

*“We must be intolerant  
of the substandard  
among us.”*

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Frank J. Iarossi

**1997**  
*Annual Review*

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**ABS<sup>®</sup>**







## Our Mission

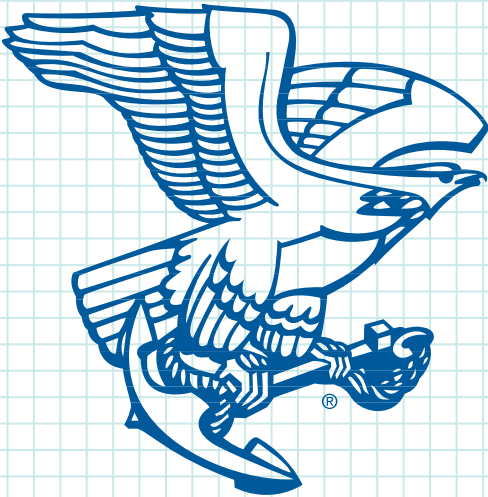
The mission of **ABS**® is to serve the public interest as well as the needs of our clients by promoting the security of life, property and the natural environment primarily through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities.

## Quality Policy

It is the policy of **ABS**® to provide quality services in support of our mission and to be responsive to the individual and collective needs of our clients as well as those of the public at large.

All of our client commitments, supporting actions, and services delivered must be recognized as expressions of quality.

We pledge to monitor our performance as an ongoing activity and to strive for continuous improvement.





# “Safety, Quality, Environment.”

The word *intolerance* tends to have a negative connotation, except when the intolerance is directed against unacceptable attitudes and practices.

When it comes to issues of safety, quality and protection of the environment we, in the marine industry, display a wide range of attitudes from the very responsible to the irresponsible. All too often, our public image has been colored by the latter.

In response to that misleading perception, national and international regulators have felt compelled to generate a near continuous onslaught of new regulations. Unfortunately, many of these have only increased the burden on the responsible members to the economic advantage of the irresponsible.

Few would argue that it is time to change this cycle. We must shift the emphasis from increasingly prescriptive regulations to the establishment of a comprehensive safety culture. This shift will foster greater awareness, an enlightened attitude and continuous, self-generated improvements in safety.

To give our industry the time and the resources to promote and maintain this new safety culture, we must encourage a moratorium on new regulations which, in and of themselves, do not improve safety. And we must become *intolerant* of the substandard among us, whether they be shipbuilders, owners, managers, charterers, flag states or classification societies.

Within **ABS**,<sup>®</sup> our mission is to serve the public interest, as well as the needs of our industry, by promoting the security of life, property and the natural environment. In a broader sense, the diversified **ABS<sup>®</sup> Group of Companies** has defined its comparable mission as assisting its clients to improve the safety, enhance the quality and minimize the environmental impact of their activities.

These two missions define one **ABS** organization committed to the highest standards of safety, quality, integrity and service. This commitment demands that we remain *intolerant* of the substandard among us.



A handwritten signature in blue ink that reads "F. Iarossi". The signature is stylized and written in a cursive-like font.

**Frank J. Iarossi**  
Chairman, ABS

**Maritime safety is being framed within a new context. Terms such as Formal Safety Case and Risk Assessment will soon become commonplace. Over the next few years there will be changes instituted that will fundamentally affect the manner in which we all conduct our business.**

# It is time...

*we must become intolerant of those who seek to avoid safety standards*



**Frank J. Iarossi**  
Chairman, CEO ABS

At **ABS**® we believe an integrated management system approach, which combines the concepts and requirements of the International Safety Management Code (ISM), the Standards for Training, Certification and Watchkeeping for Seafarers (STCW), the ISO 9000 quality standard and the ISO 14000 environment standard will provide the four cornerstones upon which to build a true safety culture in our industry.

The joint stimuli of Quality Systems and of the ISM Code has begun the development of a new holistic approach to setting and maintaining more modern, more effective and ultimately safer standards within the shipping industry. This new approach, building on the above four cornerstones, places particular emphasis on assessing the risks inherent in the marine industry, on the specific impact of the human element in the safety equation, and on the potential to limit those risks through an enhanced commitment to safety.

We do not yet know the exact variation and deviation of the new compass but we know the direction in which the needle points. That direction is 180 degrees removed from the minimal, compromise standards of the past. It is time to replace this culture of reluctant compliance and, on occasion, compliance avoidance, with a new approach, one which embraces the concept of a true safety culture.

It is time for the responsible members of the marine industry, for the majority of this industry,

to become intolerant of the substandard within its ranks. This includes not only substandard vessels but the substandard shipbuilders, substandard owners, substandard operators, substandard charterers and the substandard classification societies that enable those vessels to tarnish the image of our industry.

This is a challenge which is crucial to our collective future well being. It is a fight which cannot be won by any single member or section of this industry. It is time for the responsible shipping professionals to join in a common desire to apply sensible safety standards which challenge us to improve.

Fortunately, most members of our industry have a very responsible attitude toward safety. But this is a business which knows no borders. Too often, a few among us have felt beyond any enforceable law. There have been periodic examples of a disregard for the safety of life, of property and of the natural environment. At times some have convinced themselves that the lives of third world seafarers, lost in some remote and unmarked ocean grave, are merely factors within the equation which measures the risk of conducting our business.

We cannot allow any among us to continue in this way. It is time for the entire marine industry to come together to replace its traditional resistance to regulation with a comprehensive safety culture which encourages enlightened self-regulation.

**Marielle Bolton and Cielo Di Savona, multipurpose vessels, 19,300gt, built by Dalian Shipyard, China.**



At the same time, national and international regulators must recognize that the marine industry is currently overwhelmed by the stream of recent new rules, regulations and requirements. We have reached the stage at which passing a new requirement, in and of itself, will not improve safety if the industry barely has the time and resources to establish minimum compliance with those already in force. We cannot continue to push an owner to meet yet another implementation date for an incompletely understood new standard.

It is time for a pause in the flow of new regulatory requirements. The focus should swing to more stringent enforcement of existing regulations. The tools to shape the future conduct of this industry are already at hand. We have a new breed of leaders who have demonstrated that they have the courage to use them. It is now a challenge of effective implementation not continued new regulation.

All of us responsible for setting standards need to review and reassess those we have available to us. We need to delete those that time and technology have rendered unnecessary or obsolete. We need to clarify those that are still applicable. And we need to ensure they are being fully and effectively implemented. We are doing this within **ABS®** by reassessing our own Rules and requirements.

This must be a collective endeavor. It requires courage and commitment. It demands a change in the way we, as an industry, have responded to the application of safety standards in the past. That attitude has been typified by reluctant action unless provoked by regulators who have lost patience with our recalcitrance.

We must act with greater boldness and courage.

If we do not, the alternative is equally unacceptable. Perhaps for the first time ever, the shipping industry is facing a different, more hostile, more concerted regulatory environment. The safety net

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is being tightened by a growing band of increasingly well informed and very conscientious port state regulators.

They have scrutinized the manner in which we operate and have found it wanting. They are demanding that we

improve. And they are gaining strength and encouragement from each other.

The safety bar has been raised. It will be raised again and again. And we must encourage our entire industry to respond appropriately.

We can, in the time honored tradition of this industry, choose to adopt a guerrilla campaign of obstruction and resistance to change, and bear the consequences. Or we can accept that, finally, we have an opportunity to shake off the substandard elements, whether they are found within the ranks of the flag states, shipbuilders, owners, managers or classification organizations.

That choice can be summarized more directly. Do we want an industry which is regulated by governments? Or do we want an industry which is perceived by those governments as having the maturity, the ability and the collective will to regulate itself.

That is the challenge. It is achievable. The process will take time. But this new direction will lead to improved standards, a more even competitive environment, and less regulation in the future.

It is time for us to renew our pride in our industry, retake control of our own environment, and promote and maintain a climate of intolerance of the substandard elements among us.

**Let us jointly create a true safety culture which will bring renewed pride and public awareness.**



Gerhard E. Kurz  
President  
Mobil Shipping & Transportation Company  
Member of the Board, ABS®

Few issues have dominated our industry with as much intensity as have safety and environmental protection. The ever-tightening maze of rules and regulatory constraints attests to that fact to the extent that the level of regulatory oversight, at both global and regional levels, is becoming quite intrusive and burdensome for many operators.

There are a number of reasons why this has happened. The primary one is past neglect of sound quality standards and critical safety procedures. In this regard no segment of our industry is without blemish.

Rather than dwell on the mistakes of the past, let us recognize the tremendous progress made over the last few years in improving safety and environmental protection standards. Our industry today has fewer accidents. Pollution from tankers has been on a downtrend for a number of years. Personal injury rates have been reduced significantly.

This is the result of many broad-based initiatives on the part of IMO, flag state administrations and classification societies. OCIMF, industry and governmental organizations, and individual shipowners and operators, have all played a part. Without this collective effort, significant progress would not have been possible.

A most encouraging development has been the shift in focus away from hardware to the human element. This is not to discount the impact of technology on maritime safety. Double hull construction, and sophisticated navigation and traffic control systems, have proven their value. The mistake is made when we create the perception that technology solves all problems.

# The new safety culture

*think safe, act safe, be safe*

This is particularly disconcerting since we all know that more than 80 percent of marine accidents are the result of human error, many of which could have been prevented through more and better training.

Developing an all-pervasive safety culture, however, is only possible with demonstrated commitment and direction from top management. There is a fundamental point of perception which is quite instructive in measuring this commitment — Is safety viewed as an expense, or as a means of improving the bottom line?

The latter attitude, which we have adopted at Mobil, reflects our belief that benefits far outweigh costs. We believe that all accidents are preventable. We encourage open communication based on trust. The more you communicate, the more you build trust.

**We believe that all accidents  
are preventable.**

Our slogan is “Think Safe, Act Safe, Be Safe.” Converting these concepts into an effective safety effort requires total teamwork. We have spent years building the Mobil Marine Team to the point where shoreside management and shipboard crew now function as one.

As a tanker operator and longtime safety advocate, I have always been supportive of measures designed to prevent accidents and raise the quality standard of our industry. As such, I view IMO propagated rules and conventions as extremely beneficial for safe vessel operations. I particularly applaud the ongoing work to strengthen standards in the area of training, certification and watchkeeping. It is important that the improved STCW convention is implemented as soon as possible.

There is a similar urgency for industry to commit itself to the orderly implementation of the ISM Code, which enters into force this coming July. I strongly agree with its preamble which states that “the cornerstone of good safety management is commitment from the top.”

If implemented in the right spirit, the ISM Code, together with the new STCW convention, will achieve the desired uniformity in standards of operation and crew competence to meet today's stringent safety and quality requirements.

It would be hard to argue that these measures are not needed or are lacking in purpose. But the question still to be asked is — Do we need to do more, or is the cause of industry better served by taking a step back and digesting what we have already developed?

I strongly believe it is time to call for a moratorium on new rulemaking. Shipowners and operators are well aware of governing requirements and penalties for noncompliance. What is now needed is aggressive implemen-

**I strongly believe it is time to call  
for a moratorium on new rulemaking.**

tation and enforcement of what's on the books. The tools are in place. Let's use them to underpin the new safety culture.

## Safety starts at the top

**Robert D. Somerville**  
President, COO ABS



If the marine industry, in its entirety, had adopted the same approach to safety as espoused by Gerhard Kurz, and practiced by Mobil and so many other responsible ship owners and operators, it would not have been subjected to the onslaught of new regulations of the recent past.

It is true that quality standards have been through a prolonged period of neglect, and that every sector of the industry can be apportioned a measure of blame. But that kind of *laissez faire* approach to standards has become an unacceptable anachronism. In recent years **ABS** and the other leading classification societies have worked diligently to redeem the reputation of class and to cooperate in the development of an industry wide safety culture.

A true safety culture will only be adopted if the most responsible elements, the top tier of the industry, demonstrate that same commitment and direction in a concerted and coordinated manner. Whether it is working with the owners and operators of **ABS** classed vessels, within IACS, at IMO, or together with the EU and Port State authorities, it is the policy of **ABS** to press each of these responsible partners to join in setting and enforcing sensible, achievable, yet demanding standards for the safe conduct of our industry.

At the same time, we are constantly reappraising our own actions to ensure that we continue to meet the necessary quality management system demands that we expect of our clients and partners. And we continue to reassess the content of our Rules to ensure they reflect the needs of the modern maritime industry.

It was such a reappraisal that led us to develop new guidelines for the application of ergonomics to marine structures, equipment and systems. We believe it is an exemplar of the type of leadership which **ABS**, class, and our partners within the responsible majority of this industry must demonstrate.

That reappraisal of our activities also led us to develop an enhanced approach to training. We applaud and support the positive improvement in the standards for training ships' crews that are embodied in the STCW Convention. But the true application of a safety culture demands that each of us should apply a comparable evaluation to the training requirements for our own activities.

As a consequence we have introduced new Lead Surveyor and Veteran Surveyor training courses within **ABS** which, together with a reinvigorated mentoring program, are already showing results. These courses are designed to build on the practical, professional skills of our most experienced surveyors, and to encourage their dissemination throughout our worldwide survey network.

Although there are significant costs attached to an expanded training program, this is one area in which we strongly believe that the cost benefits which stem from these expenditures far outweigh the direct costs involved.

A true safety culture places responsibilities and demands on every individual within every organization which participates in the marine industry. At **ABS** we are committed to the process. It starts with our staff, it includes our Rules and procedures, and ultimately takes in the manner in which we liaise with our partners in safety, whether they be owners, operators, insurers, regulators or governments. We are encouraged to find that the number of like minded partners who have joined us in this challenge is swelling daily.



# ISM will stimulate a safety culture

*anticipating problems  
enhances prevention*

I have been associated with IMO for more than twenty-five years — first as the head of the Canadian delegation, then as Chairman of the Council and now as Secretary-General — and during that time someone or other has always complained that IMO produces too many regulations.

It is not very often that an international organization is accused of working too hard and so, in a way, these complaints could be seen as something of a compliment. But even so, they do contain some truth and there is no denying the fact that some of IMO's regulations have owed a lot to political necessity rather than to technical evolution.

Names like the *Torrey Canyon*, *Argo Merchant*, *Amoco Cadiz*, *Herald of Free Enterprise*, *Exxon Valdez* and *Estonia* are all well known in shipping circles. They were all disasters of one sort or another. To IMO they represent much more. Each one was a catalyst for change. Each one resulted in demands for action from politicians and the public alike and IMO was approached to make sure that something was done.

**I think that it is possible to anticipate**

**most problems and to prevent them**

**from happening in the first place.**

The effects have generally been beneficial. As a result, conventions such as the International Convention for the Safety of Life at Sea [SOLAS] 1974, and the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto [MARPOL 73/78], have been largely rewritten and improved. But it would be naive to agree that a political crisis provides the best background for making technical decisions. And responding to disasters in this way is suspiciously like a knee-jerk reaction.

I believe that the time has come for IMO and the maritime community in general to stop reacting to events and start looking forward in a far more positive way. I think that it is possible to anticipate most problems and to prevent them

William A. O'Neil  
Secretary-General  
International Maritime Organization

## ISM is only the first step

*A new approach to setting safety standards*

**Antonio Lino Costa**  
President, ABS Europe



from happening in the first place. However, to achieve this, we have to change some of the old, conservative and frequently negative attitudes that still exist in our industry.

We have to replace them with what has been called a Safety Culture — a culture in which nothing is done without safety being taken into account, not as an afterthought but as a priority.

This is already happening. The International Safety Management [ISM] Code seeks to make safety a prime concern of shipping company management. Few subjects have attracted as much attention in the shipping community in recent months as has the ISM Code. It is not surprising, perhaps, that many of its critics have, in the past, complained about IMO adopting too many conventions and seem to think that the ISM Code is yet another piece of bureaucratic red tape.

In fact, the ISM Code is different from almost all the legislation that IMO has adopted in the past because it does not demand new equipment nor changes to hardware. In essence it merely asks shipowners to demonstrate that they can operate their business safely and with due regard to the environment.

### The ISM Code asks shipowners

**to demonstrate that they can operate their business safely.**

To some, the ISM Code represents no great hardship — because they have been applying its provisions for years. They have already adopted a safety culture. Others have discovered that far from being a burden, implementing the ISM Code has brought great advantages, by making their operations more efficient as well as safer.

That is perhaps the best motivation of all for making safety part of the company culture — it means good business.

We believe the implementation of the ISM Code is a significant step towards the application of more modern, more effective and ultimately safer standards within the shipping industry. **ABS** supports the code wholeheartedly.

ISM is taking the marine industry in a new direction. Many within the industry appear unaware that a new captain has taken the helm. They continue to respond to changes in safety standards by looking over their shoulder to the way standards have been set and enforced in the past. In so doing, they risk being left behind as their competitors adopt the management system of the future.

To understand this movement we must lift our sights from the more mundane elements of implementation, which have preoccupied most owners in recent months, and look towards the safety horizon.

Approaches which have been formulated under terms such as Formal Safety Case and Risk Assessment are the new drivers of maritime safety standards. ISM is the first step in this new direction.

What does this mean? For the first time, maritime safety is being framed within a new context, one which begins with an assessment of the management system adopted by the operator of the ship, and in the operation of the ship itself.

This carries the potential to fundamentally change the manner in which classification and regulatory oversight are conducted. It is the application of an holistic approach to safety, applied to the entire management and maintenance of a vessel. Past regulatory efforts have focused on specific remedial, usually technical, modifications or obligations.

The ISM Code has introduced the concept of quality management, of clearly defined procedures, of required incident reporting. An ongoing audit verifies that these procedures are being followed. Conformance is monitored by targeted sampling. Scrutiny of the vessel has begun to move away from the inspection of a structural member with a flashlight and hammer, to an assessment of the manner in which the vessel is operated. If those management and operational standards are being adhered to, can we then begin to make assumptions regarding the fabric of the ship?

In the same way, instead of opening up a piece of machinery for inspection at rigidly specified intervals, do we apply risk assessment techniques in which comprehensive databases of performance criteria and failure rates are established which will give clear indications of operational life cycles, of inspection periods, of replacement requirements?

We are feeling our way past a process of random selection based on experience, to one of scientifically considering the whole ship, and then targeting inspection in the highest risk sections of the hull and engine space.

There are significant benefits which will accrue to those operators prepared to shift the emphasis of their operations in conformance with this new direction. It is indisputable that real cost savings and greater efficiencies flow from the adoption of a quality management system.

We believe the implementation of the ISM Code is a significant step towards the application of more modern, more effective and ultimately safer standards within the shipping industry. We strongly support the code and believe that no responsible shipowner or operator should fear its implementation.



# Safety is not just about saving lives *it's also good business*

Bulk carriers are vital to world trade. Regretfully, there remain a large number of 'substandard' operators trading 'substandard' bulk carriers with 'substandard' charterers. They undermine the efforts of responsible owners.

The complex issue of the safety of bulk carriers has been Intercargo's principal interest in recent years. Safety is important. Not only does it safeguard the lives and well-being of seafarers but it is part of making the industry more efficient and competitive. It requires cooperation from all — charterers, insurers, flag and port state administrations, ports and terminals.

As a first step it must be understood that low quality ships can be profitable. In a free market, these substandard operators substantially undercut the responsible owner. In the absence of effective flag state control, or self-regulation, the 'substandard' operator has been able to prosper at the expense of quality operators.

This lies at the root of many safety problems. When coupled with an historic lack of enforcement by flag states, and complicity by some shipowners, charterers and class, these shortcomings have allowed substandard shipping to take root, profit and flourish.

For many years dry bulk charterers have had little incentive to employ quality tonnage. It seems to matter very little if a cargo of 150,000 tons of iron ore is lost with its ship — the insurer pays up, there is plenty more ore in the mine, little environmental damage is done and few hear or care about the drowning of seafarers. There are many more ships available to carry a replacement cargo.

This is changing — gradually. The noose is tightening around substandard shipowners and the charterers that support them. But change is hard to effect in the opaque and fragmented dry bulk sector.

Pressure is coming from a number of sources. It started in Australia after too many capesize ships sank after leaving the load port. New standards have created a two-tier market for capesize bulk carriers; younger ships operate in the Pacific, where the average age of capes is 11 years, while older units stay in the Atlantic basin where the average age is 17.

**Sverre Tidemand**  
Chairman, Intercargo

## Operational aspects of bulk carrier safety



Walter J. Czerny  
President, ABS Pacific

But age discrimination is a crude response. Key issues of safety and management are not necessarily being addressed by insisting on modern tonnage. The ISM Code and STCW 95, for example, will make it more difficult for the bad operators, even of modern tonnage.

There is now a consensus that what we need is enforcement of existing laws, not a plethora of new ones. Intercargo strongly supports this.

Neither is port state control the ideal solution. There remain many countries with inadequate, poorly managed, even corrupt port state control. So, who else can help?

Classification by an IACS society is seen as the badge of the better quality operator. IMO has adopted new recommendations on the structural integrity of bulk carriers. Insurance can help by refusing to underwrite non-IACS, non-ISM Code certified tonnage.

What is needed is information which will allow charterers to make responsible decisions. Some charterers have already established risk management and compliance departments to ascertain whether ships meet their criteria. And Intercargo itself is seeking to establish a database on dry bulk carriers to assist charterers in making informed decisions. No responsible owner should be afraid of such transparency and the mutual suspicion between owners and charterers must be broken down.

### The mutual suspicion between owners and charterers must be broken down.

Intercargo is also seeking to achieve a better understanding by ports and terminals of their vital role in bulk carrier safety. For years there has been anecdotal evidence of damaging loading and discharge practices, and of terminals ignoring prepared loading plans. The operators of loading and discharge facilities must understand that they have responsibilities to the ships they work and the safety of the crews that sail in them.

This is another area where transparency is important in improving safety, reducing losses and costs. As already pointed out, safety is not just about saving lives; it is — or should be — Good Business!

**ABS** recognizes the need for a continuing search for practical methods to improve the safety of bulk carriers, particularly aging bulk carriers. In recent months the focus of those efforts has been on the more technical aspects of structural integrity and enhanced survey practices.

These are essential elements within the overall safety equation. But, in seeking to nurture the more pervasive concept of an industry wide safety culture, **ABS** has adopted a more comprehensive view of the development of safety standards.

Our stated Mission is the promotion of safety standards for the protection of life, property and the marine environment. To conform to this Mission we must participate in and, on occasion stimulate, discussions in every area of marine safety which bears on the effective implementation of a safety culture.

Intercargo has been especially active, working with IACS, ICS, BIMCO and the International Association of Ports and Harbors to help raise awareness of the risks inherent in accidental overloading or improper loading for bulk carriers. The IMO has also responded with the inclusion of detailed new requirements governing the loading and discharge of bulk carriers as part of the draft SOLAS Chapter XII amendments which will become effective, for classification purposes, in July of 1998.

The amended SOLAS regulations contain a long list of measures, but the central element is that the master and the terminal representative will be required to agree upon a loading (or discharge) plan for bulk cargoes (other than grain) before cargo operations commence. And that they must then ensure that the cargo operations conform to this plan.

**ABS** believes that, although this is a very positive step, more can be done. The obligation stops short of requiring direct approval of the specific loading plan as a statutory requirement. And it does not require independent supervision of the loading and discharge operations to ensure that the plan is followed.

The strong and persistent anecdotal evidence to which Sverre Tidemand refers, suggests that, too often, the terminal conducts loading in a manner which best suits the terminal, not the ship. And too often what suits the terminal is speed. It is the speed of loading, reducing the number of passes, or overloading a particular hold which we believe leads to the overstressing of the hull structure.

Making rules and regulations is only half the battle. Without proper supervision and enforcement there is a natural and very human tendency at times to bend those rules to gain a perceived advantage. The problem with bending the rules on bulk carrier loading is that the ship itself can only bend so far.

It is **ABS'** belief that substantial further improvement in the safety of bulk carriers, which regularly carry high density cargoes such as ores, could be achieved if both approval of the loading plan, and a requirement for independent supervision of the operations by a recognized third party to check compliance with the plan, were mandated.

It is this proposal which **ABS** broached during 1997, first within our own Council comprising shipowners, insurers, naval architects and shipbuilders who overwhelmingly supported us, and subsequently within IACS where it failed to gain comparable support.

We recognize the difficulties of implementing such a proposal. But we also believe that Class societies must be prepared to act forcefully when we have identified a clear shortcoming in safety standards.



**Roberto Salvarani**  
**Head, Maritime Safety,**  
**Environment & Technical Aspects**  
**European Commission Directorate VII Transport**

There are still far too many operating practices in the shipping industry — not just in shipping companies — which are driven only by considerations of short-term profit, with little regard for the safety of human beings, the environment and vessels. High casualties and detention rates show that international safety standards are consistently ignored. The efforts of prudent operators, regulatory bodies, shippers and insurers are constantly undermined by those who do not comply with the laws.

But the answer to unsafe shipping and delinquent operators is not more regulations — it is to enforce the rules that already exist. There is danger that those companies already operating below standard will not comply with new rules any more than they do with the old ones.

**Priority should be given to binding quality standards for Flag Administrations.**

Development of further standards for ocean shipping should, for the moment, be drastically slowed. Priority should be given to binding quality standards for Flag Administrations. Too many Flag States have neither the will nor the ability to fulfill their important obligations. They undermine standards of safety worldwide.

Given this inability to cope with their responsibilities, today the primary route for enforcement of compliance has to be Port State Control. In 1995 we adopted a European Community Law regulating the inspection of ships of all flags entering the ports of the member states.

This was strengthened in December 1997 to ensure that, from 1 July 1998, those vessels required to be certified in conformity with the ISM Code, will be detained immediately if they enter a European Community port without valid certificates, or if they do not fulfill the safety management requirement.

# Port State Control *is here to stay*

More precisely, when a ship enters a European port without the copy of the Document of Compliance and the Safety Management Certificate onboard, it shall be immediately detained. Considering the risk that European ports may become congested, the competent authorities have the option to lift the detention, provided there are no other deficiencies.

A ship banned following this procedure will be refused access to any European port until the owner or operator has demonstrated that the ship has valid certificates issued in accordance with the ISM Code.

### Believe in the ISM Code.

This measure will be accompanied by complementary initiatives at Paris MOU level. For example, PSC inspectors, during any normal inspection, are issuing a “letter of warning” to all ships which have not yet completed ISM certification. And a three month concentrated inspection campaign will start on 1 July 1998 checking on ISM implementation. Operators of companies and of ships without valid ISM certification are recommended not to try their luck in EU ports.

The advice to all operators is to believe in the ISM Code, to look at it not as an additional regulatory burden, but as a working tool to minimize human error and management deficiencies as causative factors in maritime casualties. This IMO instrument has the potential of initiating fundamental changes in the industry which will have significant impact not just on safety but also on companies' savings.

Statistics taken from companies which have voluntarily introduced ISM, show evidence of a more than 10 percent reduction in liability insurance, 7-8 percent reduction in P&I insurance premiums, an almost 40 percent reduction in lost man/hours and above 20 percent reduction in hospitalized personnel.

For all these reasons, I wish to stress that Port State Control is here to stay, with new elements under development to make it more effective by focusing primarily on those market players — flags, class, operators — which consistently operate and maintain their vessels and crews in a substandard manner.

But “government-driven” measures can be really effective only if they are seen as a contribution to stimulating self-regulation by the industry. This will only be possible if the market players are ensured that quality pays. A Quality Shipping campaign is being promoted in Europe. We rely upon the support of all industry components, starting with the classification societies.

The time is ripe for all shipping industry components to implement a policy of INTOLERANCE towards noncompliance culture competitors.

## Port States and class — a safety partnership

Gus Bourneuf  
Chief Surveyor, ABS



No one element within the safety chain can be totally effective by itself, neither class nor Port State inspections. But, by working together, we are slowly tightening the net on the substandard operator. Responsibility for monitoring compliance with the ISM Code will inevitably devolve on the responsible Port States. **ABS** views its role as more preventive in nature, one that is tailored to assisting our owners to meet all relevant standards at all times.

We have taken a two pronged approach to meeting this challenge. On the one hand we have adopted an informational strategy, designed to directly assist an owner and, most importantly, a vessel's crew, to structure the routine maintenance of the vessel, and monitoring of its documents, in a methodical manner.

In this we have drawn on our accumulated experience to update, produce and distribute to the industry, not just to **ABS** owners, a comprehensive guide to Port State Control inspections. This includes a detailed checklist which the master and chief engineer can use to monitor the maintenance of the vessel.

The guide and the checklist emphasize those areas which our monitoring of recent Port State Control activity has indicated are most likely to be subject to scrutiny. It is a practical, operational tool which the crew can use to identify short-comings at the earliest opportunity.

It is our belief that preventive maintenance should always be the preferred approach to vessel safety, rather than the more traditional reactive response. We are confident that, if this checklist is followed, the vessel will be fit for its intended purpose and unlikely to be found deficient by a Port State.

The second element within our strategy is to use the evidence gained from Port State Control inspections to improve our own survey procedures. These Port State inspections have proven invaluable to **ABS** as a means of monitoring the performance of our own surveyors.

During 1997 we instituted a new analytical procedure for all port state detentions of **ABS** classed vessels to better determine how the deficiency arose. If it could be attributed in any way to a short-coming in our own actions, we determine how our procedures should be amended to prevent a recurrence. The primary differentiator is to determine if the deficiency stemmed from an oversight in either the classification or statutory survey, or if it arose from a subsequent in-service deterioration.

As a result of these investigations **ABS** has taken a number of steps to further improve our survey methods. These include the introduction of a requirement that two **ABS** surveyors must attend a safety equipment survey on all vessels over 15 years old. A further reduction in the already very limited number of class (and statutory certificate) related port state detention figures for **ABS** classed vessels during 1997 has validated the wisdom of this approach.

In conjunction with this, we instituted a Lead Surveyor program, which was given particular emphasis throughout 1997, in an effort to provide a faster, local, seasoned-judgement referral process for our worldwide network of field surveyors. Early indications are that the result is a reduction in class and statutory related port state deficiencies.

We are intolerant of any careless mistakes on the part of our field surveyors. It is our publicly stated aim to reduce the number of class related Port State detentions of **ABS** classed vessels to zero. 1997 saw us make significant progress towards that goal. We shall not rest until it is achieved.



Jean-Marie Brodin  
President, Sedco Forex  
Member ABS®

# The case for safety

A safety culture starts with a total commitment to such a philosophy by the management of every company, large or small. For a company which has not yet adopted a management system approach to its operations, the concept can appear to be so radically different as to be daunting. For other organizations, which have taken the first step by introducing a Quality Management System, there is much more that is still to be done. The approach demands objective self regulation. Our experience confirms, however, that the rewards make the effort worthwhile.

The international offshore oil and gas exploration industry has always had a heightened awareness of safety factors. But it was not until the early 1990's and the UK Government's Cullen Report recommendations stemming from the *Piper Alpha* disaster, that we began to understand and adapt to the new requirements imposed by a 'Safety Case' approach.

On reflection, this new 'Safety Case' policy can be seen to have enhanced and included the then fledgling Quality System philosophy. Since that time, the two have matured together. As more international quality standards are introduced, the most recent being the ISO 14000 Environmental Standard, the more we can expect to see society moving from the traditional prescriptive approach to standards to one which requires the setting of goals. These are concepts of quality management, continuous improvement, formal safety case, risk assessment and, ultimately, the acceptance by every business, operator and industry, of its individual responsibility for safety.

Sedco Forex signed on to this new direction from the outset. Our semi-submersible drilling rig, *Sedco 706*, was one of the six voluntary test cases used for developing the safety case approach to standards in the North Sea in 1992. We have not deviated from this course. Over the last decade we have developed a comprehensive Quality, Health, Safety and Environment Management System (QHSE). QHSE is a line management responsibility requiring visible commitment, leadership and involvement. Our proactive QHSE culture is understood, shared and practiced by ALL employees and an integral part of everyday business. A fundamental tenet of this culture is our belief that all people, property and process loss are considered management failures and avoidable.

An integral part of this program is the accumulation and analysis of data from past accidents and incidents in a Risk Database. This provides us with the information needed to develop Risk Profiles and effective safety plans. It is the same approach demanded by the safety case which has become the cornerstone of the offshore industry's safety culture.

## Making a case for the safety case

*Shipping faces a different  
regulatory future*

**V.F. Bud Roth**  
President, ABS Americas



An effective and acceptable (to the regulatory bodies) safety case requires the company to demonstrate that its safety policies are achievable through safety targets. The safety case must establish procedures for continuous review, and allow for periodic audit of the QHSE management system.

The information contained in the safety case must provide for the safe operation of the installation by clearly demonstrating that the QHSE management system complies with all applicable health and safety laws. It must identify all hazards with the potential to cause major accidents. It must demonstrate that the risks associated with these hazards have been identified and evaluated and that reasonable steps have been taken to reduce the risk to as low a level as is reasonably practicable.

**An acceptable safety case  
must include the participation  
of the workforce.**

Risk to individuals must be similarly quantified, assessed and, where necessary reduced. Statistical analysis of accidents and fatalities within a company, and the industry is required if reasonable targets are to be set.

Most importantly, an acceptable safety case must include the participation of the workforce. The knowledge and experience of Sedco Forex personnel, at all levels, has been an integral part of our approach to hazard assessment and emergency response planning. And the members of our team have gained, through participation, an increased awareness of the importance of safety issues throughout our organization.

It should be clear from the experience of the offshore industry that a safety culture within an industry is inevitable. If every participant within an industry has adopted a Safety Case approach to their operations, and a philosophy of Continuous Improvement to their organization, it should not take a disaster, such as the *Piper Alpha* to stimulate regulatory change. Safety makes sense.

We need look no further than the offshore industry to see the future of the regulatory process for the international shipping industry. The process has already begun with the pending implementation of the International Safety Management Code (ISM). Yet perhaps the majority of ship owners, operators and managers have not fully understood the future implications of this initiative.

ISM will move the industry towards a management system approach to its operations. It introduces the concepts of quality management and continuous improvement to vessel operations. For the first time within the shipping industry, it demands the direct involvement of the operator in assessing and setting its own requisite safety standards. And it requires regular audits to ensure those standards are met and maintained.

When those basic principles are compared to the Quality Management and Safety Case requirements for the offshore industry, which Sedco Forex has outlined, it is clear that the future direction of ship safety standards has been set. Inevitably the journey towards implementation will be considerably more difficult for the shipping industry than it has been for the offshore sector. The number of participants is much larger, there is less specific geographical jurisdiction and, unfortunately, there are many more owners and operators who remain philosophically opposed to regulation of their activities.

These factors are hurdles to be surmounted, not barriers to implementation. Support for the process will gain momentum as individual companies and organizations adopt these new concepts within their own operations. At the IMO there has already been practical application to the organization's own internal activities of Formal Safety Assessment techniques. Proposed new regulatory initiatives must now be weighted according to the risks which are addressed, when determining priorities for committee consideration.

We will all need to develop new skills as we adapt to this changing regulatory environment. Risk identification, risk profiles, risk databases, risk analysis and risk amelioration are not concepts with which the shipping industry is widely familiar, if at all. Much of this expertise is available from consultants skilled in applying these techniques in other industries. **ABS** is aggressively seeking to add these core skills to its own services.

For **ABS**, this is a natural outgrowth of our activities. We were at the forefront in adopting a Quality System for our own activities. We have been leaders in developing the necessary skills to advise on the implementation of the ISM Code, and in qualifying as auditors for its ongoing application. **ABS** affiliated companies have developed comparable leadership positions for the introduction of the main ISO standards, most recently, the ISO 14000 environmental standards.

It takes only a moments' reflection to observe the pattern which is emerging. Prescriptive regulation of shipping safety standards will be viewed as an anachronism within the next few years. It is to be hoped that, unlike the offshore industry and the *Piper Alpha*, there will not be a horrific casualty involving either significant loss of life or environmental damage to stimulate a hastily conceived, sweeping new mandate. But neither can the industry afford to ignore the forces which are shaping its regulatory future.

By accepting this new direction, and actively participating in formulating the new safety framework, we will develop improved safety systems and a pervasive safety culture within our industry.



# Replacing *the regulatory culture*

The concept of 'safety' needs to be further enhanced within the maritime industry. Safety should not only refer to vessel ocean-going reliability but also proper cargo handling, life and environmental safety, as well as comprehensive ship and shore-side procedures that will ensure such safe practices. The industry, operators and shippers alike, must begin to see safety not only as a regulatory item but as a natural and everyday necessity. In other words, we need to develop a safety culture.

A safety culture can perhaps be best promoted by the industry itself. The industry needs to encourage self-monitoring and self-regulation to ensure compliance to present regulatory standards. The continued introduction of regulations without careful consideration will lead to over regulation, rather than the formation of a safety culture.

This is not to say that we should blindly support the need for a moratorium on passing new regulations. There very well may be existing regulations that are inadequate or outdated. In these cases, it is in the interest of the industry to ensure that regulations are deleted, amended or superseded as necessary.

However, careful analysis must be given to any and all new regulations so that their effects on, and benefits to, the industry can be fully ascertained. Any increase in the regulatory burden, especially when regulations are flawed and unnecessary, will become counterproductive. They will only put undue pressure on shipping companies and, in turn, endanger full compliance with the regulations which are truly valid and necessary.

Let us remember that our common objective is the establishment of a safety culture rather than a regulatory culture.

In addition, the interpretation of existing regulations should be universally consistent. The effective implementation of existing regulations, and continued monitoring of compliance to these regulations in a uniform, effective and fair manner, will alleviate the need for the introduction of new regulations.

In turn, this should result in the emergence of globally recognized safety standards. All players within the industry, including operators, shippers and port authorities, should have a thorough understanding of the adopted safety policy. Thus, together with management support and direction, a successful safety culture can be achieved.

**C.C. Tung**  
Chairman

Orient Overseas [International] Ltd  
Member of the Board, ABS®

## Modernizing Rule requirements will simplify safety compliance



**John F. Conlon**  
Director, Rule Development, ABS

The ISM Code has introduced a standard under which shipping companies must operate. Proper implementation of the ISM Code can serve as a good foundation for the establishment of a safety culture. Under such a Safety Management System, accident, near accident and nonconformity schemes will assist us in monitoring and tracing the source of incidents, thereby allowing proactive measures to be taken in anticipation of any potential mishaps.

However, to be successful, there needs to be a commitment from all levels of management and staff, both afloat and ashore, to reach a recognized safety standard. This cannot be achieved without support, cooperation, constant dialogue and teamwork throughout the organization.

Experience has shown that establishment of a safety culture is based on the understanding and dedication of the people involved. From the highest echelon of management down to front-line level, there must be an unyielding commitment to achieving such policy objectives, rather than simply fulfilling regulatory compliance.

Together with a proper safety management structure and ethical business practices, a safety culture concept will grow and eventually integrate into the operations of the company. Poor implementation of the ISM Code will result in compliance for the sake of regulations rather than a true creation and permeation of a safety culture within the organization. We must together promote adherence to the original spirit of the ISM Code and discourage mere regulatory compliance.

At the end of the day, safety is an issue that is paramount to shipowners, shippers, classification societies and shipyards alike. I look forward to the day when such a safety culture becomes the norm of our industry. I am convinced that it is both in our interest and our responsibility to encourage and develop such a culture.

**ABS** has lent its support to the growing demand for a moratorium on new regulations applicable to the safe operation of international shipping. It is our view that there are ample regulations already in place. We believe that vigorous enforcement of existing regulations will be a more effective means of improving safety standards than yet another round of incompletely understood and erratically implemented new requirements.

We also recognize that such support for a reassessment of the international regulatory environment places an obligation upon us to review our own classification Rules and requirements. The industry is demanding that statutory regulations be assessed for their continued relevance to the conduct of modern shipping. That same criteria of relevance should, we believe, be applied to our own requirements.

But we also believe that this period of reassessment creates a more exciting opportunity for us to look ahead to the future nature of classification rule making. It is becoming clear that changes in the manner in which risk is assessed, and therefore addressed through class rules, is inevitable.

The IMO has already broached the concept of Formal Safety Assessment, which is predicated upon the principles of risk assessment. The benefits of addressing safety, based on rational and systematic analyses of risk will move the marine industry, slow as it may be, towards adopting a similar approach.

We believe that the process must start by exploring how this approach can be adapted to what we do. We began by employing the techniques used in risk assessment to define safety and to determine how risks could be mitigated. We then applied these findings to our *Machinery Rules*. From this we established a risk template, which we applied to the new *Proposed Machinery Rules* which were released for industry comment in late 1997. Although the criteria of the *Proposed Rules* remain essentially the same as the existing Rules, we have reaffirmed their validity by mapping them within a risk model of a ship which will allow us to systematically develop appropriate risk-based criteria.

It is not possible to make an instant, or even quick transition from the traditional rule making process, based upon empirical interpretations of practical experience, to the more sophisticated risk based methods. Such a change requires the compilation of reliability, maintainability and availability databases, among others. These processes will take years to evolve.

The next step is a comprehensive reassessment of the core *Steel Vessel Rules*, and of the many other **ABS Rules and Guides** which are related to them. Once again clarity, ease of use, applicability and relevance will be paramount considerations as we conduct this evaluation. We have already modernized our Rules for refrigerated vessels, machinery and systems to reflect the latest technology.

It is important that none of these steps be taken in isolation. Wherever relevant, the concurrent efforts of IMO to introduce risk and reliability based criteria are being taken into consideration. And the continuing efforts within IACS to unify certain central elements of all the leading classification society rules continues to offer ship owners and builders greater consistency in their design efforts. It is this sort of cooperative approach which is the backbone supporting the fledgling, industry-wide safety culture.



# Enlisting the people – *the human element is the key*



Admiral Robert Kramek  
Commandant  
United States Coast Guard  
Member, ABS Council

Much has been said in recent years about safety and the need for a safety culture, but just what does this mean? To many, it means having a predisposition towards safety, first and foremost. While this does not repress other important considerations, like efficiency and cost effectiveness, it does mean safety must be ingrained in all aspects of marine operations.

The U.S. Coast Guard (USCG) has long recognized that no one project, initiative or slogan will bring about a safety culture in a company, let alone the marine industry. A true, lasting culture of safety will only occur through long-term commitment to a balanced and prudent application of regulatory and non-regulatory accident prevention measures, with an overarching focus on the human element role. Significant advancements were made in 1997 in this area that we must capitalize on in 1998.

Achieving national and international goals of safety and environmental protection by focusing on the human element requires creativity and innovation. The USCG has taken a leadership role at the International Maritime Organization (IMO) which has led to the establishment of a committee-level working group to focus on human element issues.

In framing this policy, the Coast Guard was assisted greatly by the contributions of its Prevention Through People “Champions”, a group of maritime executives which included the chairman of **ABS**®.

The IMO working group drafted a resolution containing a set of human element principles and goals which was adopted by the IMO Assembly at its 20<sup>th</sup> session in November 1997. The group has also drafted *Guidelines for Application of the Human Element Analyzing Process (HEAP)*, to ensure the human element is considered early in the drafting process for every new IMO standard. The Maritime Safety Committee will review these guidelines with the view towards approval at its 69<sup>th</sup> Session in May 1998.

This exemplifies the growing, comprehensive international emphasis being placed on the human element. The USCG, in close cooperation with industry and with **ABS**, has embraced this approach to safety in a variety of domestic and international efforts.

Two of the initiatives which were widely publicized in 1997 are the Standards of Training, Certification and Watchkeeping (STCW), and the International Safety Management (ISM) Code.

## We have done, and can do more

*Defining the workplace for  
safer operations*

**Dr. William Moore, Manager  
Human Factors Technology, ABS**



The challenge facing all of us — industry, **ABS**, and the USCG — in the coming year, is the implementation of these standards, particularly the ISM Code.

The ISM Code marks a significant philosophical shift in the maritime community's approach to safety. It recognizes the human element's role in preventing marine casualties and in ensuring vessels are operated responsibly, in accordance with domestic and international standards.

It will help change the current approach of industry regulatory compliance from a passive defect notification and correction response mode, to an aggressive approach of preventive action. Under this proactive approach, potential discrepancies are resolved by the companies themselves *before* casualties or incidents that can adversely impact the marine environment can occur.

The USCG has already begun conducting pre-enforcement checks for ISM Code compliance on all vessels calling in the U.S. Our boarding officers are ensuring that masters of vessels not yet in compliance understand the importance the USCG places on these standards. And they have been communicating the unbending stance we will take to deny entry into the U.S. after the 1 July deadline by any vessel not in compliance.

The USCG remains committed to working with all stakeholders to promote safe, efficient and competitive operations worldwide, while preserving our precious natural resources. Heightened awareness, increased discussion regarding safety, risk assessments that guide investment of limited resources into prevention measures that will yield the greatest safety improvements, and the many projects initiated by industry all contribute towards this end.

Ultimately, safety improvements will depend upon the successful capitalization of 1997 advances in the human element arena and infusion of them into corporate cultures throughout the maritime community.

It is often stated that the human element accounts for possibly as much as 80 percent of all catastrophic marine casualties. But many incidents, which are not as well publicized, can also be attributed to human failings. If we are to nurture a safety culture within our industry, these hazards must also be addressed.

Through the ISM Code and the STCW, industry attention is being focused on the management approach to the safety of ships. This emphasizes the importance of well trained crew members and sound management systems. But there is a growing awareness that human element problems in ship safety are rooted in the initial design, in the construction and in the maintenance of marine systems.

It is these design factors, resulting in slips, falls, falling objects, burns, body strains and many more, which contribute to the litany of operational hazards to which seafarers are exposed and which make up the majority of P&I personal injury claims.

By extending the application of practical standards into these important, but previously overlooked, areas of day-to-day operations, we believe that **ABS** can make a significant contribution towards the creation of a safety culture on board a vessel, without resorting to further government regulation, or imposing additional cost burdens on owners.

The new suggested standards are contained in the groundbreaking **ABS Guidance Notes on the Application of Ergonomics to Marine Systems**, released in late 1997. The Notes are the first step in what will be a multi-phase approach to this subject, extending the micro-ergonomic focus on individual elements to a macro-ergonomic consideration of the seafarer's working environment.

Ergonomics is not a new science. It has been used for years by the military and many high-tech industries. Yet the pioneering work being undertaken by **ABS** in this field is the first application of these principles in the marine industry.

Maritime regulators have become very aggressive in addressing two of the most critical human element issues: safety management and training. But the safety management system (ISM) and seafarer training (STCW) cannot completely compensate for errors that result from poor design. The design of a vessel must be conducive to the safe and efficient operation of the ship or offshore rig. Every person who has worked aboard a ship or rig can probably identify design elements that could have been significantly improved to better suit operational use.

In developing these new guidelines, **ABS** has been careful not to merely frame another set of onerous regulations with which to bedevil a marine operator. There are direct and indirect cost savings and benefits for the ship or rig owner. Good ergonomics is good economics.

Some savings are immediately obvious. These include a significant reduction in the likelihood of catastrophic incidents stemming from human failings. Better design of integrated bridge systems and unmanned engine rooms can enhance safety by limiting the likelihood of errors. Reductions in personal injuries, lost time and insurance premiums can also be expected.

And the application of ergonomics can ensure that the highest level of efficiency and safety is attained on the modern vessel with the small crew numbers which have become commonplace.

It is the belief of **ABS** that the Human Element must be considered as an integral part of an overall safety culture.



Elmer P. Bud Danenberger  
Division Chief of Engineering and Operations  
Mineral Management Service  
U.S. Department of the Interior

**Regulation of the US Offshore Continental  
Shelf oil and gas industry is focused on  
performance, not regulation.**

Safety objectives are achieved by facility operators, not facility regulators. A regulator cannot prescribe the type of corporate commitment necessary to achieve outstanding safety performance.

For that reason, the Mineral Management Service (MMS), the US Government agency responsible for regulatory oversight of offshore drilling and production activity, generally limits prescriptive requirements to “best practices” adopted from industry standards. Further, operators are free to propose alternatives that provide an equal or greater degree of safety.

However, compliance with prescriptive regulations or industry standards should be only one element of an offshore operator’s safety program. Each company must systematically manage its operational activities to minimize the risk of accidents.

The MMS seeks to encourage active safety management through a number of different approaches. These include working closely with industry on the development and implementation of voluntary Safety and Environmental Management Programs. Such comprehensive safety management schemes are essential to the successful long-term operation of offshore facilities.

We also work with operators to assist them in maintaining compliance and incident data on offshore facilities. We meet with each operator annually to review the results. During these meetings, operators have the opportunity to report on their internal safety reviews and actions being taken to improve safety performance.

# A different approach to offshore industry safety

The focus of our compliance resources is on the facilities with the poorest performance record, and those where the risk of accidents is highest.

MMS is committed to vigorous enforcement. Warnings, component and facility shut-ins, and civil penalties are routinely imposed. New rules may authorize MMS to prohibit poor performers from acquiring additional leases.

## Managing risk on a daily basis

**Christopher J. Wiernicki, President,  
ABS Integrated Services**



But encouragement is an equally important element within our approach. We publicly recognize the very best operators. We may allow such operators to depart from some regulatory requirements. In turn, these successful operators are encouraged to share information on their safety programs.

Accountability is essential. We hold facility operators accountable for the conduct of their contractors.

Education, research and information sharing are major factors in encouraging a safety culture. We frequently initiate research projects and workshops, usually with industry partners, to address important safety issues.

**The long term success of the deepwater program may be more dependent on effective safety and environmental management than on technological achievement.**

When things do go wrong we investigate all serious accidents and spills and publish the findings. We also publish compilations of accident data to assist operators and contractors in assessing and improving their safety programs.

The offshore oil and gas industry has a reputation for technological innovation, and has received well-earned praise for achievements in deepwater development. However, the long term success of the deepwater program may be more dependent on effective safety and environmental management than on technological achievement.

We believe active safety management is not just good social strategy. It is also smart business strategy, for each participating company and the collective offshore industry.

There is a danger that many companies may subscribe to a corporate philosophy of safety but fail to ensure that such a philosophy is translated into practical, day-to-day, operational procedures and practices. A smart, modern business strategy must include quality principles, safety practices and concern for the environment. But an effective modern business strategy also includes functional procedures which ensure on-the-job application of these principles.

While no single element is overly complicated, nor difficult to implement, an effective safety culture requires both a broad vision and thoroughness in application. The **ABS® Group of Companies** specializes in assisting our clients in defining that vision and in developing the applications.

Our experience has confirmed that many companies still focus on only one of the three elements of safety, quality and the environment. Some companies do have a wider view but perceive a safety culture as being largely hardware oriented. Yet others have a mirror image of the obligations entailed and think mainly in terms of software — the human element.

To place any such limitation on the safety culture is to seriously weaken the safety chain. The companies of the **ABS Group** have defined the challenge as being of six interlocking parts — *Awareness, Evaluation, Training, Implementation, Verification and Certification*. To manage risk effectively on a daily basis, each of these parts must be addressed.

*Awareness* ranges from a knowledge of the regulatory environment within which a company operates, to focused research which can give advance warning of new developments and directives.

*Evaluation* covers a company's current level of compliance but, more importantly, should also take into account the full range of risk assessment and qualitative analysis techniques which should guide the risk reduction policies of the organization.

*Training* is a never-ending requirement in a constantly changing world. New staff must be trained and existing staff kept updated of new developments. And training must be all encompassing so that there is a corporation-wide familiarity with the work process, and safety and quality procedures, which guide the company's activities.

*Implementation* is crucial to success. This is the development and effective execution of the necessary quality management systems, safety compliance procedures, risk management strategies and process safety management techniques which translate the concept of a safety culture into a part of the everyday fabric of the company's operations and of its employees' work processes.

*Verification* ensures that each element within this corporate safety culture meets the required standards. It should not be viewed as solely an internal auditing process. It is crucial that the subcontractors and suppliers with which the company does business also meet the standards which are demanded by the quality management system.

*Certification* must be the goal of every safety conscious company. The various ISO and industry standards (such as ASME) have not been developed in a theoretical vacuum. They are effective, pragmatic tools for maintaining a safety culture.

A weakness in any one of these links within the safety chain can threaten the integrity of the entire process. Strength comes from proper integration and a total commitment. The evidence is in. From the boardroom to the workplace, safety pays.



# A gradual, disciplined & focused approach to safety



**Archibald N. Stewart**  
Chairman,  
International Registries, Inc.  
Member, ABS®

In the generic sense, a safety culture can be envisioned as an integrated safety management system, based upon a suite of regularly verified and updated requirements which ensure continued relevance and effectiveness.

With that thought in mind, let's consider what is needed to develop a safety culture in the maritime industry. One of the first steps should be the completion of a safety assessment to determine whether our current regulations meet our expectations, if they are valid, and whether any changes are necessary for them to survive with time.

This new approach for analyzing and developing regulations is only as good as the methodology, development, and application behind the safety assessment mechanism itself. We hope that IMO will ensure that any new decision making tool is fully proven before it is placed into service so that we are assured a true safety culture, having correct and realistic courses of action.

## **We recommend proceeding with caution.**

Because the philosophy behind a safety culture will be new to much of the industry, we recommend proceeding with caution by a process that is gradual, disciplined, and focused. The successful implementation of the ISM Code will represent a step toward the development of a maritime safety culture and, from our observations, it reflects an appropriate incremental movement in this regard.

Due to the conceptual freshness of the ISM Code, it will probably take time for the associated benefits to foster full acceptance by ship operators and crews. We have noted that companies with ISM Code certification are more aware of incidents occurring aboard their ships and are able to quickly provide both details surrounding the incident and a description of the preventive measures they intend to take. This is a positive sign with regard to developing the basis for a safety culture.

We should build upon this foundation slowly. We recommend that any newly developed standards first be introduced as a voluntary Code. Companies that have transformed the current quality management system into a "way of life" are best suited to serve as a test platform for the industry by implementing, evaluating, and recommending changes to the prototype.

## Flag State support is crucial if safety standards are to improve

**Steven R. McIntyre,**  
Director, Regulatory Affairs, ABS



The evolution of a maritime safety culture will also require changes of emphasis in IMO regulatory procedures. As already noted, it is essential that newly developed regulations are reasonable, satisfy their intended mission, and be effectively monitored. The relevance and effectiveness of existing regulations must also be verified and they must be amended or eliminated, as appropriate.

We must begin to develop a means for measuring and monitoring regulation effectiveness. Under the current system, the effectiveness of new requirements and equipment is not always monitored. We must bear in mind that a safety culture cannot be mandated. Regulations which vessel operators find burdensome or ineffective will not be considered in the decision making process and they will not become elements of our safety culture.

We must also begin to look at the industry as a whole. Convention requirements are often categorized on the basis of whether they represent Port/Coastal State or Flag State responsibilities. We believe that the Port/Coastal and Flag State distinction, which tends to minimize the fact that the actions by one group may have a significant impact on the other, has no place in a safety culture and will only erode the foundation.

The concept of a properly developed and applied safety culture is sound. However, it will only function when it becomes a way of life. This is something that must evolve and will require training, adapting to new philosophies, and learning how to gain the most benefit from its application. It cannot simply be legislated.

As with any management scheme, it must be accepted by the company from the highest levels downward and be based upon convention requirements which are developed and maintained in harmony with the practices and needs of the industry. We must all see the need, be willing to make the necessary changes, and proceed patiently.

Absent a major marine catastrophe, which may stimulate knee jerk, unilateral legislative action by a single nation, a regional group, or IMO itself, the pace of international regulatory change within this industry is perforce measured and judicious. It is rarely an easy process to achieve agreement on the content of new regulations and Conventions within the 'decision by consensus' environment of the International Maritime Organization.

Yet these understandable checks on that body's deliberative actions need not restrict its capacity for action. With safety of life and property at sea as its overriding concern, the IMO continues to demonstrate a willingness to act forcefully and promptly in pursuit of that mission. Increasingly it appears to be the industry itself which is the reluctant participant in the process of moving towards the adoption of a true safety culture.

Never has that reluctance been more starkly evidenced than in the begrudging acceptance of the ISM Code. Despite the long gestation period of this new initiative within IMO, and the equally generous notification period prior to its implementation, it is a sad reflection on the industry that a significant number of operators will not have completed the certification process in time.

It has been a matter of concern within the regulatory sector that many Flag States appeared equally reluctant to accept the responsibility which the Code placed upon them as part of SOLAS. While a number of responsible Flag States, including those administered by IRI, did take early, strong, supportive actions requiring timely implementation of the Code as a condition of registration, many other Flags, particularly Open Registry nations, chose a path of silence.

For a true safety culture to begin to pervade this industry, all elements within the industry must subscribe to that ideal. In the same manner that we must become intolerant of the substandard owner or manager, of the substandard classification organization and of the Port State which welcomes deficient tonnage into its waters, we must be intolerant of the Flag States which have neither the will, nor the ability, to exercise the responsibilities which are placed upon them.

It is for this reason that new guidelines have been drafted at IMO which seek to clarify the responsibilities of the Flag State in the effective application and enforcement of the principal international safety conventions. These guidelines build upon the recently imposed mandatory standards for Recognized Organizations, such as **ABS**, which act on behalf of Flag States.

**ABS** was active in developing those new standards for Recognized Organizations. We consider that there must be a close working relationship between the Flag State and its statutory agents for the system to meet its objectives and function smoothly. Acting as we do for almost 100 Flag States, **ABS** is supportive, in principle, of the new guidelines which have been designed to assist the Flag States in meeting their responsibilities.

We are concerned that, if consensus cannot be reached within IMO on this issue, the EU or other jurisdictions may proceed with tentatively announced unilateral efforts to impose strict standards of accountability on Flag States.

Although **ABS** strongly supports a moratorium on new regulations which could further burden the industry, we continue to believe that selective use of the IMO to provide guidance and standardization in the application of safety standards remains an important function if the industry is to develop a clear set of common, equally enforced, applicable safety regulations which will define the safety culture to which we all aspire.



A poorly trained crew on a well found ship is as much at risk as a well trained crew on a ship whose structure is suspect. Safety is all pervasive. It requires the seamless integration of every facet of marine operations if we are to be able to speak confidently of a safety culture having taken root.

As an industry, we have a tendency to

significant improvements in technology, but they must also convince a traditionally conservative industry of the benefits inherent in the new technology. Only with the demonstration that there will be clearly identifiable, life cycle cost benefits attached to its adoption, have most past technological initiatives received widespread acceptance.

development very seriously indeed. Our selection of the name SafeHull® for the unique, dynamic based ship design and structural assessment method which we have developed and continue to refine, is indicative of the focus of our efforts.

During 1997 we were heartened to find that the industry's acceptance of the sophisticated technology embodied in

# Technology's role *within a safety culture*

**Dr. Donald Liu**  
Senior Vice President, ABS®

react only when the glare of the spotlight illuminates any one sector. For some time that focus was on technological development as the industry sought to more completely understand the consequences of some of the fundamental changes in vessel design and construction that have taken place over the last twenty five years.

More recently the human element has commanded the greatest attention as a perhaps belated assessment of the causal role of human failings in marine casualties and accidents has gathered momentum. But neither technological research, nor human factors analysis, should be viewed as the sole path to improved safety standards. Each has its role although, at times, the two become intertwined, as they are with human factors engineering or ergonomics.

For the engineers, designers, naval architects and scientists, there is an unrelenting challenge to apply the latest technological advancements in an ongoing search for safer and more reliable marine structures. We seek ways for them to be built more cost effectively, maintained to higher standards at lower operational costs, while offering the greatest protection for the seafarers who entrust their lives to the soundness of the structure.

The highly competitive nature of the international shipping industry places an additional burden on the researchers and technicians involved in this challenge. Not only must they develop



This can be difficult when different operating philosophies motivate shipowners, some of whom build and operate a ship for most of its commercial life, while others prefer a more speculative approach to ownership. Many of the real advances in marine safety technology have carried benefits which accrue over the life of a vessel. The short term asset trader has less motivation to support, or even recognize, these advances as they may, in some instances, be perceived as carrying a short term cost penalty.

It is this differentiation which a true safety culture addresses. Safety should not carry a price tag and should never be a discriminant against committed, responsible ship ownership.

At **ABS®** we take the responsibilities associated with our position as a leader in marine structural technology

**We view technology as the  
servant of safety.**

SafeHull was cemented with a rush of new orders for SafeHull compliant vessels. With well over 200 SafeHull approved vessels, aggregating more than 20m dwt, now either in service or on order, the superior technology which the system offers has been validated and accepted.

On its initial release, SafeHull was recognized by the most prominent industry award for its "Technical Improvement Leading to the Reduction of Risk to Human Life at Sea." That recognition encapsulates both the SafeHull system and our technology driven research at **ABS**.

Our continuing contention that SafeHull is better able to determine that a vessel's structural strength can satisfactorily withstand the dynamic loads which it will experience in service has spurred debate, and a degree of dispute, from other classification societies which offer competing, differently configured approaches to the establishment and application of their Rules. We believe that this debate, and the efforts of these other societies to apply more sophisticated analysis to their Rule applications, have greatly enhanced the safety of all newly constructed ships. We believe they

provide an excellent example of how a commitment to enhanced safety can have wide ramifications when there is a common goal.

It is our hope that our continuing improvements to the SafeHull® system will spur further development within the field of design and structural evaluation. We believe it is only a matter of time before the first principles approach embodied in SafeHull, will be accepted as the industry standard. Its effectiveness in developing stronger, and therefore safer designs in which the fitness for purpose of each structural component, and of the entire ship, has been scientifically determined is, we believe, indisputable.

Yet it remains a matter of concern to us that some designers and ship builders have not fully grasped the fundamental difference in the SafeHull approach to design evaluation. SafeHull is not an empirical prescriptive approach to Rule making, reformatted into a computerized presentation. It uses, and applies, the same basic principles of a full Dynamic Loading Approach at a fraction of the cost and time, and in an easy to use format.

The key element is the determination of realistic dynamic loads, and load combinations, acting on the ship structure. The strength requirements, which include fatigue strength, are the core of the system and represent true engineering innovation. They define precisely how structures are assessed in terms of loads, load cases, strength modeling and criteria to obtain safe lifetime performance against all relevant failure modes.

The truly innovative aspect of SafeHull is the programming of these basic strength formulations. It is this integrated calculation and evaluation routine which allows rapid development of the initial scantlings for the structure, and evaluation of structural alternatives, before develop-

ing a detailed design or conducting a detailed strength assessment. Although a full Finite Element Analysis package is integrated into the SafeHull system, it is not applied until the final stages of the overall strength assessment.

How is it that this more sophisticated engineering approach can guide a designer towards producing a stronger, safer ship? For the first time the dominant failure modes of hull structures can be explicitly accounted for at the very first stages of the design development in a simple, cost effective and easy to use tool.

Traditional primary structural design criteria has been based on the limit of yield strength, amended by the application of empirically determined margins for buckling, fatigue and corrosion. SafeHull takes a different, more rational, scientific approach which is able to account for these failure modes in a realistic manner.

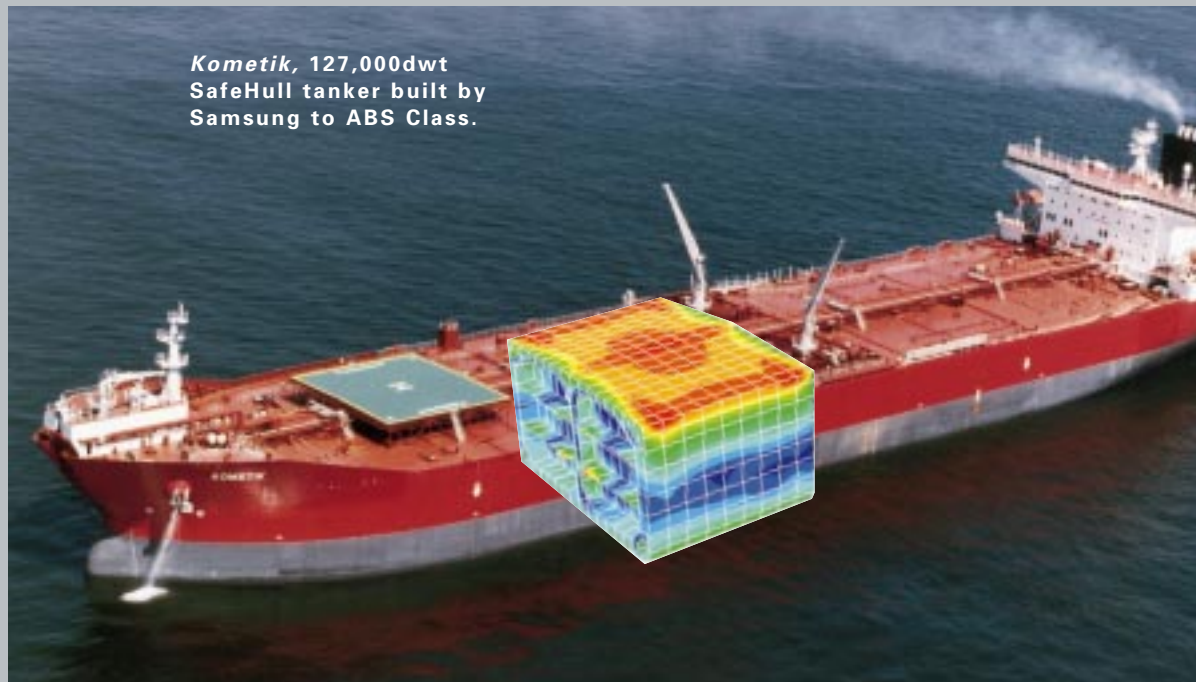
From the outset, a SafeHull design accounts for realistic environmental conditions appropriate to the

structure, to resist all relevant failure modes stemming from those loads. And it establishes criteria which satisfy these failure modes which take into account deterioration that is expected due to normal wastage and corrosion.

Because of the specificity which the SafeHull analysis performs on each component, and on the entire structure from the outset of the design process, a SafeHull ship will inevitably have steel allocated throughout the hull in a slightly different configuration to a vessel which conforms with traditional prescriptive rules, whether computerized or not.

The single largest contribution which SafeHull makes to increased structural safety is to pinpoint exactly where the greatest stresses will be experienced within the hull and to determine exactly what the required strength of the components should be to properly withstand those stresses.

We are confident in prescriptive interpretations.” We firmly believe that



nominal lifetime operation of the vessel. It then accurately establishes the resultant static and dynamic loads acting on the ship, as well as the expected interaction and combination of those loads. It models the strength of the global structure, and of the individual elements within the

**ABS®** SafeHull is the single most significant technical contribution towards enhanced ship safety, and the consequent protection of life, property and the environment, in the recent past. Technology has a major part to play within a marine Safety Culture. SafeHull is proof of that.



# Harnessing information to support a Safety Culture



## SafeNet™ provides the reins

Modern fleet management demands tracking and conformance with a growing number of more complex technical requirements, rules and regulations. A new safety culture, founded on the bedrock of the ISM Code, STCW, the ISO 9000 quality standard and the ISO 14000 environmental standard, requires the accumulation and interpretation of a vast array of data — operational data, incident and accident data, reliability data, classification and statutory data and technical data — for the development of risk profiles and effective safety plans.

Intelligent integration of these various data streams will be the key to enhanced safety and efficiency. By harnessing information, the modern fleet manager will be able to make more informed decisions regarding the maintenance and operation of the vessels under its control.

ABS® has anticipated this new direction, and the demands that will be placed on the modern operator, by developing ABS SafeNet™ which was released to owners of ABS classed vessels in 1997.

SafeNet has applied advanced technology to create a comprehensive, yet very practical tool with which to manage and interpret this growing volume of safety related information, whether for a single vessel or an entire fleet. It offers a powerful combination of databased information, detailed hull and machinery assessments, and advanced analytical tools to assist a vessel owner improve

operating efficiencies, and control costs, while building a safety culture.

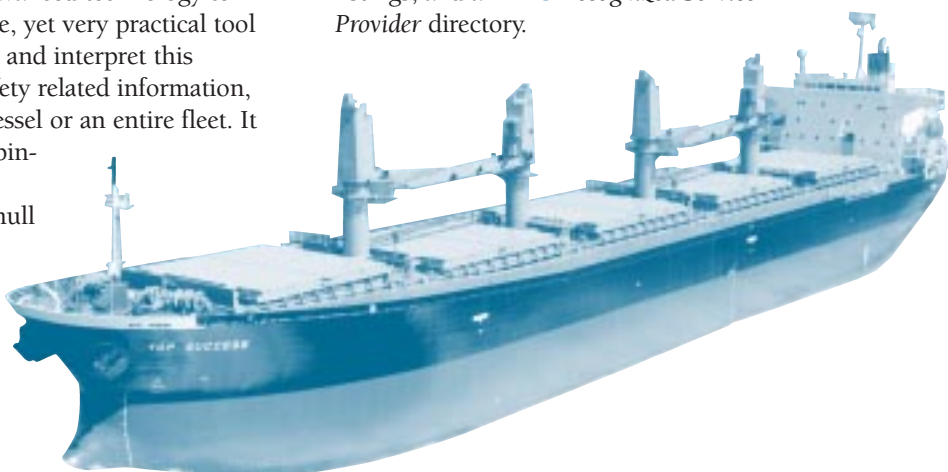
These range from detailed assessment of the vessel's hull structure and its continued fitness for purpose, to simple listings of essential features of repair yards around the world. SafeNet has been developed to assist an operator to pinpoint potential trouble spots before trouble arises, avoiding costly failures, delays, or service disruptions.

Shipowners and managers who use the network have access to volumes of essential, operational information, all condensed, sorted, and displayed in an easily understood, manageable, on-screen format. And they can select those modules best suited to their individual needs.

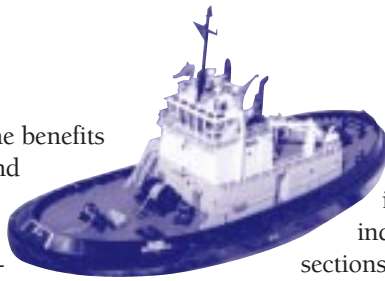
It is the desire to offer simple solutions for common, practical, operational tasks which has driven the development of SafeNet at ABS. For example, tracking and controlling the survey status of even a small fleet is a challenge for the modern vessel operator. An overdue class or statutory survey can lead to expensive delays or a possible Port State detention. And coordinating all the structural, machinery, and statutory surveys is a time consuming task.

This has been simplified with SafeNet. The *Fleet Status* module allows an operator to monitor survey data for a vessel or see an overview of the status of an entire fleet.

Another module contains comprehensive *Marine Information* including worldwide repair yard details, port and flag state contact information, ABS Approved Manufacturers and Products listings, and an ABS Recognized Service Provider directory.



For the SafeNet™ user, the benefits are direct, accountable, and ongoing. Easier, more efficient planning of surveys will minimize off-hire and repair costs. Repair and survey work can be scheduled for the most cost competitive ports or repair yards. SafeNet can provide contact information to assist in making repair decisions. Traditional paper files can be discarded with all the information available quickly, simply and reliably through SafeNet.



This approach is particularly evident within the *Vessel Plans* module. A vessel owner's filing cabinets can become clogged with sheaves of drawings, plans, and technical documents relating to each vessel within the fleet. These documents must often be retained for the life of the vessel.

SafeNet provides a modern response — simple digitized, electronic storage. A complete, life cycle suite of drawings can be retained within SafeNet. With extensive search capability, the appropriate drawings of any structural member, from any period of the vessel's life, can be easily recalled and linked to other modules. Drawings may be marked and annotated for future reference.

The International Safety Management Code and requirements of the STCW Convention have vastly increased the need for retrievable storage of management support documentation. A separate *Code Compliance* module offers such storage and retrieval capability for records required under these and other international regulations.

Monitoring the condition of a vessel's hull to ensure its structural integrity demands years of professional experience and dedicated, skilled, management supervision. It is a traditionally reactive process which has relied on detecting and assessing deterioration and structural failures.

**ABS®** SafeNet provides the modern ship operator with a more precise, more cost effective, and more efficient manner of managing this essential task and of reducing the risk of failure or accident. The *SafeNet Hull Planned Maintenance* module offers owners and operators an extensive hull structural condition database. Effective application of this module offers drawing board to scrap yard life cycle monitoring of the structure of a SafeNet vessel.

Complete modeling of the structure is available, with every structural element capable of being associated with a history of gaugings, drawings, digitized damage and condition photographs, and plate renewal requirements.

It is here that SafeNet demonstrates its power. A life history of gauging information, stored in the network, indicates the actual condition of selected sections of the structure. This can be compared with the as-built condition, Rule renewal criteria, and the expected rate of structural deterioration. Linkage to the unique **ABS SafeHull®** dynamic based design system provides sophisticated assessment of rational plate renewal criteria. Using this analysis may lead to significant savings in steel replacement requirements and cost.

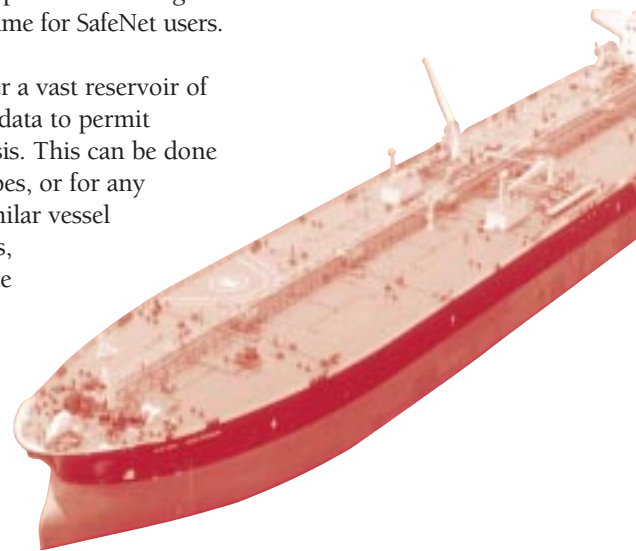
By importing actual survey reports relating to that sector from the *Fleet Status* module, a more complete description of the hull's condition is obtained.

Most importantly, SafeNet enables the user to quickly, simply, and more accurately forecast the future condition of the structure. With this powerful information in hand, the operator can develop various alternative repair and maintenance scenarios which take into account an efficient long-term repair strategy without compromising safety.

A similarly comprehensive approach to tracking the condition of a vessel's machinery is available within the *SafeNet Machinery Planned Maintenance* module. Efficient coordination of repair, maintenance, survey requirements and management of a vessel or a fleet's spare parts inventory should return operational savings and reduce mechanical downtime for SafeNet users.

SafeNet can bring together a vast reservoir of practical and operational data to permit sophisticated trend analysis. This can be done for specific machinery types, or for any vessel in a fleet, or for similar vessel designs across many fleets, without compromising the confidentiality of any owner or vessel. In this way SafeNet can assist operators to identify potential failures before they occur, preventing incidents, and minimizing operational delays.

The strength of SafeNet is its ability to bring together these four crucial elements of Survey Status, Structural Assessment, Machinery Maintenance, and Code Compliance. Safety must be a part of every action taken within a maritime organization. For the modern ship operator, these four elements, which are integrated within SafeNet, represent a sound foundation upon which to build an effective safety culture.





**Record revenues, a surge in new construction classification contracts, strong net operating income, decreased Port State detention statistics, a stable fleet size, continued strong demand for classification services by the offshore industry and an expansion of the geographic spread of the Bureau add up to one of the most successful years on record for ABS.®**

the year confirmed **ABS**' position as the leading society for newbuilding contracts with a 3 percent lead and a 24 percent market share.

This performance marked a strong increase over the share of 1996 orders and was principally sustained by a renewed interest in tankers for which **ABS** has long held a dominant position. During the year **ABS** received an extraordinary number of contracts to class new tankers — 39 vessels totaling over 5.5m dwt, eight of which are VLCCs. By year end, 33 percent of all tankers on order around the world were to **ABS** requirements.

Also making a significant contribution to 1997 returns was a resurgent offshore market, another traditional stronghold for **ABS**. Innovative contracts included the more than 700 ft tall *Oryx Neptune*, (pictured above) the largest



# 1997 In Review

For the first time in the history of the organization, revenues from classification and related activities surpassed \$200m for the year. This was achieved despite a continuing freeze of survey fees and vigorous competition for new construction class contracts. Despite the uncertainties created by Asia's economic instability, and a continuation of the fee freeze into 1998, **ABS** expects a further increase in revenues in the next twelve months as a result of a 20 year high in the **ABS** orderbook.

## Orderbook

In 1997 the market responded to the recent concerted efforts of **ABS** to improve service responsiveness, and to the inherent benefits of the unique SafeHull® approach to design evaluation, by choosing **ABS** to class more tonnage than any other society. The close of

spar-buoy floating production system. With no precedent for classing this size and type of structure **ABS** used a combination of its *Mobile Offshore Drilling Unit Rules* and the application of sophisticated first principles engineering techniques for assessing structural strength. Oryx Energy subsequently contracted with **ABS** to class a sister unit.

Another unique offshore newbuilding contract involves two 56,000 gt, super-drillships to be built by Samsung, applying SafeHull technology. They will deploy dynamic positioning to keep on station while exploring for oil in depths of up to 10,000 feet.

1997 was also notable for the release of **ABS** SafeHull criteria for containerships which was greeted positively by this sector. It is the ability of SafeHull to accurately assess the dynamic loads experienced by these open hatch vessels, and to indicate how the steel should be allocated within the hull to counter such loads, that has garnered such strong interest.

Evergreen International had approached **ABS** for the application of SafeHull technology to its new "D" series of 52,100 gt containerships from

Mitsubishi Heavy Industries even before the formal release of the program. As a result, the *Ever Dainty*, accepted into class in August of 1997, has the distinction of being the first containership to receive a SafeHull® notation.

A.P. Moller expressed similar interest in SafeHull technology for the design evaluation of the new series of 6,000 ten vessels currently under construction at the Odense Yard, five of which were contracted to ABS® class during the year. The relationship proved so successful that classification contracts for a further ten, 14,000 gt containerships at China Shipbuilding Corp. were placed with ABS by the Danish owner. This brought the total number of contracts ABS received to class containerships in the year to 40 vessels aggregating 1.28m gt — seven of which will be to SafeHull criteria.

### Port State Control

Efforts to eliminate class related Port State detentions of ABS classed vessels were intensified during 1997. It is the stated goal of ABS to reduce these detentions to zero and we were successful in that for five months out of the twelve month span. Worldwide, class related detentions among the more than 11,000 vessels in ABS class, averaged two per month for the year, a 45 percent improvement over 1996.

Several ABS initiatives led to the improved performance and promise further advances in 1998. A lead surveyor program was instituted to provide more immediate guidance to the 600-strong ABS exclusive surveyor staff. A requirement that two surveyors must jointly conduct the Safety Equipment Survey on bulk carriers over 15 years old had a significant impact. And the requirement that an ABS principal surveyor or surveyor-in-charge reviews and countersigns all SOLAS and Load Line reports on vessels 10 years of age and older has proved similarly beneficial.

These internal ABS measures were supplemented by the release of an expanded, new edition of the widely used *Guidelines for Port State Inspections for Owners, Masters and Crews*. First issued two years ago, this booklet contains new information on the background and procedures of Port State Inspections as well as an extensive checklist detailing the many class and statutory items, grouped by category, that should be considered in the course of vessel maintenance.

### Rules and Guides

Several other publications were also issued by ABS during the year to assist owners either

**Ever Dainty, 52,100gt  
built by Mitsubishi for  
Evergreen International —  
the first containership  
to receive ABS  
SafeHull® notation.**

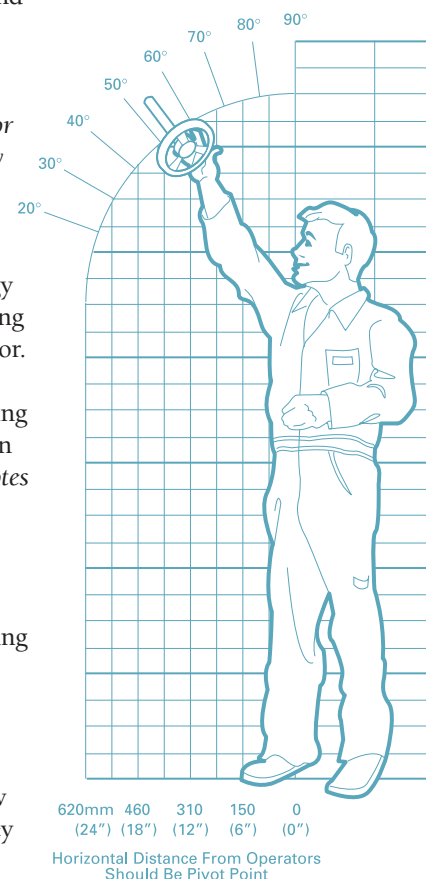


meet or understand new regulations, or apply new ABS Rule criteria. These included a revised edition of the *ABS Guide for Building and Classing High Speed Craft* covering catamaran, SWATH, air cushion, monohull and other novel design hulls constructed of steel, aluminum alloy and fiber-reinforced plastic.

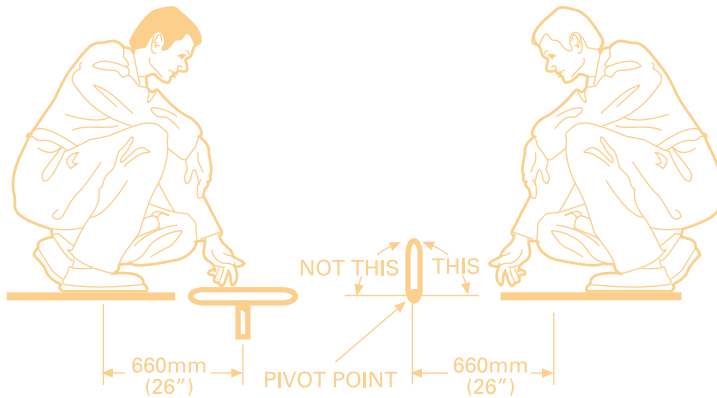
Also issued was a completely revised *Guide for Building and Classing Vessels Intended to Carry Refrigerated Cargoes*. Developed in close cooperation with leading reefer carriers and equipment and systems manufacturers, the Guide takes into account the latest technology and environmentally sensitive techniques being applied to this increasingly sophisticated sector.

1997 also saw the release of an industry leading approach to the Human Element factor within the marine industry — the *ABS Guidance Notes on the Application of Ergonomics to Marine Systems*. These are the first such guidelines issued by any class society. Their focus is on micro-ergonomics. The next phase, already under way, will take a macro approach applying ergonomic principles to the design of more complex human/system work environments.

Yet another pioneering effort in ABS® Rule development was the release of proposed new Rules governing machinery and systems. They include a complete reassessment of existing







machinery Rules with respect to application, clarity, ease of use and intent.

An important new standard addressing environmental concerns was issued in mid-year. The **ABS**® *Guide for Propulsion Redundancy* was produced in close cooperation with the tanker industry, although gas carrier, ferry, cruise operators and others are expected to find the new guide of particular interest. Its intent is to reduce the risk of damage, injury, environmental and economic losses stemming from a single failure in propulsion or steering capability.

Environmental concerns had led to the new MARPOL requirement for all ships of 400 gross tons and above to carry a garbage management plan and to keep a garbage management book. **ABS** responded by preparing and distributing a *Garbage Management Manual* in an electronic format which allows the user to easily prepare the appropriate documentation.

The SOLAS requirement that all ships engaged in the carriage of cargoes, other than solid and liquid in bulk, must be provided with a cargo securing manual led to the issuance of the PC-based **ABS** *Guidance for Preparation of the Cargo Securing Manual* that owners can easily customize for their individual vessels.

**Kennicott,  
12,900gt Ro/Ro  
Passenger/Vehicle  
ferry built  
by Halter for  
State of Alaska**

A wave of safety-related regulatory changes mandated by international conventions and national legislation continues to swamp the industry. To assist owners in identifying, and preparing for these changes, **ABS** has published a *Regulatory Timeline* summary of the known changes scheduled for the next three years.

A significant advance in simplifying the regulatory burden for U.S. owners was the successful completion of a two year pilot of the Alternative Compliance Program (ACP) between the U.S. Coast Guard and **ABS**. Open enrollment in the program for internationally trading, U.S.-flag ships became effective 1 August. ACP empowers **ABS** surveyors to act as agents of the USCG in conducting surveys and inspection in support of the issuance of full term USCG Certificates of Inspection.

### Bulk Carrier Safety

Bulk carrier safety remained a preoccupation for **ABS** throughout the year as the Maritime Safety Committee of IMO and IACS wrestled with new structural requirements for both new and existing vessels. These are aimed at reducing an unacceptable loss ratio of older bulk carriers carrying high density cargoes. The new structural safety standards were adopted as a SOLAS requirement by the IMO assembly later in the year and closely match the unified requirements of IACS.

Application of the IACS requirements for new construction was simplified by **ABS** with the issuance of a special module to its SafeHull® program. The module allows the designer to check a given design against the IACS requirements ensuring that all the necessary factors have been accounted for. Special software was developed by **ABS** to speed the assessment of existing bulk carriers to determine if struc-



tural modifications will be necessary and to guide in the selection between alternative remedial options.

## Technology

**ABS**® continued to make strategic investments in new technology aimed at raising maritime safety and improving ship management practices throughout the year. Enhancements to the **ABS SafeHull**® system released during 1997 included a more responsive version with enhanced modeling capabilities. The new version was made available for Windows™ 3.1 and Windows™ 95 operating systems and in UNIX for workstations.

Other SafeHull® upgrades included application to tankers 150 meters in length (previously restricted to tankers above 190 meters), application to containerships 130 meters and above, new automatic handling of design element calculations for corrugated center line bulkheads in larger tankers, and scantling determinations taking into account sloshing pressures.

Offering advanced technology in an easy to use format, the **ABS SafeNet**™ fleet management network was released to the industry in late 1997 following extensive field testing. Operators of **ABS** classed vessels were supplied with the *Fleet Status* and *Marine Information* modules at no charge.

At the same time, work progressed on additional SafeNet modules which were released for selected piloting at the end of the year. These include a complete *Vessel Plans* storage module, *Hull Planned Maintenance*, *Machinery Planned Maintenance* and *Code Compliance* modules. The real power of SafeNet, once the *Hull Planned Maintenance* is formally released, will be its unique ability to apply the dynamic-based structural analysis attributes of SafeHull to the condition assessment of the vessel.

## Training

A continuing emphasis on training was maintained throughout 1997. The **ABS Academy** offered a wide range of courses for **ABS** surveyors, engineers, auditors and administrative staff.

In addition, **ABS** recognized the need to encourage a new generation of professionals to enter the marine industry by establishing two international scholarship programs in naval architecture, marine engineering and ocean sciences. The first program involves scholarships for studies at technical universities in China, Greece, Italy, Japan, Korea, the US and the UK.



The second is a ten year joint program with the Institute of Marine Engineers in London for the award of up to ten scholarships a year for studies at a number of leading maritime international universities.

## ABS® Group of Companies

The year drew to a close on an auspicious note for the **ABS** organization with the award of a \$15.8 million contract to the affiliate **ABS Integrated Services** by PEMEX. The project involves the provision of certification services for 18 specified EPC (Engineer, Procure and Construct) contracts for the modernization and optimization of the Cantarell oil field in the Gulf of Mexico.

This contract is indicative of the new focus and direction of **ABS Integrated Services** as it seeks to diversify away from a past reliance on verification contracts to more sophisticated project related packaging of the full range of **ABS Group** skills for the marine, offshore oil and gas and petro-chemical industries.

Financial performance of the **ABS Group of Companies** remained flat in 1997 as these internal structural realignments were taking place. With a new organizational structure, new focus and a strong commitment to the provision of a full range of services relating to safety, quality and the environment, the **ABS Group of Companies** entered 1998 with an ambitious strategy for growth through internal expansion coupled with aggressive acquisitions.

**A Certification services contract related to the PEMEX Cantarell offshore field project boosted ABS Group activity in 1997.**

Windows™ 3.1 and Windows™ 95 are trademarks of Microsoft, Inc.



# Looking *Ahead to 1998*

**1998 promises to be a watershed year for the marine industry. The consensus opinion, based on the most reliable advance statistics available, is that possibly 20 percent of the vessels required to be in compliance by the July 1 implementation date of the International Safety Management Code (ISM) will not have met these new standards.**

This prospective scenario does not threaten world trade. The tanker industry has achieved almost total compliance well in advance of the deadline. So too has the passenger vessel, high speed and gas carrier sectors. It appears that the shortfall will be among bulk carrier operators with an as yet unquantified impact on the market and the movement of bulk commodities.

It is the resolve of the leading flag states, particularly the EU, the US, Canada and Australia which will be put to the test. That resolve must also apply to an astute vetting of those vessels with certificates that do not appear to have the required safety management procedures in place.

The three months which follow the July 1 implementation date will prove crucial in establishing an unequivocal adherence to these safety standards by the appropriate authorities and administrations, and of the support for their actions by the responsible members of the industry who have already adopted the requirements of the Code.

**ABS®** fully supports the ISM Code. We have a dedicated team of experienced professionals willing to assist shipowners and managers in meeting these new requirements and subsequently conforming to them. We stand ready to support the Port State authorities and to advise, guide and assist owners as they adjust to this new operational reality.

As the safety management system approach begins to spread throughout the organizations of the most responsible owners in 1998, the **ABS® Group of Companies** expects to receive

more requests for assistance in adopting the new ISO 14000 environmental standards. We are encouraged that a leading shipowner has already implemented these new standards. Others will quickly follow.

1998 may also prove to be the year in which another fundamental change begins to impact the safety culture of the marine industry. The EU has indicated a willingness to institute new policies which will impose financial penalties on the substandard operator. Should this approach prove successful, 1998 may see other sectors beginning to develop policies which attempt to redress the perceived financial benefits which can accrue to the substandard elements among us.

Within **ABS** the year ahead promises a series of challenges as we seek to maintain our leadership role within both the policy and the practical arenas of enhanced safety standards. Of the most immediate practical benefit to our clients is the steady expansion of our SafeNet™ fleet management and information network which is planned for 1998. During the year all owners and operators of **ABS** classed vessels will be given access to the network to permit them to track the survey status of their fleet and to access the several informational databases contained within the network.

Later in the year, the more progressive owners and managers will be able to apply the power of the hull planned maintenance and machinery planned maintenance modules to their operations. They will have access to electronic vessel plan storage and to applications which will ease the burden of compliance with the ISM Code, STCW and other regulatory initiatives.

A central element of the SafeNet™ Hull Planned Maintenance module is the link it will provide to the advanced analysis offered by the **ABS**® SafeHull® system which can be harnessed to more accurately assess a vessel's continuing fitness for purpose. New, easy to use rational plate renewal criteria, which will see the application of the leading edge technology of SafeHull to one of the most important operational problems faced by the modern ship operator, will also be available in 1998.

SafeHull itself will continue to be improved during 1998 with a scheduled May release of the latest Version 4.0. This will carry several enhanced elements, faster routines, easier use and a significantly upgraded modeller.

A wide range of other research studies will be undertaken by the **ABS** technology division. The more ambitious of these undertakings include: residual strength of damaged hulls, reliability of degrading ship structures, tanker grounding protection, and wave-induced large amplitude motions and loads (LAMP). Nearing completion of a multi-year study, LAMP is expected to be the most advanced available ship motion program, able to accurately predict extreme wave loads on ship structures.

The application of formal safety assessment risk and reliability techniques to future marine safety standards will also be an area given considerable attention by **ABS** in 1998. A first step in the direction was achieved in 1997 with the issuance of the new **ABS Proposed Machinery Rules**.

The publication of the **ABS Guidance Notes on the Application of Ergonomics to Marine Systems** in 1997 signaled an ongoing area of research which will be further developed in 1998. The micro-ergonomic approach of the Notes, which focus on such elements as console designs, visual displays, alarms, labels, stairways and platforms, will be expanded into a macro-approach which applies ergonomic principles to the design of more complex human/system working environments.

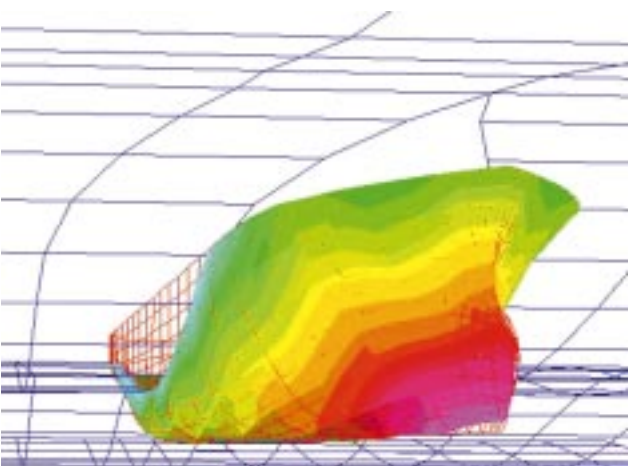


A host of statutory requirements, other than the ISM Code, will enter into force during 1998 and **ABS** will be offering assistance to owners, as appropriate, as they struggle with compliance. These include corrosion protection requirements for salt water ballast tanks for new bulk carriers and tankers; the phaseout of certain single hull tankers under the provisions of both OPA-90 and MARPOL; and SOLAS requirements for a loading plan for most bulk carriers.

July 1 1998 is the implementation date for the fitting of monitoring and control equipment to restrict oily water discharge, in accordance with MARPOL. New STCW standards take effect 1 August 1998. Most existing ro-ro passenger vessels will also be required to upgrade stability by 1 October 1998 in compliance with the requirements of SOLAS.

These, and the array of other international and national requirements that will be entering into force, are summarized in a revised and reissued **ABS**® *Regulatory Timeline*.

1998 will also be notable for the application of the new IACS and IMO structural safety standards for bulk carriers carrying high density cargoes. **ABS** has been working with affected **ABS** classed bulk carrier owners to smooth the assessment of existing vessels and to assist in the determination of optimal structural responses.







A resurgence in the offshore industry has brought attention to a new generation of structures for drilling, storage, production and transportation. Class contracts for several new unique offshore vessels and structures will occupy **ABS** during 1998. Included among these are a 700 foot spar drilling and storage structure for operation in 2000 foot depths, a new generation of “super” drill ships for operation in 10,000 foot depths, and a number of floating and fixed production and storage units.

During 1998 **ABS** will be updating and expanding its range of offshore related technical software. Evaluations of tension leg platforms and advanced purpose column stabilized MODUs, as well as drill ships and floating production and storage systems, will be covered by this new software.

Several ambitious studies focusing on structures for offshore service will be undertaken during the year. These studies include FPSO system strength and fatigue, spar buoy instrumentation and monitoring, jack-up MODU dynamics investigation and vortex induced vibration.

A reorganization of the **ABS® Group of Companies** in late 1997 positioned it for aggressive expansion during 1998. That expansion is intended to be twofold — a more focused targeting of activities to build on several notable contracts which were won during 1997, particularly in the offshore oil and gas and petrochemical sectors; and an aggressive acquisition strategy which is expected to double **Group** revenues within a short period and offer significant synergies with existing activities.

Consistent with this strategy, in early January of 1998 it was announced that the **ABS Group** completed its first acquisition — the purchase of **Government Institutes, Inc.**, a Maryland based leader in the provision of training and publishing services in the environmental, health and safety fields.

**A resurgence in the offshore industry has brought attention to a new generation of structures for drilling, storage, production and transportation.**

*Peene Ore*, 322,400 dwt, built by Daewoo, the largest bulk carrier to enter ABS class.





# 1997

## Statistical Summary

### Manpower Resources

<b>ABS®</b> .....	1,545
<b>ABS® Group of Companies</b> .....	330

### Offices

**ABS®** is represented in 81 countries with 171 exclusive offices and 56 non-exclusive offices in other locations.

**ABS® Group of Companies** is represented in 20 countries with 31 offices.

### Government Authorizations

**ABS®** has been authorized to act on behalf of many governments for the conduct of surveys and issuance of Statutory Certificates, either wholly or in part. These authorizations number as follows:

Loadline .....	99
Tonnage Admeasurement .....	66
Safety of Life at Sea (SOLAS) .....	87
Marine Pollution Prevention (MARPOL) .....	68

### ABS® Share of New Building Contracts by Country

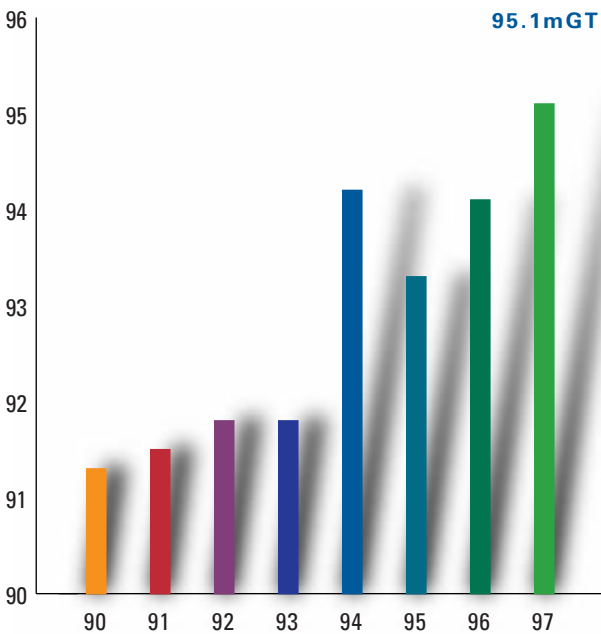
World .....	.24%
Japan .....	.21%
Korea .....	.32%
Singapore .....	.77%

**American Progress, 46,000 dwt, built by Newport News for Mobil. The first double hull vessel built in a US shipyard that meets all requirements of OPA 90.**

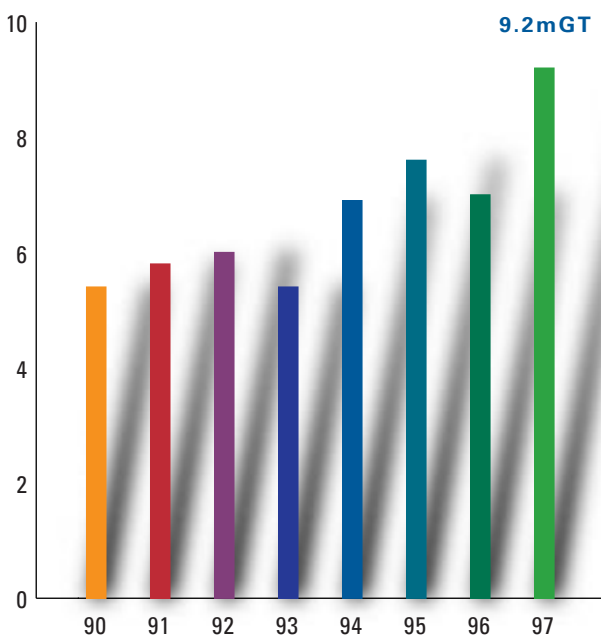


# 1997 Classification Activity

## Total Tonnage in Class



## Orderbook



Further strong classification activity was recorded by **ABS**® during 1997. All three of the major vessel types — tankers, bulk carriers, and containerships — showed continued growth during the year. Contracts were received to class a total 112 such vessels aggregating 5.2m gross tons. By year end the cumulative orderbook for tankers, bulk carriers and containerships had grown to 192 vessels totaling 7.96m gross tons.

Market acceptance of the benefits of SafeHull® technology strengthened in 1997. By the close of the year **ABS** had classed 61 ships to the SafeHull notation, totaling in excess of 3.6m gross tons (27 tankers, 32 bulk carriers, and 2 containerships), with an additional 147 ships of more than 8.0m gross tons (89 tankers, 44 bulk carriers, and 14 containerships) building or contracted to be built using SafeHull design criteria.

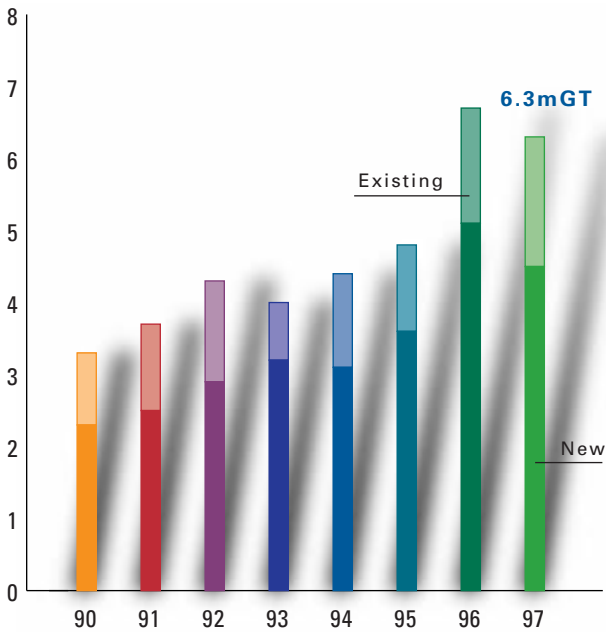
## Vessels Classed

Proving to be one of the most successful of recent years, 1997 saw **ABS** accepting into class a total of 674 new and existing vessels aggregating 6.33m gross tons. Of these vessels, 443 of 4.5m gross tons were newbuildings. The other 231 vessels classed in 1997 were existing vessels, including 135 of 1.42m gross tons that had been previously classed by another society, or were unclassified. 96 vessels, the prior **ABS** class of which had been dropped, were re-instated.

## Vessels Removed

Removed from the **ABS** classed fleet during 1997 were 1135 propelled and non-propelled vessels. Of these, 548 were dropped for noncompliance with the **ABS** Rules. Most of this number were small, and non-propelled vessel types. 250 vessels were scrapped and 337 were withdrawn at the owners' requests.

## Total Incoming GT



## Classed Fleet

At the conclusion of 1997 the **ABS**® fleet totaled 11,162 vessels of 95.12m gross tons operating under 100 different flags of registry. This marks a slight increase in tonnage and a slight decrease in numbers, compared to the close of 1996.

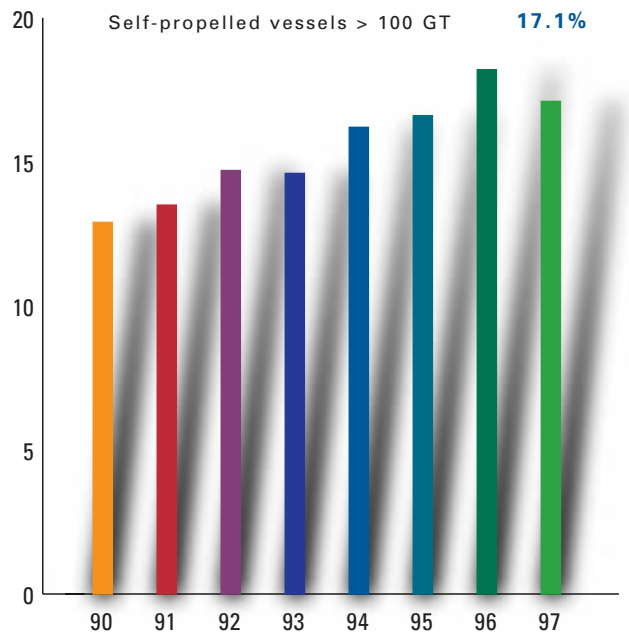
## New Contracts Received

During the year, formal contracts were received to class 493 new ships and offshore units totaling 5.86m gross tons. This registers a solid increase over 1996 in both numbers of vessels and aggregate tonnage, and represents the single greatest tonnage total to have been contracted with **ABS** in more than ten years.

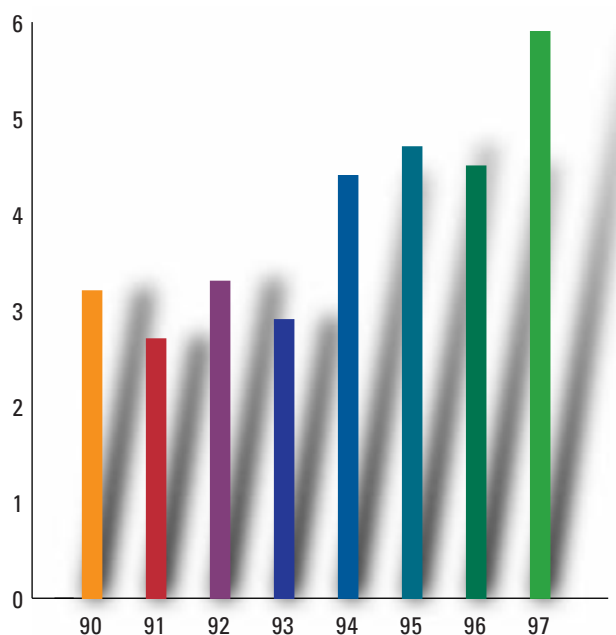
## Orderbook

There were 656 new ships and offshore structures totaling 9.2m gross tons contracted to be built, or building to **ABS** class, at the end of 1997. Both figures represent significant increases over the year earlier when the orderbook held 574 vessels of 7.03m gross tons. This surge has lifted the **ABS** orderbook to its highest level since 1982 in tonnage terms, and assures **ABS** a high level of newbuilding activity into the next century.

## ABS® Percentage of World Deliveries



## Contracts Received





*Spring Virgo, 15,200 dwt,  
built by Shin Kurushima  
for N.T. Marine Service.*



## Tankers

In 1997 **ABS**<sup>®</sup> classed 29 tankers of 1.12m gross tons. New high ground was reached for future newbuilding activity with the total contracts received for new tankers numbering 39 of 3.0m gross tons (including 8 VLCCs and 22 Aframax vessels). This represented a 39 percent increase in numbers and 147 percent surge in tonnage compared to a year earlier.

These mark the largest yearly number and tonnage totals for new tanker classification

contracts received in several years and provide evidence of the growing recognition of SafeHull<sup>®</sup> as the leading technology for tanker design evaluation. With this burgeoning of new orders, the number of new tankers building and contracted to **ABS** class rose sharply to 72 vessels aggregating 4.02m gross tons by year end. This represented a boost of 53 percent in numbers, and 120 percent in gross tonnage, over the year end figures for 1996. At the completion of 1997 there were a total of 845 tankers of 38.46m gross tons in the **ABS** class fleet marking a small gain over the year earlier.

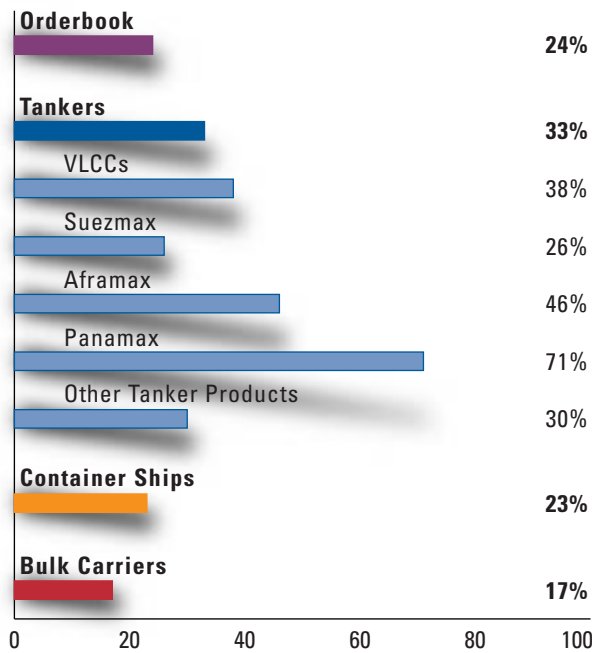
## ABS Activity During 1997

Type	As of 31 December 1997 Vessels in Class		As of 31 December 1997 Vessels on Order		During 1997 New Vessels Classed	
	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
Barge	4,574	6,908,500	138	297,200	187	430,600
Bulk Carrier	798	21,864,400	52	1,747,200	42	1,919,600
Combination (Dry/Liquid) Carrier	20	727,300	-	-	-	-
Container Carrier	334	10,300,000	68	2,195,300	25	775,200
Dredge	49	113,800	-	-	3	3,000
Ferry/Passenger Cargo	113	462,400	6	33,500	10	1,900
Fishing Vessel	40	39,200	13	6,600	-	-
General Cargo Vessel (Dry Cargo)	594	5,490,900	2	1,000	10	129,100
Launch/Crew Boat	181	18,600	8	1,800	5	500
Liquefied Gas Carrier	67	2,484,500	5	180,500	-	-
Mobile Offshore Drilling Unit	542	3,551,600	7	155,800	3	2,800
Offshore Platform*	93	2,700	3	-	4	12,700
Passenger Cruise Vessel	86	689,500	12	57,300	-	-
Single Point Mooring	26	-	4	200	2	-
Supply/Tug & Supply Boat	867	487,300	25	28,800	9	7,000
Survey/Research Vessel	112	199,800	19	17,300	5	3,900
Tanker	845	38,464,400	72	4,022,400	29	1,122,600
Tugboat	1,062	296,000	62	27,200	64	17,800
Underwater Vehicle	61	400	9	300	-	-
Vehicle/Barge Carrier	96	2,460,800	10	351,200	1	9,700
Yacht	285	60,600	56	15,000	27	7,100
Other	317	501,700	85	49,300	17	44,600
<b>Total</b>	<b>11,162</b>	<b>95,124,400</b>	<b>656</b>	<b>9,187,900</b>	<b>443</b>	<b>4,488,100</b>

\*Includes offshore installations and pipelines where gross tonnage does not apply.

## ABS® Share of Newbuilding Contracts

End 1997



### Bulk Carriers

ABS® also experienced a strong year for the classification of new bulk carriers during 1997. 42 bulk carriers totaling 1.9m gross tons were accepted into class, representing an increase of some 55 percent in both figures over 1996. Particularly noteworthy among those classed are the sisters *Peene Ore* and *Neckar Ore* (both SafeHull®) which, at 155,000 gross tons (322,400 dwt), are now the largest bulk carriers in the ABS classed fleet.

Contracts received for the classification of new bulk carriers numbered 33 of 910,000 gross tons, comprised entirely of Panamax and Handysize vessels. The ABS bulk carrier orderbook declined as expected over the year, following a bulge of newbuilding activity during the prior two years. Nevertheless, at the close of 1997 there were 52 bulk carriers aggregating 1.75m gross tons building or contracted to be built to ABS class.

At the close of the year there were 798 bulk carriers totaling 21.86m gross tons in ABS class — a slight decline from a year earlier which can possibly be attributed to the imposition of more stringent IMO and IACS structural requirements.

### Containerships

1997 was a positive year for classification services for containerships. During the year 25 new containerships totaling 775,000 gross tons were classed. Noteworthy among these is the *Ever Dainty*, the first containership designed and built using SafeHull® technology. SafeHull for Containerships was formally made available to the industry in mid-1997.

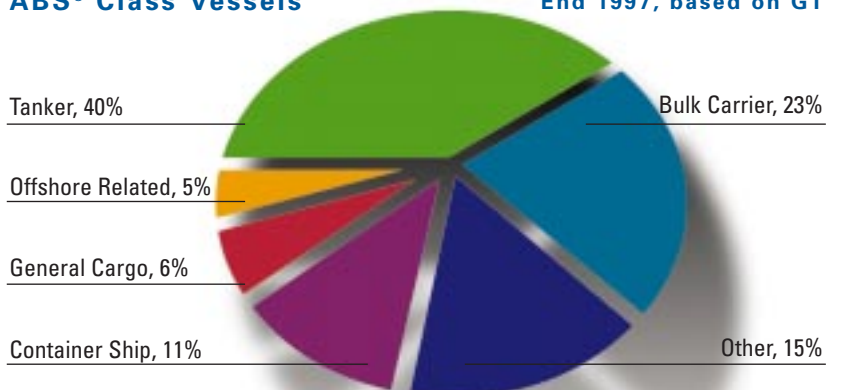
Contracts received during the year for new containerships numbered 40 of 1.28m gross

tons. These boosted the ABS orderbook for containerships to 68 vessels totaling 2.2m gross tons by the end of 1997 up from the 1996 year end totals of 58 and 1.77m gross tons respectively.

The ABS classed fleet of containerships continues to grow. By the end of 1997 this included 334 containerships aggregating 10.3m gross tons, up from 312 vessels and 9.5m gross tons a year earlier.

### ABS® Class Vessels

End 1997, based on GT





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**The semisubmersible  
MG Hulme, Jr. under-  
going conversion  
during 1997 at AMFELS  
in Brownsville, TX.**

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**Originally named Vidal de Negreiros, the 282,000 dwt, ABS®-class VLCC/FPSO conversion will be assigned to the Campos Basin off Brasil. The 300m vessel will be the world's largest FPSO.**

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Robert J. Bauerle  
*ABS Group of Companies, Inc.*

Christopher J. Wiernicki  
*ABS Group of Companies, Inc.*



## Our Mission

The mission of **ABS® Group** and its operating companies is to assist its clients to improve the safety of their operations, to enhance the quality of their services, and to minimize the environmental impact of their activities.

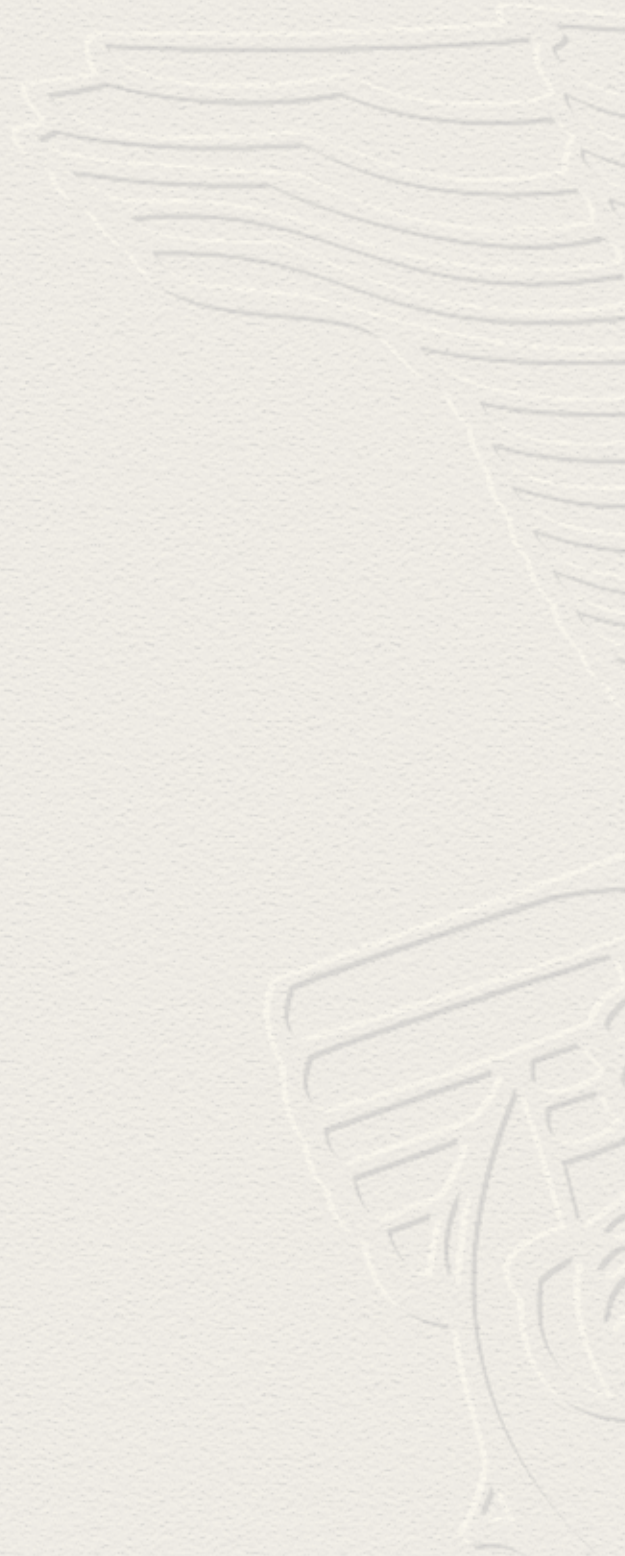
The **ABS Group Companies** pursue this mission by offering integrated services related to awareness, evaluation, training, implementation, verification and certification.

## Quality Policy

It is the policy of the **ABS Group Companies** to provide quality services in support of our mission and to be responsive to the individual and collective needs of our clients as well as those of the public at large. All of our client commitments, supporting actions and services delivered must be recognized as expressions of quality. We pledge to monitor our performance as an ongoing activity and to strive for continuous improvement.







**TWO WORLD TRADE CENTER, 106TH FLOOR, NEW YORK, NEW YORK 10048**