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# Chairman's Message

## INTEGRITY, STABILITY, EXCELLENCE

Over the last year a very small number of large corporations have sullied the reputation of the business sector and of its corporate governance. The largest of these entities were based in the US but there have been similar revelations of questionable ethical dealings in the boardrooms of large organizations in several other countries.

The consequences have been dramatic. Investor confidence has been shaken; government oversight has been increased and, significantly for ABS and its affiliates within the ABS Group of Companies, one of the world's largest and most respected firms of financial auditors and business consultants have been legally prosecuted for its actions and commercially ruined.

In each instance the companies, their boards of directors and their most senior executives have been found guilty in the court of public opinion of betraying the trust that had been invested in them. Damaging as their personal and professional failures have been, they have provided a cautionary

reminder to all of us who are relied upon by others, of the weight that trust entails.

2002 marked the 140th anniversary of ABS. Our beginnings may have been humble and focused on the marine industry but our vision and our growth has never been constrained. From the outset our founders identified a need for an independent, professional body, able to establish and apply the highest standards of excellence and professionalism. With the founding of ABS Group of Companies as a separate set of operating companies in 1991, we broadened our activities to encompass a wide range of compatible professional skills that we now offer to industries of all types and to governments around the world. Yet we never wavered from that philosophy of our founders.

We exist to serve the public interest, as well as the needs of our clients. We are still responsible for establishing standards that protect life, property and the environment. And we have added to our enormous knowledge base and reservoir of technical



and operational skills with the expansion of ABS Consulting in a manner that allows us to assist governments and clients reduce the risks inherent in their operations.

For ABS and each of the Operating Subsidiaries of the ABS Group of Companies, our Mission statements provide a daily reminder of the responsibilities that we have assumed.

If we are to continue to effectively fulfill our respective missions, we must continue to adhere to the highest standards of ethical conduct in whichever discipline or industry we are acting. We must continue to approach our responsibilities with

We must approach  
our responsibilities  
with impartiality and  
meet them in a manner  
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to professional  
excellence

impartiality and meet them in a manner consistent with our absolute commitment to professional excellence. If we are to retain the trust that has been placed with us, our reputation must remain above reproach.

Integrity is the cornerstone of our organizations. Without it, we lose our reason to exist. It is an essential part of our corporate cultures and it must remain so. It is the obligation of every member of ABS and ABS Group to ensure that it remains so, whether a Bureau surveyor in a remote port, an ABS Quality Evaluations field auditor or an ABS Consulting risk professional. Whatever our role, our integrity must never be put at risk.

By so doing we also maintain our financial stability and enhance our vibrant future. This past year is one in which both ABS and the ABS Group of Companies further solidified the firm financial footing that underpins our global activities. That foundation continues to offer exciting opportunities for our multitalented staff to further their professional aspirations.

And it is our strength, our integrity and our reputation for technical excellence that encouraged governments and industry to turn to ABS Consulting in their search for a partner in confronting the growing number of security, operational and natural hazard risks that have emerged from the tumult of the times.

It is said that the mark of true leadership is the manner in which an organization responds to adversity. No person, no company, no organization is immune to adversity. The loss of an ABS classed tanker, the first such incident in 25 years, off the coast of Spain in mid-November, with horrendous

attendant pollution, provided us with a unique and serious challenge.

We drew on resources from ABS and from ABS Consulting in our attempts to help mitigate the impact of the casualty. Our response was unprecedented in its transparency, proactiveness and technical competence. We broke down traditional informational barriers and opened our files and our people to government and public interrogation and scrutiny. And we established new benchmarks for the manner in which an entity involved in such a disaster publicly shoulders the responsibilities that it carries.

Our hallmark is now defined by four principles: integrity, financial stability, technical excellence and transparency. These are the principles that will continue to guide the 2,700 employees of ABS and ABS Group in the fulfillment of their respective missions. Each of these principles was put to the test in 2002. Each was strengthened as a consequence.



FRANK J. IAROSSI  
CHAIRMAN & CEO

# *We Make A Difference*



*Every* employee of ABS, ABS Consulting and the other operating subsidiaries of the ABS Group of Companies, contributes to the creation of a safer and more environmentally friendly world. As the ABS Group of Companies has grown to complement the traditional classification services of ABS with a variety of risk management services, the reach of our contributions has become increasingly varied. Everyday, somewhere within our global family, employees are helping to develop earthquake resistant buildings or playing a vital role in creating an effective antiterrorist security program or assessing the continued fitness for purpose of an aging tanker. Each of them, through their actions, judgment and application of knowledge, are helping to make a difference.

## **ABS Surveyors Meet Caspian Sea Challenges**

ABS surveyors provided classification services for *DSS-20-CAS-M* semi-submersible rig located in the oil and gas rich Caspian Sea in northwest Asia. The most technologically advanced semi to operate in the region, the rig is capable of drilling in water depths from 240 to 3,280 feet, allowing the unit to operate in two-thirds of the Caspian with a maximum drilling depth of 30,000 feet. Fierce winters mean the rig must be capable of operating in harsh climates like North Sea rigs. Additionally, the Caspian is considered an environmentally-sensitive region because it is a breeding ground for the famed sturgeon that produces caviar. Therefore the rig is equipped with a high level of environmental protection systems such as a zero discharge drilling mud system. Within the machinery space of the *DSS-20-CAS-M*, ABS Surveyor Jaroslaw Wasowski checks the rig's diesel engine.



### ABS Consulting Blast Engineers Analyze Explosion Hazards

Responding to risk with rational solutions keeps ABS Consulting blast engineers focused on addressing client needs to evaluate explosion hazards to personnel and the response of buildings, structures and equipment to blast load conditions. A variety of advanced computer modeling and dynamic structural analysis techniques such as finite element analysis (FEM) are used to analyze, model, assess or predict explosion hazards. The blast analysis and design team applied their expertise on a range of projects from terrorist threat assessment to dispersion modeling to explosion testing for structural components and upgrades to buildings. Principal Engineer Kim King works with proprietary ABS Consulting software in preparing a hazards analysis.



### IT Solutions Provided By ABS Nautical Systems

Ship management companies, operators and maritime universities around the world contracted with ABS Nautical Systems (NS), the world's leading provider of fleet management software for the marine and offshore industries. ABS NS provides software solutions to address the everyday business needs for effective fleet management. The powerful suite of software modules can stand-alone or function as a fully integrated management system sharing data between different operating departments. Ocean Shipholding Inc.'s (OSI) John James (left) signs a contract with ABS Nautical Systems President Jack Kitchura for ABS Nautical Systems Crew Management and Payroll modules to implement fleet wide. OSI says it was impressed with the functionality of the software and database flexibility offered by the ABS NS system. ABS Nautical Systems is headquartered in Houston, Texas, US, and has regional offices in Piraeus, Dubai, Singapore and Rio de Janeiro.



## ABS Paves the Way for Gulf of Mexico Truss Spars

As the global leader in offshore classification, ABS assisted operators with the regulatory hurdles and compliance requirements for Gulf of Mexico truss spar installations. Spar systems are particularly suited to deepwater Gulf of Mexico applications by providing operators with increased flexibility in terms of water depth capability, extending traditional floating technology up to 10,000 feet of water. ABS' experience with the classic or caisson spar, and now the second-generation truss spar design, further cements ABS' industry leading offshore reputation. ABS was the classification society of record for the world's first and second truss spar projects, *Nansen* and *Boomvang* for spar pioneer Kerr-McGee.

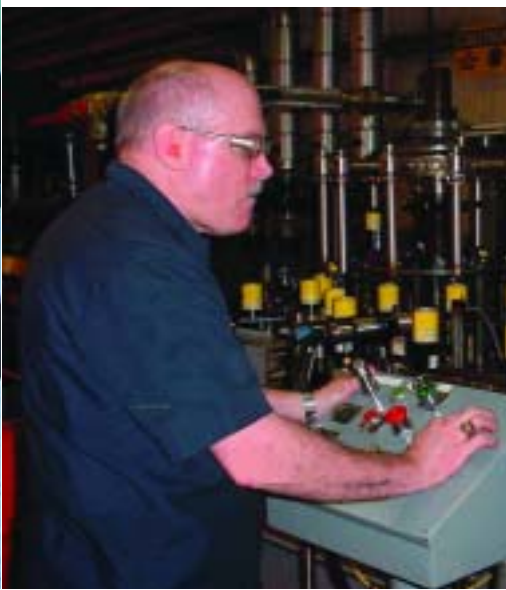






### Expanding Risk Consulting In China

The far-reaching impact of ABS Consulting's risk management expertise can be seen with the formation of a joint venture between the China Classification Society Industrial Corporation (CCSI) and ABSG Consulting Inc. to provide risk assessment services in China. The scope of risk services available covers the energy and chemical industries, communication and transportation sectors, civil engineering, as well as risk assessment due to natural disasters. The signing of the agreement took place in Beijing, the headquarters for ABS CCS Risk Management Consulting Ltd.



### ABS QE ISO 14000 Certifies Shell Lubricants Plant

ABS Quality Evaluations (QE) is one of the world's leaders in independent, third-party management system certification. Shell Oil Products US selected ABS QE as the registrar of choice to assist them in gaining ISO 14000 certification, demonstrating compliance to the highest international environmental standards. The certification process took approximately one year for the Shell Lubricants Houston Plant located in Galena Park, Texas. This is one of Shell's largest worldwide lubricants plants. Shell has historically had an aggressive safety and environmental program. By working with ABS QE, the oil major says the value of the certification process was the risk impact analyses and the documentation process that comes with attaining ISO 14000.

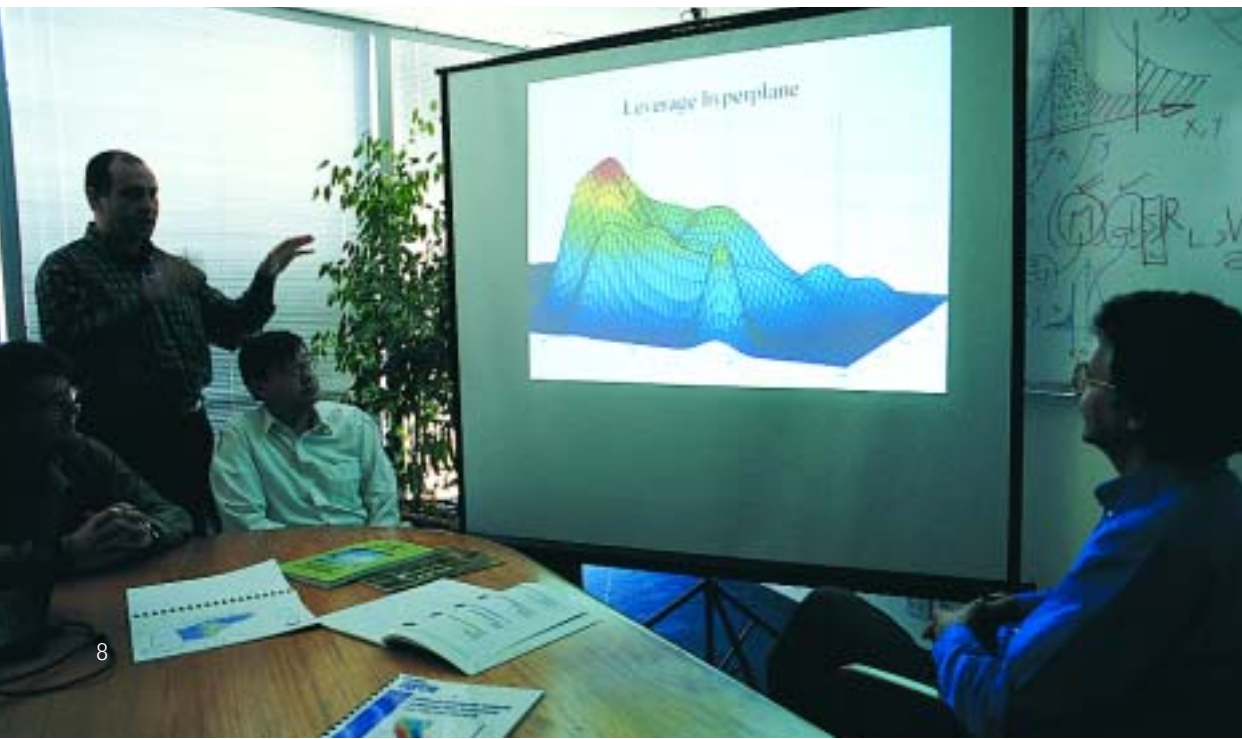
### The Pursuit of Quality Begins at Home

The ABS commitment to quality can be illustrated with the compliance to internal and external audits of all functions. Outside audits on quality processes and procedures at ABS take place as part of the International Association of Classification Societies (IACS) requirements to maintain the quality standards of member organizations. As an example, surveyor audits are part of the continuous improvement process of the company, as well as the individual, and include practical field testing and oral examination. Auditors look at the job basics: how surveyors prepare for each job; how they mentally approach the work; and how they perform the job and report the results. ABS Auditor Paul Greenwood observes the work of ABS Surveyor Stefan Patzwald during a crankshaft survey at Wildauer Kurbelwelle, Berlin, Germany.



### Leading the Commitment to Management Systems


By synthesizing the highest standards set for safety, quality and environmental practices, ABS SQE certification has become synonymous with unwavering quality standards. Clients around the world looked to ABS for certification to its internationally recognized combined Safety, Quality and Environmental Management Systems (SQE) certification to publicly demonstrate its commitment to this three-pronged approach to quality. Evergreen Marine Corporation (Taiwan) Ltd. is one of the world's largest container carriers with a longstanding commitment to quality by voluntarily meeting the International Safety Management (ISM) Code requirements in 1997, five years before the mandated date. Evergreen expanded its management system to include full compliance with the ABS SQE standards for both the company and individual certification of every vessel in the fleet, which is scheduled for completion in the next two years.



### Catastrophe Risk Management Spells EQECAT

Chances are when you hear of a high profile catastrophic event around the world such as an earthquake, flood or other natural disaster, the work of the EQECAT team is not far behind. EQECAT provides state-of-the-art catastrophe risk management, information, software and consulting services to property and casualty insurers and reinsurers, financial institutions and large corporations with significant property values. The multidisciplinary EQECAT team incorporates science, engineering, insurance, financial and computer science expertise in preparing detailed and accurate risk assessment reports, studies and full scale total catastrophe management programs. EQECAT has been recognized and honored by the reinsurance industry for its quality risk assessment programs.





### ABS SafeHull Express Team Builds on Technology Excellence

Ten years ago, the ABS Technology team first developed the Dynamic Loading Approach (DLA) to assess the structural strength of vessels. The pioneering approach was expanded with the development of the innovative, dynamic-based ship design evaluation system founded on engineering-first principles, called ABS SafeHull. SafeHull has received widespread industry recognition for its significant technical contribution toward enhanced ship structural safety, and the consequent protection of life, property and the environment. Now, a team of 40 engineers, naval architects, software designers and client users from shipyards in Korea, Japan and China are writing a new chapter in SafeHull's history. Seamless integration of classification software to the ship design process is highly demanded. And, the SafeHull Express team is working to overhaul the software to improve speed and user-friendliness.

# President's Message

## CONFRONTING CHANGE

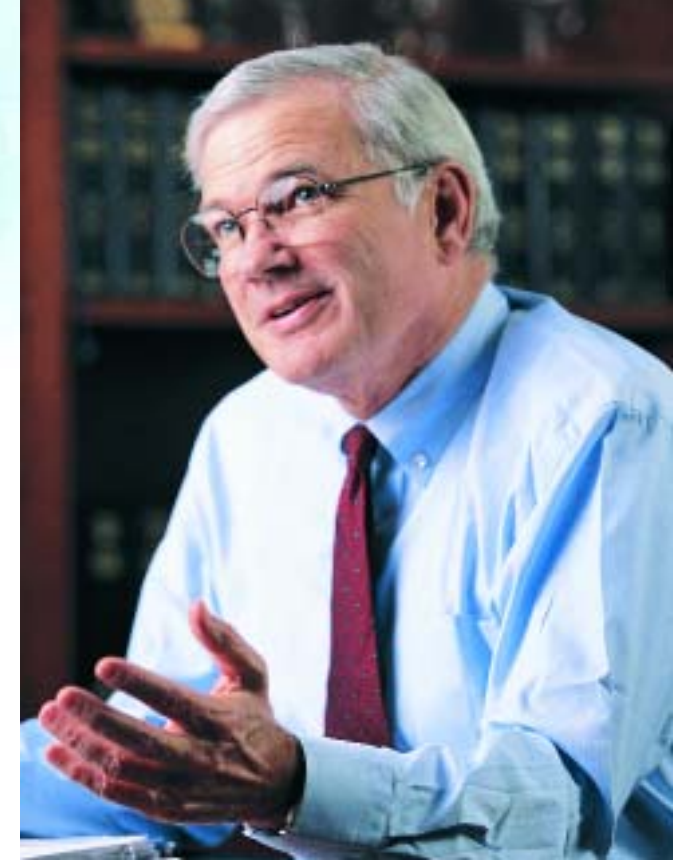
No company, no industry can survive if it is resistant to change. The past year came to a turbulent end with significant changes confronting the maritime industry, the classification profession and ABS. How we respond to those challenges will determine our future success.

Three specific issues acted as the catalysts for change. The most prominent, and the greatest challenge for ABS, was the sinking of the ABS-classed tanker *Prestige* off the northwest coast of Spain in mid-November. On passage in a winter storm, the vessel experienced rapid flooding of two empty ballast spaces. ABS believes a weakening of a small section of the hull structure, coupled with the prevailing weather conditions combined to cause a failure in the tanker's shell. The cause of the structural weakening and the exact nature of the initial damage may never be known.

The next six days witnessed the unfolding of a preventable disaster. Refuge was denied the

damaged ship, despite the warnings of technical experts. The tanker was forced farther and farther out to sea in adverse weather conditions and with a hull structure that, due to the flooding, was severely overstressed. Gradually the damage spread and the volume of oil spilled increased until the vessel finally broke in two and sank, the first ABS tanker lost to structural failure in 25 years. An estimated 25,000 tonnes of heavy fuel oil washed up on the coasts of Spain and France creating a pollution incident of distressing severity.

As the classification society of record, ABS was thrust into the glare of intense media and political scrutiny. From the outset our focus was on how best to limit the pollution, determine the cause, and assess what, if any, improvements could be made to the safety regime to minimize the chance of future similar casualties. Our approach was one of total transparency as we took unprecedented steps to involve government and industry in our investigations.



Meanwhile a far more consequential response was formulated within the European Union. It is one that will fundamentally affect the tanker industry in the future through an accelerated phase out of older single hull vessels, greater regulation of tanker operations, stricter oversight of classification societies and criminal penalties for anyone deemed to have contributed to a pollution incident.

ABS is directly affected by these changes which further entrench the responsibility for establishing industry standards within the



# The next few months will pose significant operational challenges for us as we begin to review ship security plans and audit the new onboard security systems

regulatory, rather than self-regulatory, arena. They place greater demands and accountability on our actions, and pose the threat of jail sentences for those found negligent should a future pollution incident occur.

The second catalyst was the ongoing debate regarding appropriate structural standards for bulk carriers. It was a debate that was focused within IMO as governments continued to voice concern for the safety of the crews of these vessels. For the second time, the perception within the legislative halls is that the industry's self-regulatory

process, which is embodied by classification, was acting neither swiftly nor decisively enough to protect life and property.

Such an assessment downplays the enormous technical contribution that has been made to the understanding of this issue by the members of the International Association of Classification Societies (IACS) including ABS. Once again, class has been put on the defensive and has been presented with the challenge of reestablishing its position as the central repository of technical excellence and the trusted developer of maritime safety standards.

The third development that has challenged class and ABS to change was the adoption by the IMO of the new International Ship and Port Security Code. For ABS, it posed the question of whether we were prepared to add new expertise in security issues to our traditional classification skills and to the recent extension of our activities into safety management auditing under the ISM Code.

It quickly became clear that our clients wanted class to accept these new responsibilities. The next few months will pose significant operational challenges for us as we begin to review ship security plans and audit the new onboard security systems.

For 140 years, as ABS has grown in size and extended its reach, both technically and professionally, it has been confronted by periods of significant change. We have always risen to meet those challenges. That experience gives us the confidence and the strength to surmount these new challenges.

Those past successes have been directly attributable to the remarkable people of ABS who have embodied technical excellence and coupled that with a remarkable degree of initiative and resilience. These same attributes, clearly in evidence in every sector of the ABS family, will carry us forward to greater success and new opportunities.



ROBERT D. SOMERVILLE  
PRESIDENT & COO

# Year In Review



**2002** An increasingly stringent regulatory environment helped propel ABS to its busiest year ever and to a new record fleet total. In particular, the enforced retirement of single hull tankers under the new IMO MARPOL regulations saw continuing strong deliveries and further ordering for tankers of all sizes.

With a market leading 24 percent share of the existing tanker fleet, ABS' reputation in this sector, buoyed by the added attraction of the robustness of ABS SafeHull approved tanker designs, helped attract a dominant 29 percent share of the worldwide tanker orderbook to ABS class.

Added to this flurry of new construction, more stringent survey requirements for the existing fleet of aging tankers and bulk carriers meant increased activity for the ABS worldwide team of surveyors.

When combined with continued growth in the world fleet to meet global trade demand, and with the continued strong support for ABS classification services from owners of all vessel types and from the offshore sector, these stimuli boosted the ABS-classed fleet to a new, all-time record of 110.1m gross tons at year-end.

This increased activity also pushed ABS revenues to a new record, although the associated rise in operating expenses kept net returns within the traditional margin, sufficient to secure the organization's financial future and ongoing commitment to technical research.



## FLEET GROWTH

The ABS fleet, as measured in gross tons, grew for the 10th straight year in 2002, reaching a new record 110.1m gt. This figure confirmed the industry's growing acceptance of larger vessels as the total number of ABS-classed vessels continued to decline to 9,086. By comparison, fleet figures for 1992 were 91.8m gt and 12,525 vessels.

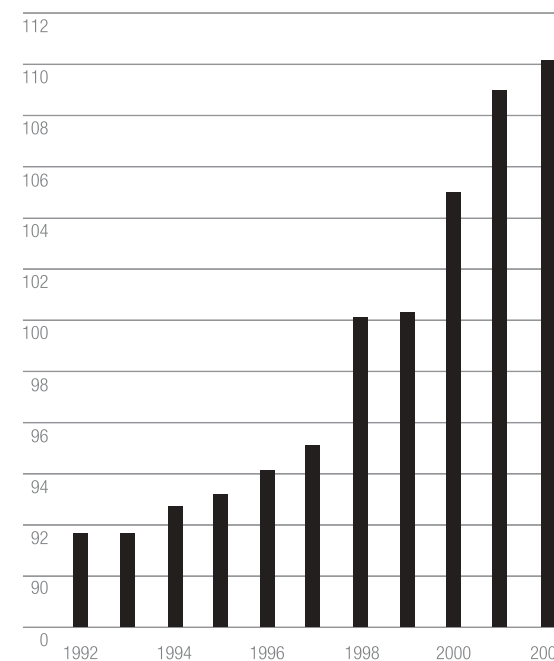
Year-on-year growth was a solid 1.1m gt as increased scrapping of old tankers, particularly 1970s built, ABS-classed ULCC and VLCC tonnage, dampened the effect of the addition of 55 new tankers aggregating 3.9m gt to the ABS fleet. Substantial net growth was recorded in the containership sector as the delivery of several post-panamax vessels pushed the fleet to a record 14.4 m gt or 18 percent of the existing world fleet. A further 58 containerships, totalling 2.5m gt were on the ABS orderbook at year-end.

Demand for new tankers remained at levels not seen since the 1970s with the 946 strong, 46.8m gt ABS-classed tanker fleet set to be augmented by an additional 154 tankers of all types aggregating 9.4m gt that were under contract at end-December. This represented a 29 percent share of all tanker orders with demand for ABS class being reflected for most types. As at end-December 2002, 22 percent of all VLCCs on order were to ABS standards. Also 52 percent of suezmaxes, 32 percent of aframaxs, 27 percent of panamaxs and 25 percent of all chemical tankers on order were to ABS class.

Since its release in 1993, ABS SafeHull has been a major incentive for owners to select ABS class for tankers. Shipyards have sought to optimize new designs against classification criteria. At the same time, tanker operations have been subject to greater regulation, scrutiny and attendant liabilities. As a consequence, many owners have specified the design robustness that results from the application of the SafeHull system for their new vessels.

This same approach has been noticeable within the large bulk carrier sector, particularly in response to the increased regulatory scrutiny of bulk carrier design following several high profile casualties with

**ABS Existing Fleet**  
*in millions of gross tons*





attendant loss of life. At year-end, 30 percent of all capesize bulk carriers on order were to ABS, and SafeHull standards, compared to the modest 15 percent share of the existing fleet of capesizes classed with ABS.

Even in the smaller bulk carrier sectors, the attractions of a more robust, SafeHull-approved design meant an increased number of long-term industrial shipowners sought ABS class for their vessels. As a result, the ABS market share for new vessels of the handymax and handysize sectors was up by 6 percent over the share of the existing fleet.

## DEMAND FOR SERVICES

ABS activities spanned the globe in 2002 as the society responded to client needs. Particularly strong areas of activity included Greece and Italy. Leading Greek shipowners showed a strong preference for ABS which ended the year with a 46 percent share of the very active, Greek-controlled newbuilding orders. Owners such as

Ceres Hellenic, Stelmar, Minerva, Athenian Tankers, Kristen, D.M. Lemos and Niarchos among many others selected ABS class for their tanker and/or bulk carrier contracts placed with yards in Japan, Korea and China.

Italian owners continued their strong support with owners such as Amoretti, Augustea, Barbaro, D'Amato, D'Amico, Deilemar, Euroceanica, LGR, Marjan, Marnavi, Montanari, Navigazione di Cabotaggio, OMC, Scinicariello, Stargas and Zacchello placing tankers into ABS class. The year also saw the Navigazione Montanari SpA IMO Type 3 25,582 dwt, ABS-classed product/chemical carriers *Valpadena* and *Valdaosta*, built by SHINA Shipbuilding of South Korea, becoming the first two newbuildings to fly the Italian flag for which both the statutory certification and classification certificates had been issued by a non-national classification society.

This followed the 2001 recognition of ABS by the Italian government to issue statutory certification



on its behalf. A similar agreement was signed with the German government in early 2002 and ABS continued to expand its activities in that country during the year with new German-domiciled clients placing contracts for ABS-classed vessels in China and Korea.

Other areas of increased activity included Japan, with 26 vessels now on order for domestic owners to ABS standards; Taiwan, with continued strong ordering by ABS clients such as Yangming, Formosa Plastics and U-Ming among others; and the Middle East with significant orders received from owners in Saudi Arabia and Qatar.

Such activity meant contracts for ABS-classed tonnage were held by shipyards in 39 countries, although the most significant activity remained confined to the yards in Korea, Japan, China, Singapore, Taiwan, Denmark, Croatia, Italy and the US. Korea continued its clear lead with a 41 percent share of all the newbuilding contracts for ABS-classed vessels.

Although each of the big three shipbuilding nations, Korea, Japan and China, held contracts for a wide variety of ship types to be built to ABS class, the over-whelming majority of tanker contracts were placed with Korean shipyards. Japanese yards held a more even mix of tanker and bulk carrier contracts; Chinese builders' portfolios of ABS-classed showed a majority of bulk carrier orders, including several capesize, including double sided vessels, at China's newest and largest shipyard, Waigaoqiao.

## THE RESURGENCE OF GAS

Interest in exploiting the world's vast reserves of natural gas continued at a very high level throughout 2002, resulting in considerable activity for ABS across a wide range of projects. Operators took advantage of ABS' expertise on developing standards for the design and construction of gas carriers. Since it classed the very first ship converted to carry liquefied gas and the first purpose-built ship designed exclusively for the carriage of gas, ABS is uniquely positioned with more than 50 years of experience.

Previous research that had led to the expansion of the ABS SafeHull system to include membrane type LNG carriers resulted in contracts to class newbuildings ordered from Samsung HI by Exmar. ABS will also participate in the groundbreaking Guangdong LNG import project for China. This will involve classing the first LNG carriers that will be built in Chinese shipyards.

## ABS Year-End Statistics

(in millions gt)	Year		
	2000	2001	2002
Deliveries	6.80	7.83	7.37
Incoming Existing	1.80	1.34	1.28
Reinstated	1.90	0.60	0.22
<b>Total Incoming</b>	<b>10.50</b>	<b>9.77</b>	<b>8.87</b>
New Contracts	9.40	7.04	7.51
<b>Total Outgoing</b>	<b>6.30</b>	<b>5.35</b>	<b>8.41</b>
Net Gain m gt	4.20	4.42	0.46
<b>Official Orderbook</b>	<b>15.56</b>	<b>14.88</b>	<b>15.26</b>

## THE RESURGENCE OF GAS



Sloshing analyses, using new sloshing formula within the SafeHull LNG application, were performed for a number of LNG projects during 2002. Several joint research projects with leading shipyards on the impact of sloshing on partially loaded LNG ships were ongoing throughout the year.

In response to client driven needs in the liquefied natural gas sector, ABS engineers developed new technical criteria for the design and installation of dual fuel engines specifically for the latest generation of LNG carriers. The criteria were developed using risk-based methodologies. The formal Guide will be issued in 2003.

The year also saw the development of novel concepts for the transport of Compressed Natural Gas (CNG) with the developers approaching ABS for guidance on appropriate safety standards. ABS

responded by drafting new *Guidance Notes for Building and Classing Ships Carrying Compressed Natural Gas* that brought together the various applicable ABS Rules and relevant industry codes and standards to give the designer a clear, integrated reference.

ABS also worked closely with the shipping companies, shipyards and designers developing these concepts with the view to granting class “Approval in Principle” to these unique vessels.

Another landmark occurred when ABS was selected to class the world’s first newbuild liquefied petroleum gas (LPG) Floating Production Storage and Offloading (FPSO) unit, slated for operation offshore Angola. ABS had previously classed the world’s first LPG FSO, also in service

off West Africa. However, the *SANHA* LPG will be the first such vessel to also incorporate production facilities that will be placed above the storage tanks. It will be built by Ishikawajima Harima Heavy Industries, Co., Ltd (IHI), and will incorporate the IHI Self-supporting, Prismatic-Shape, IMO Type-B tank system or SPB.

Mounting concerns, particularly in the US, over the vulnerability and security of new shore-based LNG reception and processing facilities to handle the projected significant increases in LNG being transported, turned the industry’s attention to the development of new offshore LNG terminals.

Responding quickly to this new challenge, ABS drew on its unmatched experience with both LNG and FPSO facilities to issue the industry’s first *Guide for Building and Classing Offshore LNG Terminals*. Initially the publication addressed floating installations only, but the criteria were then expanded to address both floating and gravity-based structures constructed of both steel and concrete.



## MARITIME SECURITY

The issue of maritime security attracted the attention of national governments working through the International Maritime Organization (IMO). This culminated in the adoption by the IMO of several significant security-related amendments to SOLAS in December 2002. These included the adoption of a new International Ship and Port Facility Security (ISPS) Code that applies to most vessels over 500 gt and will become effective July 2004.

Recognizing that classification societies would inevitably be asked to expand their activities to include specified audit and certification responsibilities on behalf of contracting governments, ABS took an active role as advisors to the US Government delegation during the development of the new Code. It also worked to prepare a new, comprehensive *Guide for Ship Security* for quick release once the official language of the new SOLAS and Code requirements was finalized. The Guide is intended to assist shipowners in meeting the new IMO security standards.





ABS also immediately sought recognition from all the leading flag States to act as a Recognized Security Organization (RSO), able to approve ship security plans and audit the onboard ship security systems.

### OFFSHORE INDUSTRY ACTIVITY

2002 was a year in which offshore operators continued to seek out ABS for classification services as they faced growing demands and the unique technological challenges of developing and producing oil and gas from fields in increasingly deeper waters. As a consequence, ABS retained its dominance in classing and certifying 68 percent of the world's offshore exploration and production fleet.

ABS' offshore activities spanned the globe in 2002, with new projects being undertaken in the US Gulf, off Brazil, in Asia, West Africa and the Caspian Sea among other areas. ABS continues to be the preferred classification society for the Gulf of Mexico, having approved all of the classed production units now operating or under construction in the area, and



having provided certification for an additional 28 such systems in the region.

Notable contracts in 2002 were placed by leading offshore operators such as Murphy Oil, Dominion/Williams, BP and Kerr-McGee for various Gulf of Mexico deepwater truss spar projects including: *Medusa*, *Devils Tower*, *Boomvang*, *Nansen*, *Gunnison*, *Horn Mountain* and *Holstein*. Spar systems are particularly suited to deepwater Gulf of Mexico applications as they provide operators with increased flexibility in terms of water depth capability. The technology is now also being considered for other regions, including West Africa.

Ship-shaped FPSO vessels remained the preferred development option for many deepwater frontier prospects worldwide and ABS continued its regional dominance in Brazil with five FPSO conversions for Petrobras being undertaken during the year to ABS class standards. The projects included *FPSO Brasil*, *Petrobras 43*, *Petrobras 48*, *Petrobras 50* and *Fluminense*.

Each converted FPSO will receive the ABS class notation ÅA1 Floating Production Storage and Offloading Unit. The *FPSO Brasil* is also notable as the first FPSO to which the SafeHull Converted Ship Notation has been awarded, although all of these converted FPSO units have been subject to ABS SafeHull assessment as appropriate.

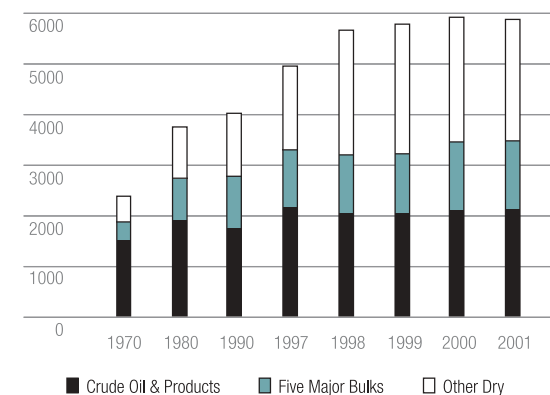
A trio of generic FPSOs for deepwater developments off West Africa in 2002 were also converted in conformance with ABS class requirements. The *FPSO Falcon*, *Atlantic* and *Eagle* are controlled by Single Buoy Mooring (SBM) of Monaco. The contract with ABS included a technical assessment of the tankers' structures, technical design reviews, surveys during refurbishment, conversions, hookups and commissions for all three for operation by Esso Deepwater Ltd., a subsidiary of ExxonMobil.

The worldwide reach of ABS was also evidenced with a contract secured for the most technologically advanced semisubmersible rig to be built for service in the Caspian Sea, the *DSS-20-CAS-M*.

Offshore classification activity was intense at many of the shipyards that specialize in the construction or refurbishment of this equipment. For example, the Keppel and Jurong shipyards in Singapore jointly held contracts for seven FPSO conversions and nine MODU upgrades in 2002 all to ABS standards, in addition to newbuilding contracts for three jack-ups, two semisubmersibles and a bevy of supply and support craft.

## International Seaborne Trade

in million tons of cargo



Source: UN, Review of Maritime Transport, 2002 (Note: 2001 Estimated)  
Major Bulks: iron ore, grain, coal, bauxite/alumina and phosphate



Along with its marketshare dominance, ABS has become synonymous with the latest in innovative technology solutions for oil and gas exploration. ABS works closely with the US Mineral Management Service (MMS), American Petroleum Institute (API) and a host of other industry regulators around the world, as well as within joint industry programs established to develop guidelines for the offshore industry.

As the leader in offshore classification, ABS continued to update its applicable Rule requirements. An expanded *Guide for Building and Classing Floating Production Installations*, including tension leg platforms (TLPs) and spars, is in review by industry experts. This is the first time a class society established its own standards for these specialist units. Historically these configurations are reviewed against the API standards. As the only society to have classed spars and with a dominant marketshare of TLPs, ABS recognized the

need for relevant class standards for these two increasingly popular forms of floating production systems.

Also *Guidance Notes on the Fatigue Assessment of Offshore Structures* was drafted to supplement the Rules, and other design and analysis criteria, that ABS has established for the classification of mobile offshore drilling units, single point moorings and floating production installations, among others.

The offshore industry also looked to ABS for IT solutions, particularly ABS SafeShip's Hull Maintenance package. A pilot program was undertaken in 2002 with one of the world's leading offshore operators to apply the Hull Maintenance module as part of its overall asset integrity management program.

The need to accurately monitor and predict deterioration of the hull structure is moving



the offshore industry toward widespread adoption of electronic management of the information on a vessel-by-vessel basis. ABS SafeShip helps to accurately track loading patterns, predict fatigue life, and monitor coating breakdown and corrosion.

## RISK-BASED RULES

In addition to strengthening the traditional analytical tools and Rules that are the foundation of a classification society, ABS technology moved a step closer in 2002 to the adoption of risk-based classification criteria. Risk-based standards have particular relevance to the offshore sector.

The wide-ranging Integrated Risk Management Program (IRMP) being pursued by the ABS Technology department lays a firm foundation for the application of risk methodologies to the establishment of classification rules for both the design and operational maintenance of ships and offshore structures.

As a result of this approach and philosophy, several new Guides were drafted. The *Guide for Risk Evaluations for the Classification of Marine-Related Facilities* was developed to provide guidance to ABS clients on how to prepare a risk-based submittal of an alternative to compliance with prescriptive ABS class requirements. *Guidance Notes for Novel Concepts* was drafted based on a methodology outlining the basic approach to be taken when requesting class or certification for a novel offshore installation concept.

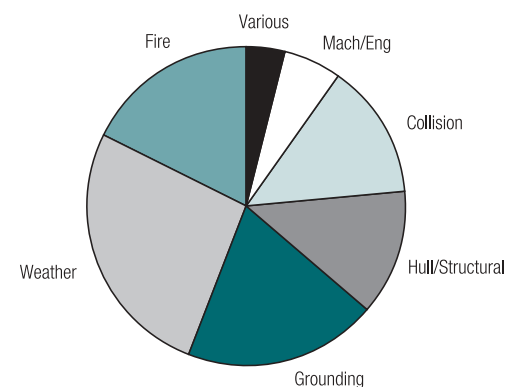
*The Guide for Risk-based Inspection for the Offshore Oil and Gas Industries* was drafted to provide offshore operators with the same type of guidance as the American Petroleum Institute or API documents. It is tailored specifically to the offshore production segment of the industry.

As an outgrowth of the ongoing risk-based Rule development program, other ABS

initiatives such as the Risk Assessment Module for ABS SafeShip and the Reliability Centered Maintenance Project, which allows owners and operators to optimize maintenance to improve equipment reliability, were further developed. They are intended to offer industry a holistic approach to meeting class requirements through the application of risk-based methodologies.

### Total Losses 1994-2001

By Cause, All Vessel Types  
Vessels > 500Grt



Source: LMIU for Joint Hull Committee



## THE HUMAN FACTOR

The far-reaching scope of ABS Rulemaking has also placed ABS at the forefront of the consideration of human factors engineering within the establishment of appropriate safety standards. 2002 saw the release of a comprehensive set of criteria for the accommodations, design and ambient environment of spaces for crew aboard offshore rigs contained within the *ABS Guide for Crew Habitability on Offshore Installations*.

With operators venturing into deeper water and personnel living for extended periods on the rigs, these criteria were developed to aid in the reduction of crew and seafarer fatigue and to decrease the likelihood of human error through the design of supportive living and working surroundings. The work being conducted by the Safety Assessment & Human Factors group within the ABS Technology department for both the marine and offshore industries has been heralded by industry for its pioneering approach to safety.

ABS remains the first and only classification society to offer a habitability notation for offshore installations.

## NAVAL, MILITARY AND GOVERNMENT CONTRACTS

The ABS Americas Division continued to strengthen its longstanding relationship with the US government throughout 2002 with initiatives to expand classification and certification support for military and government vessels.

The classification of the Military Sealift Command's (MSC) newest vessels – the T-AKEs under construction at NASSCO – moved into high gear with a focus on technical plan review and advanced analysis. In addition, survey support was provided to vessels being activated from the Ready Reserve Fleet for operation by MSC in the Middle East.

Military Sealift Command also contracted with ABS for ISM certification and began a project to



move as many of its vessels as possible into the Alternative Compliance Program which had been jointly developed by the US Coast Guard and ABS.

Work on the development by ABS of appropriate *Naval Vessel Rules* intensified with the decision of the Navy Program Executive Office (Ships) to require their use for both the DD(X) destroyer and Littoral Combat Ship (LCS) Programs. A contract to support completion of the *Naval Vessel Rules* was framed for award in early 2003.

In addition, ABS is under contract to Northrup Grumman to help the ship and system builder develop and implement an appropriate certification approach for the DD(X). Support for classification of the Landing Craft Replacement Program (LCU(R)) continued as well as that for the follow-on Maritime Prepositioning Ship (MPF(F)). Furthermore, ABS was asked to certify all engines being acquired for the LHD-8 and the entire Navy mine hunter fleet.

The Office of Naval Research (ONR) contracted with ABS to class the experimental X-Craft, a 73 meter, 63 knot aluminum catamaran which will serve as a precursor to the LCS Program. In addition, ABS will be doing technical plan review for the HDV-100, a composite high-speed catamaran, also for use by ONR. ABS is also classing the HSV(X)-2, a high speed catamaran being procured as a mine warfare support ship for the Navy.

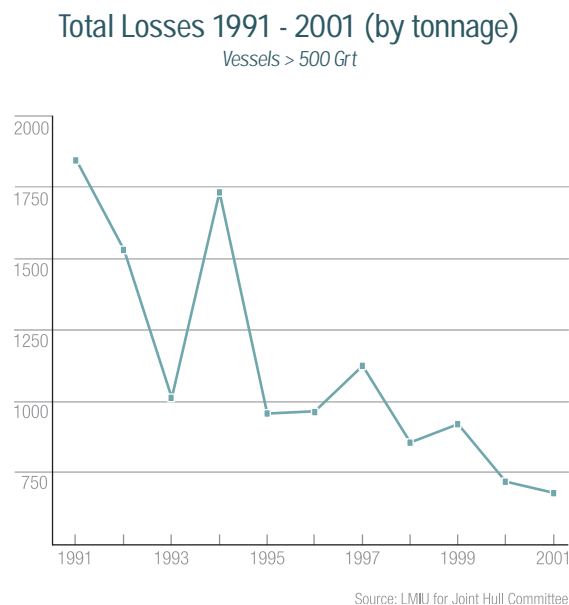
ABS continued its close relationship with and support of the US Army Corps of Engineers by classing several new vessels for its fleet. In addition, for the US Army Tank-automotive and Armaments Command (TACOM), ABS continued classification of the new Logistic Support Vessels (LSV) and began the necessary work to class the envisioned Theater Support Vessel fleet.

In order to provide the necessary foundation for this military high-speed craft work, ABS developed and published its *ABS Guide for Building and*



## SURVEY ACTIVITY

*Classing High Speed Naval Craft*, and associated *Guidance Notes on 'Dynamic Load Approach' and Direct Analysis of High Speed Craft*. This effort was led by the ABS New Orleans engineering office resulting in the establishment of a high-speed craft center of excellence in that office.



ABS provided classification services for the National Oceanographic and Atmospheric Administration, for the new series of Fishery Research Vessels (FRVs), as well as a number of other transfers and reactivations to enhance their fleet. In support of the US Coast Guard fleet, ABS continued to provide certification support for elements of both the DEEPWATER replacement program and the Great Lakes icebreaker program.

In the area of naval and military support, an international organization, the Naval Ship Classification Association (NSCA), was formed to promote standards of safety for naval vessels. This was established in mid-2002 with an ABS representative elected as Vice Chairman. ABS is one of the seven class societies that have been granted membership in the association and that are working, in consultation with NATO navies, to develop naval safety objectives that complement international civil maritime regulations.

## SURVEY ACTIVITY

ABS increased its worldwide team of more than 600 surveyors in 2002 to meet the increased demands of both the robust newbuilding sector and the more stringent survey requirements for older tankers and bulk carriers. Many of these requests stemmed from the investigations into the loss of the product tanker *Erika* in late 1999 and the damage sustained by the product tanker *Castor* a year later, both incidents occurring in European waters.

Many of the regulatory initiatives were spawned by the European Union and subsequently introduced through the IMO. Other changes were introduced by IACS as new Unified Requirements. Where appropriate, ABS acted unilaterally to strengthen its survey procedures, particularly for tankers over 15 years of age.

Of particular note were the preparation of a new *Damage/Repair Reporting Manual* for use by ABS surveyors that will be released in 2003, and the



issuance of new *Guidelines for Surveyors on How to Control the Thickness Measurement Process*.

In addition to requiring additional girth belts and greater density of gaugings for both plating and internals to better identify the condition of a vessel's structure, the new requirements explicitly reinforce the requirement that the selection of the thickness measurement locations is to be the responsibility of the surveyor and not left to the owner or the thickness measurement firm.

New standards were also introduced that address the coating of replacement steel at the time of structural repair, and more stringent survey requirements of ballast and cargo ballast tanks, including the requirement for close up survey and gaugings depending upon the condition of the coatings in the tanks.



## TECHNICAL DEVELOPMENTS

The previously mentioned casualties also focused industry discussion on the issue of appropriate corrosion margins. ABS began working, in collaboration with IACS societies, to review current corrosion margins with a view to enhancing the robustness of newbuild tankers. As part of the review study, gauging data is being analyzed to determine corrosion rates for use in validating corrosion margins.

### Class Related Detentions

*Paris MOU and Tokyo MOU as Reported for 2002*

IACS Class	Fleet Size	Class Related Detentions	Ratio by Number of Vessels*
CCS	1,603	4	0.0025
ABS	7,196	21	0.0029
DNV	4,863	16	0.0033
KR	1,833	8	0.0044
RINA	1,733	8	0.0046
GL	4,935	42	0.0085
LR	5,583	52	0.0093
BV	5,523	55	0.0100
RS	5,068	59	0.0116
NKK	4,942	61	0.0123
Total	43,279	326	0.0075

\*The ratio represents a weighted average of class related detentions to Fleet Size (as reported to IACS).

Working in conjunction with IACS, ABS also contributed to efforts within IMO to develop new requirements for permanent access arrangements within cargo and ballast tanks to facilitate future surveys. Of particular note are the provisions and conditions considered to be acceptable for gaining sufficient access to conduct effective close-up surveys of a tank or compartment's overhead structure.

Port State Control and casualty and damage incidence statistics remain key industry indicators of the effectiveness of a classification society's survey performance. In 2002 ABS remained in the top echelon of class societies in terms of detention ratios for class related deficiencies in each of the three main Port State Control jurisdictions – the US Coast Guard, the Paris MOU and the Tokyo MOU.

However, ABS has not yet reached its goal of zero worldwide port State detentions of any ABS-classed vessel for a class related

deficiency. Continuous training of our survey staff supports the pursuit of this goal.

Providing valuable assistance to the survey department in its continuous review and improvement of survey requirements is the Safety Analysis Group, established in early 2002. These experienced survey and engineering professionals identify trends in structural and machinery performance, including valuable analyses of significant incidents, that assist in the ongoing development of appropriate survey and criteria standards.

## TECHNICAL DEVELOPMENTS

In addition to the many new Rules, Guides and other technical developments already mentioned, the ABS Technology Department maintained a vigorous research and development program throughout the year. Nearly 70 projects were initiated or ongoing in 2002, several of them advanced research projects conducted in conjunction with outside research institutions or as part of joint industry programs.



The breadth of these projects encompassed almost all aspects of ship and offshore structural, machinery and human factors engineering. Subjects ranged from an analysis of bow flare impact damage, to a consideration of the strength of aging ships, to a performance based fire safety case study.

Other projects addressed the influence of hull deflection on shaft alignment; the non-linearity of ship motion and wave load on vertical bending moment due to water on deck for bulk carrier and container ship designs; and the development of an enhanced integrated software system that increases the ABS engineering analysis capability in areas of Dynamic Loading Approach and Spectral Fatigue Analysis.

## ADMINISTRATIVE EFFICIENCIES

ABS is committed to providing services that are not only technically innovative and to the highest professional standards, but that are also efficient and cost effective. To that end, ABS has adopted a number of sophisticated computer applications to



improve its internal administrative and financial efficiencies. And it is undertaking a multiyear

project that will bring similar techniques and efficiencies to the worldwide survey process.



Although technology will never replace the knowledge, skills and judgment of the field surveyor, it can be used to assist the surveyor in preparing for the ship specific survey to be undertaken. Particular applications are the timely reporting on, and databasing, of the findings of that survey on completion.

A similar program that is expected to significantly improve the speed and manner in which engineering plan review is undertaken also made substantial progress in 2002, and holds great promise for improving the level and responsiveness of the service provided to clients within the near future.

Along with global enterprise IT solutions came programs from human resources intended to enhance the professionalism and opportunities for the more than 1,600 ABS employees. A Global Career Development program was unveiled at the end of 2002 that will place even greater emphasis on teamwork and integrity.

## INDUSTRY ISSUES

2002 was a year in which ABS continued to play a leadership role in vigorously defending the role and responsibilities of class in the face of ongoing regulatory assaults and an adverse public perception of the marine industry's safety record.

The *Prestige* tanker casualty off the coast of Spain provided a catalyst for critics of the industry and placed ABS in the center of the international debate regarding appropriate safety standards and regulation of the shipping industry.

A key issue for some time prior to the incident had been the manner in which the industry has traditionally sought to restrict information. ABS was firmly on record as being committed to the concept of transparency. In responding to the massive public and political interest in the *Prestige*, ABS adhered fully to its previously stated principles and took unprecedented actions not only to release all relevant information as quickly and openly as



possible, but also to voluntarily open up its records for review by interested parties, including the European Union.

While tragic, the high profile casualty has further strengthened ABS' resolve toward educating the industry and the public on the role of class as a self-regulating mechanism for the shipping industry.

## ORGANIZATIONAL CHANGES

A significant announcement was made by ABS Chairman Frank J. Iarossi following the November meeting of the ABS Council. It laid out a carefully planned transition strategy for the organization's leadership.

Iarossi, currently ABS Chairman and Chief Executive Officer, announced that he will relinquish his duties as CEO, effective 1 May 2003. Robert D. Somerville, currently President and Chief Operating Officer will assume the duties of Chief Executive Officer from Iarossi at that time, becoming President and CEO. It was also announced that

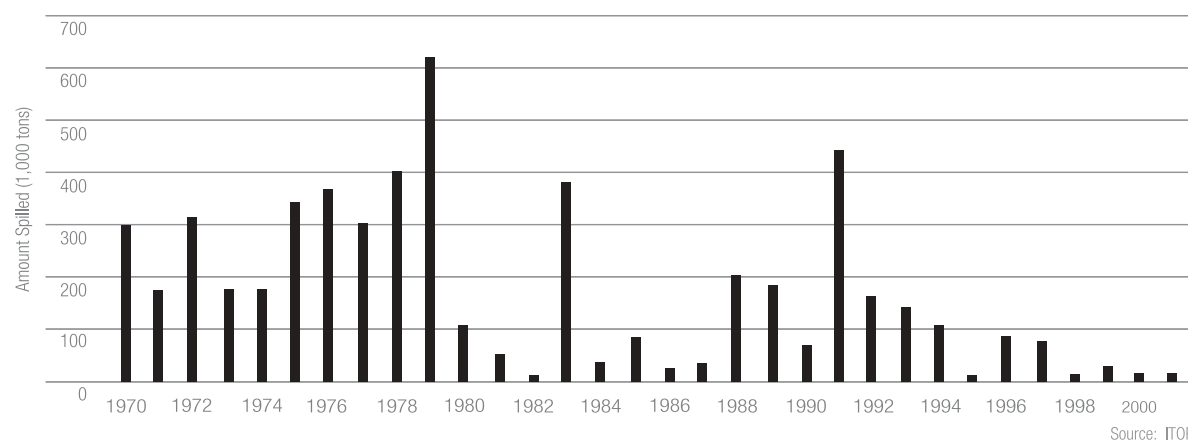
Somerville would succeed Iarossi as Chairman of ABS, effective May 2004, adding those duties to the Chief Executive Officer responsibilities.

Iarossi will remain Chairman and Chief Executive Officer of ABS Group of Companies, Inc., a wholly owned subsidiary of ABS engaged primarily in risk management consulting for clients outside the marine industry, for the foreseeable future and is expected to remain as a member of the ABS

Board of Directors after relinquishing his post as Chairman of ABS.

It was further announced that Robert E. Kramek, currently Senior Vice President of ABS and President, ABS Americas will be appointed Executive Vice President and Chief Operating Officer of ABS, effective May 2003 when Somerville assumes the duties of Chief Executive Officer.

Quantities of Oil Spilled  
Maritime Incidents Worldwide (1970-2001)



# Classification Activity

**2002** continued a strongly positive trend in classification activity, with the ABS-classed fleet reaching a new record of 110.1m gross tons by year-end. ABS remained particularly strong in the core sectors of tankers, bulk carriers and container-ships. It also maintained its dominance in the offshore sector with several notable contracts including the first LPG FPSO unit and cell spars.

Aggregate gross tonnage contracted during 2002 remained strong. Contracting was sufficiently active to ensure continuing newbuilding classification activity for the society for the next two years. The year-end orderbook stood at a very healthy 15.3m gt representing a slight increase over the previous year.

Tanker contracts continued to dominate the new construction orderbook. Both contracts received and year-end orderbook for new tankers yielded totals that were consistent with those of the prior year.

At the close of 2002, a market-leading 29 percent of all tankers on order at shipyards around the world were to ABS class.

Throughout 2002, a number of new deepwater oil and gas exploration and production units were classed by ABS. Indicative of its preeminent position in the offshore industry, year-end statistics showed that ABS classed or certified a 77 percent share of the worldwide mobile offshore drilling unit (MODU) fleet.

With the high level of demand for its services, ABS retained a leading position in the major Asian shipbuilding countries, particularly Korea, Japan and China. In terms of gross tons, the 2002 year-end results showed ABS with a 24 percent share of orders contracted with



Korean shipbuilders. In China, ABS held the third largest orderbook, and in Japan, ABS ranked second behind the national society.

Much of the continuing success of ABS within the newbuilding market can be attributed to the technical superiority of ABS SafeHull. Owners of larger vessels, particularly tankers, continued to demand the more robust approach of SafeHull to structural strength.

## VESSELS CLASSED

During 2002, ABS classed 515 new, existing and reinstated ships and offshore structures totaling 8.9m gt. This included 384 newly built vessels aggregating 7.4m gt. Also accepted into ABS class were 64 existing vessels of 1.3m gt that were previously unclassified or classed with other societies and 67 vessels of 0.2m gt that had been previously classed with ABS.

The new vessels registered a slight decrease in gross tons over the prior year offset by a slight increase in the number accepted into class. Major components of the new vessels classed were tankers, bulk carriers and containerships aggregating 125 in number of 6.6m gt – up 15 percent

in number classed during 2001 but marginally smaller in terms of gross tonnage.

## VESSELS REMOVED

Removed from the ABS fleet of classed vessels during the year were 771 propelled and non-propelled vessels. Of these, 203 were withdrawn at the owners' request for various reasons. 87 vessels were scrapped and 481 were dropped for non-compliance with the ABS Rules. Among those dropped were 33 oceangoing commercial ships.

## CLASSED FLEET

Taking into account vessels classed and removed during the year, the ABS-classed fleet at the close of 2002 stood at 9,086 ships and offshore structures of 110.1m gt. In comparison to year-end 2001, this

ABS Share of Newbuilding Contracts by Country of Build

Japan	18%
South Korea	24%
China	16%
USA	76%
Singapore	93%
Taiwan	76%

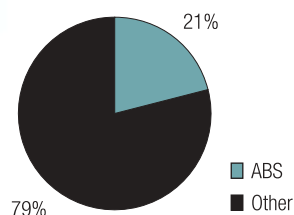




## ABS CLASSIFICATION ACTIVITY

### ABS Share of Worldwide Orderbook

percentages based on gt



Bulk Carrier	22%
Container Carrier	18%
Dry Cargo	9%
Ferry/Passenger Cargo	8%
Liquefied Gas Carrier	2%
Research/Survey Vessels	11%
Supply & Tug/Supply	23%
Tanker (Liquefied Cargo)	29%
Vehicle/Barge Carrier	12%
Other	11%

Source: LLP Databases  
Generally Vessels > 1000 GT

marks a gain of 1 percent in gross tons, but a loss of 2 percent in number. The gross tonnage figure marked a new record for tonnage worldwide to ABS class standards.

The dominance of tankers, bulk carriers and containerships within the ABS fleet can be noted from their accounting for 84.1m gt of the total. This comprised 2,070 vessels and represented a slight increase from the 2,051 vessels aggregating 83.4m gt, in class at the conclusion of 2001.

### NEW CONTRACTS RECEIVED

Contracts for the classification of new vessels were received at a brisk rate throughout 2002. By year-end the final tally amounted to 347 vessels of 5.7m gt, sufficient to ensure a continuing high level of shipyard activity by the society for the immediate future.

During 2002, ABS received contracts to class 98 new tankers, bulk carriers and containerships totaling 4.4m gt – compared with 2001 when the corresponding figures were 119 and 6.2m gt. The contract figures for all types of new vessels remained well ahead of historic ordering patterns of the previous decade.

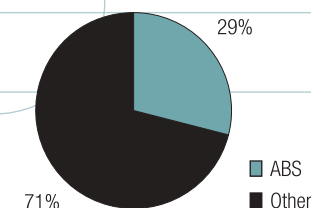
### ORDERBOOK

At the end of the year, the orderbook of ships and offshore structures contracted to be built or building to ABS classification was at 721 vessels of 15.3m gt in shipyards of 39 countries. This represents a marginal increase in gross tonnage, although the number of vessels decreased by 74 over the year-end orderbook of 2001. Within these totals, the mainstay of tankers, bulk carriers and containerships numbered 161 (9.8m gt), 45 (1.1m gt) and 58 (2.5m gt), respectively. In aggregate terms, these figures remained stable over 2001 performance, although there was a clear emphasis on increased tanker ordering coupled with weak demand for container vessels.

### TANKERS

Orders for new tankers received by ABS during 2002 reflected the replacement needs created by the upcoming regulatory phaseout introduced by IMO. In this period, ABS received contracts to class 69 new tankers of 3.6m gt. This represented a decrease from the previous year's activity of 10 percent in number and 22 percent in gross tonnage. Among the new tankers contracted were six VLCCS, nine suezmaxes, 14 aframaxs and 25 product tankers. These new contracts contributed to a year-end orderbook of 161 tankers of 9.8m gt for a growth

## ABS CLASSIFICATION ACTIVITY



of 23 percent in number and 21 percent in gross tonnage over the previous year.

During 2002 ABS classed 55 new tankers of 3.9m gt including: nine VLCCs, 18 suezmaxes, five aframaxs, and 20 product tankers. This rapid pace represented an increase of 34 percent in numbers and 8 percent by gross tonnage over the year 2001. By the close of the year, the ABS fleet of classed tankers stood at 927 of 46.8m gt, similar to the number and gross tonnage at year-end 2001.

## BULK CARRIERS

ABS classed 42 new bulk carriers during 2002 aggregating 1.5m gt, down from the 2001 figure by seven in number and 0.6m in gross tonnage. Among the new bulk carriers classed were five capesizes, 11 panamaxs, 11 handymaxs and 14 handysizes.

At the close of the year, the fleet of ABS-classed bulk carriers stood at 732 vessels aggregating 23m gt, a level comparable with that at the close of the prior year. Because of the dearth of new bulk carrier contracts received in 2001, the orderbook declined to 45 of 1.1m gt at year-end 2002.

## CONTAINERSHIPS

In 2002, ABS classed 28 new containerships of 1.2m gt representing an increase of 10 vessels over the prior year. Gross tonnage rose significantly as 15 of the vessels were of post-panamax size, up to 91,000m gt. This is consistent with ABS' reputation for expertise in the classification of the larger-size containerships. ABS has classed 29 percent of all existing post-panamax containerships on a gross tonnage basis.

There was a drop-off of new orders received in 2002, indicative of the over-ordering that had characterized the previous three years, skewing the demand-supply balance for these vessels.

## ABS Share of Tankers Newbuilding

*percentages based on gt*

VLCC	22%
Suezmax	52%
Aframax	32%
Panamax	27%
Product	13%
Chemical	25%



Reflecting this, ABS received contracts to class 15 new containerships amounting to 0.9m gt for declines of 14 in number and 0.2m in gross tonnage from 2001.

Nevertheless, strong deliveries created a respectable overall growth in the ABS-classed fleet of containerships. At the end of 2002, the ABS-classed fleet of containerships numbered 411 of 14.4m gt for increases of 4 percent in number and 7 percent in gross tonnage. However, the strong deliveries and the weak ordering undertaken during the year meant that containerships contracted or building to ABS class at the close of 2002 numbered 58 of 2.5m gt for a decrease of 7 percent in number and a slight decrease in gross tonnage.

### OFFSHORE

Within this period ABS classed 12 MODUs – including a column stabilized unit, an offshore installation and seven self-elevating units – as well as four single point moorings, an FPSO and 15 fixed installations. In addition, while classification work was proceeding on these various units, ABS was involved in reconditioning and rebuilding work on a number of classed units for employment in hydrocarbon fields worldwide.

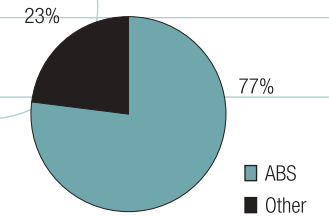
Throughout 2002 the vigorous rate at which the offshore industry enlisted ABS' services continued. Contracts were received to class 13 major structures comprising five MODUs, an LPG floating production and storage unit, a spar, three single point moorings and three fixed installations. At the completion of the year the orderbook showed nine MODUs, five fixed installations and 45 offshore supply vessels building or contracted to be built to ABS classification.

Year-end statistics show that ABS remained well ahead of all other class societies in the share of classed MODUs. These include a 53 percent share of semi-submersible units, an 88 percent share of drillships and an 87 percent share of jack-ups.

At the year's end, there were 521 mobile offshore drilling units (including 22 drillships) in ABS class. Offshore production installations classed and/or certified by ABS totaled 212 at year end, including 43 FPSOs, 13 tension leg platforms, 13 spar-based systems, 13 semi-submersibles and 130 fixed installations, as well as over 1,200 offshore supply vessels of various types (including crewboats) – all gains over 2001.



## ABS CLASSIFICATION ACTIVITY



### ABS Market Share Offshore Exploration Units

Jackups	87%
Tender	78%
Drillship	88%
Barge	71%
Arctic	100%
Semisubmersible	53%
Submersible	100%

VESSEL TYPE	Vessels in Class as of 31 Dec 02		Vessels on Order as of 31 Dec 02		New Vessels Classed During 2002	
	NO.	GROSS TONS	NO.	GROSS TONS	NO.	GROSS TONS
Barge	2,342	6,266,030	107	378,885	103	288,164
Bulk Carrier	732	23,039,388	45	1,093,525	42	1,454,454
Combination (Dry/Liquid)	13	499,549	0	0	0	0
Container Carrier	411	14,351,415	58	2,512,830	28	1,241,729
Dredge	46	105,808	3	2,790	1	4,898
Drill Ship	22	575,039	0	0	3	15,717
Dry Cargo	443	4,466,543	2	14,130	4	33,187
Ferry/Passenger Cargo	105	878,176	15	87,146	10	212,862
Fishing Vessel	24	40,133	2	644	0	0
Launch/Crewboat	259	40,549	26	4,408	17	5,118
Liquified Gas Carrier	70	3,010,506	6	422,599	0	0
Mobile Offshore Unit	499	3,776,378	9	84,899	2	14,802
Other	335	705,186	41	102,115	13	38,722
Passenger (Cruise) Vessels	60	498,970	36	306,788	0	0
Pipeline	5	0	0	0	0	0
Platform (Fixed)	130	70,463	5	4,745	15	0
Research/Survey Vessels	107	187,452	2	2,458	2	7,261
Single Point Moorings	37	0	0	0	3	0
Supply & Tug/Supply	958	803,810	45	114,832	16	31,577
Tanker (Liquid Cargo)	927	46,758,074	161	9,750,981	55	3,858,486
Tug	1,052	347,090	51	17,524	34	16,455
Underwater Vehicle	45	361	4	28	0	0
Vehicle/Barge Carrier	103	3,611,326	9	330,730	2	142,102
Yacht	361	90,601	94	25,448	34	7,489
<b>TOTALS</b>	<b>9,086</b>	<b>110,122,847</b>	<b>721</b>	<b>15,257,505</b>	<b>384</b>	<b>7,373,023</b>

# President's Message

## EXTENDING GLOBAL RISK LEADERSHIP

In 2002, ABS Consulting extended its position as the global leader in Risk Management. The company strengthened its lead by expanding its Risk Management Services to include Security Risk and by increasing its share of core markets. By adding Security Risk to its existing Natural Hazard and Operational Risk capabilities, ABS Consulting is able to offer an Enterprise Risk Solution in any time zone of the world.

ABS Consulting's strategy has been to maintain its focus on its core markets of government, and the oil and gas, nuclear, utility, transportation, chemical process and insurance industries and existing geographic regions. At the same time, we have expanded overall market share by leveraging our capability to handle the full spectrum of risks ranging from natural hazards to operational and security risks.

In support of this strategy, ABS Consulting consolidated its US Risk Consulting activities into one operating division and strengthened its international focus by creating one international division made up of Latin America, Europe/Middle East and Asia-Pacific regions. This alignment resulted in a more focused and responsive global organization whose revenue mix is 60 percent US and 40 percent international.

As a result of both the organizational restructuring and the sharper market focus, 2002 revenues reached \$130 million with US Risk Consulting revenues growing 14 percent and those of EQECAT by 30 percent. ABS Consulting ended the year with a full orderbook. Our team of 968 employees can be proud of what was accomplished in a tough global economic climate.



2002 was a year in which risk management took on a new meaning. Government and corporate management teams focused more intently on identifying those risks that can adversely impact their operations. These risks include natural hazards, such as hurricanes or earthquakes, operational issues and breaches in security. Executive teams are raising more and more questions about the most effective ways to estimate exposure and allocate resources: What do we have to do? How can we achieve a tolerable level of exposure? How can we best allocate loss prevention resources?

By adding Security  
Risk to its existing  
Natural Hazard and  
Operational Risk  
capabilities, ABS  
Consulting is able to  
offer an Enterprise  
Risk Solution in any  
time zone of the world

In 2002, ABS Consulting risk professionals helped organizations answer these questions and provided them with practical solutions for the management and mitigation of the identified risks. Examples of landmark projects worked on in 2002 show the breadth and depth of this activity.

These projects ranged from a vulnerability assessment to determine whether a nuclear plant could withstand the impact from an airplane, to blast analyses of selected Federal buildings in

Washington DC, to the next generation of risk-based safety and environmental standards. Our EQECAT team developed new terrorist risk models for the National Council for Compensation Insurance. And internationally, ABS Consulting continues the expansion of its operations around the world. With major projects in the areas of Risk Consulting, Environmental Risk Assessment and Asset Integrity Management for oil and gas, nuclear, utility, chemical process and transportation industries.

2002 also saw an increasing number of national governments embracing the principles of risk assessment as part of their new industrial development models. ABS Consulting is honored to have been selected as the partner of CCS (China Classification Society) Industrial Corporation in a new joint venture for the development and provision of risk management consulting services to that nation's rapidly growing energy, communication, transportation, civil engineering and chemical industries.



CHRISTOPHER J. WIERNICKI  
PRESIDENT & COO

ABS Consulting's leadership in risk management is a natural extension of the ABS Mission of promoting security of life, property and the natural environment. Our competitive advantage lies in our value proposition to our clients, and the engineering and technology investments that support this commitment.

Determining where to begin can be intimidating without a clear map. That is where ABS Consulting's experience, technologies and practical engineering-based solutions make the difference. We have a proven history of providing clear, analytical assessments that arm decision makers with the means to build comprehensive strategies for safeguarding life, ensuring the business continuity of enterprises, and protecting the environment.

We are proud of this charge and proud that we can make a difference.



# Year In Review



**2002** Industries, businesses and governments across the globe increasingly turned to ABS Consulting over the past year for assistance in assessing risks and managing their vulnerabilities through the development of rational, enterprise-wide solutions. The company aligned all of its risk service activities to better meet these market needs in a fully integrated manner.

As a consequence, ABS Consulting is firmly positioned to respond to the new risk landscape through the provision of clear, analytical assessment and effective risk mitigation programs focused on the safeguarding of life, the maintenance of business continuity, and the protection of the environment.

A landmark event was the agreement with CCS (China Classification Society) Industrial Corporation to form a new joint venture for the development and provision of risk management consulting services to that nation's rapidly growing energy, communication, transportation, civil engineering and chemical industries. ABS CCS Risk Management Consulting will be headquartered in Beijing, China.

The continued success of ABS Consulting can be attributed directly to the knowledge, skill and dedication of its worldwide team of risk professionals. Examples of innovative thinking and successful synergistic team effort can be found in countless endeavors during 2002. These range from traditional areas of expertise such as Natural Hazards and Operational Risk consulting, to the rapidly evolving area of Security Risk.

## NATURAL HAZARDS

ABS Consulting constantly seeks to leverage expertise developed in one sector to other associated areas with similar concerns. This was the case with the HAZUS Flood Model Development Project, which established ABS Consulting as a government contractor for the development of decision-support models required in the management of natural hazards. Developed for FEMA under contract with the National Institute of Building Sciences (NIBS) the HAZUS<sup>®MH</sup> Flood Model is part of a suite of nationally applicable loss estimation tools for wind, flood, and earthquake.

The HAZUS<sup>®MH</sup> Flood Model loss estimation methodology has been used by ABS Consulting to analyze the financial impacts of future development in flood studies for Mecklenburg County, North Carolina, Flood Insurance Rate Maps (FIRMs). The HAZUS<sup>®MH</sup> Flood Model allows ABS to provide clients with mitigation recommendations and to visualize alternatives for urban planning and growth management that best reflect current and future

floodplain management practices throughout the US. Interestingly, HAZUS<sup>®MH</sup> also now serves as a guide for integrating a company's existing and future security risk models into an *all hazards* decision-support tool.

The development and release of WORLDCAT-enterprise<sup>™</sup>, a new multi-user, client-server software platform, enabled EQECAT to gain significant market share in the important reinsurer segment and fueled revenue growth of 40 percent in 2002.

WORLDCATenterprise<sup>™</sup> enables global insurance organizations to use efficient centralized PC servers to support catastrophic modeling analyses by underwriters and accumulation managers located in offices throughout the world. End users access the system through simple internet browsers.

The product supports catastrophe analysis for earthquakes and windstorms in 88 countries. WORLDCATenterprise<sup>™</sup> has received outstanding market acceptance by primary insurers, reinsurers and reinsurance intermediaries worldwide.

EQECAT further strengthened its leadership in the provision of securitization, which structures natural hazards risks as securities that are sold to investors





in the capital markets. The securities, referred to as cat bonds, have the potential to greatly increase the amount of capital organizations have available to prepare to prepare for catastrophic risk, thus altering the cost of risk.

Risk consulting and structural engineering for potable water utilities produced very positive sales in 2002. In an excellent illustration of the internal emphasis on cross-functional teamwork, many of these contracts involved ABS Consulting experts in seismic risk assessments, security vulnerability assessments and design and multi-hazard risk assessments.

ABS Consulting was selected on a sole-source basis to perform seismic analysis of selected facilities at the Pantex Plant, which is operated for the US Department of Energy (DOE), by BWXT Pantex LLC. The subject facilities contain nuclear explosives and nuclear materials critical to national defense.

Contract activities performed by ABS Consulting included seismic analysis of steel building structures, soil-structure interaction analysis of heavy concrete and earth-covered structures, structure capacity evaluation, and seismic

walk-down screening of essential systems and components. BWXT Pantex will incorporate the seismic evaluation results in authorization basis documentation.

ABS Consulting experts also completed a seismic risk assessment for over 500 sites worldwide for a major pharmaceutical manufacturer. This assessment included recommendations for facility improvements and general risk management consulting. Following this review, the top 20 most vulnerable sites were visited, and more accurate estimates made of the probable maximum losses from a seismic event.

These contracts were in addition to the more traditional seismic assessments of the design of water facilities that continued their strong contribution to the company's performance. Major projects were undertaken in Salt Lake City and Seattle that involved risk analysis of existing treatment plants and reservoirs, and the design of seismic upgrades.



Multi-hazard risk assessments were undertaken for clients in Washington, Oregon and California looking at the risk associated with both natural and human-caused hazards. Multi-hazard risk assessment is an area that is developing rapidly as more and more organizations seek enterprise risk approaches for the assessment of their exposure.

## OPERATIONAL RISK

It is the ability to apply both technology and engineering expertise to the development of solutions for the mitigation of risk that distinguishes ABS Consulting within the market place. This capability is vividly demonstrated in the manner in which risk-based inspection and maintenance programs were developed for the offshore industry.

Detailed knowledge of the structural engineering of offshore assets continues to give ABS Consulting a unique advantage when developing appropriate risk strategies for these units. The organization used

these skills to perform inspection-planning projects for global petrochemical clients, covering a wide variety of assets including fixed base platforms.

ABS Consulting also reviewed a newly designed core for the Vanguard Submarine Nuclear Steam Raising Plant. Risk modeling of transient faults after certain initiating events was developed for the submarine's nuclear plant. The methodology consisted of developing event trees and supporting fault trees for existing models, write up risk models, request and input reliability data, and report results on core damage frequency, public risk and event importance and sensitivity.

And the company provided extensive support to the manager/operator of the US Department of Energy nuclear weapons complex in Oak Ridge, Tennessee, to assist them in meeting federal safety requirements.





Another area of engineering expertise in continued high demand was ABS Consulting's SafeHull Condition Assessment Program (CAP) for aging tankers. The ability to quickly and cost effectively undertake the advanced fatigue analysis that is at the center of the CAP service continued to differentiate ABS Consulting from other providers of CAP related services.

In Europe, projects included the Queensway Tunnel risk assessment in Liverpool and a review of the European Rail Traffic Management System (ERTMS). The Middle East experienced a significant growth in Risk Consulting and Asset Integrity Management capabilities with major projects such as the risk and integrity assessment of the Khafji Joint Operations (KJO) onshore and offshore facilities, PDO and NDO multiple safety case and integrity studies for their onshore processing, drilling and exploration assets as well as land rig transportation and supply camp operations.

In Saudi Arabia, where traditionally strong activity was supplemented by a multiyear contract with Saudi Arabia Basic Industries Corporation (SABIC), ABS consultants will provide courses in Process Hazard Analysis Leadership, Investigation Leadership, Procedure Writing, Management of Change, Mechanical Integrity and Process Safety Management overviews under this agreement.

The year also saw a further expansion of activity in Mexico. A total of seven ABS Consulting offices in the country positioned the company to attract contracts across all business lines. Notable success included a 60,000-hour risk assessment project for PEMEX Cantarell Field in the Campeche Bay in the Gulf of Mexico.

This project included extensive hazards identification, quantitative risk assessments (QRA), and safety integrity level/layer of protection analysis (SIL/LOPA) services, for the offshore operations. The importance of this activity is highlighted by the contribution of the Cantarell



Field to the Mexican economy. It produces 1.5 million barrels of oil per day (BOPD), equivalent to almost half of the nation's total daily oil production capacity.

Leveraging this high profile work, ABS Consulting conducted an International Risk and Reliability Conference in Merida, Mexico. The success of this event will lead to a threefold expansion of these activities in 2003 to include Reliability-Centered Maintenance (RCM), Risk-Based Inspections (RBI) and Facility Security issues.

Other ABS Consulting experts worked with PEMEX Drilling to develop and implement an environmental management system for PEMEX Onshore and Offshore Drilling Operations in Mexico.

The past year also saw a significant expansion of ABS Consulting's already robust presence in Brazil. Activity included a contract for Agência Nacional do Petróleo (ANP), Brazil's national oil agency, for the development of draft operational safety models







and regulations for the Brazilian upstream (offshore) and downstream (refineries, terminals, and pipelines) oil sectors.

To reflect international best practices, project leaders visited more than a dozen regulatory agencies in seven countries and participated in several international workshops with hundreds of participants from industry, government and academia.

2002 also saw the commencement of a five-year Integrated Engineering Management contract with Petrobras to provide a variety of services to 20 offshore units. ABS Consulting is helping Petrobras establish and implement Change Management Controls for all modifications to ensure that all statutory regulations and class requirements are identified and complied with in the early stages of the project. The ABS Consulting Rio de Janeiro, Macae and Salvador locations currently provide a staff of more than 25 for this multi-million dollar contract.

One of the most interesting projects was undertaken by ABS Consulting's Tokyo office. It required a risk assessment of Abandoned Chemical Weapons (ACWs), left in China following World War II. This is the first such risk assessment ever performed on abandoned weapons that were stored.

The very nature of these weapons calls for great expertise and care. A memorandum of understanding between the governments of China and Japan stipulates that the weapons be destroyed in China rather than risk moving them from the country. An ACW office was established in China within the Prime Minister's office from which to implement the project.

## SECURITY RISK

The emerging demand for security risk assessment presented ABS Consulting with its greatest challenge during 2002. ABS Consulting responded to this demand by expanding existing capabilities and, by developing innovative risk-based services

and software that responded to the new, more ominous realities. The response was the rapid formation of teams of security risk specialists from many different backgrounds in related engineering sub-disciplines as well as experts in law enforcement and emergency response.

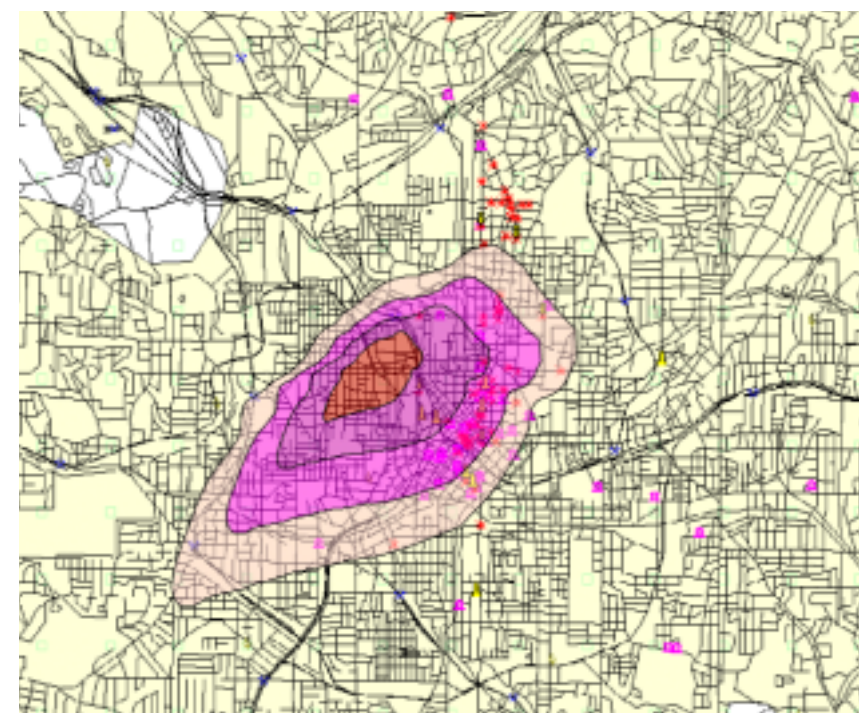
A selected list of our 2002 security risk management activities in the government and private sectors includes extensive work with the US Coast Guard, consulting with the US Transportation Security Administration on multi-modal security risk applications, the development of chemical plant and refinery security vulnerability assessments, water treatment facility security vulnerability assessments, nuclear power facility security risk management applications, and explosion vulnerability assessments for buildings controlled by the US Government Services Administration.

Other vulnerability analyses and security risk management projects undertaken during the year

included a contract to support the US Defense Threat Reduction Agency's (DTRA) Alternative Terrorist Weapons Program. As the range and sophistication of terrorist weapons has expanded to include more powerful weapons of destruction, so too must government widen its understanding and response planning.

2002 saw significant demand for modeling and consultation with respect to weapons of mass destruction. This included analyses of a range of mass casualty attack scenarios for an international financial services client located in New York City. The scenarios considered chemical, biological, and nuclear (CBN) weapon attacks in the New York metropolitan area.

ABS Consulting's MIDAS-AT software was used for many of the CBN scenario analyses. Consultants helped examine the consequences of an attack to metropolitan environments, on less-dense building environments, and at certain key locations such as tunnels and overpasses.



The threat of terrorism, and government and industry's concern regarding its possible impact on buildings and facilities, prompted ABS Consulting to dramatically increase its blast assessment activities during 2002. Projects in 2002 included



several high profile facilities in the Washington DC area and in New York City. And, a significant new market developed in assisting architectural, engineering and construction firms address new US Department of Defense criteria for Anti-Terrorist/Force Protection.

Research and development continued to be a strong component of blast consulting work in 2002 and included a high-profile project to design and test a blast resistant window retrofit for a 41-story federal office building with more than 7,000 windows.

EQECAT consultants developed a terrorism model that covers threats due to blasts as well as nuclear, biological, chemical and radiological risks. The terrorism model has since been expanded to include property loss estimation in addition to workers compensation. The model was used to develop the terrorism rate component of Worker Compensation Insurance for rate filings made in 37 States in the US. This innovation is expected to be an important source of new revenues in 2003 and beyond.

The heightened security emphasis also extended to nuclear power facilities, where ABS Consulting was called upon to develop threat scenarios, determine vulnerability and damage, and identify effective mitigation measures. Similar contracts were also received during the year from operators of chemical plants and pipelines.

Demand for security vulnerability assessments for water utilities grew rapidly in response to post 9/11 recommendations from the US Environmental Protection Agency. ABS Consulting conducted or provided support for 11 of these projects in Washington, Oregon, California, Utah and Pennsylvania. Security vulnerability activities can be anticipated to expand to the wastewater and electric power industries in 2003.

Intensified security risk consulting took on a particular maritime character as the US Government, local cities and governmental authorities paid greater heed to the risks associated with the ships and cargoes entering the nation's ports.



This was emphasized by the expanded consulting role undertaken for the US Coast Guard including the development of a Port Security Risk Assessment Tool. This effectively integrates best practices from a number of different strategies/tools under development at various Marine Safety Offices and takes into account federal agency guidance on security risk management.

ABS Consulting also developed a methodology and a user-friendly software tool to help the USCG's Marine Safety Office (MSO) Group in Charleston allocate its limited personnel and physical resources to the zone's most significant risks.

Another project required close collaboration with USCG personnel in the development of a risk assessment tool intended to help the agency's National Incident Command make the best use of key resources, while concurrently managing multiple incidents or threats of national significance.

As part of a larger project to integrate risk management principles into business planning, ABS Consulting personnel created a methodology for characterizing and managing port security risks within the Ports of San Diego and San Francisco.

## POSITIONED FOR THE FUTURE

In 2002, ABS Consulting aligned its organizational structure and supporting systems around a clear strategy to be the recognized global leader in providing risk management services. Our goal is to assist our clients in protecting their assets and ensuring the business continuity of their operations. Synergies were developed between business units and between worldwide offices that were designed to take advantage of the impressive range of expertise that exists throughout the organization.

This multi-disciplinary approach encouraged enterprise solutions that span traditional and emerging areas of risk concern. Based upon this progress, ABS Consulting closed the year well positioned to pursue emerging global Natural



Hazard, Operational and Security Risk. It is a strategy that draws on the entire range of skills and contacts, and which demands active sharing of technologies to better serve the enterprise needs of our clients.

# President's Message

## APPLYING THE HIGHEST STANDARDS

ABS Quality Evaluations continued to distinguish itself within the confines of a mature market during 2002. We were honored as the first registrar selected to audit to the new Responsible Care RC 14001 environmental standards for the chemical industry. And we were among the first to work with automotive manufacturers and suppliers as they adopted the new ISO/TS 16949 quality standards.

As a consequence, ABS QE is now working with a more diverse portfolio of clients and auditing to a wider range of quality, safety and environmental standards than ever before.

The core ISO quality and environmental management system standards – ISO 9000 and ISO 14000 respectively – continue to provide the two key foundation blocks for industries and businesses committed to the concepts of continuous improvement. However, new certification standards continue to be developed to meet the very specific needs of certain industries or business sectors.

The new Responsible Care RC 14001 environmental standard combines the American Chemical Council's well-respected Responsible Care Program® with ISO 14000 environmental standards to provide this sector with a widely accepted means of demonstrating the safe handling and operation of chemical-related businesses.

The same concept has also been adopted by the automotive industry. The new ISO/TS 16949 quality standard harmonizes existing automotive standards with specific requirements applicable to automotive manufacturers and suppliers. In 2002, ABS QE audited both manufacturers and suppliers to the new standards that demonstrate adherence to the highest, internationally recognized automotive quality standards.

To protect our reputation as one of the world's leading registrars we must continuously demonstrate our own adherence to the highest quality standards. In 2002, we undertook a comprehensive, independently administered customer satisfaction

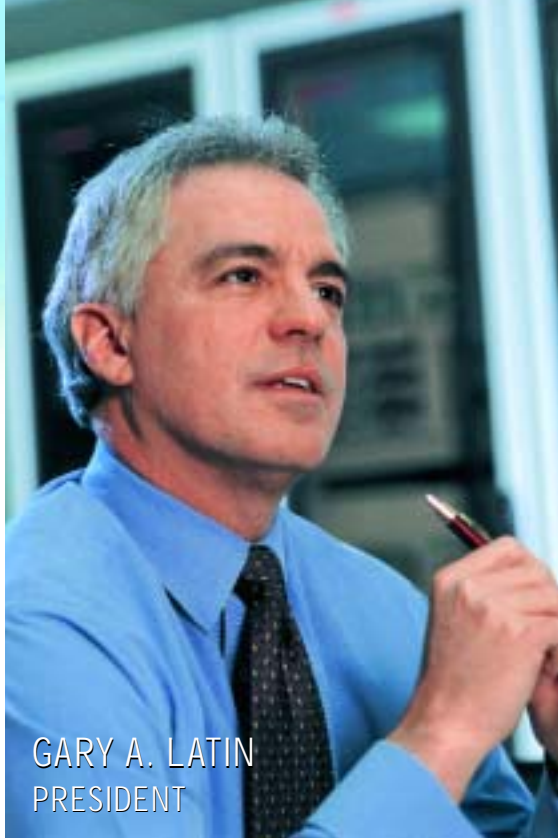


ROBERT W. GILMAN, JR.  
PRESIDENT

survey. We were pleased to receive a 97 percent overall customer satisfaction rating, yet this essential feedback also helped us identify areas for further improvement.

ABS QE clients continue to be guided by some of the most knowledgeable quality and environmental system auditors in the field. We believe it is our experience, professionalism and innovative approach that differentiate us from competitors. Whatever the desired goal of our clients, ABS QE provides the experienced auditing services needed for them to demonstrate adherence to the highest accepted international and industry standards.

# President's Message



GARY A. LATIN  
PRESIDENT

## HARNESSING INFORMATION TECHNOLOGY FOR GREATER EFFICIENCIES

2002 was a period of continued sustained growth for ABS InfoLink. Since its formation in 1996, the company has proven to be a creative and cost-effective business structure for meeting the Information Technology (IT) needs of ABS, its affiliate companies and clients worldwide.

The hub of development activities is the organization's Offshore Center in Kolkata, India. A staff of nearly 200 engineers, developers and programmers

work to create IT solutions and to anticipate the software needs for the marine market and other industrial business sectors.

A key activity for InfoLink is support for the ABS SafeNet Survey Status program. A number of significant new features were incorporated into the web-based application, Version 3.0, released in 2002.

Another major project undertaken in 2002 was a pilot engineering drawing storage program. Appropriate software was developed and thousands of drawings scanned in high resolution to create a sophisticated collection of structural diagrams.

From the outset, the ABS SafeShip lifecycle integrity management system has relied heavily on the software development resources of InfoLink. In 2002, a significantly expanded Version 2.0 of the Hull Maintenance module was released.

ABS Nautical Systems (NS), a majority-owned subsidiary of InfoLink, strengthened its position as one

of the leading providers of software for the marine and offshore industries.

Particularly gratifying for NS in 2002 was the growing recognition for its Structural Maintenance module by the offshore industry, as these operators' increased emphasis on implementing effective asset integrity management programs.

The marine industry continued to validate the unmatched expertise of Nautical Systems by awarding more than 20 new contracts throughout 2002 from clients in Europe and North America.

Industry recognition came with the prestigious Seatrade Award for New IT Application for the Shipping Industry for SafeNet ChemSTOW.

With the growth of ABS Nautical Systems, and ongoing demand from ABS and ABS Consulting for sophisticated IT methods, 2003 promises to keep the dedicated professionals within ABS InfoLink enthused, challenged and busy.



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