

World Fleet 38%  
Bulk Carrier 37%  
23%  
37%  
38%  
34%  
37%  
27%  
28%  
24%  
24%  
2001  
2002

# RAISING THE SAFETY BAR

**ABS**

ANNUAL REVIEW 1999





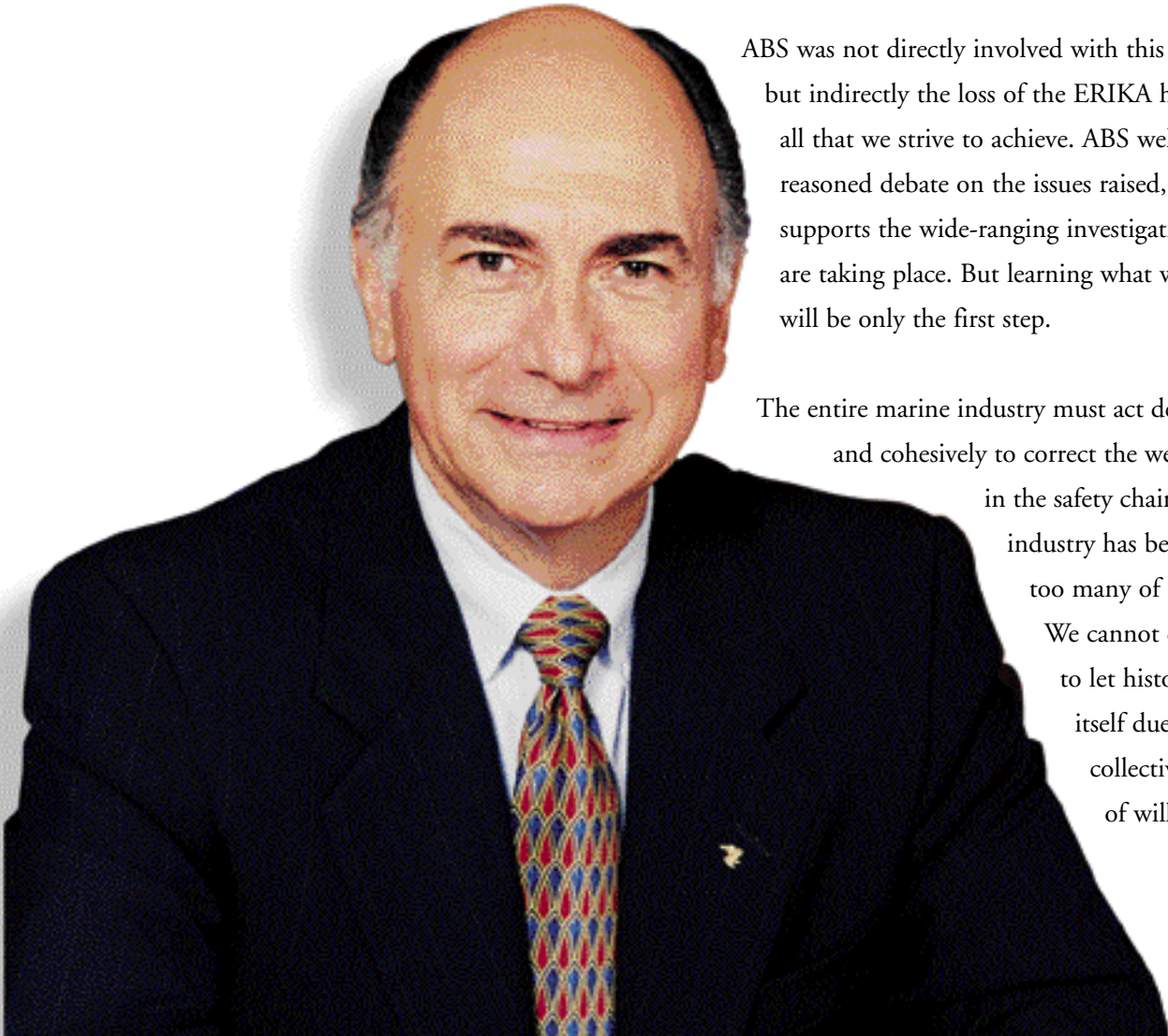
**T**he only  
alternative to  
strong self-regulation  
is strong government  
control



## **ERIKA in perspective.**

The sinking of the 25-year-old product tanker ERIKA has reminded the world once again of the devastation that can remain after a marine incident. Fortunately in this case there was no loss of human life, but there was and will continue to be severe damage to the marine environment.

This casualty has reflected badly on all of us in the marine classification profession. When a vessel goes through a special survey and its class certificate is renewed, the world expects this vessel will be able to operate safely for an additional five-year period. When, after only eighteen months, as in the case of the ERIKA, the vessel suffers a massive structural failure and sinks, the governments and citizens of the world have a right to ask "What went wrong?" This is a legitimate question. It demands a full and open answer for certainly, something did go wrong.

A portrait of a middle-aged man with thinning hair, wearing a dark suit, white shirt, and a colorful patterned tie. He is smiling slightly and looking towards the camera.

ABS was not directly involved with this vessel, but indirectly the loss of the ERIKA has tarnished all that we strive to achieve. ABS welcomes reasoned debate on the issues raised, and supports the wide-ranging investigations that are taking place. But learning what went wrong will be only the first step.

The entire marine industry must act decisively and cohesively to correct the weaknesses in the safety chain. The industry has been through too many of these cycles. We cannot continue to let history repeat itself due to a collective weakness of will.

# RAISING THE SAFETY BAR

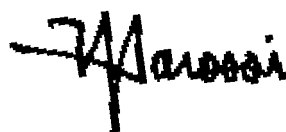
Some suggest that the public interest can only be protected by placing classification societies under government control. Those who harbor this view fail to understand that many classification societies have been, until quite recently, under direct government control. A few still are. RINA, the society classing the ERIKA through its last special survey, was under direct government control until only a few months ago. Government control is clearly not the panacea imagined.

The paramount issue, which must not be lost in this critical debate and which the marine industry must face up to, is “Can this industry muster the courage to support a strong self-regulating process?”

The time for the marine industry to become intolerant of the substandard in its ranks is already long overdue. Industry associations such as Intertanko, OCIMF, Intercargo and the ICS must make themselves heard. There is only one alternative to strong self-regulation — strong government control. We believe this alternative is unacceptable.

ERIKA is unfortunate in one other respect. It represents a very high-profile failure of an industry which otherwise has been making a steady improvement in both the safety and the environmental impact of its operations. Regardless of the source of the statistics, or the safety or environmental factor being considered, the marine industry has been improving its performance.

This annual review highlights this important fact. But, in spite of the progress being made, ERIKA challenges all of us to continue raising the safety bar. ABS is committed to taking a leading role in this endeavor.



Frank J. Iarossi  
Chairman

**The marine industry has improved its safety and environmental performance... but, ERIKA challenges all of us to continue raising the safety bar**





rotecting people,  
property and the  
environment



# IMPROVING OUR RECORD

**IN MAY 1999**, the US Coast Guard released its annual Port State detention statistics. These include a detailed report on classification society performance.

## ABS/USCG Port State Performance

	Vessel Arrivals	Class-Related Detentions	Ranking
<b>1996</b>	970	6	2*
<b>1997</b>	989	4	2**
<b>1998</b>	968	3	1**

\* Reflects 2-year Average  
\*\* Reflects 3-year Average

Source: USCG

It is a matter of pride to every member of the Bureau that, for the first time, the US Coast Guard ranked ABS as the classification society with the best record over the three year period measured. We believe this ranking is a clear public validation of the enormous efforts that have been made to improve the manner in which we inspect ABS-classed vessels and enforce the safety standards contained within the *ABS Rules*.

These efforts have been wide-ranging. They have included a concerted training program for our global network of more than 600 surveyors, specially tailored to enhance their professional knowledge and judgment. Our efforts have led to a tightening of our survey standards, particularly the requirement that two surveyors attend safety equipment surveys on all vessels over 15 years old.

When necessary, we have instituted requirements that exceed IACS minimums as we believe that consensus decisions do not always adequately address serious operational issues.

It is for that reason that ABS has required the class surveyor to be in attendance during the taking of thickness gaugings. We are pleased that, in recent deliberations, IACS has now agreed to the wisdom of this approach and will introduce new requirements governing this procedure.

As evidenced by the Port State detention statistics, these

tougher ABS standards have led to a clear improvement in safety standards. But they are not enough. Our goal is a zero detention record and an unblemished safety record. More is constantly expected of this industry, and of class, by society and by governments. At ABS we expect it of ourselves.

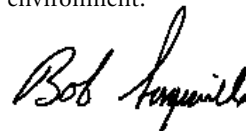
For us, the challenge is never ending. The recent loss of the tanker ERIKA has been a reminder that, despite the vastly improved safety record of the international marine industry, further improvements can and must be made.

ABS has taken a leadership role in developing these standards. We have called for tougher survey standards for older vessels since there is overwhelming evidence that older vessels are at greater risk from the cumulative effects of fatigue and corrosion. We have called for greater transparency of information, particularly at the time a vessel changes class. And we have issued warnings that intense competition between shipyards

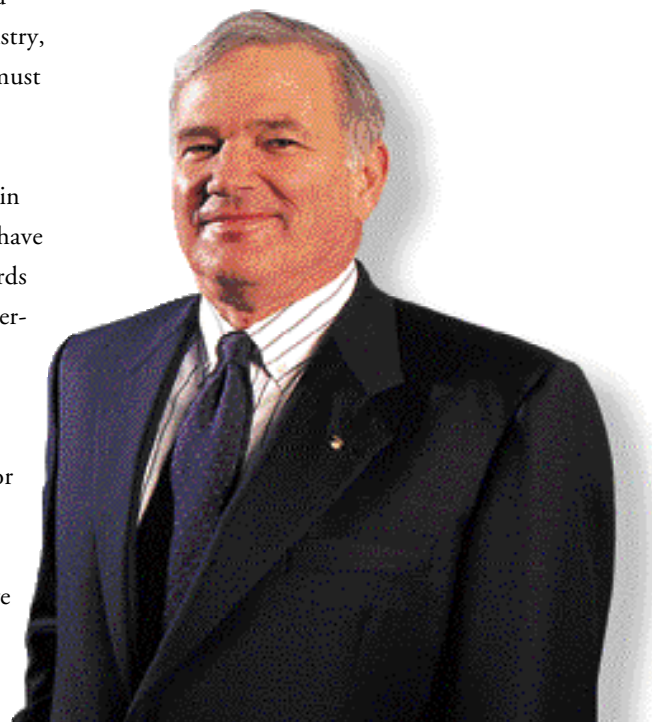
is creating a new generation of light scantling, short-life ships.

At ABS we are committed to the concept of continuous improvement. It is a philosophy that stretches far beyond our own administration and organizational efficiency. It shapes everything that we do. It guides the actions of every member of our worldwide staff. By every statistical standard, this industry operates more safely and more responsibly than at any time in its history. But there are still many areas in which further advances can be made.

In 2000 and beyond, ABS has pledged itself to the development and implementation of new standards that will further improve the safety of life, property and the marine environment.

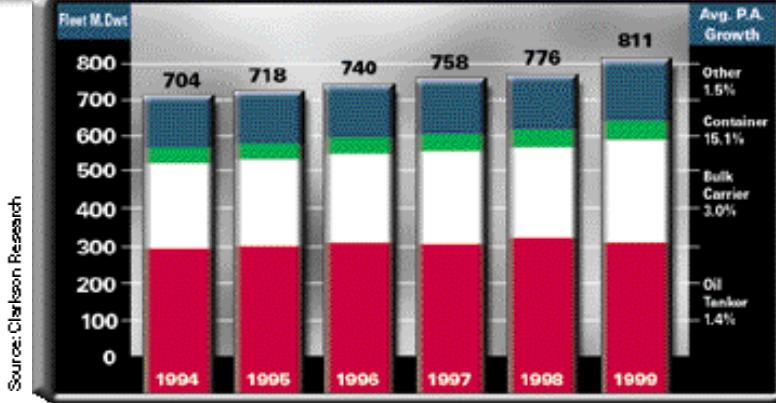


Robert D. Somerville  
President



## World Fleet - All Cargo Ships

2.9% Average Annual Growth



**Ships are larger, faster and more complex than ever before, yet overall loss statistics for ships and cargoes show steady improvement**

the professional classification society; the conscientious underwriter.

The other is the darker image shaped by the substandard owner, the Flag State more interested in revenues than responsibility, the classification society too eager to accommodate the wishes of its clients, the underwriters, charterers and financiers who measure their exposure in the dry statistics of their ledgers. This is the image presented to the world when the next, inevitable casualty hits the headlines.

Ours is an industry defined by the irresponsible minority. To the govern-

## THE MARINE INDUSTRY

presents two faces to the world. One is the acceptable face of the responsible operator; the quality register;

sibilities. Increasingly, the public response is one of outrage, coupled with attempts to impose well-meant, if often damaging unilateral regulation. Each time, the responsible members of the industry react defensively, attempting to deflect such external government intervention.

This repetitive cycle encapsulates the challenge confronting those who choose to ply their trades within the shipping business. It is a two-fold challenge.

The industry is not accurately reflected in this darker depiction. There is a positive story to tell, one which encompasses enormous improvements in its safety record and accountability. And there is the challenge of identifying and implementing further improvements that will lessen the risk of casualties that threaten life, property and the natural environment.

ments and citizens of nations whose coastlines have been soiled, ours is an industry hiding behind multiple corporate veils, operating from remote, incompetently-administered tax havens.

Our industry is believed to

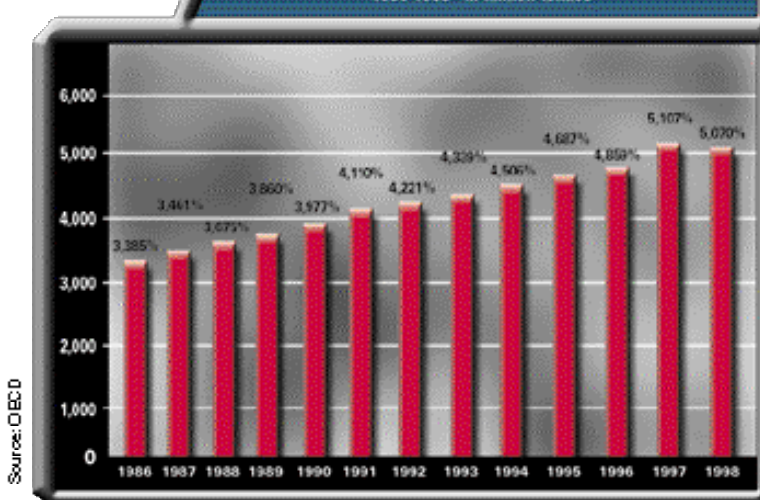
Better than 99.8 percent of all the ships in the world trade safely. More than 99.9 percent of all oil carried by sea is delivered without incident. The world's fleet continues to grow in number and tonnage, world trade continues to increase year-on-year, the total tonne miles of cargo moved remains on a steady upward trend. Ships are larger, faster and more complex than ever before. Yet overall loss statistics for ships and cargoes show steady improvement.

This is the unwritten and unread history of the industry. It is peppered with success stories. These include

be willing and able to dodge safety standards and attendant respon-

## World Seaborne Trade of Main Bulk Commodities in Terms of Tonnage

1986-1998 - in million tonnes

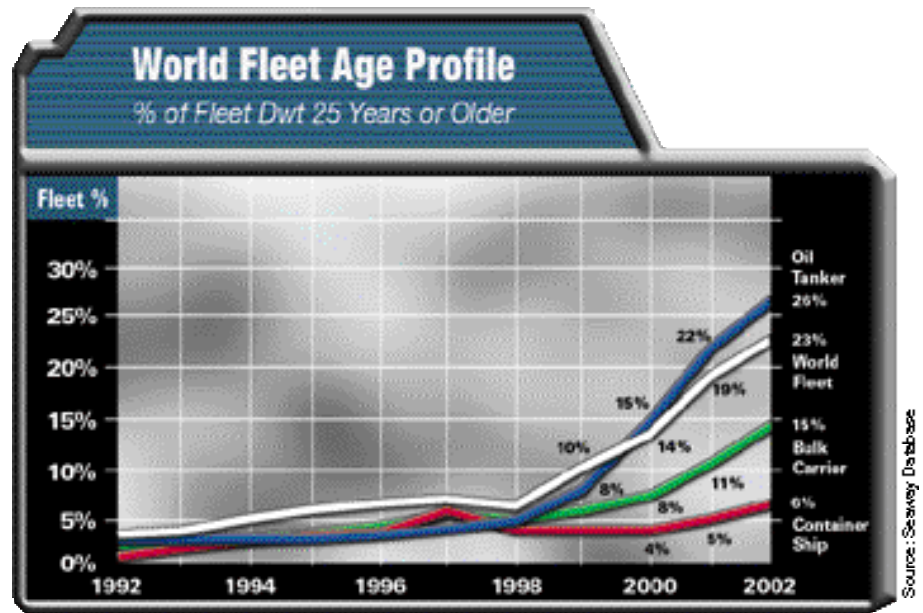


# A RECORD OF IMPROVEMENT

improvements in technology, such as ABS SafeHull, that assist designers to develop stronger, safer hull structures. Equipment and machinery is now more reliable, more capable and often smarter than before. There have been significant changes in the manner in which the fitness for purpose of vessels is assessed through the application of enhanced survey programs. Safety standards have been advanced through the efforts of conscientious Port State inspection regimes. And management systems have been implemented through the progressive phase-in of the ISM Code requirements. There are many others.

These improvements provide just cause for satisfaction. But they are no more than stepping stones on the path towards respectability, responsibility and accountability for the industry. There are danger signals in every direction. The average age of the world's fleet continues to climb. The statistics are clear. Older ships are at greater risk. They demand more maintenance, closer inspections, and better judgement.

Fractures and failures of ship structures occur too frequently for shipyards, classification societies or owners to claim unalloyed confidence in their design and construction. The high tensile steel, light scantling fleet of 1980s built tonnage is approaching a critical period of operation in which the cumulative effects of corrosion and fatigue will become apparent. Once again shipyards are competing



vigorously on the basis of reduced steelweight rather than robustness of design.

## Once again shipyards are competing vigorously on the basis of reduced steelweight rather than robustness of design

The quest for lighter, faster, larger craft — whether high-speed passenger ferries or the largest container-ships yet envisioned — continue to push technology into uncharted areas in which empirical experience can be no more than a guide.

And watching these developments are governments whose patience has worn thin, eager to impose standards if the industry shows itself reluctant to regulate itself.

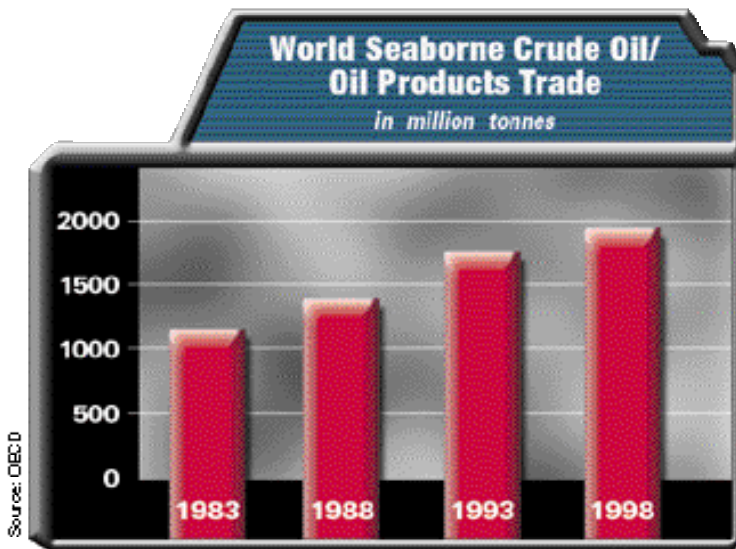




# A 0.001 PERCENT FAILURE RATE IS NOT ACCEPTABLE

**BY ANY RATIONAL STANDARD**, the international tanker industry does a remarkable job of transporting the world's primary fuel source safely and delivering it without incident. This is a silent service, routinely conducted out of the public's eye until....

oceans each year. Figures from the International Tanker Owners Pollution Federation confirm that most spills from tankers are less than seven tonnes in volume and result from routine port operations such as loading or discharging cargo or bunkering.



**More ships are carrying more oil, more safely than at any time in history**

action, legislators impose further strictures on the manner in which tankers can be built and operated. Lost in this reactionary flurry is the positive record of this vital maritime sector.

The number and severity of oil spills has declined precipitously over the last twenty years, despite the fact that the volume of oil being moved by sea has steadily increased, as has the

size of the tanker fleet. More ships are carrying more oil, more safely than at any time in history.

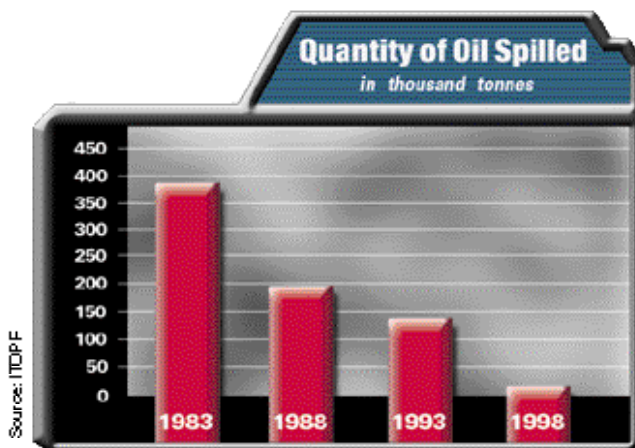
Moreover, tankers are responsible for a smaller and smaller share of the total oil entering the world's

The number of major spills, classified as those over 700 tonnes, has decreased significantly in recent years. And of those, relatively few occur in sensitive coastal areas and have any direct impact on the environment or local economies.

Yet, when a high profile incident does occur and the spotlight shines afresh on the industry, it is common for one or more glaring shortcomings to be highlighted. When a 25-year-old tanker breaks in two off a densely populated coast, the industry as a whole must accept that it is not yet doing everything that it can to minimize the risks associated with transporting oil.

Class cannot be excused from among the blameworthy. In those instances where structural failure is determined to be the cause of the accident, the whole of the classification profession, not solely the classification society of record, will be the target of criticism and reform.

The loss of a 25-year-old tanker in late 1999 has re-energized a perennial debate over the safety of older tankers. It is universally acknowledged that ownership is the single most important factor in determining the condition of a ship. This point is eloquently made by





the responsible owners of such well-maintained tonnage.

But, as the arguments are made, one factor is inescapable. Older tankers are more likely to be detained by Port State Control authorities because of deficiencies; older tankers are more likely to suffer casualties; and older tankers are more likely to be actual or constructive total losses than younger vessels. This susceptibility to loss increases rapidly from age 15, accelerating once the vessel passes 20 years of age and beyond.

Such statistics demand that classification societies, among other bodies, re-evaluate the manner in which they establish and enforce standards for tankers over 15 years of age. But there is added urgency attached to such a re-evaluation. The world's tanker fleet is old and growing older by the month.

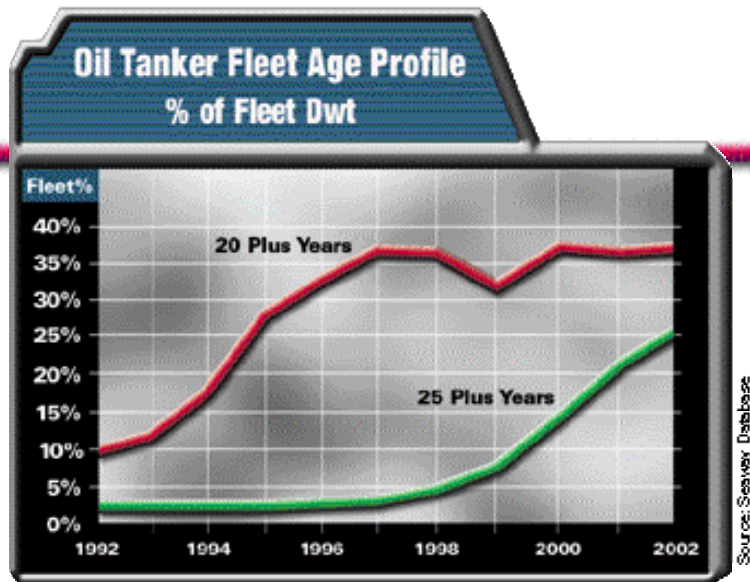
Despite a feverish pace of ordering for new tankers of all size ranges, projected deliveries will not reverse this aging process. By 1999, one-third of the tanker fleet was more than 20 years old. By 2002, this figure is projected to rise to 38 percent. More significantly, 26 percent of the tanker fleet will be 25 years of age or older by 2002.

At that time, excluding potential scrapping and losses, 165 of the current vlcc fleet will have reached or passed the 25 year milestone. Yet only 75 new vlccs will have been delivered to replace them. A similar pattern is demonstrated in each sector of the tanker fleet

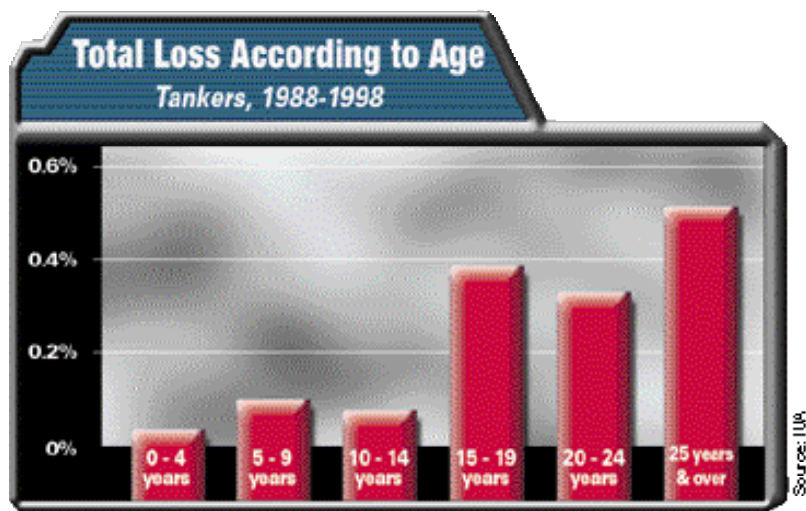
from suezmax to product tanker.

An old ship need not be a substandard ship. But an old ship is at greater risk. Not every one of these tankers will be under the care of a responsible owner, nor classed with a reputable society. It appears statistically inevitable that the number of tanker casualties will rise in the near term unless everyone with an interest in this sector, from charterers to underwriters, from Flag States to class agree to further tighten their requirements.

ABS is committed to such action. By using the power of ABS SafeHull during either a Condition Assessment or at the time of special survey, structural weaknesses can be pinpointed and addressed. Enhanced survey, closer oversight of thickness measurements, more targeted inspections of critical areas, such as ballast spaces adjacent to heated cargo tanks, and a more transparent approach to the sharing of information at the time of transfer of class will all positively impact the continued safe operation of these vessels.



**Older tankers are more likely to suffer casualties and are more likely to be actual or constructive total losses**

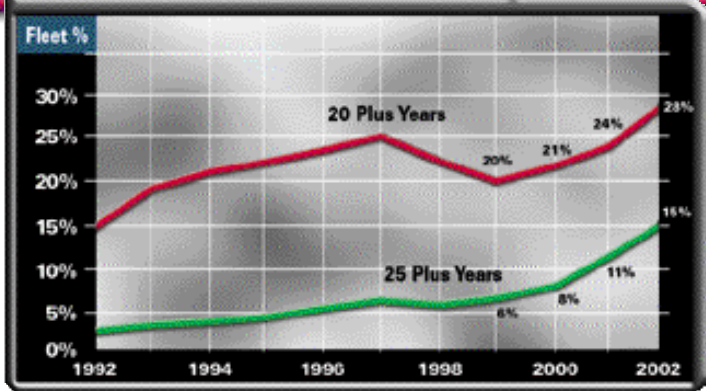




## Bulk Carrier Fleet Age Profile

% of Fleet Dwt 20 & 25 Years or Older

Source: Seaway Database



## The loss statistic for bulk carriers is now at its lowest level in a decade

bulk carrier fleet has experienced a 3 percent annualized growth rate through much of the 1990s. During this same period, the fleet itself grew at an almost identical rate as new-building deliveries offset withdrawals from scrapping or loss.

As a consequence, the age profile of the world's bulk carrier fleet has been in decline since peaking in 1997. At that time, 25 percent of the fleet, by deadweight, was aged 20 years or older. By 1999, this

percentage had dropped to 20 percent, yet the number of bulk carriers declared a total loss has spiked up during this period. Given that the prepon-

derance of bulk carrier losses occur in the over 20 years of age category, this apparent anomaly contains a more complex story.

One thread can be traced back to the spate of bulk carrier losses in the

late 1980s and early 1990s. The cause of many of those losses is now well known. Structural failure in the forepart of the ship when carrying high density bulk cargoes, particularly in the alternate hold configuration.

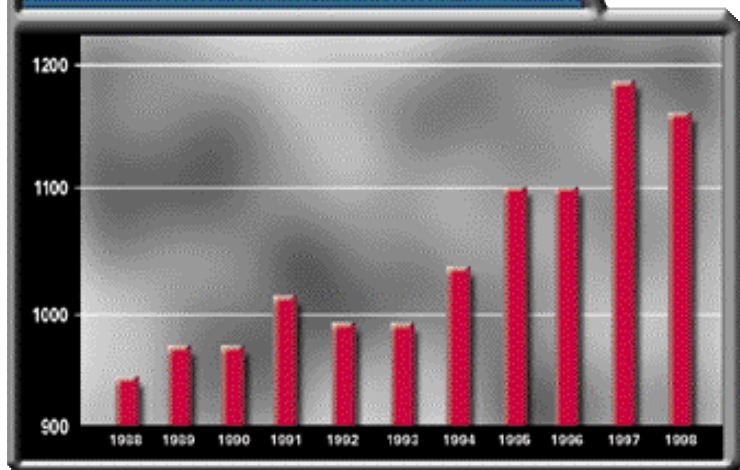
The wide-ranging investigation into these casualties by class led to the introduction of the enhanced survey program for older bulk carriers in 1993 and a measurable decline in losses. Further analysis led to specific unified class requirements for structural reinforcement that began to take effect in late 1996. Concurrently, Port State Control authorities increased their scrutiny of bulk carriers, further tightening the safety standards.

The positive result of these initiatives is evidenced in the loss statistics for bulk carriers as a percentage of the fleet expressed in gross tons. It is now at its lowest level in a decade, providing ample proof that a concerted effort to improve safety by all sectors of the industry, from IMO to Port and Flag States to class can have a dramatic impact.

Another thread to the story is woven from a breakdown of the different component parts of the bulk carrier fleet. Since 1994, the preponderance of new tonnage ordered and delivered has been capesize, panamax and handymax vessels, an indication of changing market demands. In each of these sectors there has been both significant fleet renewal and expansion resulting in the reversal of the age profile of the entire fleet.

## World Seaborne Trade of Principal Dry Bulk Commodities in Terms of Tonnage 1988-1998

Source: OCEC-D





# ESP TO PREVENT DÉJÀ VU

The lone exception to this pattern is the ubiquitous handysize bulk carrier. Throughout the 1990s, there was insignificant growth in fleet size and desultory ordering for replacement as owners turned to larger tonnage. As a consequence, the age profile of this sector continued on an upward trend, placing more and more of these vessels in the highest risk, 20 plus years old sector.

Although it is expected that handy-max and panamax vessels will replace a portion of the handysize fleet, it will be some time before this transition is effected. In the interim, 92 handysize bulk carriers will be more than 25 years of age in 2000. Just 33 such vessels are scheduled for delivery. In 2001 this 59-ship discrepancy between vessels past their fifth special survey and scheduled deliveries will jump to 191 vessels. By 2002, absent a rush of new orders, this gap will have widened to 424 vessels.

By contrast, throughout this same period, more capesize and panamax vessels are scheduled for delivery than will reach the 25-year barrier, and handymax vessels will largely maintain balance.

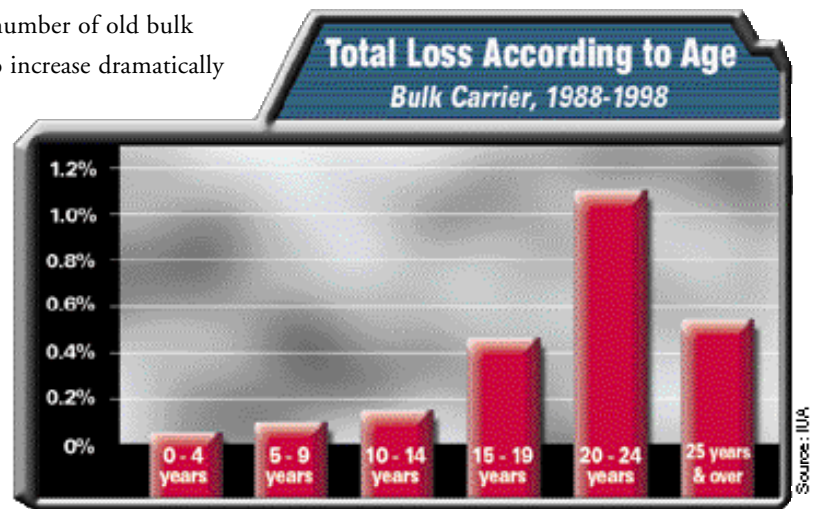
The impact of the aging of the handysize sector on the whole bulk carrier fleet age profile is dramatic. The short-term downturn of the last two years has already been reversed. By 2002 an estimated 28 percent of the bulk carrier fleet, in terms of dead-weight, will be over 20 years of age.

The juxtaposition of the two statistical profiles provides a clear

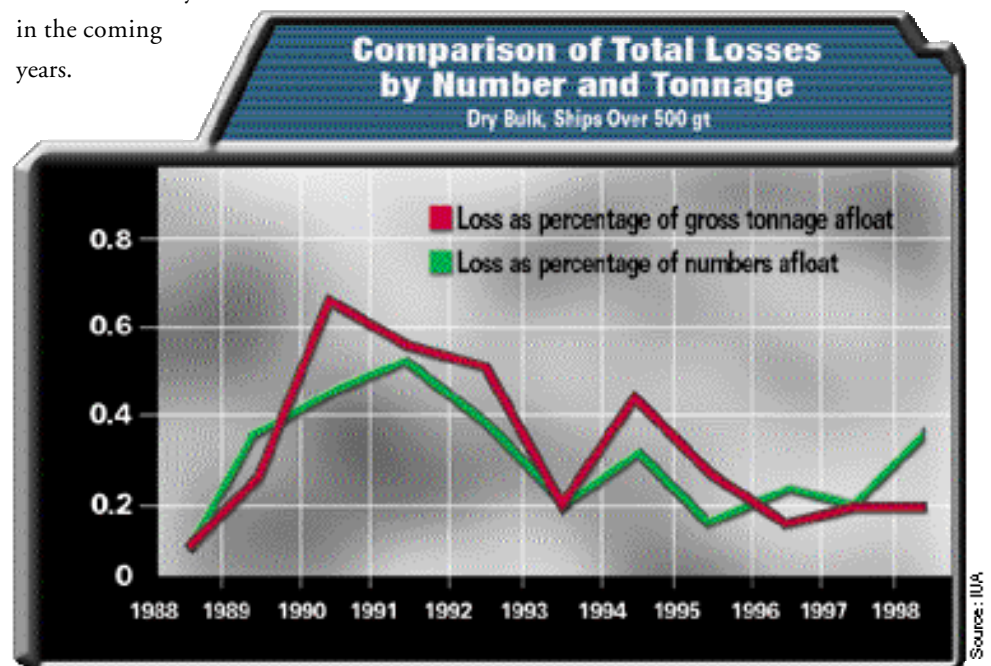
warning. The number of old bulk carriers is set to increase dramatically over the next three to four years. And the incidence of loss of bulk carriers begins to rise after age 15 and spikes sharply after age 20.

ABS has responded by tightening our survey requirements for older bulk carriers, raising our standards, and applying the most advanced SafeHull technology to make bulk carrier structures stronger and safer.

But neither ABS nor class can do this alone. Unless every sector of the industry accepts that it has a responsibility to review and improve its approach to safety, more old bulk carriers will be lost unnecessarily in the coming years.



**The impact of the aging of the handysize sector on the whole bulk carrier fleet age profile is dramatic**

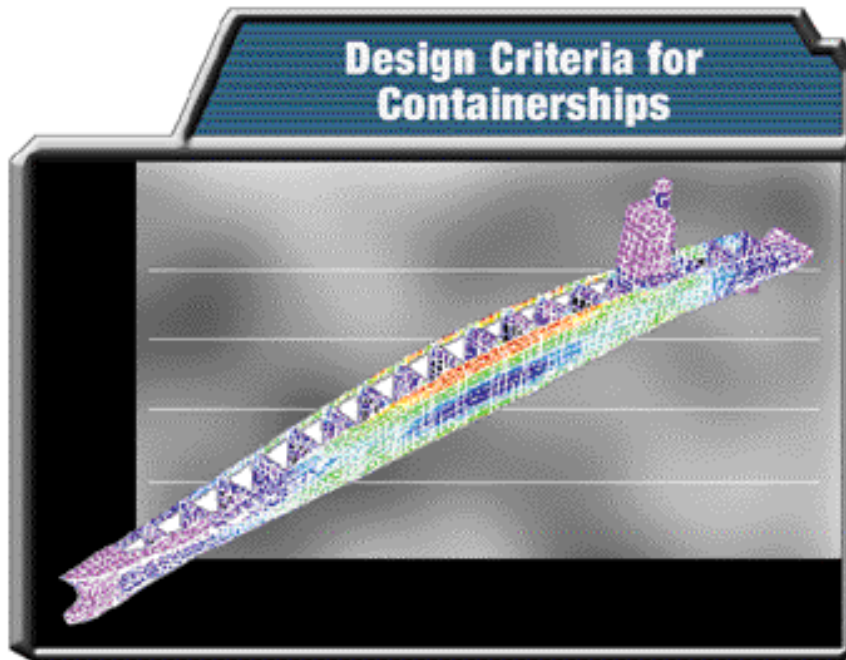




# SPEED, SIZE AND SAFETY

**SIZE IS VIEWED** by many container-ship operators as the key to future success. Speed, when coupled with size, offers enhanced productivity. Combined, these operational demands are pushing design tech-

for vessels able to carry in excess of 6,000 teu are increasing and it is projected that 10,000 teu and larger ships will be built in the future as economy of scale becomes the dominant operational factor.



**Operational demands are pushing design technology into new areas in which there is no service experience**

nology into new areas in which there is no service experience. If the industry is to steer a clear course, rational criteria and risk-based assessments will become essential tools in shaping future safety parameters.

Five years ago, the container-ship newbuilding market was dominated by orders for traditional panamax-sized vessels and smaller. Orders for these vessels outstripped post-panamax orders by a 5:1 ratio. By 1999, the dominance of the larger vessels was secure with 375,000 teu of post-panamax tonnage on order compared to just 205,000 teu of smaller vessels.

This trend towards larger ships shows no sign of abating. Orders

Until now, containership design has been based on a semi-empirical approach. The design of components has been based on simple formulations that have evolved over time. However, many of the structural design features of modern large containerships fall outside the experience base of the prescriptive rules of classification societies. This means that a new and more scientific approach, based on engineering first principles, is required to develop the strength of ship structures if the risk of structural failure is to be minimized.

This new approach is embodied in the ABS SafeHull System for Containerships. It is defined by its innovative approach to structural load criteria and particularly its ability to explicitly define the dynamic component of the total load, without requiring the complex analysis of a full Dynamic Loading Approach (DLA).

All container vessels are characterized by large deck openings. In post-panamax vessels this feature is particularly pronounced. For such configurations, the evaluation of torsionally induced longitudinal warping stresses is critical to the development of a successful design.

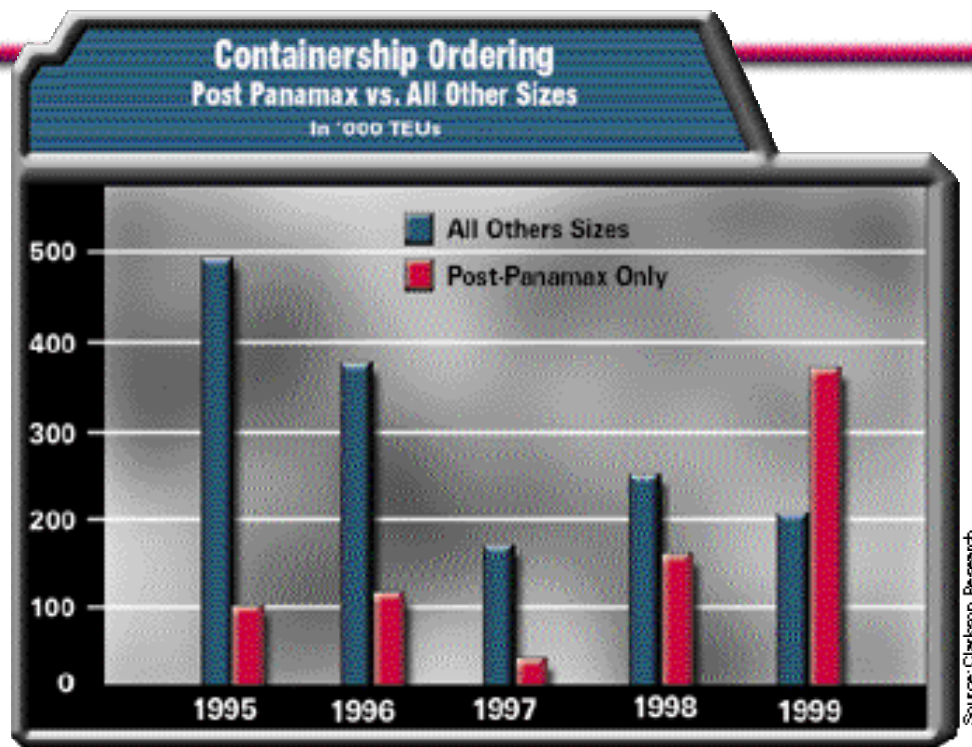


Distortion of hatch openings is another critical concern. The combination of hull girder vertical and horizontal bending, torsional twisting and large deck openings are all factors contributing to this distortion. The distortion of hatch openings also influences the stress distribution in transverse structures and hatch corners.

Fatigue strength of the hatch corners is also a prime design consideration.

Additionally, the dynamic loads resulting from bow flare impact, bottom slamming and green water loads on the fore end of a container-ship can be substantial and are accentuated by increases in service speed. These impact loads should also be considered in the design of the bow structure. ABS studies on bow flare impact loads show that, for the full load condition, increases in dynamic bending moment can be as much as 25 percent for ships with large bow flare. Other studies of bottom slamming carried out by ABS indicate that increases in dynamic bending moment amid ships can be as high as 15 percent.

SafeHull's complete definition of total load, including explicit dynamic components, with a rational and consistent approach to acceptance criteria, allows the system to place strength to meet a realistic demand distribution. The analysis can improve the design by redistributing material within the vessel without significantly changing the overall steel weight.



Source: Clarkson Research

As the industry struggles to determine appropriate design and strength criteria for this new generation of very large, very sophisticated vessels, ABS has developed a thorough, rational and unique approach that designers can use to develop stronger, safer ships without any constraint upon the size of the vessel.

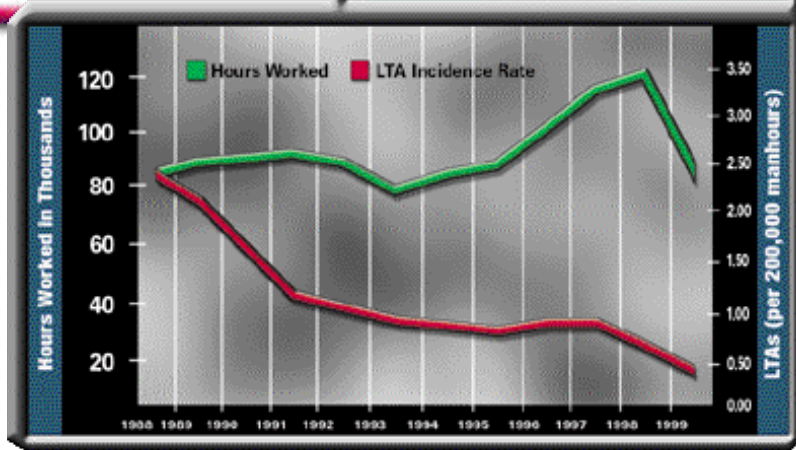
It is a further example of the commitment that ABS has made to raising safety standards within the marine industry, framed by pragmatism and solidly rooted in advanced technology.

**ABS has developed a thorough, rational and unique approach that designers can use to develop stronger, safer ships without any constraint upon the size of the vessel**



### Lost Time Accident Incident Rate & Hours Worked in Drilling (Worldwide Offshore)

Source: IADC



**TO BE EFFECTIVE,** the process by which safety standards are established and maintained must be

both flexible and pragmatic. For many years the trusted method of rule-making was prescriptive, based on empirical evidence and practical experience. Within the offshore sector, where new technology keeps pushing the industry into areas where there is no direct experience to rely on, alternative approaches to safety assessment are an essential component of development.

## Responsibility for safe operation is placed firmly on the shoulders of the operator

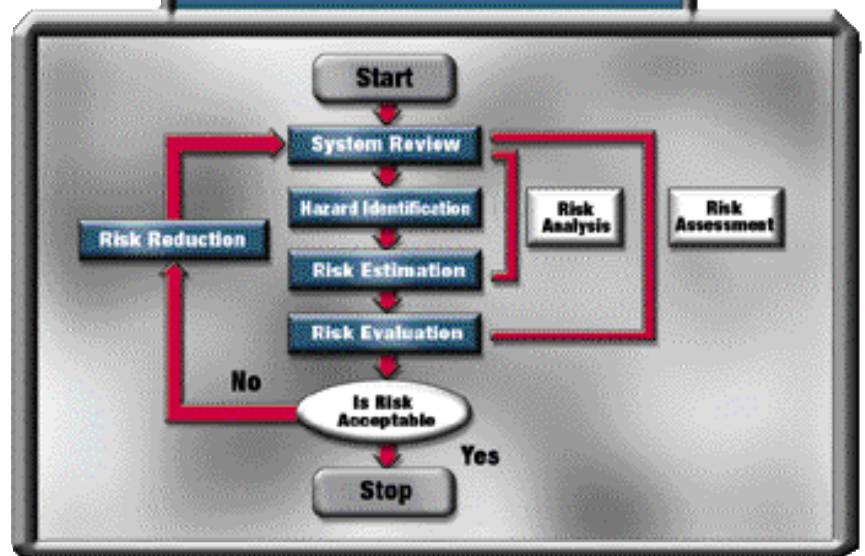
This is particularly the case with deepwater development where more sophisticated technology and greater technical expertise is needed. One approach that is commonplace today is risk management. Designers, operators and owners may use a variety of

techniques including risk assessment, both qualitative and quantitative, scenario based design, and cost benefit analysis (CBA). To evaluate a facility as a whole entity, a safety case or asset risk management approach may be taken. Regardless of the techniques employed, the overall goal of risk management is the same: to reduce risk, using objective criteria, to as low as reasonably practicable (ALARP).

What is notable about these alternative approaches to safety is that they bring a holistic approach to the subject, one that considers structural safety, operations, inspections and the human element. To meet these standards, operators must not only assess the risks associated with the facility hardware but also have in place an effective management system that continually identifies hazards, and either prevents their occurrence or mitigates their consequences.

From the introduction of the Safety case approach in the North Sea in

### Risk Assessment & Risk Reduction for the Offshore Industry





# ALTERNATIVE APPROACHES TO OFFSHORE SAFETY

1993 and SEMP (API RP75 Safety and Environmental Management Program) in the Gulf of Mexico in 1995-1996, loss statistics have shown a steady decline. Within US waters, the Lost Time Accident Incidence Rate, as reported by the International Association of Drilling Contractors, has dropped from 1.02 in 1996 to 0.30 in 1999. Improvements have also been recorded in European and international waters.

What is remarkable is that these management system approaches have been so effective without the need for a regulatory or other oversight body to prescribe specific standards. Responsibility for safe operation is placed firmly on the shoulders of the operator. There are no formulae for "survivability." There is no clear definition of what is "reasonably practical." For an operator to demonstrate that the level of risk is as low as reasonably practical, it must first determine the probability of occurrence for each incident and establish a base risk.

Such a review demands that the operator begins by reviewing the entire system, identifies the hazards, estimates the risk associated with each hazard, evaluates whether or not it is acceptable and, if not, implement risk reduction procedures before reiterating the process.

The role of class is evolving rapidly in tandem with these changes. The industry demands more than merely the development of risk-based rules for either structure or inspections, although these are significant steps. Operators require assistance in

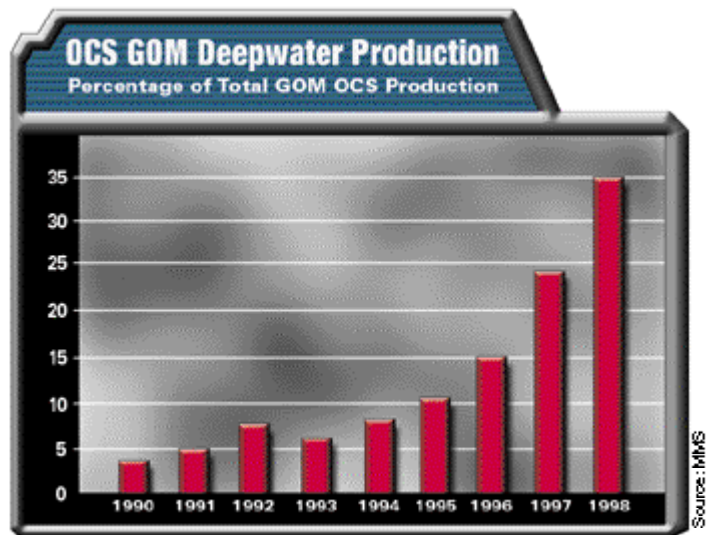
developing appropriate systems and standards to meet the entire range of responsibilities that have been placed on them.

ABS, as the leading classification society providing services to the offshore industry, is expanding rapidly to meet these new demands.

These new areas of activity range from the development of ergonomic guidelines that address human factor issues, to the development of risk-based survey requirements for FPSOs.

These developments fall within the traditional role of classification. But ABS is aware that these old parameters that described class can no longer meet the needs of the offshore industry. Through its affiliated ABS Group of Companies, ABS is able to offer the most sophisticated risk assessment and management services to offshore clients worldwide.

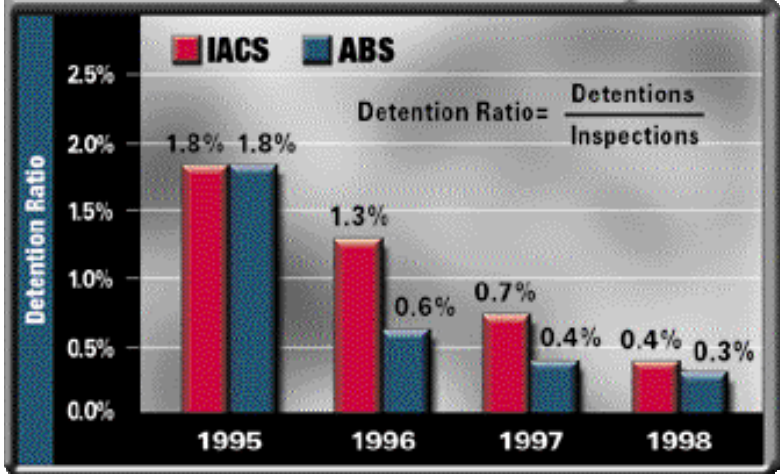
At ABS we consider our offshore clients to be our partners. As they venture into deeper waters, as they face increasingly complex technical challenges, as they struggle to develop new, risk-based safety solutions, ABS stands beside them offering practical, flexible and responsive guidance and standards.



**The role of class is evolving rapidly in tandem with these changes**

## US Coast Guard Class Related Detentions

Source: USCG



## Our goal is to have zero class-related Port State Control detentions of ABS-classed vessels

**PORT STATE CONTROL** detention statistics are one of the best score-cards against which classification society performance can be judged.

These findings are the reality that must be set against the otherwise encouraging trend statistics that are being provided by the principal Port State groupings. The 10 percent detention rate was a clear improvement over the nearly 14 percent ratio for all bulk carriers inspected within the Paris MOU jurisdiction in 1998.

Four-year trend figures for all vessels detained under the Paris MOU show a steady decline.

Over a three month period in mid-1999, the Paris MOU undertook a targeted inspection campaign against bulk carriers of more than 30,000gt and older than 15 years. Seventy-nine ships were inspected. The scope of the campaign was wider than for a normal port state inspection and included a physical examination of, on average, three holds and three ballast tanks. *(It should be noted that the Paris MOU statistic does not differentiate between class related and non-class related deficiencies.)*

Similarly, the US Coast Guard (which does issue statistics solely for class-related detentions) has charted a steady decline in the ratio of detentions relative to inspections over the same period.

ABS is pleased that it has excelled in both the Paris MOU and USCG statistics. Of the four major classification societies, ABS was the only society not to have a vessel detained as a result of the Paris MOU's bulk carrier campaign. And of all societies ABS had the best record, with the lowest detention ratio under the US Coast Guard's rolling three-year average that is used to target ships for inspection.

The results are sobering. Ten percent of the vessels inspected were detained with structural deficiencies considered serious enough to prevent the vessel from sailing until repairs were made.

A total of 141 structural defects were identified ranging from holes in the decks and hatch covers to badly wasted longitudinal and transverse stiffeners. Just over one-half of all the ships inspected were found to have at least one deficiency affecting the structural safety of the ship.

But we are not satisfied. Our goal is to have zero class-related Port State Control detentions of ABS-classed vessels. That is made more difficult by the fact that ABS has one of the oldest fleet of the major class societies and statistics clearly show there is a direct correlation between the age of the vessel and the likelihood of detention. The goal has not yet been met. The challenge remains ahead.

## Paris MOU Detentions

October 1998 - March 1999

Source: Paris MOU





# MANAGING RISK

**OVER THE LAST TEN YEARS**, more tankers have been lost due to fire and explosion than any other cause. For the same period, the most significant factor contributing to bulk carrier losses was weather.

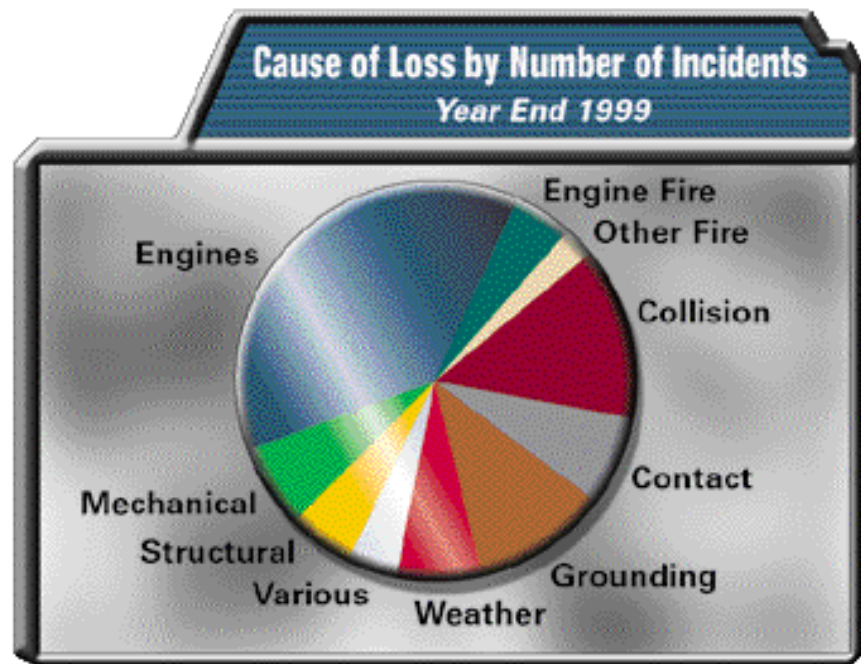
In 1999, more marine casualties were attributed to failures of the main or auxiliary engines, generators or electrical equipment than any other reason. Structural failure, by comparison, was a relatively minor cause of loss.

Such statistics help the marine industry identify the risks of vessel operations. It is the first, very broad-brush step towards developing risk-based responses that target the root cause of failure. Drawing on such information, the industry and individual operators can begin to develop effective management programs that will mitigate the identified risks.

Information is the key to developing such a program. Unlike many shore-based industries, the marine industry has been relatively slow to scientifically collect and interpret reliability data. It is an industry that has relied on empirical experience and prescriptive rule-making based on judgement.

Such experience will always be an important component in the development of appropriate safety standards. But risk-based techniques that complement and can significantly improve this traditional approach are now available.

Although each member of the maritime community should assess the applicability of risk management techniques to its own activities, the



primary responsibility will fall on the shoulders of the shipowner. The process may start with the IMO, which is already using risk assessment to determine where best to focus its regulatory efforts. It will certainly include the classification societies, the most advanced of which have begun to incorporate a risk-oriented approach to improving their rules.

But, ultimately, it is the ship operator who is in the best position to identify and assess the risks associated with the operation of each vessel within its fleet.

ABS is proactively incorporating risk-based, rational criteria into its standards. ABS SafeHull applies rational criteria to the design of the vessel. ABS SafeNet provides a sophisticated method for collecting and interpreting operational performance data.

Our development of risk-based inspection requirements, risk-based machinery rules and the application of risk assessment techniques to human factor standards places us in the forefront of this new approach.

**In 1999, more marine casualties were attributed to failures of the main or auxiliary engines, generators or electrical equipment than any other reason**

# 1999

## SO MANY ACHIEVEMENTS...

### ALMOST TEN YEARS AGO,

ABS committed itself to a clearly defined strategy, *ABS 2000*, that has guided the organization from troubled times to a period of sustained success. That strategy boldly defined the steps that would not only secure the future of ABS, but would also

position the society as a leader among both its classification peers and the entire marine industry.

The closure of the decade, the century and the millennium provides an appropriate opportunity to review the organization's performance in 1999 within the context

of this vision. From every perspective the successes of 1999 validate that vision. They conform to the goals that were laid down and provide clear evidence of the benefits that the strategy has returned.

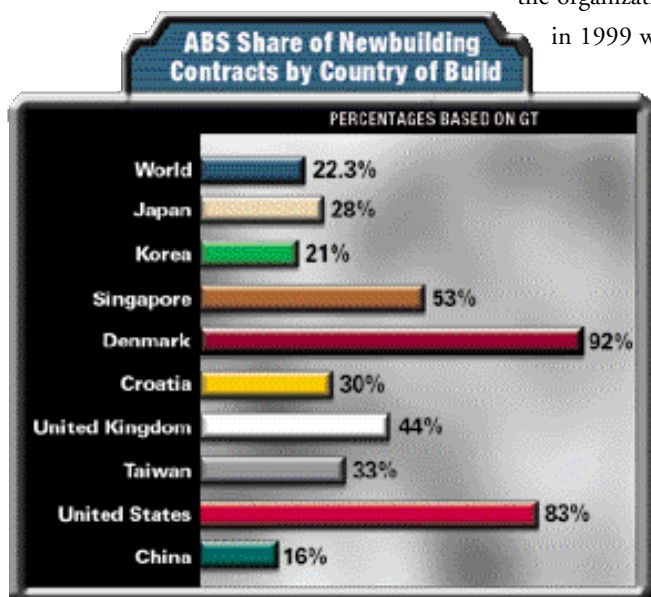
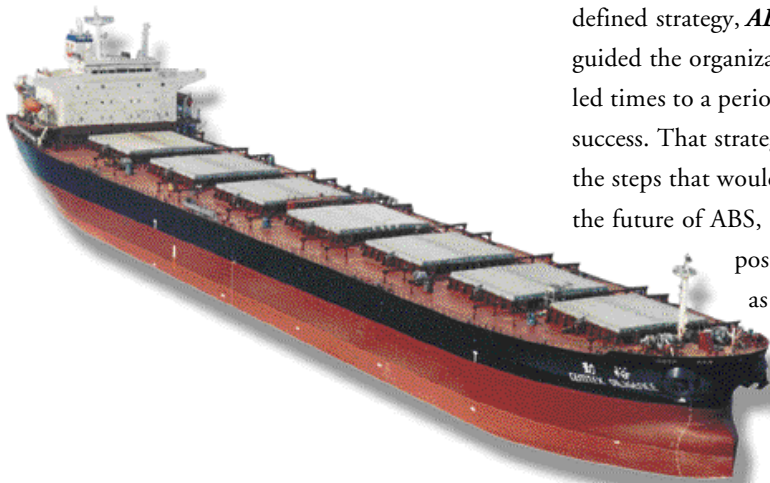
market share could no longer completely offset inflationary pressures. Despite this tightening operating environment, ABS once again ended the year with a healthy operating surplus, sufficient to continue to fund improvements in technology and operating systems as well as maintain the fee freeze into a sixth year to the benefit of our clients.

### Newbuilding Successes

A second key objective of *ABS 2000* was to increase the ABS share of the newbuilding market. 1999 proved to be another resoundingly successful year for ABS. For the second consecutive year, final figures confirmed its position as the class society with the largest share of the newbuilding orderbook, with more than 22 percent of all tonnage on order specified as being to ABS class.

Much of this success can be attributed to the application of the Dynamic Loading Approach as embodied in ABS SafeHull, now widely recognized as the most innovative, most advanced and most technically comprehensive method of analyzing ship designs. SafeHull applies to tankers, containerships and bulk carriers. ABS and SafeHull achieved significant market shares in each sector, with particular successes in the tanker and very large containership markets.

Of particular encouragement was the SafeHull-stimulated surge in contracts for bulk carriers to ABS class. Owners seeking robust designs, best suited to a lifetime of trading in this most demanding sector, increasingly turned to ABS.



### Financial Strength

One of the key strategic objectives of *ABS 2000* was to ensure the financial self-sufficiency of the organization. From the time of its implementation, operating revenues have grown steadily. 1999 saw continued strong performance, although the cumulative impact of a five-year fee freeze finally saw a flattening in performance as operating efficiencies and growth in



# SO MUCH STILL TO BE DONE

But the successes within the new-building sector spread through all areas of the industry. The year saw ABS secure significant contracts for fast ferries, for cruise vessels, large and small, and for specialty vessels from gas carriers to FPSOs.

Equally important, these successes were recorded across the globe. A record 52 vessels were delivered from Korean yards to ABS class in 1999. More than 100 ships were on order at Japanese shipyards to ABS class. The first complete semi-submersible drilling unit to be delivered by a Korean shipbuilder in a decade was built to ABS class. The two largest containership operators in the world continued to trust ABS classification requirements for their biggest vessels.

Ships were also delivered to ABS class from yards in China, Taiwan, Singapore, Italy, Germany, Turkey, Indonesia, India, Australia and the United States among others. Those vessels were delivered to owners from Greece, Scandinavia, the Middle East, Hong Kong, Belgium, Singapore, the United Kingdom, Italy, Switzerland, China, the United States and a host of other countries.

Comparable success was also achieved by ABS in the offshore sector in 1999. During the year, five MODUs and a TLP were built to ABS class. Contracts were received for three self-elevating and seven column-stabilized MODUs as well as a super drillship and deep draft caisson structure.

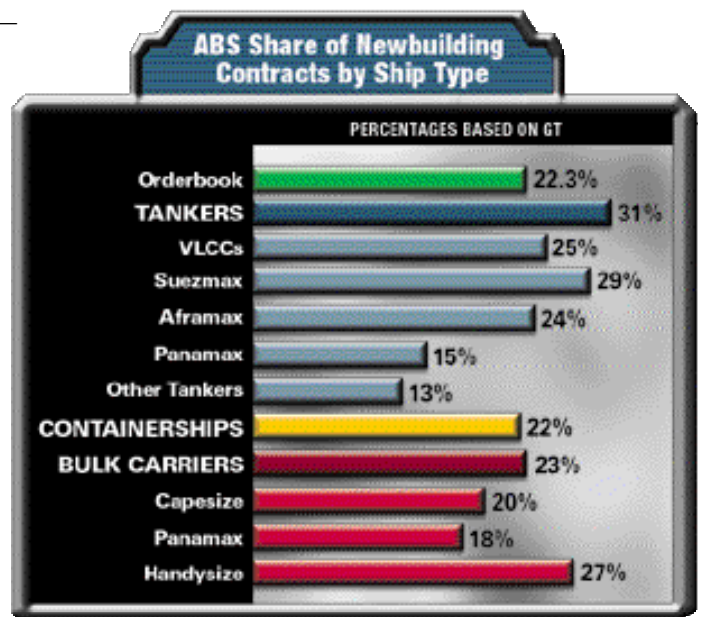
ABS was also very active in major conversion work involving FPSOs and upgrades of existing units such

as the SAFE GOTHIA — a former accommodation unit converted over 21 months to a fully self-propelled, dynamic positioning, semi-submersible deepwater drilling unit. The continued domination of offshore classification by ABS is due to a concerted effort, spawned by *ABS 2000*, to lead the development of technology tailored to meet the unique and technically complex needs of this dynamic and innovative industry.

## Technology Advances

That strategic plan established a clear and realizable technical goal. It was for ABS to become and remain the recognized leader in marine technology. There is no doubt that SafeHull, the most innovative dynamic-based design and evaluation system available, remains unmatched in its technical superiority. Six years after it was first released to the industry in 1994, it continues to provide the most advanced ship safety technology for producing robust and durable ship structures. The rise of ABS to the top of the newbuilding market share table offers convincing evidence of this superiority and of the recognition that has been accorded SafeHull by shipowners worldwide.

ABS continues to refine this technology. Late in 1999, SafeHull 6.0, a new, more user-friendly version,



was released to industry. A major feature is a “builder” module that automatically performs criteria checks of the 3D model. Other features include interfaces to increase the speed of solving FEM models and to transfer geometry and scantlings input from AutoCAD to SafeHull, an automated process for investigation of interconnected upper and lower ballast tanks for bulk carriers, and a complete ship model for containerships. As with prior upgrades, feedback from users helped shape these improvements.



Although substantial resources continue to be devoted to further improving SafeHull, ABS has pursued technical initiatives in a wide range of ship and offshore related disciplines. These projects benefited from a reorganization of the Technology Department in the latter part of the year. To more effectively address areas of increasing emphasis to ABS and provide technology leadership to industry, the department has been restructured into seven groups. Of these, four are new — risk & reliability, offshore technology, marine engineering systems, and safety assessment and human factors. These have been added to the existing rule development, SafeHull and research groups.

During 1999 ABS completed a major redesign of the *ABS Rules for Building and Classing Steel Vessels*

2000. Responding to client feedback and as part of Rule Development’s own commitment to continuous improvement, the Rules have been issued in a new, more easily followed format. The most significant technical change to the Rules is a more robust machinery section. Some changes in criteria are included and the information is presented in a two-tier format. The base tier details common denominators applicable to all vessels. The secondary tier describes machinery specific to specialized vessels. The upgraded standard also provides enhanced search and cross-referencing capability.

In addition to the sophisticated and innovative technical research activities of ABS, several significant practical standards were developed and released to industry during 1999. Typical of these are *Guidance Notes on the Prevention of Air Pollution from Ships*, the first such guide to be issued that interprets the new IMO standards. Also, *Advisory Notes on Ballast Water Exchange* contains warnings on the need for caution when following new unilateral and/or voluntary requirements to minimize the introduction of unwanted aquatic organisms, lest hull girder strength values be exceeded. And *Guidance Notes on the Application of Synthetic Ropes to Offshore Mooring*, the most comprehensive standards to have been developed in this rapidly evolving sector.

### **Quality, Safety, the Environment**

Another core strategic objective of ABS 2000 was upholding quality as a hallmark of ABS by encouraging continuous improvement. In 1993,



ABS was the first classification society to be certified to the ISO 9000 Quality Standard. In 1999, the decision was made to expand this commitment to include the environmental standards of ISO 14000. This process will be completed with certification in 2000. ABS expects to be the first class society to achieve this goal.

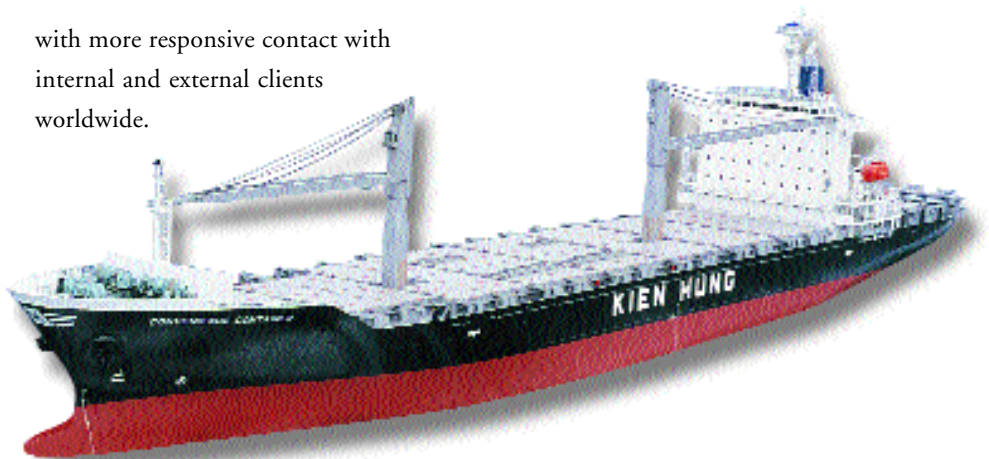
Certification and adherence to recognized quality standards is only one part of the process of continuous improvement to which ABS is committed. Employees at all levels are urged to examine their jobs, functions and processes while asking themselves how they can improve the way ABS does business.

**Operating Efficiencies**

For ABS to continue to prosper, it is essential that it meet the strategic goal of improved operating efficiencies. Revenue per employee is one good measure of such efficiency. Another is the proportion of surveyors and engineers to management. In 1999, both these benchmarks were closely watched and improvements instituted to ensure ABS retains its position as the most efficient provider of classification services.

Perhaps the most visible manifestation of ABS' ongoing commitment to improving operating efficiencies was the relocation of the ABS World Headquarters from its traditional location in New York City to the newly expanded and refurbished ABS Plaza in Houston. Lower operating costs, improved coordination and the elimination of unnecessary duplication of staff and systems are coupled

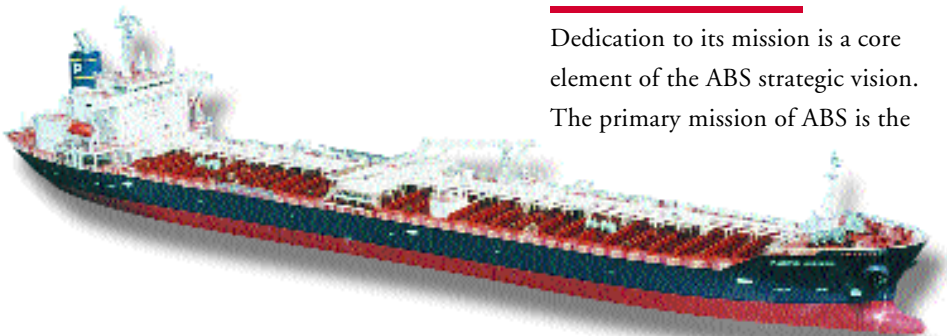
with more responsive contact with internal and external clients worldwide.



During the year, ABS also initiated the ambitious Global Enterprise Management System project which will significantly improve the future administrative capabilities of the organization. Work also continued on the *Office 2000* project to develop an integrated, electronic process for streamlined delivery of survey services.

ABS SafeNet modules dealing with survey status and related information have already significantly improved individual surveyor's ability to prepare for surveys. 1999 brought further upgrades to SafeNet survey status, benefiting both ABS users and clients.





**Mission Driven Actions**

Dedication to its mission is a core element of the ABS strategic vision. The primary mission of ABS is the

promotion of safety of life, property and the natural environment through classification and related services. While dedication to this mission is, in a sense, embodied through the attainment of the other objectives of *ABS 2000*, it was vividly characterized by two events in 1999.

The first was the announcement that ABS moved to the top of the US Coast Guard's Port State Control list, with the best record of all the major class societies over the past three years. ABS-classed vessels had the lowest detention ratio for class-related deficiencies. This US agency is universally regarded as one of the toughest port state regimes. For the ABS-classed fleet to be recognized as having the best classification performance is a testament to the quality and safety record of the fleet, of ABS owners, and to the dedication of the society's survey staff.

The other noteworthy event was that two prominent tanker operators, Marine Transport Lines and Vanguard, were the first to commit to meeting the requirements of the newly released ABS Safety, Quality and Environmental notations, following the pioneering certification to the relevant ISO standards by Ceres Hellenic. This new certification

is based on a carefully crafted program developed to help ship-owners achieve and demonstrate adherence to the highest levels of safety, quality and environmental management system standards.

These new standards synthesize the common elements of the ISM Code, ISO 9000 Quality Management and ISM 14000 Environmental Management Standards. These largely generic standards have been supplemented by specific prescriptive requirements for marine management. SQE was developed by ABS to help owners better control their operating environments and to clearly demonstrate that they are operating as responsible citizens wherever in the world their vessels trade. This new approach is indicative of ABS' unending search, within the framework of its mission, to develop improved methods by which the industry can advance ship safety.

**Strength Through People**

Drawing out the best from the people who lie at the heart and soul of ABS is essential if ABS is to continue its successful development. Developing these human resources to provide the leadership needed to support our mission is another strategic objective, and 1999 saw ABS continuing to focus considerable attention on professional development.

Appropriate training is a prerequisite for efficiency. In 1999, ABS made concerted efforts to expand the training of its worldwide workforce, encouraging management at all levels to identify training needs and implement appropriate programs.

U.S. COAST GUARD	
1999 IACS Classification Society Performance	
Class-Related Detentions Relative to Distinct Vessel Arrivals	
ABS	0.44%
DNV	0.71%
NKK	0.72%
GL	0.77%
RINA	0.82%
LR	0.94%
BV	1.29%
KR	1.48%
CCS	3.93%
RS	5.82%



Incorporated in the newly expanded Houston complex is a state-of-the-art training facility to assist these efforts.

Late in the year, training took on a new identity within ABS. The ABS Academy joined with ABS Institute (a recently formed ABS Group Inc. initiative) to form an expanded and enhanced training body that can provide everything from internal ABS and Group training to public courses for industry. Considerable attention is now being focused on the development of effective distant learning courses whether by CD-ROM, video, Internet or internally via the ABS Intranet, to more effectively and efficiently expand training throughout the Bureau.

### Non-Classification Developments

It is now nearly a decade since the senior management of ABS outlined *ABS 2000* and its vision for the successful rejuvenation and expansion of the organization. Rapid and profitable growth of the non-classification business lines of ABS Group of Companies was considered an essential strategic component of that vision. 1999 proved to be perhaps the most important year in the development of the ABS Group. As the year came to a close, agreement was reached for the acquisition of EQE International, one of the world's largest and most respected risk consulting and management firms. Once completed this acquisition would almost double the size of the Group and firmly position the company for future growth.

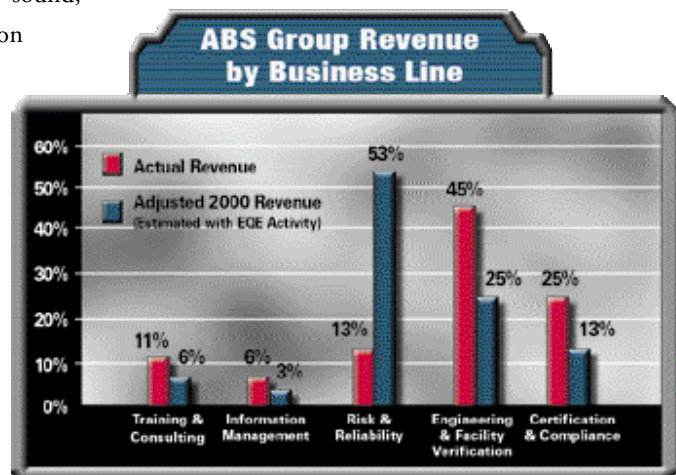
ABS Nautical Systems also scored major advances during 1999, quickly

emerging as the most innovative leader in the provision of fleet management software to both the shipping and offshore industries. Also, the addition of QMX software brought a new and superior product with new market opportunities to ABS Nautical Systems and its parent, ABS Infolink.

### Clarity of Vision

From every perspective, it is evident that, by the close of 1999, ABS has met the objectives of *ABS 2000*. It has solidified its position as one of the strongest, most respected classification societies in the world. And ABS Group Inc. is poised to become a world leader in providing safety, quality and environmental services to a wide range of market sectors.

Such success is cause for celebration. But it does not mean that the challenges are vanquished. The strategic objectives laid down in *ABS 2000* remain as relevant today as they were nine years ago. Much has been accomplished. But there is much more still to be achieved as ABS moves into the new millennium financially sound, with a clear vision and purpose, a strong and stable management team and a continuing commitment to financial, operational and technical excellence.



# 1999 CLASSIFICATION ACTIVITY

## CLASSIFICATION SERVICES,

provided by ABS, remained in demand throughout 1999. Activity was comparable to that experienced in the previous year when the demand for ABS class attained levels not seen in almost 20 years. Within certain categories, such as aggregate gross tonnage classed, 1999

led those earlier.

The resulting strong orderbook consolidated ABS' position as the favored classification society for

new tonnage for the second consecutive year. Market share, which had languished in the mid-teens in the late 1980s/early 1990s, closed the year at a healthy 22.3 percent, down only marginally from the leading 22.5 percent share of a year earlier.

ABS attracted orders from all corners of the world, although global economic factors saw a preponderance of European-based

owners active in the newbuilding market. ABS also retained its position as the leading non-national classification society for orders placed in Japan, one

of the most dominant shipbuilding countries. The resulting strong orderbook, totaling 12.58m gross tons ensures the future of ABS remains bright.

Performance in 1999 also confirmed the continued superiority of ABS SafeHull as the preferred method for design assessment for large ships.

The continued strong demand for ABS class can be attributed, in part, to our engineering expertise, our experience in the marketplace, our strong client relationships and commitment to providing the most responsive service possible.

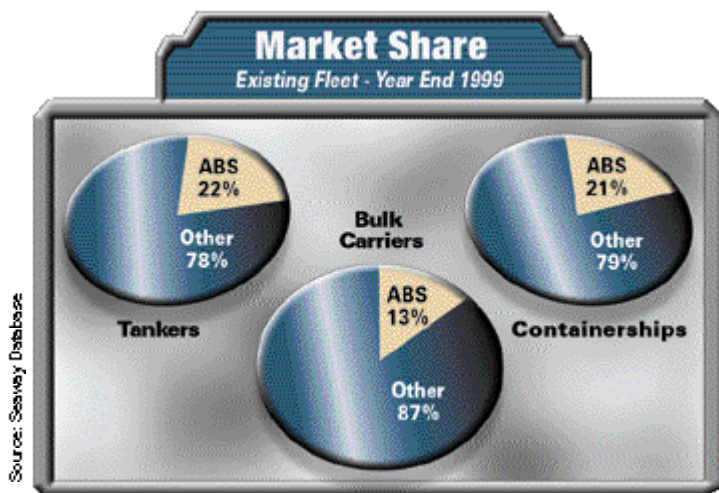
## VESSELS CLASSED

During 1999, ABS classed a total of 713 new and existing ships and other offshore structures totaling 8.87m gross tons. This represents a 17 percent increase in gross tonnage classed compared to the already very strong performance of 1998. Tankers, bulk carriers and containerships, combined, totaled 5.50m gross tons of this total, a 25 percent increase over 1998.

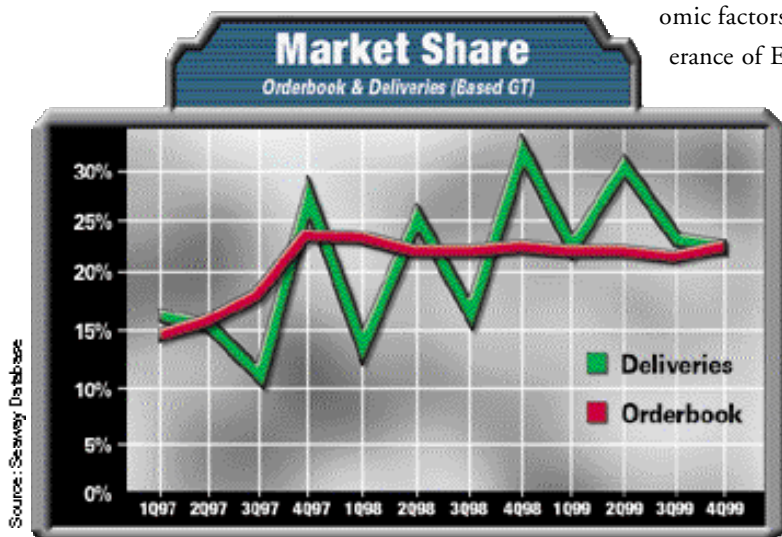
Of the total vessels classed, 469 of 6.46m gross tons were newbuildings while 98 vessels aggregating 2.10m gross tons were existing vessels previously in the class of other societies or unclassified. The remaining 146 were previously ABS-classed vessels, reinstated after necessary survey.

## VESSELS REMOVED

Removed from the ABS-classed fleet in 1998 were 737 propelled and nonpropelled vessels. Of these,



Source: Seavey Database

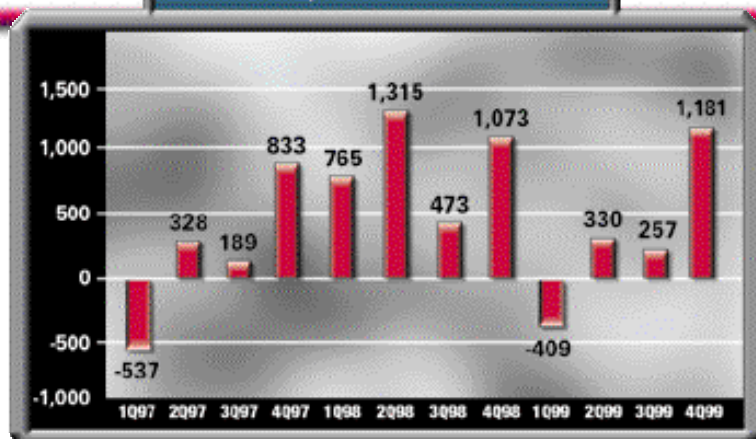


Source: Seavey Database



## ABS Fleet Activity

Net Quarterly Gain or Loss - Thousands GT



312 were withdrawn at the owners' request, 73 were scrapped and 352 were dropped for noncompliance with the *ABS Rules*. These figures closely parallel those recorded in 1998 for each category. Of those dropped for noncompliance in 1999, only 35 were ocean service merchant ships, the majority being smaller vessels and barges.

### CLASSED FLEET

The positive net result of this activity brought the ABS-classed fleet to a year-end total of 11,249 ships and offshore structures aggregating 100.3m gross tons flying the flags of 98 different registries. These totals are similar to year-end results of 1998.

### NEW CONTRACTS RECEIVED

Requests to class newbuildings with ABS were received at a steady rate throughout the year. Contracts to class 449 new vessels aggregating 7.74m gross tons were added to the ABS orderbook. This reflected a marginal decrease from the unusually strong ordering pace of 1998, attributable mainly to a decline in tanker orders from 85 in 1998 to 45 in 1999. A surge in orders for 40 new bulk carriers helped offset this reversal. Containership activity remained strong with class contracts taken for 21 new vessels during the year.

### ORDERBOOK

At the close of 1999, the orderbook of vessels building or contracted to be built to ABS class in 38 countries around the world tallied 654 ships and offshore structures aggregating 12.58m gross tons. This represents a 6 percent increase in tonnage over

1998 offset by an 8 percent decline in numbers. The orderbook totals include 84 tankers, 63 bulk carriers and 54 containerships.

### TANKERS

ABS classed 60 new tankers during the year aggregating 3.23m gross tons, representing an increase of 24 percent in number and 33 percent in tonnage over 1998. Included in this total were 9 vlccs. During the same period ABS received contracts to class 45 new tankers of 3.4m gross tons, 12 of which are vlccs.

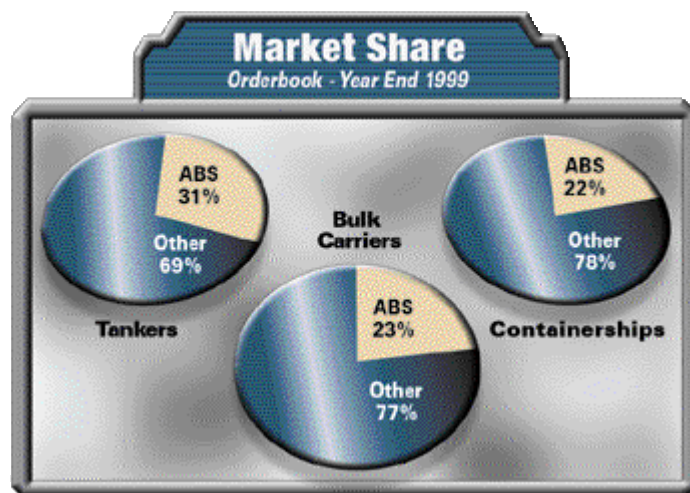
At year-end, the ABS world's fleet of tankers numbered 885 totaling 41.74m gross tons with another 84 of 5.62m gross tons contracted to be built or building to ABS class.

### BULK CARRIERS

Bulk carrier activity moved ahead during the year as 36 new bulk carriers of 1.33m gross tons were classed. Bulk carrier orders maintained the strong pace experienced in 1998. ABS received contracts to class 40 new bulk carriers aggregating 1.58m gross tons, with orders taken for all size ranges

## Market Share

Orderbook - Year End 1999



Source: Seaway Database

from handysize to capesize. At the close of the year, there were 749 bulk carriers of 21.47m gross tons in ABS classification with an additional 63 of 2.40m gross tons building or contracted to be built to ABS class.

**CONTAINERSHIPS & ROROS**

1999 confirmed ABS' position as the preferred society for the largest containerships. Five vessels, each of 92,000gt, the largest yet constructed,

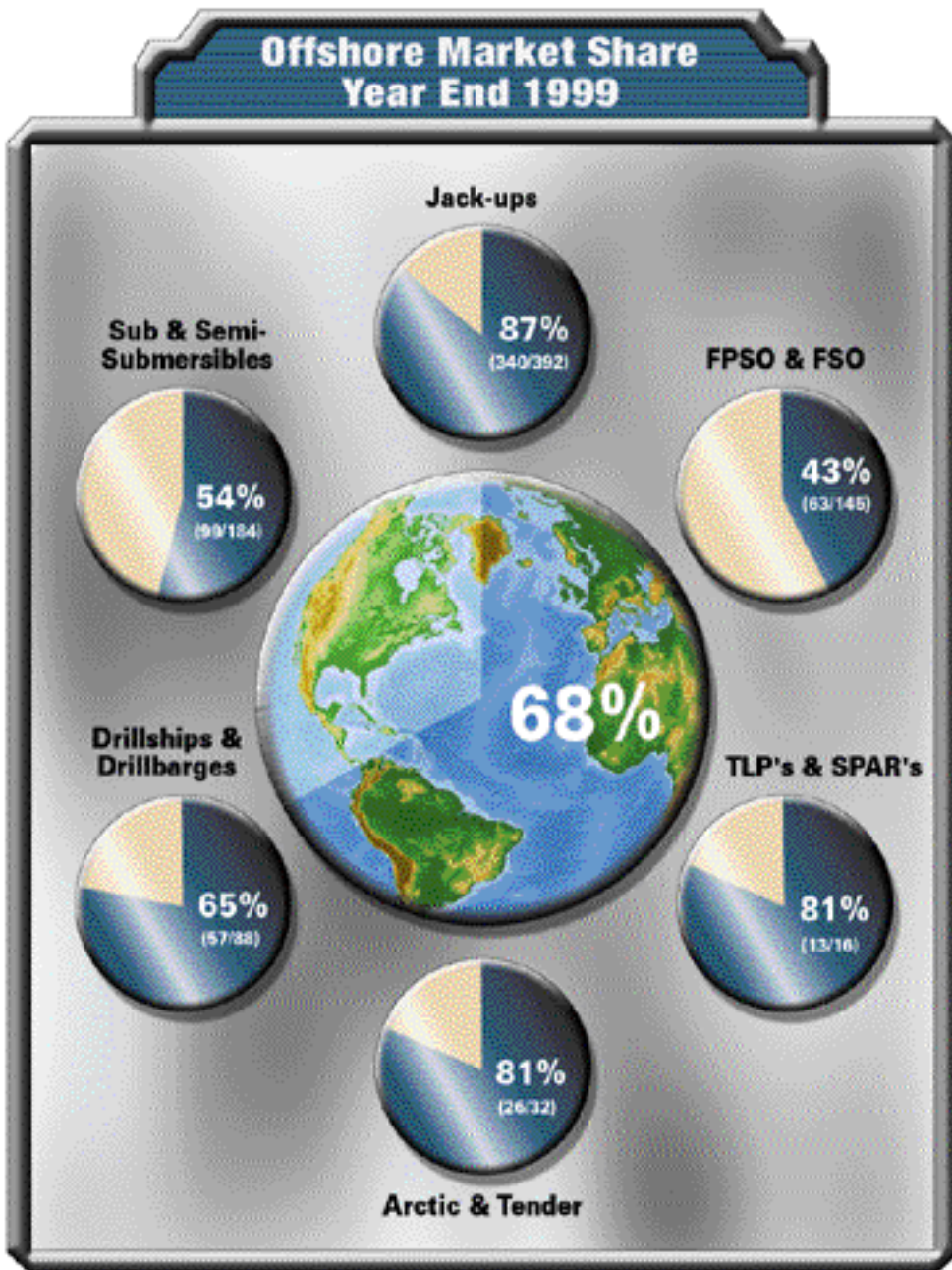
were delivered into ABS class during the year. Another five vessels of 69,000gt were classed in 1999. In total during the year, ABS classed 24 containerships of 1.0m gross tons for a 24 percent increase in tonnage over 1998.

Also in 1999, ABS received contracts to class 21 new containerships of 1.07m gross tons — including four vessels of 92,000gt, and eight others of more than 60,000gt. This represented a modest increase over 1998. At year-end, the ABS fleet of containerships numbered 371 of 11.47m gross tons with an additional 54 of 2.18m gross tons contracted to be built or building to ABS class.

In 1999, ABS was also well represented in the roro sector classing 12 vessels ranging in size from 12,000 gross tons to 73,000 gross tons. Requests were received to class eight other new roro vessels during the year. These ranged from 9,000 gross tons to 61,000 gross tons.

**OFFSHORE**

Indicative of the strength of ABS in the offshore industry, during the year, 14 drilling units were classed including 8 site-dependent platform installations, five MODUs and a TLP. In addition, contracts were received to class 15 more drilling units including three self-elevating and seven column stabilized MODUs, three site-dependent platform installations, a super drillship and a deep draft caisson structure. At the end of the year, there were 528 MODUs and 106 fixed platform installations classed or certified by ABS.



Source: OPL/OD S/MA



# ABS ACTIVITY

TYPE	As of 31 December 1999 Vessels in Class		As of 31 December 1999 Vessels on Order		During 1999 New Vessels Classed	
	NO.	GROSS TONS	NO.	GROSS TONS	NO.	GROSS TONS
Barge	4,444	6,629,657	108	261,740	106	218,160
Bulk Carrier	749	21,470,848	63	2,399,162	36	1,327,346
Combination (Dry/Liq)	18	729,494	—	—	—	—
Containership	371	11,467,738	54	2,177,759	24	997,520
Dredge	46	122,570	4	3,841	1	1,993
Drill Ship	17	249,062	5	291,526	1	56,400
Dry Cargo	562	5,377,330	1	4,990	5	48,900
Ferry/Passenger Cargo	122	586,567	15	315,241	9	74,448
Fishing Vessel	40	45,964	19	12,893	—	—
Launch/Crewboat	219	28,288	17	2,005	17	3,451
Liquified Gas Carrier	64	2,453,919	8	525,100	1	3,500
Mobile Offshore Unit	528	3,626,853	23	214,151	10	62,860
Other	341	502,202	40	68,983	28	8,034
Passenger (Cruise) Vessel	82	647,872	20	213,410	2	4,402
Platform (Fixed)	109	7,572	—	—	9	—
Research/Survey Vessel	125	193,395	6	10,737	4	3,029
Single Point Mooring	29	—	4	138	4	800
Supply & Tug/Supply	946	671,300	30	52,907	55	87,326
Tanker (Liquid Cargo)	885	41,741,897	84	5,622,510	60	3,225,807
Tug	1,079	322,962	56	23,548	52	20,139
Underwater Vehicle	58	402	8	153	1	129
Vehicle/Barge Carrier	108	3,348,237	10	355,348	7	309,934
Yacht	307	71,827	79	23,887	37	8,374
<b>TOTAL</b>	<b>11,249</b>	<b>100,295,956</b>	<b>654</b>	<b>12,580,029</b>	<b>469</b>	<b>6,462,552</b>





The background features a dark blue grid with several white line graphs overlaid. One graph in the upper right shows data points for 'World Total', 'Bulk Carrier', and 'Container Ship' from 1997 to 2002. Another graph at the bottom shows a fluctuating line. The overall aesthetic is technical and data-driven.

**C**reating integrated  
safety, quality and  
environmental management  
systems and standards



# CREATING POSITIVE RETURNS FROM MANAGING RISK

**1999 MARKED THE YEAR** in which ABS Group of Companies harnessed its already considerable resources within management system consultancy, training and risk assessment to offer a fully integrated suite of services to assist its clients in managing the safety, quality and environmental risks (SQE) associated with their activities.

ABS Group believes that isolating any one of these initiatives from the others is costly and counter-productive. Yet many companies continue to view the adoption of management system standards as a tiered process.

Since the standards often have common requirements, duplications are unavoidable.

Only a fully integrated management strategy returns benefits of improved efficiencies, greater productivity, decreased margins for error, fewer accidents and greater security.

As 1999 drew to a close, ABS Group of Companies put the final touches to a wide-ranging strategy that integrates risk assessment and mitigation with an integrated SQE program, backed by significant enhancements in our training and information management products that support these services.

At year-end, ABS Group of Companies announced it had reached agreement on the purchase of EQE International, one of the largest and most respected risk management and information companies in the world.

This acquisition, following the 1998 acquisition of JBF Associates, saw the realization of the ABS Group strategic vision — to be the premier company in the world providing integrated risk, reliability, quality, environmental and safety services to a broad spectrum of industries and government.

The technology-driven approach now offered by ABS Group towards managing natural, human and technological risks provides a template for optimizing risk transfer, improving safety and mitigating loss.

It is ABS Group's belief that most companies need far more than ISO certification. In today's competitive market, companies need a partner that understands their processes, and can provide a full spectrum of services from compliance-based management systems, to continuous improvement systems, to risk management.

The strength of ABS Group lies in its determination to be the most innovative provider of risk-based SQE services. It is constantly seeking to develop new methods that will assist clients to become more efficient, more productive, more profitable and to operate more safely.



**In today's competitive market, companies need a partner that understands their processes, and can provide a full spectrum of services**

# ABS GROUP INTEGRATED MANAGEMENT SYSTEMS

## ABS Group Audit Scheduling

ABS Group Schedules all Audits  
Concurrently for Best Time Management

Continuous Improvement

## ABS Group SQE Audit Checklist

### Safety/OHSAS 18001

- Initial Meeting
- Audit w/OHS Safety Representatives
- Overall Plan Review
- Records Documentation & Verification
- Risk Assessment Criteria
- Operations Review
- Contingency Planning
- Corrective Action
- Facility Sanitation
- Personnel/Subcontractors
- Operations Plans

### Safety/Crisis Management

- Initial Meeting
- Audit w/Security Representatives
- Overall Plan Review
- Crisis Response Plan
- Retraction from Plans
- Fire Codes
- Fire Protection
- Security Locking Systems
- Identification
- Training
- Background Investigations

### Environment/ISO 14001

- Initial Meeting
- Audit w/Environmental Representatives
- Overall Plan Review
- Documentation & Records Review
- Facilities Maintenance
- Hazardous Waste
- Sampling/Monitoring
- Water & Air Pollution
- Soil Protection
- Chemical Accident Prevention
- Clean Fuel Program
- Permits

### Quality/ISO 9001: 2000 Revision

- Initial Meeting
- Audit w/Quality Representatives
- Management Responsibilities
- Quality Manual Review
- Customer Related Processes
- Document Control
- Human Resources
- Facilities
- Preservation of Services
- Purchasing
- Corrective Action

## ABS Group Partnering Action

ABS assists with implementation  
of Best Practices through:

- Corrective Actions
- Consulting
- Training

## ABS Group SQE Gap Analysis

Safety/OHSAS 18001  
Security/Crisis Management  
Environment/ISO 14001  
Quality/ISO 9001: 2000 Revision

- Executive Report
- Summary of Gap Analysis
- Strengths of Current Program
- Weaknesses of Current Program
- Corrective Action
- Recommendations
- Documented Gap Analysis Report
- Checklist

## ABS Group SQE Training Schedule

### Safety/OHSAS 18001

- SQE Integrated Overview
- Introduction to SQE Integration
- OHSAS 18001 Overview
- Auditing
- OHSAS 18001 Internal Auditing
- Procedure Writing for Integrated Systems

### Security/Crisis Management

- Recognition & Control Techniques
- Security Awareness

### Environment/ISO 14001

- ISO 14001 Overview
- ISO 14001 Implementation
- ISO 14001 Understanding
- ISO 14001 Internal Auditing
- ISO 14001 Lead Reviewer
- Identification of Environmental Aspects
- Monitoring & Measuring for Objectives & Targets

### Quality/ISO 9001: 2000 Revision

- ISO 18001-2000 Overview
- ISO 14001: 2000 Assessment
- Overview of Environmental Laws & Regs for ISO 9001 Auditors, Integration to ISO 14001



# SQE — A JOURNEY TO EXCELLENCE

**THERE IS NO ONE PATH** to the adoption of a management system based on mitigating business risks or compliance with safety, quality and environmental standards.

One client of ABS Group recently traveled the path to quality management. Within six months of implementing the system, that client reported savings in excess of US\$1 million through greater efficiencies in its procurement program.

Another ABS Group client suffered a ruptured oil pipe that created a major environmental incident. The ensuing publicity, the cost of cleanup and the potential liabilities sparked a desire to implement an environmental management system that will minimize the chance of similar incidents in the future.

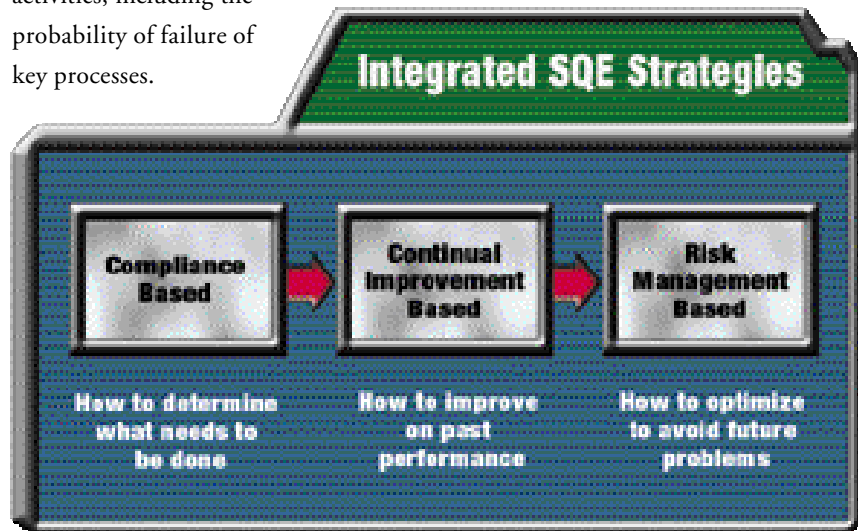
For another client, a high-profile, public breach in its security set them searching for systemic changes that would improve their safety procedures.

In each instance the immediate response was directed specifically towards addressing the immediate need — operational cost-efficiencies, environmental-impact mitigation, improved safety systems. The first is addressed through implementation of a quality management system, the second by an environmental impact management system, the third by a safety management system.

By adopting an integrated strategy, the manner in which the systems are introduced within the enterprise can

be simplified. The training, consulting, certification and compliance phases can be conducted within a conceptual whole, rather than as fragmentary elements.

These management systems are not restricted in their application to large enterprises or smokestack industries. They are as equally applicable to small business. Whatever their size, businesses demand effective decision-making to be successful. This requires a systematic assessment of all their activities, including the probability of failure of key processes.



Proactive organizations have grasped the tremendous potential for improvement, and the financial benefits that can accrue from the implementation of an integrated safety, quality and environmental management system to assist them in that decision-making process.

ABS Group has developed a complete range of services to meet this growing need. It is part of the ABS Group commitment to excellence, a commitment that, like the journey itself, is never ending.

**Proactive organizations have grasped the tremendous potential for improvement from an integrated management system**

# AIMING FOR LIFECYCLE EFFICIENCIES

**A successful AIM program will also frame the development and implementation of an effective life extension strategy**

**ABS GROUP** has carefully crafted a comprehensive package of asset integrity management (AIM) services demanded by modern industry. These services received growing market acceptance during 1999 as operators of large, complex, capital assets sought to maximize efficiencies and minimize the cost of operation without increasing their exposure to risk.

AIM should begin at the conceptual stage and provide lifecycle support until decommissioning. It is a process that starts with the feasibility study, including a full risk analysis of the facility and the intended operation.

to design practical and cost-effective risk-reduction solutions.

AIM evolves through the design phase with a complete engineering assessment of the facility to verify full compliance with all relevant safety standards.

Once in service, the emphasis of the AIM program moves to an auditing function of both the hardware and the management systems that govern its operation. Risk-based inspection programs will focus survey scrutiny in the most effective manner.

As the asset ages, a successful AIM program will also frame the development and implementation of an effective life extension strategy.

Such a comprehensive lifecycle approach demands seamless integration between the key operational elements, a service that can best be provided by a single supplier of a full range of engineering, risk, and management system services. This is the combination of skills that ABS Group has developed.

But merely responding to a client's specific needs is no longer sufficient. ABS Group and its operating subsidiaries maintain an aggressive approach to the manner in which an asset integrity management program is implemented. This places particular emphasis on the anticipation of commercial and technical changes to minimize any disruptive impact these may have on client activities.



By applying an in-depth understanding of the vulnerabilities to both natural and man-made hazards, ABS Group subsidiaries are able



# THE POWER OF INFORMATION MANAGEMENT

**THROUGH ABS INFOLINK INC.,** ABS Group has established a formal mechanism to develop specific, tailored, information management solutions to meet the needs of select industry sectors. This capability was expanded substantially during 1999.

Intelligent use of information encourages better allocation of resources, lower costs and fewer people making more informed decisions supported by integrated, intuitive software.

There is no shortage of data available. The challenge is determining what data is needed and how to gather, store, analyze and apply it in order to create useful information.

ABS Infolink experts are able to develop client-specific portfolio and asset databases to improve commercial efficiencies, facilitate risk-based decision-making, and improve safety, quality and environmental system management.

No management system can function effectively without a rational method of managing the data flow associated with it. From trend analysis to risk assessment to document and inventory control, seamless storage, interpretation and application of information provides the foundation upon which the modern management system will be structured.

The IT benchmark for the new millennium will not be the number of products or databases that will be launched but the sophisticated integration of IT on a much wider

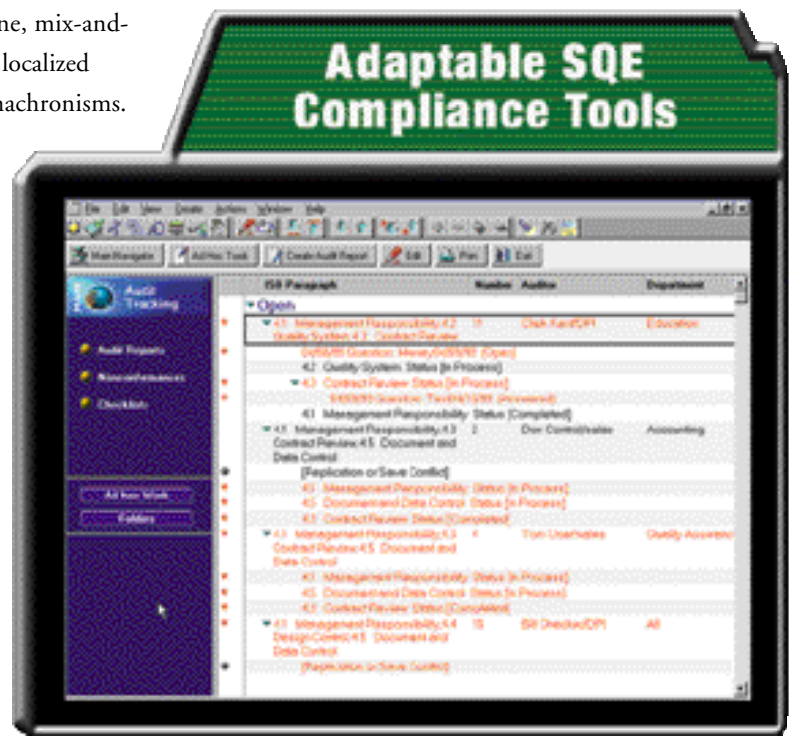
level. Stand-alone, mix-and-match suites of localized programs are anachronisms. It is the fully integrated, globally-supported, client-oriented systems, like Nautical Systems' SafeNet that will make a difference in business productivity, profitability and safety.

SafeNet allows a marine operator to continuously monitor the entire operational and commercial activity of a single vessel or an entire fleet in a flexible and user-friendly manner.

The application of this type of fleet management solution also offers reductions in business communication costs, better analytical decisions, better maintained and, ultimately, safer vessels.

In 1999, a significant enhancement to this capability occurred when ABS Infolink acquired the market-leading QMX quality software product line. Clients use QMX to create a paperless system that makes quality system information universally available through a central network database.

The result is a significant bottom-line impact in terms of both efficiencies and cost.



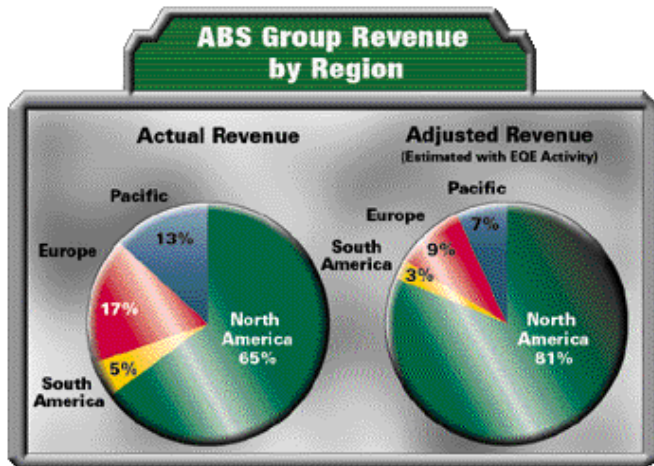
**No management system can function effectively without a rational method of managing the data flow**

# 1999

## POISED FOR EXPANSION...

### 1999 SAW THE EMERGENCE

of the ABS Group of Companies Inc. as one of the world's leading providers of integrated risk, safety, quality, environmental, asset integrity,



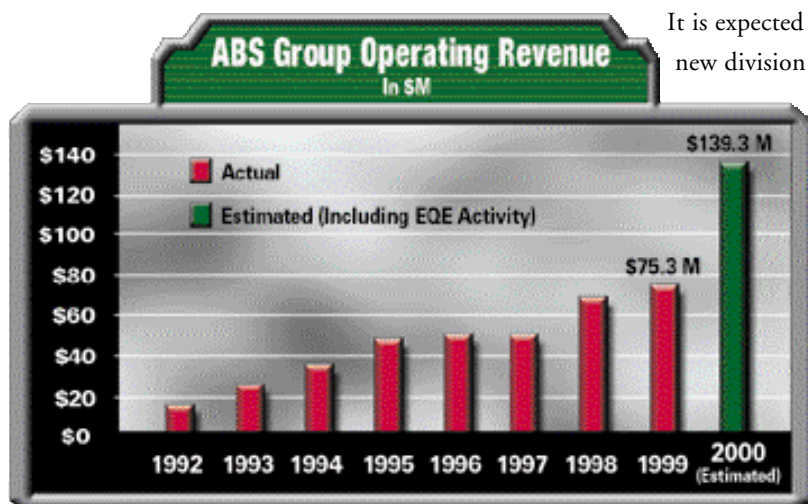
management that would have been a solid year for ABS Group, in which consolidated revenues reached a new record following a 9 percent increase, turned into a watershed year with the

mid-December agreement to acquire EQE International.

### Acquisition

EQE brings to ABS Group a market leading position in risk management for businesses, industries and governments. Its approach, built on a solid foundation of engineering, science and technology, mirrors that of ABS Group.

It is expected that this new division will account for slightly more than 50 percent of the Group's future activity.



The acquisition represents a near doubling of Group consolidated revenues and will have a similar impact on employee numbers.

### Full Range of Services

1999 was a year of positive growth within each of the ABS Group of Companies. ABS Group Inc., the principal operating subsidiary, turned in a solid performance with its training, consulting, engineering, verification, compliance, marine and offshore business units all performing commendably.

Of particular importance to the Group was the continued expansion of the scope of work with Pemex, the Mexican oil major, relating to the modernization of the Cantarell offshore oil field. ABS Group continued to play a strong role in the project, providing a sweeping range of services, including engineering, certification, verification, compliance and training services.

### Full Range of Markets

During the year, ABS Group entities continued to find successful new market segments for its comprehensive package of services, including new governmental and educational clients. The US Government's Army Materiel Command, Naval Sea Systems Command, and Naval Air Systems Command have all turned to ABS Group for safety, quality or environmental services. The Naval Aviation Depot in Cherry Point, North Carolina was the first full US Department of Defense (DOD) industrial facility to achieve the distinction of ISO 9000 certification with ABS Quality Evaluations Inc.

In the US, some of the most progressive public school administrators, seeking new ways to improve the efficiency of their operations, relied



# ABS GROUP OF COMPANIES

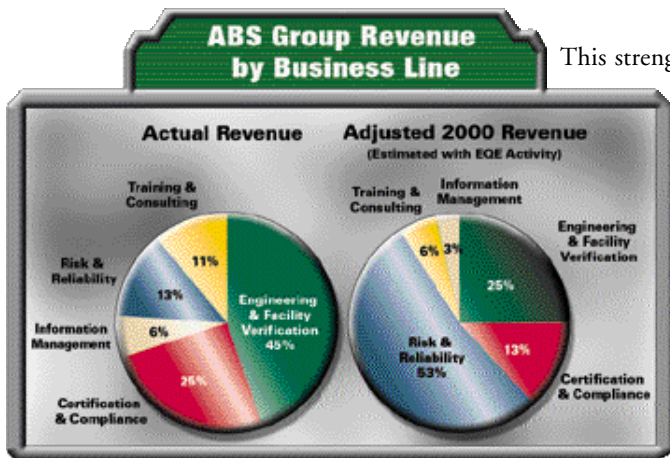
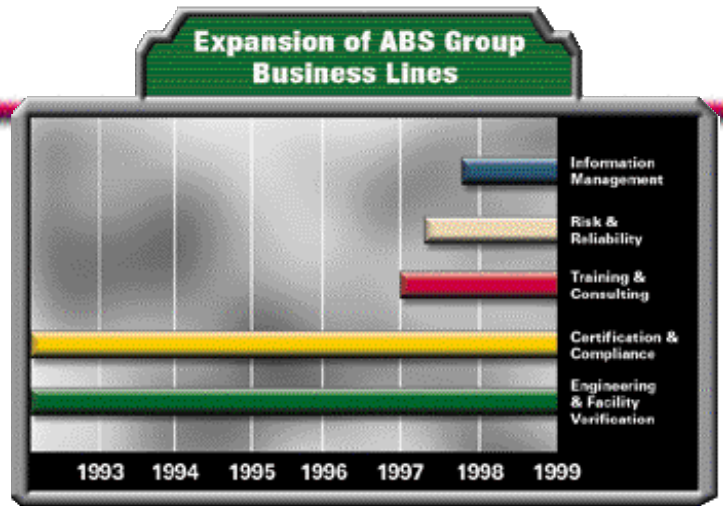
upon ABS Group to guide them towards certification to ISO quality standards.

## Training

Training services offered by ABS Group were strengthened in 1999 with the foundation of ABS Institute. This provides a coordinated approach to services previously offered individually by the various Group business units.

## Fleet Management

Through its majority-owned subsidiary, ABS Nautical Systems, ABS Infolink seized the second largest share of the fleet management system market based on its advanced programming and global support network.



This strength was boosted through a series of strategic alliances with prominent partners.

The year also saw the creation of

The ABS Institute will pioneer advanced distance learning techniques to offer a wider range of services to a geographically-dispersed client base.

a worldwide network of sales and support offices that were instrumental in increasing sales opportunities.

## Information Management

ABS InfoLink Inc., an ABS Group subsidiary, also turned in a year of strong growth, jumping from a mere 1 percent contribution to 1998 revenues to 6 percent in 1999. Through the acquisition of the widely-respected QMX Quality Management Software, ABS Infolink is now able to offer ABS Group and other clients the most sophisticated system for tracking, integrating and managing the information generated by a company's quality management system.

A completely new version of ABS Nautical Systems' SafeNet program was launched for the offshore industry, specifically tailored to the needs of this market.

## Focus

It was a year when the energy and focus of the ABS Group was aimed at integrating its message of risk, safety, quality, environmental, asset integrity and information management for clients, wherever in the world they may be and whatever the focus of their business activities.

## ABS Group entities continued to find successful new market segments for its comprehensive package of services







roviding innovative  
risk-based safety  
solutions



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[www.abs-group.com](http://www.abs-group.com)

[www.abs-infolink-com](http://www.abs-infolink-com)

[www.abs-ns.com](http://www.abs-ns.com)

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