formation of a special rescue squad that supports the shipyard’s emergency response team. The shipyard also has a self-education program in the form of “learning visits” with other shipyards that bring insights for company-wide self-improvement.

**HSE is a Human Journey**

The backbone of the company’s HSE management system is the PDCA methodology (Plan – establish processes and objectives; Do – implement them; Check – monitor and measure their effectiveness; and Act – take action for their continual improvement). The PDCA philosophy is applied not only as a maintenance scheme for programs and initiatives, but also as a means of involving all employees in the company’s journey of self-improvement. In 2013 MMHE introduced what has become a core concept of its HSE journey, an idea expressed in the acronym DAPAT, which is an acronym for a phrase in Malay, *Dah Ambil Peduli Ambil Tindakan*.

“We came up with the DAPAT concept to bring workers to a higher level of HSE participation,” Khairol says. “When they started reporting, they started to *dah ambil peduli* (make an effort to participate). Then we asked them to *ambil tindakan* (responsibly take action).” MMHE followed DAPAT with this year’s “Take 5” program, which encourages employees to make an effort to enforce HSE and provides a guide to questions that should be asked before, during and after work is undertaken.

For MMHE, the human side of the safety culture takes the form a concept called behavior safety. One core initiative encourages workers to immediately report unsafe conditions and practices. When workers see an unsafe situation that poses an immediate danger, they have the right – and obligation – to call a stop to it right away. If the situation does not pose an immediate threat, workers are expected to submit an anonymous form to the HSE department, which then initiates a process of consequence management.

The first steps in consequence management involve lenient intervention and counseling – a process Ahmad says can lead to illumination for the company as well as for the individual worker.

“In our system, everyone takes responsibility for his part of the big picture. That’s how we came up with this “hand in hand” concept: we grow together, hand in hand, and nobody gets hurt – it’s recognition of mutual dependence in having a safe and healthy workplace,” he explains.

“Safety and productivity are related,” Ahmad adds. “Incidents harm productivity, so creating the right safety behavior is very important to productivity. One of our goals is to make everyone understand that, in order to deliver a good quality product, we need to have a strong safety culture.”

MMHE teams train in firefighting and disaster response.

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Changes in the marine and offshore industries present both challenges and opportunities – the chance to rethink traditional ways of doing things, examine issues from a different perspective, and reimagine solutions. ABS continues to invest in research and development to support industry in contending with new technologies, regulations and shifting operating environments.

No matter the dynamics in the marketplace, technology trends, or evolving regulatory requirements, safety drives everything a class society does by virtue of its mission. Within this large picture of global economics and changing regulations, class remains committed to enhancing safety and environmental protection in the marine and offshore sectors it serves.

One of the ways ABS does this is through its Technology program. This year, ABS increased its investment in technology projects – approximately 200 – at research centers and universities worldwide. The ABS Technology program focuses on such issues as extreme environments and loads, environmental solutions, asset performance management, energy efficiency, alternative fuels and offshore energy.

These projects fall into a few main categories. On the one- to three-year horizon, ABS is looking at existing and near-term issues that impact the industry. We are producing rules and guides to help our members and clients tackle these challenges and comply with regulatory requirements in areas such as ballast water and emissions compliance. On the three- to five-year horizon, ABS is anticipating next-generation technologies by studying how to address overall performance of assets, how to minimize downtime and looking into what other alternative fuels may exist. The third category, ‘Blue Sky,’ involves researching long-term technologies that show promise. How can we better leverage sensor technology to improve overall performance? What are the next generation of materials or coatings? What applications are there for nanotechnology?

In 2015, the ABS Technology program will be touching all of these horizons. Class will be working to develop improved tools to support regulatory compliance and safety in the design phase. We also are researching ways to improve vessel and equipment systems in the areas of LNG containment, subsea infrastructure and drilling technology. Performance management also remains a critical focus. Research areas include human factors, asset life cycle monitoring, improved survey and asset efficiency.

Rounding out our priorities is environmental stewardship as industry continues to probe frontier regions and push the limits of technology. This includes operating in extreme conditions, applying alternative fuels such as LNG and working toward zero discharge operations.

As part of our mission to promote offshore safety and security, ABS formed the ABS Offshore Equipment Advisory Committee in May 2014. The expert-led committee plays an important role in bringing together industry stakeholders to provide critical expertise for improving equipment safety standards.

Convening industry committees is one of the ways ABS has taken safety to the next level – leading the industry toward the next generation of safety tools and systems. Class is always searching for ways to improve technical standards so they are as relevant and helpful as possible.

In the spirit of collaboration, we will continue to work with industry, academia and government to maintain a robust offshore safety regime that safeguards assets, the environment and most importantly people.
“If we have learned one thing from the history of invention and discovery, it is that, in the long run — and often in the short one — the most daring prophecies seem laughably conservative.”

Arthur C. Clarke, from The Exploration of Space (1951)