



FOUNDED 1862

ABS



ANNUAL REVIEW
2012

150 years
Tradition in safety

OUR MISSION

The mission of ABS is to serve the public interest as well as the needs of our clients by promoting the security of life and property and preserving the natural environment.

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WELCOME TO ABS & ITS AFFILIATED COMPANIES

In 2012, ABS celebrated its 150th anniversary. The company was formed in 1862 as the American Shipmasters' Association to establish qualifications for ships' officers, and in 1898, the organization took the name of the American Bureau of Shipping to provide shipowners, shipbuilders, underwriters and industry with an accurate classification and registry of merchant shipping.

Throughout its existence, ABS has dedicated its activities to promoting the security of life and property and protecting the natural environment. Over the course of its history, a key element of ABS' success has been the ability to evolve and adapt to change. While the maritime industry has changed greatly over the years, as has the scope of ABS' work, the commitment to the organization's basic principles has not.

The traditional focus of ABS' activities has been the provision of classification services to promote the common safety interests of its members and clients,

primarily the builders, owners and operators of ships and marine-related facilities. This core classification activity continued at a high level throughout 2012 with the ABS-classed fleet reaching new record levels and the ABS organization expanding to meet the increased demand for its services.

ABS Group of Companies, Inc., which is a wholly owned affiliate of ABS, offers its clients a portfolio of related services, primarily in the risk management sector through its various operating subsidiaries. In 2012, ABS Group secured a record volume of new contracts placing it in a solid position for continued growth.

Headquartered in Houston, ABS and its affiliated companies provide services to clients worldwide through a network of 200 representative offices in 70 countries. This review of ABS activities covers the sectors in which the organization participates and is intended to provide an overview of its performance in 2012 and highlights some of the notable achievements recorded during the year.

ABS CHAIRMAN'S MESSAGE



Welcome to this review of ABS activities in 2012. It was yet another very successful year for the entire organization with the classification sector achieving further growth in the ABS-classed fleet and the wide-ranging risk and quality management activities of ABS Group of Companies further cementing the reputation of its operating entities as global leaders in their respective fields.

The net result is that ABS consolidated its position as a financially strong, technically innovative and service-driven organization dedicated to promoting safety,

protecting the environment and providing products and services that assist our clients to better manage the risks of their operations.

These results are particularly satisfying to me on a personal level as this is the last such annual review in which I will participate. After 43 years with ABS I shall relinquish my positions as Chairman of ABS and of ABS Group of Companies in 2013. I have always found the opportunity to introduce you, our many readers, to the *ABS Annual Review* as a time to reflect on the many successes of the past year which can, on occasion, be overlooked in the bustle of day-to-day activities.

This year it does more than that – it gives me a chance to reflect on the growth of not only ABS but also the marine and offshore sectors over almost half a century.

The changes are astounding. We have seen the introduction of containerization, the proliferation of gas as not only a major commodity to be carried but also as the possible fuel of the future for the ships of tomorrow. There has also been the incredible growth of the offshore sector.

The period has seen tankers reach the upper limits of practical size and their retreat to more commercially pragmatic designs, a cycle that has yet to be completed by containerships and bulk carriers as new orders keep stretching existing boundaries.

Together with these technical advances, there has been a growing recognition of the importance of the human element within the overall safety regime, a trend that has also seen the concept of classification evolve from its engineering roots to encompass onboard management system audits and an appraisal of onboard living and working conditions for the crew.

ABS has always been at the forefront of these changes and is now firmly positioned to maintain that leadership role as new innovations, particularly with respect to the development of risk-based standards for the design and maintenance of ships and offshore structures, are introduced.

During this period there has also been the remarkable growth in the ABS Group of Companies' activities to where it is now an acknowledged leader in the provision of risk-related services to governments and industry around the world.


This growth has provided ABS with the necessary diversification, without eroding our commitment to our core values, that has underpinned our success and stability as an organization, especially over the last decade.

None of these advances would have been possible without the unwavering commitment and amazing dedication of the entire global staff of professionals who comprise the ABS family. I will never forget the personal mentoring that I have received from so many outstanding individuals over the course of my career and I know that this same process of support is currently enriching the career path of so many of the newer generations within this tightknit community.

I extend a comparable vote of thanks to ABS clients, past and present, who have entrusted us with their risks and their fleets. We have never taken that trust for granted. We have done everything possible to deserve the confidence that you have placed in us and it has been gratifying to have received so many commendations for the quality of the services that we have provided over the years.

In 2012, ABS celebrated the 150th anniversary of its foundation. Its longevity is attributable to its ability to anticipate change and to provide astute technical guidance and leadership to its clients as they adapt to those changes.

Additionally, the pace of change keeps increasing. The demand for sound management and a forward-looking strategy has never been greater.

I am confident that the future of ABS will be even more illustrious than its past as its management and exceptional staff continue to establish ever higher standards of excellence that will contribute to a safer world and cleaner environment for everyone. 



Robert D. Somerville
ABS Chairman

THE PEOPLE OF ABS



The history of ABS is the story of the transformation of a small US-based organization, founded in the Clipper Ship Era of the 1800s, into one of the world's leading maritime classification societies. Throughout its history, the one constant has been the contribution of generations of dedicated people whose knowledge, skills and judgment have helped propel ABS to its current position of leadership.

The creation of groundbreaking analytical computer programs, the enhanced survey of ship structures, the personal assistance given by countless surveyors to shipbuilding nations, the contributions of

engineers in the creation and implementation of rational international regulation, the qualitative and quantitative hazard studies conducted by risk management professionals – these are only a few examples of the roles that the men and women of ABS have played in promoting safety, maintaining quality and protecting the environment.

Like every successful organization, ABS has defined a number of strategic goals that drive the actions and decisions of the organization. Simply stated, the goals are to consistently deliver value to clients, invest in employee development, achieve operational excellence, encourage innovation, and continue to strive toward zero employee workplace incidents

while strengthening the company's ability to be self-sufficient in the long term. It has been said that an organization which looks after its employees creates a workforce of willing ambassadors for the company, its products and its services. And, at ABS, investing in the future includes a continual investment in the people that make this organization a success.

Expanding the Workforce

Over the last ten years, the number of employees in ABS and ABS Group of Companies has more than doubled so that, today, nearly 5,500 dedicated employees staff more than 200 offices in 70 countries. By expanding the workforce, ABS has been able to broaden its services and provide local assistance to more of its clients around the world.

As ABS has expanded its activities, the organization has focused on hiring qualified, national candidates wherever possible, resulting in an enhanced ethnic and professional diversity that is truly reflective of our position as a global service provider. The multi-cultural staff, representing more than 40 nationalities, gives ABS a local touch and a global reach. The unique talents of thousands of employees give ABS

the agility to deploy resources from a global team of experienced and knowledgeable employees around the world.

While most of this growth was organic, the ABS Group of Companies targeted certain acquisitions to further accelerate the company's growth. As a result, ABS Group expanded its international workforce by more than 700 new employees.

With a strong foundation of core values, ABS has continued to thrive and grow by leveraging the capabilities of its employees across the organization in pursuit of its mission of promoting safety and protecting the environment.

Focusing on Safety

Since its inception, ABS has focused on safety – the safety of its clients and their assets and, as importantly, the safety of its own employees, many of whom are often called upon to work in difficult and, on occasion potentially dangerous environments.

Throughout 2012, ABS employees participated in the "Always be Safe" campaign – a multi-year



THE PEOPLE OF ABS



attention to safety and to work together to create a safer work environment.

Safety Day also served as a platform from which to launch the new Golden Eagle Award program, which recognizes individual safety efforts in the office and in the field. The goal of the program is to encourage employees to continue to

program introduced to emphasize safety awareness with the goal of further reducing and, hopefully, eliminating lost-time incidents from the workplace. The fundamental message at every level of the organization is that no assignment is so important, or so trivial that it cannot be approached with a safety mindset.

exceed the current safety initiatives of ABS and to find innovative ways to improve safety. In 2012, 18 employees of ABS and ABS Group received Golden Eagle Awards.

To oversee this increased emphasis on safety, ABS brought together all of its global safety programs, policies, processes and practices under the newly created Corporate position of Vice President of Occupational Health and Safety. In addition, ABS celebrated its inaugural Global Safety Day to increase safety awareness – a full day of planned events to encourage field and office personnel to pay particular

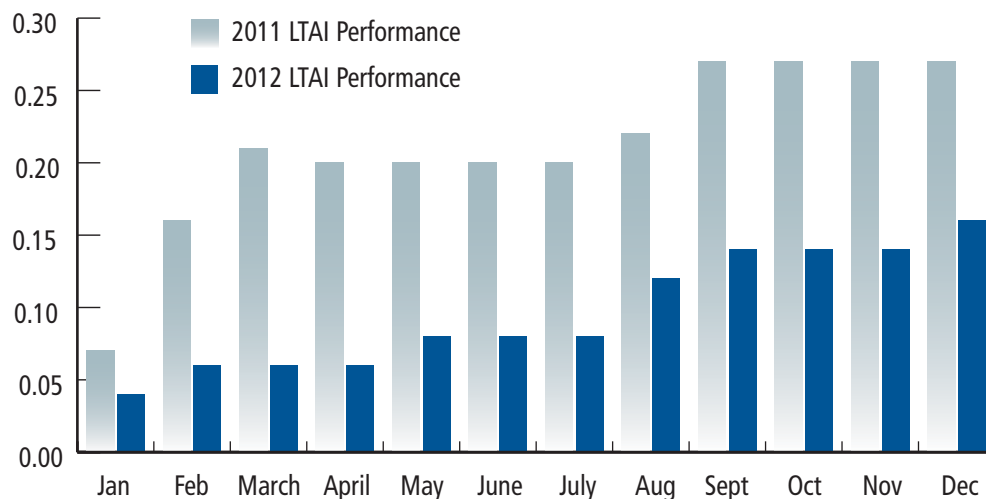
As a result of these programs and others, ABS significantly reduced the number of lost-time incidents from the prior year.

Sustainable Resource Engine

The strength of ABS is directly attributable to its people. To help build a pool of talented and motivated professionals, ABS strengthened its training and employee development programs, and created new opportunities for career advancement.

TOTAL ABS ORGANIZATION

Lost-Time Annual Index (Work-related Incidents)



Recognizing that it takes time to develop experienced personnel, especially surveyors and engineers, ABS committed considerable resources to expand the ABS Learning Organization – the Corporate department charged with aiding employees in career development. Traditional classroom training was complemented by a blend of online, video-on-demand, virtual classroom and instructor-led classes.

Multiphase orientation and training programs were introduced to integrate the influx of new employees into the organization, and the same multiphase training philosophy was also applied to the continuous professional development of experienced personnel. New accelerated survey and engineering training programs were also introduced and satellite training centers opened around the world to accommodate the increasingly international workforce.

Preparing for the Future

In today's fast moving world, no organization can survive if it does not embrace change. For ABS, striking the right balance between defining the innovative services of the future while, at the same time, fulfilling the duties and responsibilities of

promoting safety, is a constant challenge. For example, the judgment that surveyors exercise every day remains the same. Yet the scope of surveying and auditing tasks continues to expand, and the tools and programs that they use to deliver those services more efficiently and effectively never stop evolving.

Looking forward requires a wide range of new thinking, new strategies, new responsibilities and new tools. ABS professionals are harnessing technology to rethink the accepted traditional practices and validate the position of class as an essential and integral part of the maritime industry.

To be competitive in the future, ABS must continue to invest in its people. They are the foundation upon which the success of ABS has been built over the last 150 years. By providing the support and training they need to keep abreast of industry issues, the latest technology and new regulatory initiatives and by encouraging the adoption of innovative approaches that both improve safety and address the needs of our clients, ABS will further strengthen its position as a leader in providing classification, risk and associated services to industry and governments worldwide. 



ABS PRESIDENT & CEO REPORT



ABS rode out the economic and market uncertainties of 2012 through a combination of advanced technical capabilities, superior service and innovation. Our intimate knowledge of the offshore sector and a willingness to lead industry issues that were fundamentally changing the marine market contributed to our success.

We closed the year firmly entrenched as the second largest society in terms of gross tons in class and as the largest society in terms of new tonnage on order. We continue to challenge ourselves to rethink accepted class practices so we can remain not only a trusted advisor to our members and clients but also a

leader in promoting more effective safety standards. Our success demonstrates our continued commitment to the mission that has defined ABS for the last 150 years – promoting the safety of life and property and protecting the environment for future generations. Our core values of safety, quality and integrity remain the foundation of our activities.

Our remarkable performance is ultimately attributable to the constantly growing worldwide staff of knowledgeable, service-oriented and enthusiastic employees of ABS and the passion with which they fulfill our mission. They are the engine that drives the continuing success of ABS and I take this opportunity to offer them my heartfelt thanks for their efforts.

The year saw the ABS fleet grow from 185.6m gt to 193.5m gt, establishing yet another record. We closed the year with a market leading 21 percent share of newbuilding orders worldwide and enjoyed the leading position with shipyards in Korea, China, Singapore, India and Brazil, among others.

Given the world's rapidly growing demand for energy, ABS offshore activity remained particularly strong. Activities covered a wide spectrum from certifying the world's first floating offshore wind terminal to receiving orders for 60 jackups, to securing the majority of orders for deepwater drillships, further consolidating our position as the leading provider of classification services to the offshore sector.

But 2012 saw a broader interpretation of 'energy' than just the offshore industry. Energy efficiency became a major preoccupation of ship designers, builders and owners and ABS responded with the research and technical support needed to address issues ranging from new innovative hull forms and propulsive systems, to the extraction, storage and transportation of LNG and to the increased interest in and use of LNG as a clean burning fuel replacing traditional emission-laden heavy fuel oils.

The quality and consistency of our survey services was evident by our continued outstanding performance record within the three major port State regimes – the Paris and Tokyo Memorandums of Understanding and the US Coast Guard. During 2012, ABS remained in the high performance tier of societies in all three jurisdictions. ABS will continue to take actions to maintain this position of leadership. We will respond quickly and knowledgeably to the rapidly evolving technology. We will continue to provide innovative yet practical standards that enhance safety and operational efficiencies.


Development and delivery of technically advanced products and superior customer service are the foundation of ABS' continued success. The quality of the services we provide is dependent upon the knowledge and abilities of our global workforce.

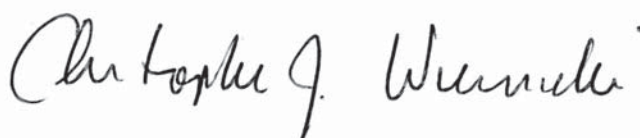
To further increase these capabilities, we enhanced the ABS Learning Organization during the year, to better maintain employee currency with the latest standards, regulations and techniques needed for job performance and career enhancement.

With a steadily growing, international workforce, the safety of our people is one of our core commitments. We continued to emphasize this vital issue, achieving a 50 percent reduction in lost-time, work-related incidents compared to the previous year.

The foregoing provides a glimpse into the successes and management strategy of our activities over the past year. It was a year during which we celebrated our 150th anniversary, a milestone achieved largely because ABS has been able to adapt to the constantly changing demands that have been placed on the classification sector over the decades.

We look ahead with optimism. We are structured to tackle the challenges and seize the opportunities that lie ahead. Our goal is to continue to define the class society of the future and to remain the leader in developing and providing the innovative products and services that will be required. There is no doubt that those products and services will be increasingly risk-based, technologically driven, holistically framed and integrated to a much greater degree than at present.

We are determined that our future will be as illustrious as our past. We take our responsibilities of promoting the safety of life and property and protecting the environment very seriously. But we are equally committed to helping our clients to operate not only more safely and in a more environmentally sensitive manner, but more efficiently as well. In doing so we will be best positioned to define the Class of the Future. 



Christopher J. Wiernicki
ABS President and CEO

ABS CLASS ACTIVITY



In 2012, ABS maintained its position as the world's second largest classification society in terms of tonnage with 193.5 million gross tons in its classed fleet. Closing the year with 11,930 marine vessels and offshore structures, ABS experienced a growth rate of more than 4 percent.

While there was an overall decline in newbuilding contracts, ABS held its position as the leading classification society for new construction orders. With requests for class totaling more than 37m gt, ABS ended 2012 with a 21 percent market share for vessels on order.

This past year presented a shift in the overall shipbuilding marketplace as the cycles of marine and offshore construction began to operate on different trajectories. In the marine market, a softening continued as overcapacity of existing vessels remained problematic – leading to the lay up or early scrapping of many vessels. The market was further constrained by an overcapacity of shipbuilding, leading to increased competition for a relatively small number of new construction orders.

The offshore new construction market was clearly on the path to recovery in the wake of the economic downturn and the resurgence of

exploration activity post-Macondo. As oil prices remain relatively strong, the trend for continued construction of new exploration and production units is expected for several years to come. The relative overcapacity for construction in the marine sector may continue to be partially filled by the demand for additional offshore assets over the next several years.

Marine Activity

2012 was another successful year for ABS in the marine market, particularly in several key sectors of the industry. Market share for new construction containerships continued to increase year-over-year, ending 2012 with 26 percent of the containership orderbook. With requests for class contracts for 29 ultra large containerships and 37 very large containerships, ABS maintained its position as the second preferred classification society for this important sector.

Long-term growth in the demand for natural gas continued to drive the design and construction of the next generation of LNG carriers. ABS realized

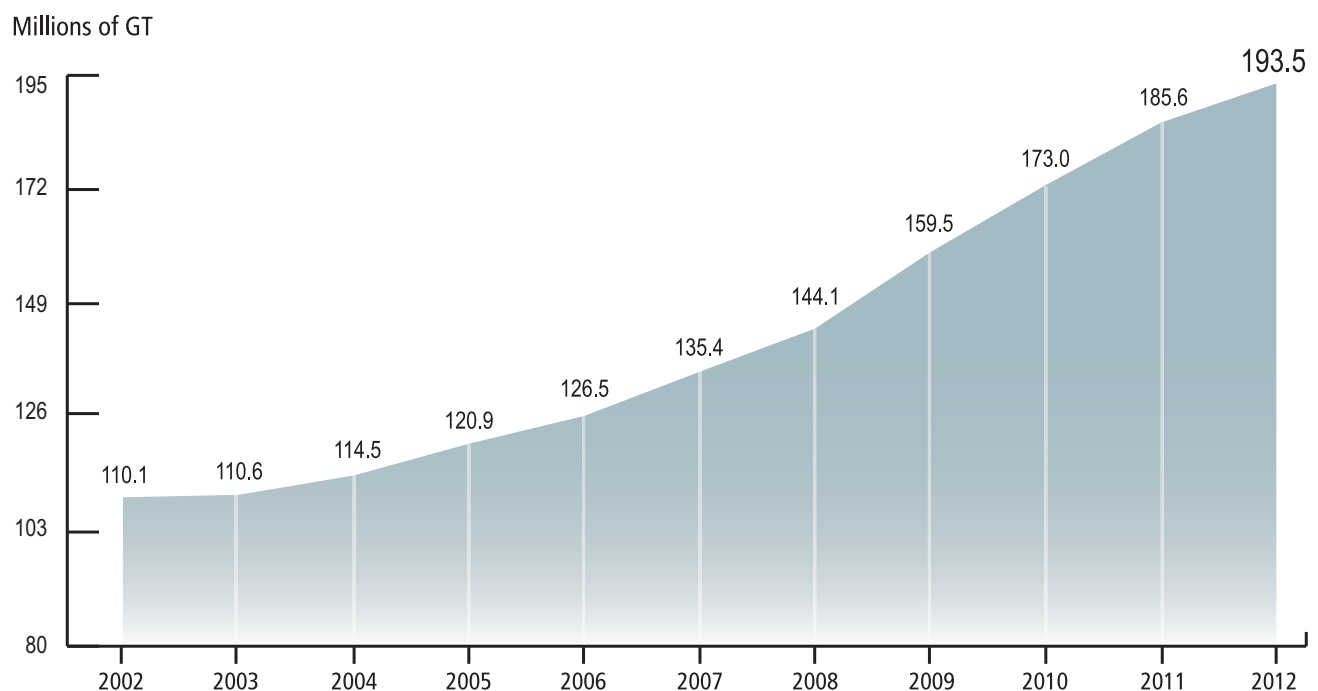
growth in the LNG carrier sector with 22 percent of existing tonnage and 35 percent of tonnage on order – positioning ABS as the top classification choice for LNG newbuilds.

By the end of 2012, the ABS-classed tanker fleet was nearly 69m gt with an additional 7m gt on order. In the bulk carrier market, ABS grew its overall tonnage by 11 percent with more than 9m gt on order.

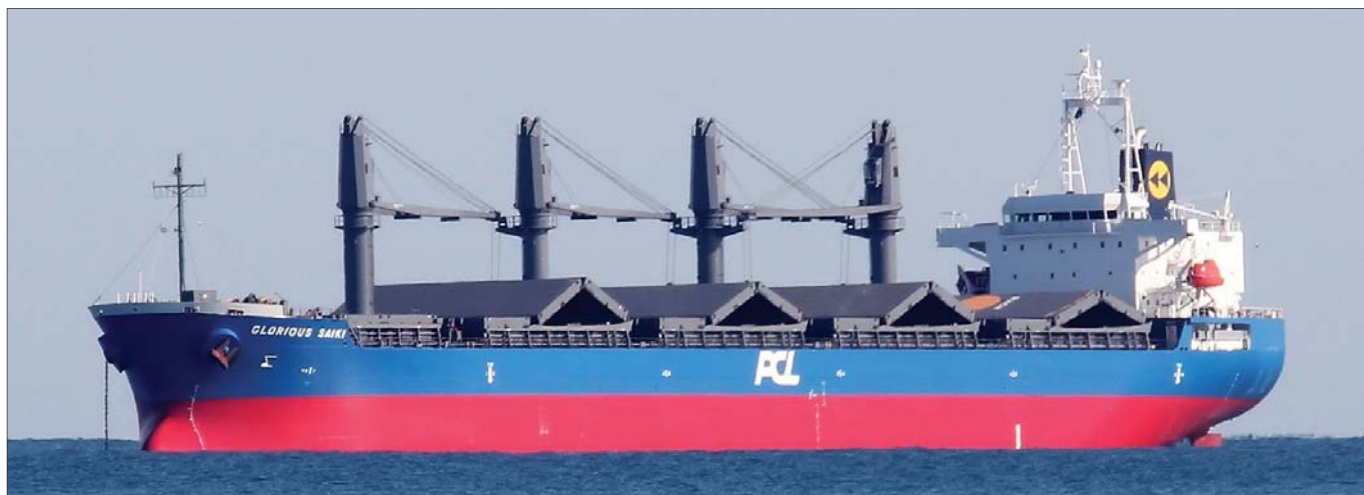
ABS continued to be the preferred society for new construction in several key shipbuilding countries around the world. In Korea, ABS received requests for class for 213 vessels aggregating nearly 17m gt, with a 29 percent share of the shipbuilding market. In China, the ABS orderbook captured 810 vessels aggregating more than 12m gt, with a 20 percent share.

ABS also held the leading orderbook market share for new construction contracts at shipyards based in Singapore (76 percent), Taiwan (49 percent), India (46 percent), Brazil (60 percent) and the United Arab Emirates (50 percent).

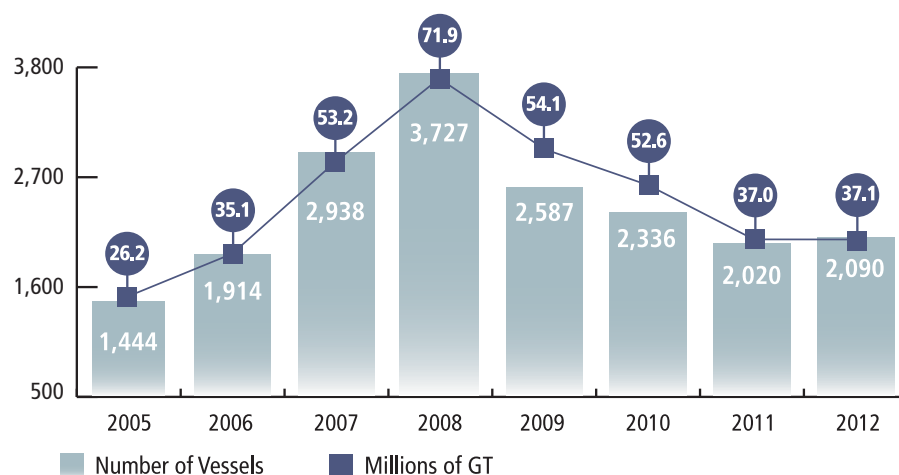
2012 ABS Existing Fleet



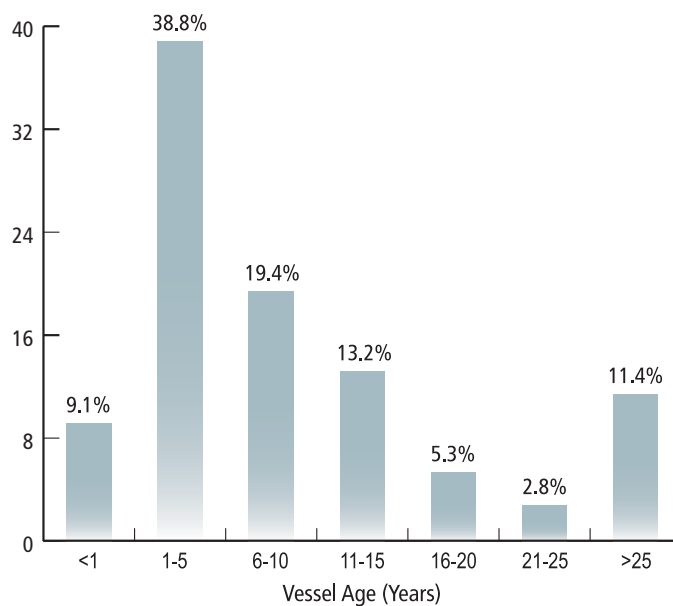
ABS CLASS ACTIVITY



2012 Vessels on Order (Requests for Class Included)

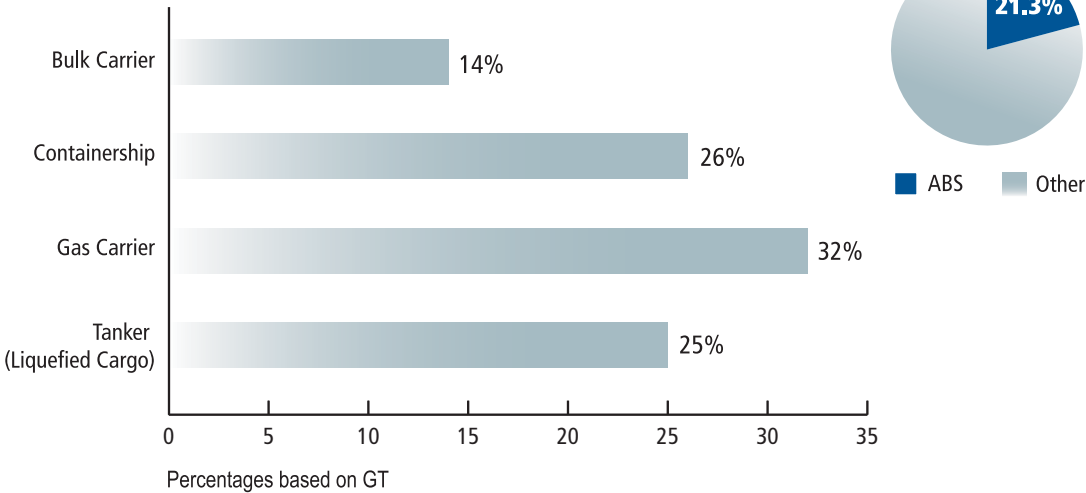


2012 Existing Fleet Age Profile



Percentages based on GT

2012 Share of Worldwide Orderbook



The relatively young ABS fleet age profile also shows long-term strength. Nearly 50 percent of all vessels in ABS class are five years of age or younger. Nearly 70 percent of all vessels have ten years or less of operational activity. This profile provides a strong foundation for the future success of ABS.

Offshore Activity

ABS began 2012 with a strong position in the offshore market, continuing to lead in the mobile offshore drilling unit (MODU) and floating production unit sectors. The jackup market, where ABS continues to have the majority share, remained robust, with 13 ABS-classed jackups delivered in

the course of the year and 60 new orders, many of which will work in the Middle East, Far East and Mexican Gulf of Mexico.


The bulk of the year's activity centered on drillships, which will carry out deepwater drilling around the world. The newbuild vessels on order generally are capable of operating in 10,000 ft water depth and drilling to 35,000 to 40,000 ft. There were 31 new orders in the course of the year, with 23 awards to ABS, including a large number of units earmarked for presalt drilling programs offshore Brazil. ABS ended 2012 with 51 drillships on the orderbook, equating to 68 percent of the new construction market.



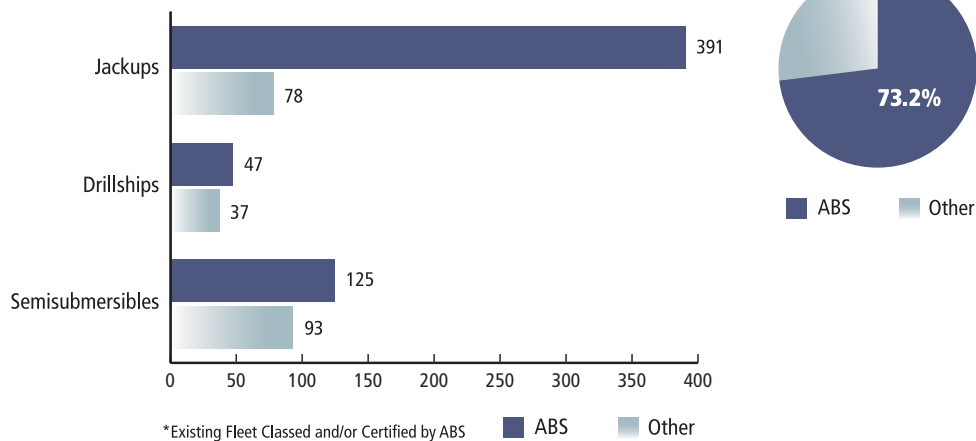
ABS CLASS ACTIVITY



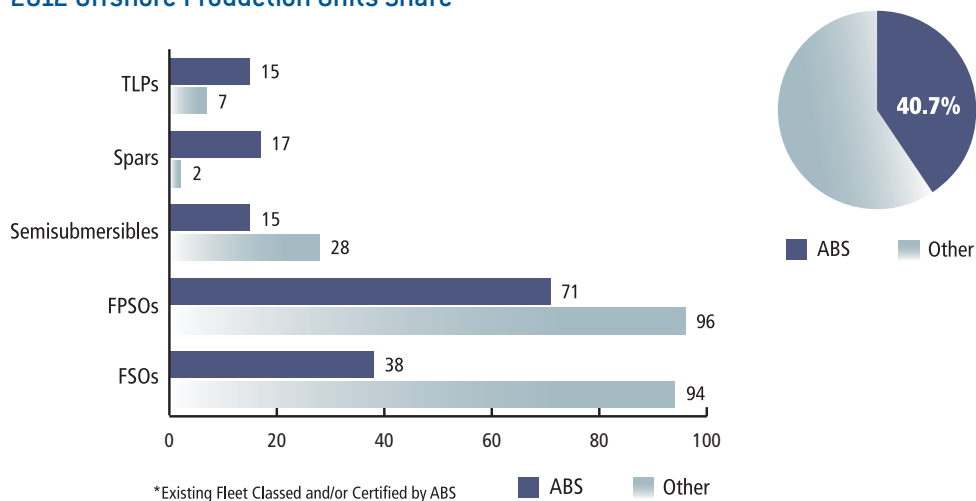
While business activity overall was strong, the semisubmersible market was softer in 2012 than in 2011, and class activity reflected the drop in newbuild orders. ABS was selected to class seven of the year's newbuilds, six of which are being built for Sete Brasil in the BrasFELS yard in Angra dos Reis, Brazil.

The floating production, storage and offloading (FPSO) vessel market also continued to expand, and industry analysts predict that the trend will continue, forecasting that projects in 5,000 ft water depth and greater will make up more than a 30 percent share of floating platform capital expenditure over the 2012 to 2016 time frame. ABS closed 2012 with 43 percent of the existing FPSOs and 35 percent of newbuilds. 

2012 Offshore Exploration Units Share



2012 Offshore Production Units Share



2012 Class Activity Summary

VESSEL TYPE	Vessels in Class 31 Dec 2012		Vessels on Order 31 Dec 2012		New Vessels Classed in 2012	
	NO.	GROSS TONS	NO.	GROSS TONS	NO.	GROSS TONS
Barge	2,881	10,217,649	384	1,190,256	328	957,941
Barge Carrier	4	154,364				
Barge Type Unit	32	148,126	1		2	25,261
Bulk Carrier	924	41,857,481	190	8,010,313	161	7,740,422
Bulk Liquid Carrier	6	26,213	3	7,830		
Chemical Carrier	239	4,370,984	19	258,505	2	40,954
Column Stabilized Unit	173	3,066,366	12	152,085	9	231,678
Container Carrier	503	25,059,304	75	7,327,834	21	1,295,404
Dredge	19	99,858	1	484		
Drillship	49	2,327,926	28	1,181,487	8	465,026
Ferry	48	451,771	3	810	1	1,312
Fishing Vessel	12	34,145	2	2,226	1	1,321
Fixed Platform	91	5,175	28		31	
Floating Drydock	20	200,407	1	8,590	1	
FPSO/FSO/FOI	84	7,714,488	9	1,352,000	1	83,985
Gas Carrier	123	9,120,468	31	2,903,644	5	511,243
General Cargo Carrier	149	1,635,477	34	397,648	6	112,608
Heavy Lift Ship	21	683,763	9	210,003		
High-Speed Craft	322	100,707	126	66,241	28	7,262
Ice Breaker	1	12,892			1	12,892
Offshore Supply Vessel	885	1,098,651	29	54,463	12	22,620
Offshore Support Vessel	979	2,081,382	387	956,857	116	281,169
Oil Carrier	1,264	70,182,621	132	7,395,189	98	5,589,867
Ore Carrier	12	732,677	2	402,000	2	233,910
Passenger Vessel	17	128,619	8	23,000		
Refrigerated Cargo Carrier	18	218,658				
Self-Elevating Drilling Unit	404	2,791,351	70	438,051	9	78,491
Self-Elevating Unit	87	349,063	27	92,553	20	136,529
Ship Type Unit (excl. FPSO/FSO)	19	2,004,863			11	669,643
Single Point Mooring	55	2,071	15		6	
Spar	14	126,771	2			
Special Purpose Vessel	427	1,248,418	31	109,855	5	104,270
Subsea Pipeline	13				1	
Swath Vessel	9	25,781	1	2,484		
Tension Leg Platform	9	32,930	3			
Tug/Towboat	1,297	597,992	160	72,044	68	33,131
Underwater System	78	98,660	27		5	
Vehicle Carrier	99	4,267,301	1	700		
Yacht	543	210,370	109	45,615	23	10,932
TOTALS	11,930	193,485,472	1,960	32,662,767	982	18,020,369

ABS MARINE ACTIVITY



In 2012, there was continued pressure on the marine industry to weather the challenges of an often sluggish and unpredictable global economy. The hope of a relatively quick return to the boom era of the previous decade turned into acceptance of a new reality that successful business strategies would be driven by optimizing performance of existing vessels and designing future tonnage to meet ever increasing efficiency expectations.

Within this shifting paradigm, an opportunity was presented to re-think the manner in which vessels are designed, constructed and operated. ABS embraced the opportunity of working alongside

industry to tackle its most pressing challenges – always with an eye towards safety, best-in-class service delivery and the development of practical, tailored solutions.

Focusing on LNG

The potential of LNG to fuel a portion of the marine fleet is a topic that has assumed increasing importance as shipowners seek new ways to reduce ship-source emissions and minimize fuel costs. Prior to 2012, potential projects were limited by a number of factors – technology, bunkering infrastructure, the development of regulations, training and commercial considerations.

As 2012 progressed, the obstacles were beginning to dissipate and ABS assisted industry clients in making LNG-powered ships a reality. In January, Harvey Gulf International Marine, a major offshore support vessel operator, announced the construction of dual fueled vessels utilizing the ABS *Guide for Propulsion and Auxiliary Systems for Gas Fueled Ships*. Additionally, ABS began work with containership operators on new construction and vessel conversions that would use LNG fuel. Key factors driving these projects are the emission control area requirements that became effective in August 2012, and the relatively low cost of LNG in North America.

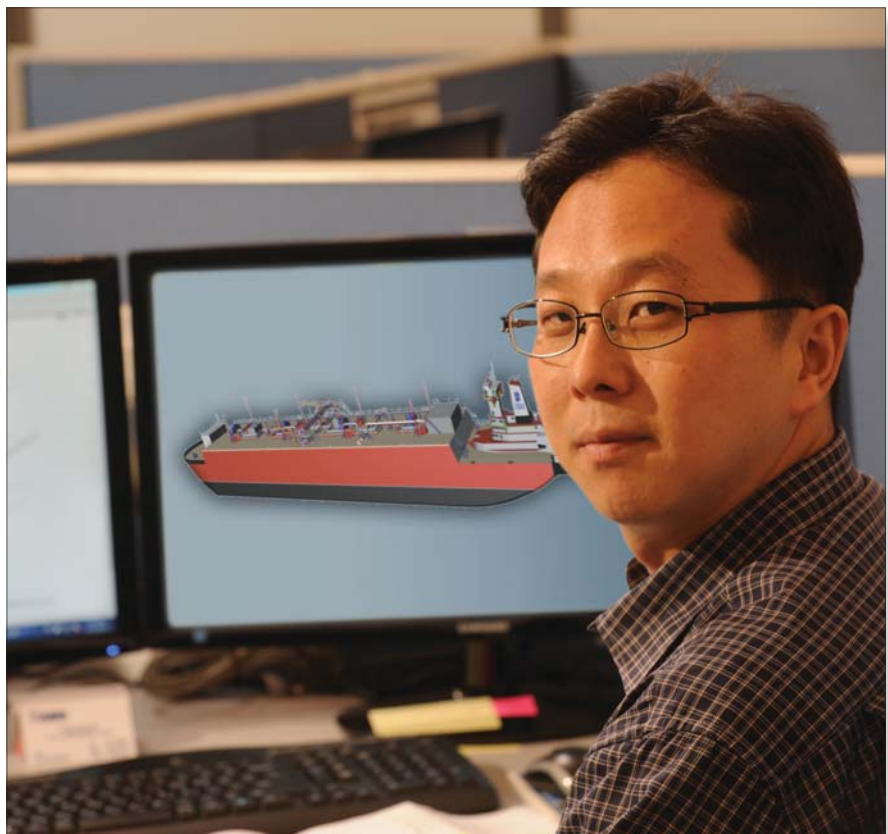
In the LNG carrier sector, ABS continues to be the leader in new construction orders placed around the world. Building upon its legacy of being on the leading-edge of this unique market, ABS is making significant investments in research and development to help owners and operators increase reliability and improve environmental performance on LNG carriers and the systems utilized to safely operate these state-of-the-art vessels. Working alongside industry stakeholders, ABS is at the forefront of many new and novel concepts that will help expand the access to this vital fuel across the globe.

In 2012, ABS provided several key approvals in principle (AIP) to new concepts that will help drive the future of this market. In October, ABS provided an AIP to an LNG articulated tug barge and regasification vessel for Waller Marine. ABS also granted GTT an AIP for a 32,000 m³ capacity small LNG carrier design. Each of these concepts will allow for the delivery of LNG on a smaller scale, increasing the market reach for a fuel that is becoming increasingly integral in the transportation marketplace.

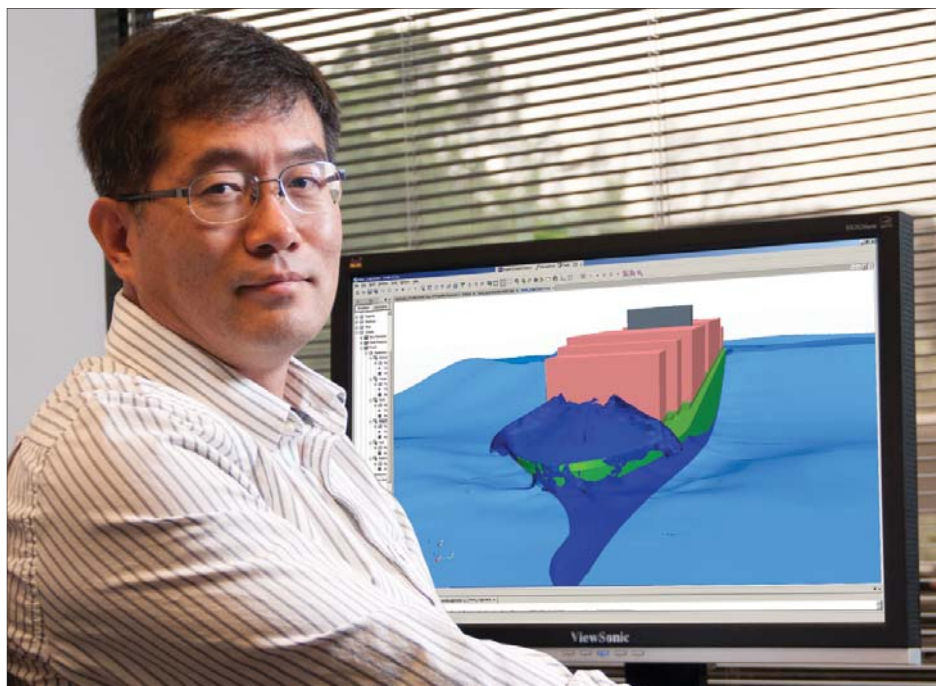
Containerships of the Future

Fleet overcapacity, rising fuel costs and increasing regulatory requirements encouraged owners and operators to develop vessels capable of operating in a challenging business environment. The long-term trends – the need for energy-efficiency improvements, the possible use of LNG and other alternative fuels, 'eco designs', the need for variable service speeds, larger and more complex ships – require ABS to provide an extended range of services that leverage technology as a tool for safe and efficient operations.

In 2012, ABS professionals continued their work to identify state-of-the-art technologies to help deliver and support the containership of the future – an eco-friendly vessel design that features more effective loading capacity. As demand for energy-efficient and environmentally conscious vessels increased, ABS led the charge in defining performance criteria for an energy-efficient, environmentally sound and safe containership.



ABS MARINE ACTIVITY



A particular focus throughout the year was assisting stakeholders in understanding the International Maritime Organization's (IMO's) Energy Efficiency Design Index (EEDI) regulation. ABS participated in a joint industry working group to provide the industry with a set of guidelines for verifying data required to support EEDI calculations. ABS also has been working to clarify EEDI regulations, explaining the basic principles of energy losses in a ship and what measures are available to reduce these losses

Today ABS is the market leader in the construction of ultra large containerships and continues to invest heavily in the development of technologies necessary to gain efficiencies in the liner trade. Technical and service delivery leadership in this unique market has positioned ABS to assist owners and operators in taking the necessary steps to operate safe, efficient and technically advanced vessels.

Efficiency & Environmental Solutions

Regulations aimed at protecting the environment presented a challenge for shipowners, but meeting these requirements was not the only issue. The requirements must be weighed alongside commercial drivers impacting the industry as well. The growing cost of bunker fuel is as important a factor in building cleaner, more energy-efficient ships as the regulations calling for global reductions in carbon and sulfur emissions.

The ABS Environmental Solutions Group spearheaded efforts to help clients address expanding environmental regulatory requirements that impacted the marine industry. From energy efficiency, to gas-fueled ships, to ballast water and biofouling management, ABS provided practical guidance to help owners and operators meet future challenges.

and improve energy efficiency.

Equally important was the work undertaken with clients to implement the IMO's Ship Energy Efficiency Management Plan (SEEMP), providing advice that takes this instrument beyond its regulatory baseline to potentially play a role in active energy management and emissions reduction.

Taking a comprehensive approach to energy and environmental management, ABS updated its previous Marine Management Systems Guide to add SEEMP and comprehensive energy management into the program. Incorporating the new ISO 50001 energy management standard into the *ABS Guide for Marine Health, Safety, Quality, Environmental and Energy Management* reflected the increasing need for ship operators to maximize onboard energy efficiency.

ABS will continue to develop the services and technologies the marine industry needs to improve energy efficiency and meet environmental expectations. While many of these changes will be driven by regulatory requirements, successful shipping companies must be able to identify operational efficiencies that provide marketplace differentiators. ABS is prepared to assist in this effort and help strike the balance between innovation and safety.

Ballast Water Management

Future compliance with global ballast water management (BWM) standards designed to tackle the spread of invasive species by seaborne trade continued to present operational challenges to vessel designers, owners and equipment manufacturers alike. In addition to BWM, there was an increasing focus on invasive species transported through the biofouling of a ship's hull, with some authorities increasing pressure to demonstrate compliance even before the global legislation entered into force.

In response, ABS released its updated *Guide for Ballast Water Treatment* to aid vessel owners and operators in preparing for the IMO BWM Convention. The Guide includes the installation parameters required for an ABS-classed vessel utilizing IMO member State type approved ballast water treatment system and offers owners two optional notations to demonstrate further due diligence in their ballast water management practices.

By the end of 2012, ABS was finalizing its *Guidance Notes on Biofouling Management Plans* to help owners achieve best practices in hull management, meeting local compliance requirements and in the process contributing further potential fuel savings.

Supporting Governments

Throughout 2012, ABS remained committed to providing its US and international government clients with the high-quality, tailored services that they expect from the organization. Government entities that class with ABS realize the value the process incorporates into the entire lives of their vessels. In an era of tight budgets and constrained resources, leveraging ABS' experience has become an even more important piece to government agencies that are entrusted with marine assets.

The Military Sealift Command (MSC) continued to maintain its fleet of auxiliary and sealift support vessels exclusively to ABS class. MSC functions within the US Navy and is primarily responsible for providing the US Armed Forces and other government entities with sealift and ocean transportation capabilities. ABS has provided classification services to a number of newly acquired and constructed MSC vessels.

In the United States, ABS is working alongside the US Navy through the specially tailored *ABS Rules for Building and Classing Naval Vessels*. This standard brought together ABS' unique commercial and auxiliary vessel experience with the specialized needs of combatant vessels. ABS also continued to expand



ABS MARINE ACTIVITY



its services to assist governments in the life cycle maintenance of their vessels. The Achieving Service Life Program (ASLP) has been successful in identifying and prioritizing maintenance needs for US naval vessels entered into the program. And by the end of 2012, more than 50 vessels had been enrolled in the ASLP program, with continued growth expected in the future.

The US Coast Guard (USCG) continued its acquisition of the national security cutters as well as the fast response cutters and began development of the offshore patrol cutter program. These classes of vessels are intended to expand and modernize the existing capabilities of the USCG. ABS supported the national security cutter program by providing technical and engineering-related services. The fast response cutters were built to the *ABS Guide for Building and Classing High Speed Naval Craft*. By the end of 2012, the USCG had commissioned four fast response cutters, all built to ABS class. In addition, the offshore patrol cutters will be built to ABS class.

ABS' involvement with government vessels spans beyond the US Navy and the USCG to include vessels from the US Army Corps of Engineers, the US Maritime Administration, the National Oceanographic and Atmosphere Agency and foreign militaries. All these entities rely on the experience and capabilities of ABS to help maintain their respective fleets.

Governments worldwide are seeing budget challenges and are seeking ways to streamline vessel acquisition processes and reduce costs without compromising on technical standards. To serve these growing needs of government clients worldwide, in 2012, ABS began development of a new set of Rules applicable to such vessels. These new Rules, initially to be published as the *ABS Guide for Building and Classing International Naval Ships*, are intended to satisfy military vessels (for navies and coast guards) but also the broader government vessel market. The Guide is expected to upgrade to Rules in 2014.

Polar Shipping

Polar shipping and the emergence of Arctic trade routes created new opportunities for owners and new challenges for regulators as they sought to balance developments for environmental protection. Even as the industry awaited the finalization of the IMO Polar Code, ABS delivered a new level of defined standards for operators working in Polar regions through its expanded Polar Class criteria.

ABS incorporated knowledge gained from the in-service application of its Polar and Ice Class requirements and its participation in joint research initiatives into a more comprehensive Ice Class system that goes beyond the minimum ice strengthening requirements already in place.

Harmonized Rules

For the past five years, ABS has held the chair of the International Association of Classification Societies (IACS) Hull Panel. Along with the work related to hull structures, materials, anchoring and polar loads, the primary responsibility of the panel has been to develop and release the IACS *Harmonized Common Structural Rules for Bulk Carriers and Tankers*.

These rules will be submitted to the IMO to demonstrate compliance with the IMO Goal-based Ship Construction Standards (GBS). It is important that these rules continue to illustrate IACS' technical capability to the IMO – and to industry in general – and also demonstrate that the new goal-based type of IMO regulation can be effective. As demonstrated by its commitment of resources, ABS is fully invested in these activities.

Global Reach, Local Touch


In 2012, several steps were taken by ABS to meet the needs of the industry through enhanced communications and improved responsiveness. ABS became the first class society to move into a platform of integrated mobile communications by the launching of ABS Connect. Through a specially tailored mobile website, clients can access a wealth of information on their ABS-classed vessels from their mobile devices. ABS also launched applications designed for the iPhone and iPad that enable downloading of Rules, Guides and other publications.

As part of its ongoing commitment to serve the public good, ABS held seminars around the world on key marine topics of importance. These events helped thousands of professionals remain up-to-date on current industry trends

and provided venues for ABS to hear directly from its stakeholders on efforts needed to support the global marine industry.

On the regional level, ABS took steps to improve responsiveness by realigning management of key geographic areas. Given the manner in which the operational, financial and trading patterns are emerging between the Middle East, the Indian Sub-continent and Southeast Asia, the ABS Middle East Region was realigned to the ABS Pacific Division. Also, activities in Africa expanded to the point that a new operational region within the ABS Europe Division was formed. These realignments allowed for a more integrated delivery of services to ABS clients in both regions.

The focus on providing best-in-class service led to another year of outstanding performance in Port State Control. The record is a testament to the quality and consistency of ABS' survey organization around the globe.

Significant investments in the technologies and services that will drive the future of the industry and unique characteristics of particular markets, combined with a dedication to meeting the needs of our clients globally, made 2012 another successful year for ABS' marine business. 



ABS OFFSHORE ACTIVITY



Offshore activity was strong globally in 2012. West Africa, Southeast Asia and Latin America continued to be areas of interest for drilling and production. And the Gulf of Mexico (GoM) saw an uptick in drilling beginning in mid-year. Around the same time, the US and Mexico announced an agreement to jointly drill 1.5 million acres along the US Outer Continental Shelf.

In the first three months of 2012, the UK Continental Shelf (UKCS) also saw a significant increase in activity, which got a boost when the UK Government announced a sizable tax relief allowance to encourage large, shallow-water gas field investment on the

UKCS. This move stimulated drilling operations, leading to a considerable increase in activity over the course of the year.

Drilling Units

Much of the drilling taking place last year was in shallow water, and that trend is expected to rise. This bodes well for the jackup segment of the industry. Starting in 2010, a number of drilling contractors began upgrading their jackup fleets, investing over the past two years in more sophisticated designs. A large number of newbuilds entered service in 2012, and many more, now under construction in yards around the world, are scheduled for delivery in 2013.

New high-specification jackups, many of which will be classed by ABS, will be capable of drilling deep high-temperature, high-pressure wells in 350 ft and greater water depths to drilling depths of 30,000 ft. These high-spec rigs will be able to work in more remote and challenging environments where operations are fairly limited today.

The greater capabilities require more hydraulic horse-power, greater hookload capacity, more storage, and increased deck load as well as more onboard accommodations, all of which require increased attention when the units are being designed and constructed. There is plenty of scope for jackup fleet modernization. Industry statistics indicate nearly two-thirds of the world's nearly 500 jackups are more than 25 years old. Many of these units are working in the Arabian Gulf, where the offshore energy sector is undergoing a transformation. The age profile of the offshore fleet as a whole is changing. Last year, Gulf Drilling International, a joint venture between Qatar Petroleum and Japan Drilling Co., ordered three new drilling units – two at Keppel FELS and a third at PPL Shipyard in Singapore.

In addition to the jackup work for which ABS is the class of choice, ABS made considerable strides in the drillship market last year with its selection by Petrobras to class a series of 22 ultra-deepwater vessels that will work initially in Brazil's presalt fields. This award provides ABS with the opportunity to build on its position as the leading offshore classification society in Brazil.

Floaters

The increased focus on deepwater reserves has been the driver for growth in the floating production unit (FPU) market. That growth was evident in 2012 and will continue according to industry analysts, who predict that more than 130 FPUs will be installed between 2012 and 2016. ABS continued to play a strong role in classing these units and was selected as the class society for the bulk of the units on order.

As in the jackup market, greater operational capability requires investment in technology development. Some of the floater technologies will target deepwater capabilities, while others will focus on subsea production. And a common desire across the board is to find ways to safely extend the operational lives of offshore assets.

FPSOs represent the largest segment of the floating production market in terms of numbers. In 2012, there was increased activity in FPSO construction/conversion, particularly in Latin America, which accounted for about half of the global investment. Latin American activity was followed by investment in offshore West Africa, an area that is expected to maintain its second-place position in the near term.



ABS OFFSHORE ACTIVITY



Offshore Support Vessels

Technology advancement ran the gamut in 2012, spanning drilling and production units as well as support vessels. As drilling and production assets transform to meet changing demands, so do the OSVs that service them. The OSV fleet has become increasingly more sophisticated.

One of those sophisticated vessels is the world's largest pipelay vessel, Saipem's new flagship, MV *Castorone*, which is designed to install large-diameter pipe in deep and ultra-deep water as well as extreme environments, including the Arctic. The vessel, which was designed for the addition of a fixed tower for J-laying pipe, can S-lay pipes up to 60 inches in diameter, prefabricating pipe strings 36 meters long.

ABS classes roughly one-third of all OSVs built worldwide, and in 2012, updated and expanded its *Rules for Building and Classing Offshore Support Vessels*. The new Rules include structural requirements as well as new notations for the many different types of specialized OSVs, including anchor handling, firefighting, dive support, pipelay, heavy lift, well intervention, well stimulation and oil spill recovery.

Another recently released resource, the *ABS Guide for Dynamic Positioning Systems*, speaks to the need for high station-keeping capability for offshore units as well as for OSVs, which have to maintain position during offshore support operations. The Guide addresses current requirements and provides new optional notations, including technical specifications that reflect current industry practice and dynamic positioning (DP) technologies.

ABS took another step forward in developing industry guidance through participation in a joint development project established to create a specialized Industrial Equipment notation. The research to support the initial notation focuses on large industrial pipelay equipment. When the requirements for this equipment have been formalized, additional notations will be developed for other specialized vessel types.

This cooperative approach toward problem-solving placed ABS in a leading role, working alongside industry and academia to push today's technology boundaries. During 2012, ABS expanded these types of relationships through a number of avenues, including invitational workshops designed with an eye toward identifying R&D needs and collaborating on projects.

Drilling & Production Unit Criteria

With the changes taking place in the MODU fleet, ABS amended and reissued the *ABS Rules for Building and Classing Mobile Offshore Drilling Units*, which were released in January 2012. The revised Rules include a section that addresses vendor equipment certification requirements and updates reflected in the IMO's MODU Code requirements.

Across the board, newbuild designs incorporate many components that have to communicate seamlessly in order to work safely. ABS published the *Guide for Integrated Software Quality Management (ISQM)* to address software development and maintenance. And the first drilling contractor put the system to work in Korea with a newbuild drillship program.

The need for software system verification (SV) led ABS to develop the *ABS Guide for Systems Verification*, which was released in July 2012. The system analysis requirements in this Guide as well as the criteria to receive the SV notation exceed those for basic classification, which means that the new Guide gives clients a higher degree of confidence in their systems. ABS has provided detailed requirements that set the standard for the verification process.

Technology Developments

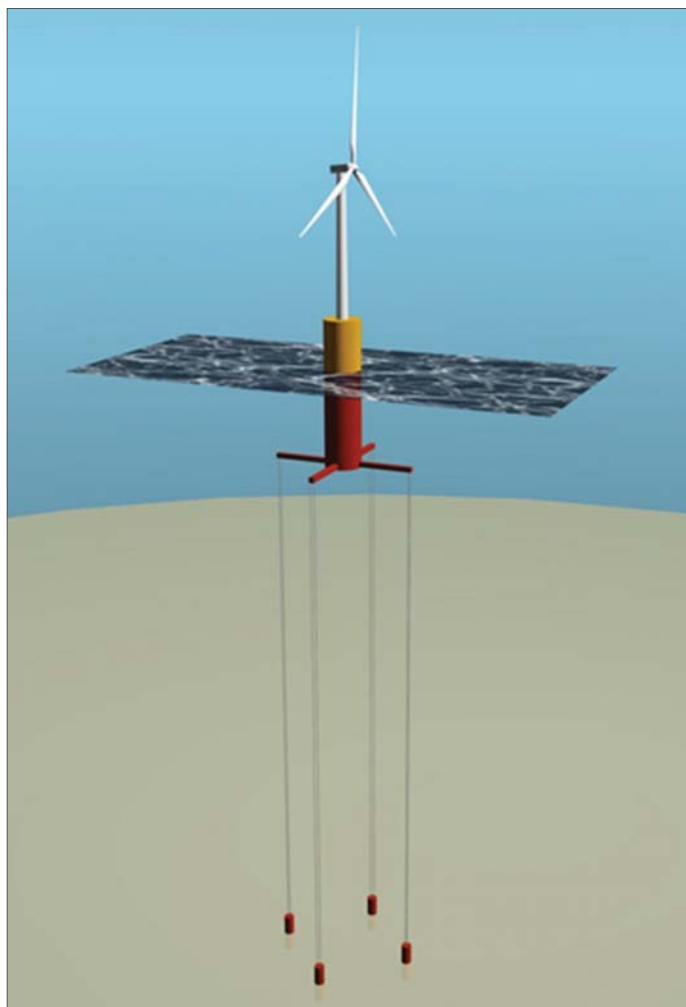
Technical engineering solutions pushed the boundaries of offshore exploration and production last year. The need to find solutions to complex challenges is growing, and the offshore industry invested considerable time and effort in 2012 toward that objective.

Much of the research and development (R&D) activity has been pursued through joint development projects and industry partnerships, and ABS contributed to these efforts both as a participant and organizer. While 2012 saw advances in riser technology, mooring systems, floating production and jackup designs, one of the biggest focuses for the industry was on the developing subsea sector, where key concerns include reliability and safety, including how data from these systems will be managed.

Development efforts last year continued to target subsea systems, including inspection, repair and maintenance, with the acknowledgement that subsea technology verification and validation, including equipment qualification, will be vital to making progress with new subsea production, boosting and separation systems.



ABS OFFSHORE ACTIVITY



Wind Energy

Within the US, there was an increased interest in wind energy, which gave rise to a number of projects funded through the US Department of the Interior, including two studies awarded to ABS. The Bureau of Safety and Environmental Enforcement (BSEE) awarded ABS a project for defining design guidelines for floating offshore wind turbine (FOWT) stationkeeping systems in May 2012. Based on the outcome of this BSEE project, new guidance for the global performance analysis of FOWTs is planned for development in 2013.

ABS was one of two sub-recipients of funding from the Department of Energy (DOE) for research on subsurface mooring and anchoring dynamics models that will inform development of a mooring-anchor program for FOWTs. In addition, ABS is involved in another DOE project that is being managed by a

major university. ABS' main role in this project is to provide technical advisory assistance. The project goal is to study dynamic interaction between freshwater ice and bottom-founded offshore wind structures in the Great Lakes.

Another noteworthy milestone for wind energy in 2012 was certification services provided by ABS for the design, fabrication and installation of the first WindFloat facility, a 2 MW floating wind turbine moored in shallow water offshore northern Portugal.

Significant work also took place on the *ABS Guide for Building and Classing Bottom-founded Offshore Wind Turbine Installations* and the *ABS Guide for Building and Classing Floating Offshore Wind Turbine Installations* during 2012. The Guides will place ABS in a leading position among class societies on offshore wind turbine guidance.

Arctic Advances

Part of providing valuable criteria is making sure class work reflects industry needs. That was the impetus for ABS organizing the 2012 Arctic Workshop Series, where technology leaders from industry and academia gathered to share ideas for developing technologies that will help the industry push through the barriers that limit Arctic operations.

The workshop venues alternated between the Harsh Environment Technology Center in St. John's, Newfoundland and Houston throughout the year, with the inaugural workshop in Canada focusing on corrosion issues including how coatings could help reduce maintenance costs to increase uptime on offshore assets operating in Arctic conditions.

Among the subjects that ABS will continue to target are the role of ice management in mooring system design, the need for global ice load models and full-scale measurement campaigns, and the development of Arctic regulations and standards.

Floating LNG

Growing global energy demand has renewed the offshore industry's focus on finding a cost-effective way to produce gas, particularly stranded reserves and associated gas. More than one-third of global gas reserves are stranded by their location or field size. With gas deposits often in remote or isolated areas far from coastal resources, 'marinizing' production, liquefaction and export facilities offers enormous potential for many future development projects. Floating LNG (FLNG) production delivers the capability to produce reserves that otherwise would not be commercially viable.

Additional drivers for FLNG development include reduced political risk and greater security by virtue of their placement offshore, lower capital costs than for land-based facilities and simpler environmental permitting. As recently as five years ago, floating solutions for importing and exporting LNG were still considered new and novel concepts.


Now, FLNG projects are being evaluated in varying degrees for developments all over the world, including offshore Malaysia, Papua New Guinea, Indonesia, Australia, Trinidad and Tobago, Brazil and Cyprus. There are 17 potential FLNG projects being considered at the moment with production ranging from 1 to 5 million tons per annum. ABS is involved

in the development effort and is working with a number of companies that are creating innovative FLNG designs.

Separate Offshore Technical Committee

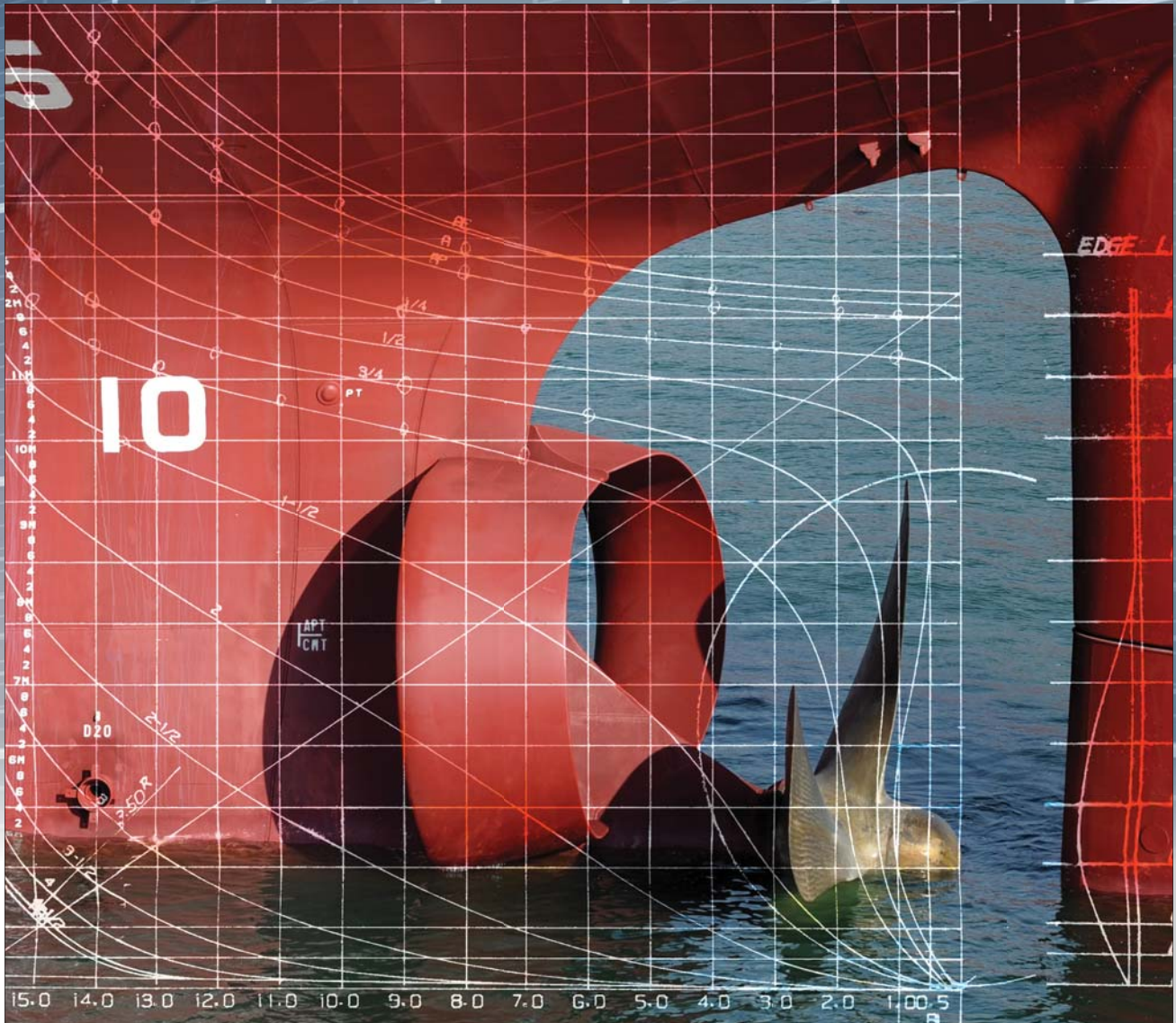
ABS has long recognized the value of tapping technology expertise in industry to guide class activity. The formation of a separate Offshore Technical Committee in May marked a step toward streamlining this process and placed ABS in a league of its own as the only class society to take this approach.

The division of the existing Technical Committee of ABS into separate committees refined the focus of each committee, facilitating information exchange for Rule and Guide development and modification. Forty members, including designers, builders, owners, operators and regulators of offshore assets, attended the first Offshore Technical Committee. Plans are in place for the Committee to meet annually as part of the ongoing ABS Rule development cycle and as necessary during the intervening months to address technical topics of particular concern.

Across the board, from drilling and production systems and OSVs to FOWT technology, ABS continues to apply the vast body of knowledge amassed over decades of offshore experience to develop guidance for next-generation projects. 



ABS TECHNOLOGY



The marine and offshore industries are facing a new generation of challenges, and ABS continued to invest resources over the course of 2012 to work with stakeholders and academia on R&D projects that address these critical issues. As operating environments change, ABS is moving in step with industry into the new frontiers.

A significant portion of the ABS Technology program continues to focus on practical short-term solutions, but the group also realizes the critical need to look ahead to future deliverables. Part of the direction for continued research at ABS came from the 2012 Global Technology Forum held in Houston in May,

where university researchers from around the world gathered to advise ABS on trends and research needs. Considerable effort went toward both mid-term (three to five-year time horizon) projects to validate emerging technologies and long-term 'blue sky' initiatives with the goal of understanding potential new technologies.

Notable R&D Projects

The Technology group had more than 150 research projects in progress in 2012 covering a broad range of emerging technologies. The scope of marine-focused projects included propulsion issues, machinery risk, electrical systems, controls and automation and

energy efficiency, which encompasses the continued enhancement of the associated classification criteria. Offshore technology projects targeted subsea solutions, umbilicals and flowlines, floating LNG, harsh environment technology development, and resolving operational issues for MODUs.

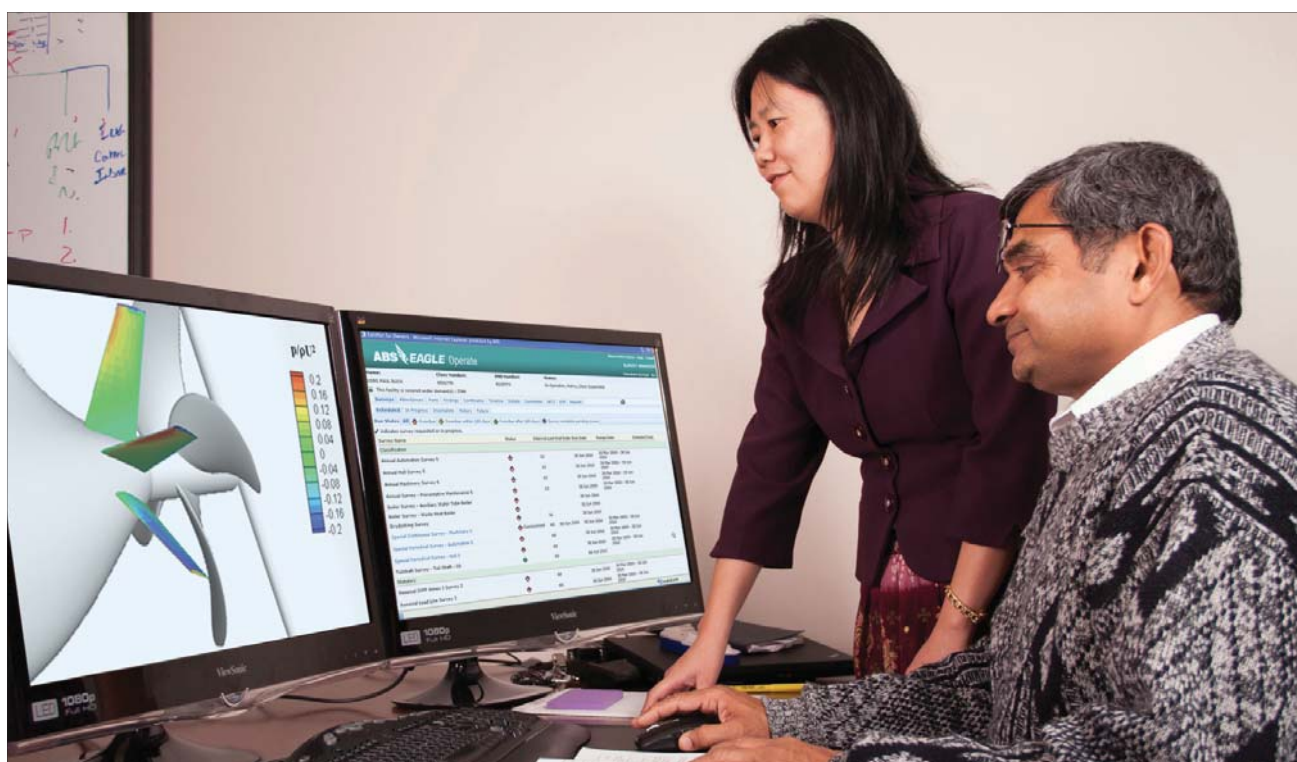
While a significant amount of the R&D work in progress is targeting technology development in the near term, longer-term projects are evaluating such things as nanotechnologies. ABS is working on nanosurface profiling technologies to create material surface properties beneficial to the marine and offshore industries. The current focus is to develop and test ice-phobic coatings to mitigate ice accretion. By profiling the surface, at the nanoscale (measurements in one-billionth of a meter), the contact angle for water droplets can be modified such that they do not adhere, which means they will not wet surfaces and will retard ice buildup in Arctic conditions.

Technology work also targeted energy-saving devices (ESDs) that improve fuel efficiency. Last year, efforts were directed toward further developing leading-

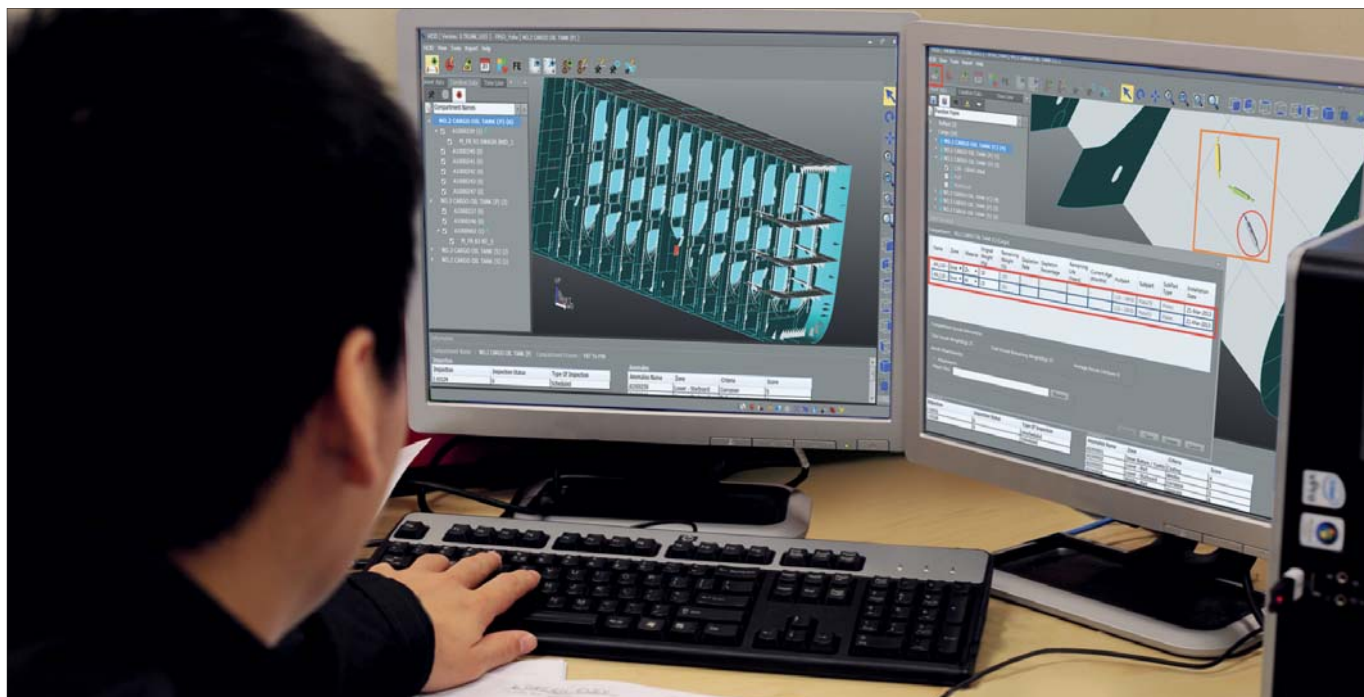
edge CFD technologies with a major research institution based in China. Research that combined existing ESD technology for pre-swirl stator and rudder thrusting fins, with CFD technology associated with model tests and sea trial data, produced a means of evaluating the energy-saving potential for ship propulsion.

Focusing CFD on a capesize bulk carrier revealed that the stators adjust the cross-flow and increase the angle of the attack, resulting in an increased and more balanced propeller load on the port side compared to the case without ESD. Propulsive efficiency was improved with the ESD installed. ABS Technology also looked into performance improvements via a project that investigated the problem experienced by vessels when large lateral forces and moments impact propeller blades during the unsteady turning stage.

Advanced CFD tools were used to simulate the viscous flow around the hull, propellers and rudders in a turning condition to evaluate the stern tube during maneuvering. Fluid-structure interaction analysis was performed to establish the clearance



ABS TECHNOLOGY



between the shaft and stern tube bearing considering the dynamic interaction of oil film inside the bearing. This particularly challenging R&D work was unique to ABS.

Another project aimed at increasing efficiency and meeting environmental requirements targets exhaust emission abatement technologies, a.k.a. exhaust gas scrubber systems. Air emissions legislation is driving the development of primary machinery technologies that reduce the combustion source of exhaust emissions as well as secondary exhaust emissions after-treatment systems.

Offshore Technologies

Of particular note on the offshore side was jackup research that is continuing in the development and verification of methodology for moving jackups on and off location. Results of this research were presented to the International Association of Drilling Contractors (IADC). ABS has proposed a joint study project with IADC for 2013 for the purpose of studying environmental limits for installations.

Additional R&D work focused on subsea hydrodynamics with the goal of progressing subsea technologies. The Subsea, Umbilicals, Risers and

Flowlines (SURF) team has worked with industry groups, and led two subsea seminars in Korea in addition to completing a number of studies. ABS is continually looking into subsea production, which is expected to be used more widely as the technology develops and production moves into environments inhospitable to surface production facilities such as the Arctic.

The SURF team is studying subsea power, an enabling technology for subsea development, and has had discussions with participants in the Subsea Electric Power Standardization joint industry project to explore ways to work together. The SURF group also worked with International Electrotechnical Commission (IEC) and Institute of Electrical and Electronics Engineers (IEEE) to begin developing ABS requirements for subsea power that address transmission, distribution, utilization and control of subsea electrical power.

Recognizing the offshore industry's move toward greater automation, ABS is meeting changing needs for assessing software control systems with tools like the Integrated Software Quality Management (ISQM) program. ABS initiated an ISQM project with Hyundai in Korea last year, and recently kicked off joint development projects (JDPs) at Samsung and DSME

that involve trial runs for implementing ISQM. The JDPs include vendor software package certification as well as certification of the integrated packages at the shipyard.

Through these JDPs, the yards will gain experience with ISQM and increase their confidence with the process, while vendors gain an understanding of the level of effort required to achieve ISQM compliance for their software packages. Valuable feedback from these JDPs will assist ABS in enhancing the ISQM process and will guide improvements to what has proven to be an effective offering.

Performance Management

Work also has gone into developing the Hull Inspection 3D (HI3D) program, the next-generation of ABS software for owners and operators that allows them to track the condition of hull structures within a three-dimensional model to monitor and measure vessel performance. The new program works seamlessly with the existing Hull Inspection module (HIMP) to provide a 3D visualization of an asset and to allow relevant condition information to be tracked

within the model, enabling comprehensive life cycle management and improving the ability to manage asset integrity.

Additional R&D last year included CFD work on anti-rolling tanks (ARTs) for container vessels. ABS engineers used CFD tools to determine sloshing and fatigue loads for the design of an anti-roll tank to be installed on an ultra large containership. The technology also can be used to predict motions. This technology could lead to reduced roll angles on containerships and allow increased above deck cargo carrying capacity.

In addition to developing software to assist the marine and offshore industries, ABS has invested in tools that improve the organization's ability to improve its services. The ABS Data Repository Application (DRA) allows trending and analysis of ABS survey findings that deliver business intelligence that is being used to improve business processes. Using text analytics engines based on textual or semantic algorithms, DRA analyzes a sentence or paragraph and discerns meaning. The program improves data analysis by automating the process, producing





output that supports classification, administration, rule development, quality and business development activities.

Human Factors

While asset optimization and environmental performance are of vital importance to the marine and offshore industries, people remain the primary concern. So R&D work within the Technology group last year also targeted human factors and worker safety.

The Marine Safety Program continued its efforts to help the industries reduce lost-time incidents and injuries through better understanding of injuries and near misses.

Work moved forward on a database that continues to expand its reach in cooperation with industry partners that contains more than 40,000 records of injuries and close calls, representing more than 1,000 vessels and 35,000 mariners. The objective of this project is to identify accident and injury trends and causes that will lead to establishing benchmarks and

sharing lessons learned. ABS' role in this discipline illustrates its leadership position in human element efforts and its continued focus on worker safety.

Innovation Ecosystem

In 2012, ABS invested in expanding the role of its Technology Centers, which were set up to broaden the reach of its headquarters-based research staff by working more closely with clients and universities locally. The network of Technology Centers that has been formed recognizes that R&D in the 21st century requires multiple stakeholders from across the globe. The goal of this network has always been to develop an ecosystem where innovative ideas can solve the complex issues facing industry.

Since the establishment of the initial center in Singapore in 2006, the research centers have helped ABS improve service delivery and expand relationships within the countries and regions where they are located. As part of ABS' global Technology organization, the centers leverage ABS technology capabilities in local markets and provide value-added service in the countries where they are located.

At the Harsh Environment Technology Center (HETC) in St. John's, Newfoundland and Labrador, recent work has investigated dynamic positioning in ice, and challenges for pipeline and subsea infrastructure in ice environments. In December 2012, the Arctic Technology Advisory Committee, which is composed of individuals from the oil majors, builders, designers, researcher and regulatory agencies, met to learn about ABS research and Rule refinement initiatives and to provide valuable feedback that will help to set future direction. ABS continues to refine its research program in the rapidly evolving Arctic market through collaboration with industry and is working through HETC to move a number of those R&D projects forward.

At the Singapore Offshore Technology Center (SOTC) engineers continued to expand CFD capabilities through the development of a virtual model basin providing CFD solutions in this key maritime hub. The team studied novel design concepts in support of industry and new materials for floating structures and advanced knowledge about floating concrete structures and structural steels in Arctic applications.

The Korea Energy Technology Center (KETC), unique among the centers for its broader energy focus, was inaugurated in 2012. Work at KETC includes offshore exploration and production, subsea equipment, systems and control, LNG and floating LNG, ISQM and renewables, including wind energy. Projects for 2012 included a major subsea seminar led by ABS in Ulsan over three days and attended by nearly 200 industry participants, development of guidance for multi-phase flow assurance, and an ISQM system trial at a local shipyard.

In Shanghai, the China Offshore Technology Center

is working on a joint development project on discrete element method ice load simulation and is conducting a gap analysis for mobile offshore unit Rules. And at the Brazil Offshore Technology Center in Rio de Janeiro, researchers have been developing methodology and acceptance criteria for dynamically installed mooring systems. Another noteworthy study that kicked off in 2012 is focused on life extension for FPSOs with the goal of evaluating corrosion rates based on operating conditions offshore Brazil.

These capabilities added through the global technology centers will facilitate advanced research. Sustained investment in R&D will continue to extend the boundaries of what is possible. The technology centers developed, staffed and supported by ABS will facilitate the regional partnerships with academia and industry that will continue to move the industry into operational frontiers.

Fundamentally, the R&D work of the Technology team underpins a core deliverable of ABS – its Rules. And rule development continues to be a core deliverable for the Technology team. ABS also invested in developing advisories on topics of critical interest over the past year and published a number of Guidance Notes with best practices for industry to complement ABS classification requirements. [↻](#)



FLEET MANAGEMENT SYSTEMS



Increasingly, maritime companies are looking for solutions that can help enhance vessel performance and facilitate and improve regulatory reporting. ABS Nautical Systems, the organization's software development division, recognizes that in today's market, success often is driven by the ability to achieve performance efficiencies to combat rising fuel costs and meet the growing number of environmental regulations.

In 2012, ABS Nautical Systems focused its efforts on giving owners and operators the ability to continuously collect, monitor and analyze performance data, providing them with information

to systematically address operational challenges. By integrating data management with the classification process, ABS continues to combine traditional class services with innovative products to support compliance and performance efforts.

Aiding Operational Performance

One of the most significant achievements for ABS Nautical Systems in 2012 was the launch of the Energy & Environmental Manager module as an addition to the NS5 Enterprise suite. The new module allows real-time electronic data capture from individual pieces of machinery and equipment to improve vessel performance.

A key objective of the software is to help owners and operators realize more environmentally sound voyage management by tracking and recording key voyage-related events, including fuel and lube oil consumption, fuel oil switching, cargo information and ballast activities.

The NS5 Energy & Environmental Manager module also can be tied into automated ship data systems, reducing crew burden in data collection, improving data reporting accuracy, protecting the integrity of collected data and assisting with automated reporting and trending to produce the reports necessary to demonstrate regulatory compliance.


With the ABS Newbuild Program, initially launched in 2009, ABS Nautical Systems offered its hull inspection and maintenance programs to every newly classed asset. Nearly 300 vessels took advantage of this program in 2012, bringing the total enrollment to approximately 1,300. The Newbuild Program helps owners and operators monitor the hull's structural condition throughout the vessel's service life.

In July 2012, ABS enhanced the Newbuild Program by adding the Energy & Environmental Manager module to the offering and more than 50 vessels took advantage of this added capability.

Fuel Optimization Solutions

In 2012, the Trim Optimization tool, a program that identifies trim and draft optimization measures for enhanced fuel savings, was developed to assist users with energy-efficient operations. The tool runs in parallel with the Energy & Environmental Manager module utilizing generic algorithms that use real-time data to propose optimal management solutions to the vessel's Master. This feature provides quick and consistent results, delivering optimal performance solutions within safety and regulatory boundaries.

Innovations like the Trim Optimization tool across ABS' software development efforts supplement the NS5 Enterprise suite of products, filling an important role in meeting the safety and energy efficiency needs of users. Integrating ABS software solutions bridges design, classification and operational management for vessels and offshore units to help owners and operators resolve complex environmental and operational issues quickly.

Through significant investment in software development and collaboration with marine and offshore industry leaders, ABS was able to develop tailored solutions to help address many of the pressing operational challenges impacting its clients in 2012. 



ABS GROUP PRESIDENT & CEO REPORT



Serving an increasingly diverse range of market sectors and industries, ABS Group of Companies, Inc. (ABS Group) faced a mix of market conditions in 2012. Overall, operating entities with ABS Group delivered another year of record revenue and new contracts for all service lines. This performance is commendable given that while strong demand in our Oil and Gas sectors helped to sustain growth in that area, uncertainty and cautionary spending in the Government, Financial and Insurance sectors resulted in weaker performance in those segments.

During 2012, we took the opportunity to assess our market strategy, organization and financial performance in order to chart the course for the next several years as ABS Group continues to build

capabilities and to increase alignment with our strategic markets and customers.

In 2012, the ABS Group leadership team worked to assess our performance and processes and initiate key programs to improve operating results. Key among these initiatives is the way in which we bid, execute and manage major projects. For a professional services organization, this process is one of our core competencies and we are establishing more diligent and disciplined processes across project life cycles. Making sure that our major projects deliver the quality both that our customers require and the results that we expect is critical as ABS Group continues to grow in size and complexity.

Since our success is tied directly to our ability to deliver technical services around the world,

ABS GROUP PRESIDENT & CEO REPORT

strengthening our workforce continues to be a top priority. In 2012, ABS Group again surpassed a previous milestone and now has more than 2,400 employees in 35 countries.

While most of this growth was organic, the addition of Agile TCP Software and Control Systems Verification staff and the acquisition of Safetec Nordic and GenesisSolutions brought ABS Group new employees in the US and in other strategic locations including Norway, the UK, Australia and Malaysia. These acquisitions demonstrate our strategy to incorporate skills and resources that strengthen and expand our capabilities.

ABS Group finished 2012 positioned for the future with year-over-year revenue growth at 32 percent and contract sales growth at 42 percent. Our strongest financial performance came from several key areas. Ongoing new construction in Asia-Pacific drove another solid year for our Technical Inspection service line. The Renewable Energy sector, a startup in 2010, completed its second year maintaining growth in both the US and Europe with a new area of demand for real-time condition monitoring of wind turbine performance data.

Another core business, ABS Quality Evaluations (ABS QE) added several large contracts in 2012 and increased year-on-year sales by more than 15 percent. In 2012, ABS QE began auditing offshore facilities against the new safety and environmental management system standard after collaborating with the Center for Offshore Safety to develop audit protocols and criteria for auditor qualification.

ABS QE also completed the preliminary assessment to receive accreditation for ISO 50001, the International Organization of Standards' energy management system standard. Certifying companies to this new standard allows ABS QE to meet the increasing demand for energy conservation, efficiency and cost reduction.

Completing the last year of a project to re-architect its core catastrophe modeling software, EQECAT released RQE™ (for risk quantification and engineering) in January 2013. The release of this new risk modeling platform is highly anticipated and we expect early adoption and market success from this important investment.

With a clearer view of each of our diverse service lines and markets, the ABS Group leadership team is developing a cohesive and common set of priorities, initiatives and programs that will enable the organization to build on its success, by sustaining where appropriate and redirecting our efforts when necessary. As with any growing organization, 2012 was a time to reassess our markets, services, competitors and develop key metrics that support a strategy that will increase our ability to integrate new resources to achieve near-term performance and long-term objectives.

As we build our brand globally, we embrace the diverse blend of backgrounds, skills and cultures that make up ABS Group today. Creating a culture that supports this diversity and rewards individuals for their initiative and performance is crucial if we are to be able to attract new talent in the locations in which we operate.

ABS Group is moving into 2013 with a solid management team, established client relationships and a clear view of the road ahead. The organization will continue to pursue its strategy to add diversity, broader capabilities and increased organizational strength, providing an environment where ABS Group employees – the cornerstone of the company's success – can continue to achieve and grow. 



David Weinstein
ABS Group of Companies President & CEO

ABS GROUP OF COMPANIES



In 2012, ABS Group continued to expand its service offerings and geographic coverage in key markets with the integration of three strategic acquisitions. This investment strengthened existing capabilities and added proficiencies in high-demand service areas, expanding the workforce internationally by more than 700 new employees.

This global strategy continued the trend that began in 2011, when ABS Group first received more than half of its revenue from outside of the United States. The company now has more than 2,400 employees around the world and retains many contractors to meet market demands.

Strategic Acquisitions

The successful integration of Safetec Nordic, headquartered in Trondheim, Norway, early in the year added new technical depth and a strong Norwegian and North Sea presence to ABS Group's existing safety and risk consulting services. In addition, the GenesisSolutions acquisition brought new capabilities in enterprise asset management (EAM), computerized maintenance management systems (CMMS) and asset performance optimization (APO). GenesisSolutions' strong pharmaceutical industry customer base provided solid financial performance and an entry into that key market.

ABS Group also acquired a new service line in 2012 to support drilling and control system verification and integration. This service is in great demand due to the increasing complexity of drillships and the software control systems used to operate them. The Austin, Texas-based control systems team assists with commissioning new offshore rigs as well as with troubleshooting and verifying software controls on operating assets.

Safety, Risk & Compliance

ABS Consulting's* reputation and experience in process safety and risk assessment led to the award, in 2012, of various projects from the Gulf of Mexico to the North Sea, and the addition of Safetec placed the organization in a position to offer even greater capabilities for safety case work from Norway, the UK and Australia.

Safetec also brought complementary capabilities in other risk areas, including major accident risk and collision risk analysis for assets in the Norwegian Sea. These services augment ABS Consulting's existing services for conducting process hazard analyses (PHAs) and layer-of-protection analyses (LOPAs) to support process safety management both onshore and offshore around the world.

This presence in Australia broadened ABS Consulting's access to the market, resulting in several new development projects for safety case and other risk management services.

In the US, ABS Consulting was called on to provide incident investigation and root cause analysis for several offshore and downstream incidents. ABS Consulting also began two key projects stemming from increased attention to blowout preventers (BOPs) and subsystems related to the 2010

Macondo incident in the GoM. Under contract to the Bureau of Safety and Environmental Enforcement, ABS Consulting worked with ABS to perform a failure mode, effect and criticality analysis (FMECA) on three BOP design configurations. The final report from this study is to be completed in early 2013.

A separate BOP reliability study was conducted by Safetec and ABS Consulting specialists for the International Association of Oil and Gas Producers. Being called upon for these types of studies demonstrates the high regard industry holds for ABS's and ABS Consulting's knowledge in the area of failure and reliability analysis.

The nuclear incident at Fukushima, Japan, increased regulatory attention on nuclear power plants around the world, and ABS Consulting was awarded a multi-year contract to complete seismic probabilistic risk assessments (PRAs) for a major utility's entire plant network in the US. ABS Consulting also provided similar services to commercial nuclear plants in Europe.

ABS Consulting continued to be a key provider of risk-related modeling and analyses for the USCG. Under the Operations Research and Mathematical Modeling



*ABSG Consulting Inc. (ABS Consulting) is the main operating entity within ABS Group.



and adding hundreds of inspectors over the course of just a few months. ABS Consulting also continued to support in-service and risk-based inspections on rigs in the GoM.

Outside the US, Asia-Pacific posted solid gains in project QA/QC inspection and project quality management (PQM), and the new presence in West Africa showed early promise with contracts to provide third-party certification on wellhead platforms

Support Services contract, ABS Consulting began a five-year project to provide these risk services. Meanwhile, the Systems Engineering and Technical Assistance (SETA) team completed year four of a five-year contract providing various risk services, including automated information system (AIS) analysis, unmanned aircraft system testing and analysis, digital radar analysis, a risk-based navigation study on Western rivers, and a risk assessment of invasive species containment systems.

The diverse scope of risk and safety-related services provided by SETA to this customer illustrates how this service line represented more than 40 percent of ABS Consulting's total business in 2012. With new capabilities and resources, this is a key target area for growth in the coming years.

Technical Inspection & Verification

ABS Consulting's Inspection services, which represented 35 percent of the company's total business in 2012, delivered a strong performance, executing several large inspection and project supervision contracts in Mexico and Saudi Arabia

and bridges for Nigerdock in Nigeria and contracts for third-party inspection on several new pipeline certification and offshore projects.

While source inspections have long been a core service at global shipyards and manufacturing facilities that supply components for newbuild assets, the inspection of operating facilities and equipment in the downstream and refining areas had been less of a focus, at least in the US. Last year, ABS Consulting established a new team near the manufacturing and refining complexes along the Houston Ship Channel to deliver fixed equipment inspections and to provide support for maintenance turnarounds. This move laid the groundwork for providing ABS Consulting greater access to operating facility projects in addition to capital projects for newbuild construction.

Asset Performance Optimization

With the acquisition of GenesisSolutions, ABS Group added significant new capabilities to support customers seeking to optimize asset performance and maintenance efficiency. GenesisSolutions brought a focused business model to this niche market

segment and to existing reliability and maintenance management competencies. The company's established presence and solid reputation with major pharmaceutical manufacturers added expanded market opportunity and the chance to bring other ABS Consulting services such as inspection, safety and risk management to a new segment of global customers.

This service line now offers reliability engineering and predictive and preventive maintenance program development, spare parts programs and maintenance planning to the implementation of EAM systems like IBM Maximo, SAP PM and Oracle EAM. These solutions extend to the overall systems and strategies that drive operating performance, including key performance indicator (KPI) development and benchmarking, workflow optimization, reliability program deployment and training.

Another promising area within this service line is condition monitoring. Last year, ABS Consulting initiated projects with various wind farm operators to monitor wind turbine conditions and performance metrics, including speed, vibration, power output and many other variables that affect overall wind farm power generation. The value of this condition monitoring program is that it provides for regular inspections and monitoring of wind turbine components throughout the asset's lifetime and collects relevant data, analyzing it and providing output to aid in asset optimization. Condition monitoring services are performed online and in real time by equipment specialists in Houston. This service line, which

today represents less than 10 percent of the total ABS Consulting business, is well-positioned and resourced for significant momentum in the next few years.

Advanced Engineering

For years, ABS Consulting has been delivering specialized engineering services in key markets. The Extreme Loads and Structural Engineering division, for example, provides a range of services related to structure and equipment performance under severe loading conditions. These services are in great demand particularly in the Middle East, where ABS Consulting specialists have completed multiple projects analyzing building risk and conceptual blast designs for refineries, gas plants and clean fuels facilities. Strong demand for these highly specialized services relying on proprietary tools make them a key component for near-term growth plans.





Management Systems Certification

Auditing management systems against international quality standards like the International Organization for Standards is the core business of ABS Quality Evaluations, Inc. (ABS QE).

Energy use represents one of the most significant costs in most industries. For companies involved in heavy manufacturing, managing energy efficiency is critical to sustained financial performance, and reducing energy consumption is a key element in decreasing greenhouse gas emissions. Organizations seeking to reduce the environmental impact of their operations are keenly interested in strategies that support this goal. The ISO 50001 standard provides management strategies to increase energy efficiency, reduce costs and improve energy performance through systematic management of energy.

By the end of 2012, ABS QE had completed all of the necessary steps to receive accreditation of its ISO 50001 Energy Management System program by the ANSI-ASQ National Accreditation Board (ANAB). While ABS QE has been conducting ISO 50001 audits and issuing unaccredited certification, earning

formal accreditation, a milestone expected in 2013, provides a strong competitive advantage over other certification bodies that lack this important credential.

Another 2012 initiative for ABS QE was its work with the Center for Offshore Safety (COS) to become an authorized auditor for the latest safety and environmental management systems (SEMS) standard for offshore installations. These new requirements, included in API RP 75 and 30 CFR Part 250, Subpart S, are a significant development toward enhancing offshore safety. ABS QE worked closely with the COS throughout the year to develop audit protocols, auditor qualification and training criteria, as well as SEMS certification and audit service provider (ASP) accreditation requirements that are now in place.

Training & Competency Assurance

ABS Consulting provided private and public training support last year through course development and delivery. In the Americas alone, more than 10,000 students attended courses during the year. ABS Consulting continued to add new offerings that reflect growing capabilities, competencies and service lines such as training support for the Project

Management Institute's (PMI's) Project Manager Professional or PMP credential, the industry's most recognized certification for project managers. A range of EAM and maintenance management courses also were added to the ABS Consulting training portfolio last year.

Completing the fifth year of the contract, ABS Consulting continued its support to the BP Operating Essentials Training Program. This blended learning program combines online instruction, simulation and classroom workshops to teach and reinforce key safety principles and skills. ABS Consulting provides facilitators for the classroom portion of this program and delivers workshops around the world for BP employees. BP also selected ABS Consulting to assist with a supervisory development program called "Learning in the Field" and a Senior Management Program. These requests for additional training support are evidence of the outstanding quality of ABS Consulting facilitators and their ability to work within the BP team.

In the public sector, ABS Consulting continued its support of the USCG Training Center in Charleston, South Carolina, by providing administrators, course developers and instructors to run the Center. ABS Consulting is a subcontractor to Lockheed Martin on this five-year project which will continue through 2016.

As companies manage staffing costs with the scarcity of qualified staff, many are turning to companies like ABS Consulting to meet both short and long-term human resource needs. During 2012, ABS Consulting provided qualified technical resources to augment client staffs in many market sectors. This took the form of providing key risk engineers for a few months to a complete staff of training developers and instructors in the US to supplying a cadre of environmental specialists for a multi-year assignment in Brazil.

Software & Strategic Data

Another growing business for ABS Consulting was the delivery of high-value software tools to clients in various industries. For example, oil and gas customers worldwide continued to rely on THESIS software for risk analysis. In the North Sea, specifically developed modeling software was used to conduct collision analysis for owners managing asset placement and movement.

EQECAT's leading position in catastrophe risk modeling for the insurance and financial markets is based on the success of WorldCAT Enterprise™. In 2012, final development work for the release of EQECAT's new platform, which will be marketed as RQE™ (for risk quantification and engineering). This latest software platform enables users to quantify and manage the potential financial impact of natural hazards. The long-awaited software was completed and moved into final testing at the end of 2012. ☞



ENDOWING THE FUTURE



ABS has had a longstanding commitment to education, particularly geared to the maritime industry. The organization stands behind its conviction that encouraging students in engineering and naval architecture is crucial to the future of the industry.

“In most parts of the world, shipping has become a forgotten industry,” says ABS Chairman Robert D. Somerville. “Without some personal connection to shipping, it is highly unlikely that bright young graduates will be aware of the career opportunities it offers.”

ABS is constantly enriching its student scholarship program as part of the organization’s contribution to ensure that worthy institutions continue to produce

the quality engineers and naval architects who will develop technologies that will determine the future for the industry. In 2012, ABS launched an expanded program to support maritime training around the world as part of its dedicated support of this critical industry.

Supporting Academic Research

The marine and offshore industries faced financial challenges following the global recession that began in 2008. At the same time, many education and research institutions saw government support decrease as austerity measures kicked in. In this difficult financial environment, ABS continued its support of maritime education. The ABS Scholarship and Educational Funding Program

ENDOWING THE FUTURE

contributed significant resources in 2012 to help fund educational facilities, faculty chairs and other programs at universities and maritime universities in the United States, the United Kingdom, Greece, Italy, Singapore, the Republic of Korea and the People's Republic of China, as well as other countries.

An endowment to the State University of New York (SUNY) Maritime College provided resources to help attract and retain talented faculty-scholars. Funds from the endowment were used to establish the ABS Chair in Naval Architecture and Marine Engineering and the ABS Chair in Marine Transportation, as well as the ABS Lecture Hall.

For more than a century, ABS and its employees have been supporters of Webb Institute, a top-ranked undergraduate institution that offers one academic option – a double major in Naval Architecture and Marine Engineering. In 2012, ABS committed to providing long-term financial assistance to Webb through the creation of a scholarship program, as well as the establishment

of the ABS Chair in Naval Architecture and Marine Engineering. Webb is the only full-tuition scholarship, private undergraduate program of its kind in the US.

In 2012, ABS announced a multi-year grant to the Stevens Institute of Technology to create a new Civil, Mechanical and Naval Engineering laboratory complex. The 25,000-square-foot facility, built above the historic Davidson Laboratory, will bear the ABS name and meet the research and instructional needs of students working in such areas as robotics, underwater systems, land and water-based vehicles, and ocean and weather sensors.

Another noteworthy contribution was the establishment of the American Bureau of Shipping Endowed Chair in Ocean Engineering in the Department of Mechanical Engineering at the University of California at Berkeley. Professor Ronald W. Yeung, a dedicated educator who has mentored more than 100 graduate students and researchers actively involved in the marine field worldwide will fill the chair for the first five-year term, which began in July 2012.



ENDOWING THE FUTURE



At the California Maritime Academy, ABS' multi-year support has led to the development of a new School of Maritime Policy and Management and the development of new lecture space.

An ABS professorship in Naval Engineering also continues at the Massachusetts Institute of Technology. ABS also maintained its ten-year commitment to the Costas Grammenos International Centre for Shipping, Trade and Finance at Cass School of Management.

The past year saw the completion of several long-term commitments by ABS to leading educational institutions. At the Massachusetts Maritime Academy, ABS resources helped construct the Academy's state-of-the-art library known as the American Bureau of Shipping Information Commons.

ABS also provided the initial funding necessary for the long-term development of Maine Maritime Academy's ABS Center for Applied Engineering and Research.

Finally, an ABS grant led to the funding of a bridge simulator at the Urban Assembly New York Harbor

School, a college preparatory school that teaches on-water job skills and environmental stewardship.

Providing support to the marine and offshore industries is vital, and at ABS, that support takes a number of forms. Last year, ABS signed agreements around the world to strengthen ties with leading universities and industry stakeholders to expand its current research capabilities.

Mid-year, the ABS China Offshore Technology Center (COTC) in Shanghai signed a letter of intent for cooperative research and development projects with the South China University of Technology (SCUT).

The agreement will enable SCUT personnel to participate in specified ABS research projects and activities, establish a jointly funded research program within SCUT, and allow ABS to provide financial support to postgraduate students who participate in the joint COTC-SCUT R&D project.

In October, ABS signed Memoranda of Understanding with Pusan National University and Seoul National University in Korea to further academic research at these institutions.

Developing Future Leaders

Encouraging students to pursue careers in marine or offshore engineering is crucial to the future of both industries. Over its 150-year history, ABS has considered its role in promoting education as a continuing commitment to industry, and it has established a number of scholarships for students pursuing maritime engineering degrees.


Today, ABS supports student scholarships at institutions around the world including Memorial University in Canada, the University of Houston, University of Michigan and several of the State Maritime Academies within the United States.

In Europe, ABS supports students at the Technical University of Denmark, the Norwegian University of Science and Technology, the Instituto Superior Technico in Portugal and the Istanbul Technical University, to name just a few.

ABS educational support also spread throughout Asia and Africa. ABS currently provides support to the Ethiopian Maritime Training Institute and the Alexandria University in Egypt.

Scholarships are also awarded to students at the Indian Maritime University, Indonesian Merchant Marine Academy, University of Tokyo, Seoul National University, Malaysian Maritime Academy and Vietnam Maritime University.

In China, the Dalian Maritime University, Harbin Engineering University and Shanghai Maritime University are a small sample of institutions receiving ABS support for student scholarships.

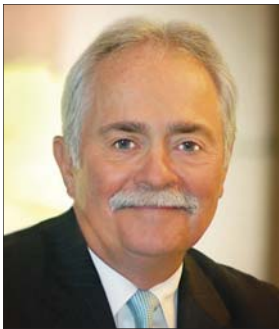
In total, ABS provides scholarships at more than 70 educational institutions around the world – a sign of its commitment to educating the next generation of leaders in the marine and offshore industries. 



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ABS

16855 Northchase Drive • Houston, TX 77060 USA
Tel: 1-281-877-5800 • Fax: 1-281-877-5803
Email: abs-worldhq@eagle.org • www.eagle.org