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*Ship Science*

**A ROCKY ROAD TO MARITIME SAFETY**

**The Rt. Hon. The Lord Donaldson of Lymington**

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## **The RNLI/University Annual Lecture.**

### **A Rocky Road to Maritime Safety.**

In February of this year Mr. Peter Nicholson on behalf of The Royal National Lifeboat Institution and Professor Sir Howard Newby, the then Vice-Chancellor, on behalf of the University of Southampton signed a Memorandum of Understanding. The two parties were no strangers having worked together for some years. However it was thought time that this co-operation be put on a more formal basis. Put shortly, its purpose was to create an environment and culture for co-operative research and education within the two bodies with particular reference to the design, fabrication and operation of high performance marine craft. The intention is that relevant fundamental research projects will be undertaken at post doctoral and post graduate levels and that the RNLI will, amongst other things, contribute to the practical side of university courses and research.

A subsidiary aim was to establish an annual lecture whose underlying theme would be safety and engineering in the maritime environment. I was both honoured and delighted to be asked to deliver this, the first, lecture in this series.

It may not come as a surprise to some of you if I say that I know rather more about maritime safety than I do about engineering. Hence the title of this lecture “A rocky road to maritime safety”. This was inspired not only by a realisation of the many almost immovable obstacles which litter the way ahead, but also in part by the “Sea Empress” incident. As you will remember, in February 1996 she tried to take the “overland” route into the port of Milford Haven suffering severe bottom damage in the process. When frustrated in that endeavour, she used each successive high water to shift to another, presumably more comfortable, rock where she whiled away the next 12 hours. This went on for no less than 6 days.

But to return to the RNLI. The requirements for their craft are very specialised. There is a limited market for high speed all weather craft of an appropriate size. Accordingly they have been fully involved in the

necessary research, design and development of all their lifeboats. Nowadays design work is undertaken in close co-operation with the yards that build the craft.

When I say "close co-operation" I mean just that., for the design offices of the RNLI in Poole and those of DML in Plymouth are linked by a permanent landline making communication almost as easy as going into the next door office for a chat. It is worth pointing out that the hull and deck mouldings of all the Institution's latest boats are supplied by Green Marine of Lymington and some of the boats are fitted out by Berthon Boat Company also of Lymington.

In meeting the RNLI's special requirement for speed and strength the weight of the craft becomes of crucial importance. This has led to the testing of a number of different materials. The most suitable has proved to be an advanced composite sandwich construction consisting of an outer skin of glass and kevlar fibres and epoxy resin, a PVC core of up to 100 mm thickness and an inner skin of fibre reinforced plastic.

The adoption of such a novel material led to a little local difficulty when one crew said that they preferred not to trust their lives to such a fancy material. This problem was overcome by showing the crews the results of comparative tests on steel and aluminium and by challenging them to make any impression on the new material using a sledge hammer

Currently the RNLI are developing the FSB2 as a new and improved fast boat for launching from slipways. Amongst many other improvements it aims to concentrate control of the flow of information from a multitude of sources in instrumentation immediately in front of or near the coxswain's seating position.. In modern lifeboats the coxswain no longer "drives" the boat prior to arrival at the scene of the incident. This task is the responsibility of a helmsman, thus leaving the coxswain free to evaluate and plan in an ever changing situation. He is assisted by such things as an autopilot which, if given the necessary area to be searched and a few other details, will construct the search pattern and follow it automatically. Incidentally if any of you wish to avoid the ill effects of what an airline pilot would describe as "severe turbulence" I suggest that you have a look at the sprung seating and shoulder safety harnesses available to all the crew in modern off-shore lifeboats.

I last visited the issue of safety in merchant shipping in 1993 and what I learnt is contained in a voluminous report called "Safer Ships; Cleaner Seas" which also dealt with maritime pollution and its prevention. My aim to-night is to revisit the safety situation as it then existed in order to see to what extent things have improved and what still needs to be done.

Politicians are for ever saying that they are not complacent, when quite clearly they are. As I am not a politician I do hope that you will believe me when I say so. You can be encouraged without being complacent and I am very much encouraged first by what has been achieved in the last eight years and second by indications that there may at last be the political will to take this forward at an ever increasing pace in the years to come.

The sea is, and always has been, a dangerous place. It holds dangers for ship owners, ships' crews, cargo owners and all who have an interest in enjoying a pollution free marine and coastal environment. So you might expect that the achievement of safety at sea would be regarded by everyone as a matter of the highest priority. Not so, I am afraid. There is clear evidence that of the merchant shipping visiting North West European ports between 9 and 10% were so seriously below internationally accepted standards that they have had to be detained as constituting an unacceptable threat to safety, health or the environment. And these figures were largely constant throughout the period. It is just possible that a general improvement of standards is being masked by improved systems for identifying ships which are likely to be sub-standard and concentrating on inspecting them. However this could only have a marginal effect on the figures and I know of no one who thinks that the figures, however interpreted, reveal an acceptable state of affairs.

Who is responsible? There are a number of candidates, but primary responsibility must rest with the shipowner. No one requires him to buy or maintain a sub-standard ship and still less an unseaworthy one. In this context a sub-standard ship is one which does not measure up to the requirements of the relevant international conventions such as SOLAS (Safety of Life at Sea), MARPOL (which is concerned with the prevention of pollution from ships), STCW (standards of training, certification and watch keeping) and the Loadline Convention (which

governs the extent of the freeboard which the ship is required to maintain if fully loaded).

Since these Conventions have had to be acceptable to most of the maritime nations of the world, they necessarily reflect the lowest common denominator. Furthermore, since it normally takes forever to update them, the recently revised STCW Convention being a notable exception, they can fall far short of what would now be regarded as basic requirements. For example, the Loadline Convention no longer provides a satisfactory standard for bulk carriers and is having to be revised urgently. Meanwhile classification societies are trying to fill the gap.

There are shipowners who maintain their ships to far higher standards than those required by law, so it can be done. But it is very expensive and this is the rub. To quote the opening line of a popular song, long since forgotten, "Money is the root of all evil". It certainly is in the case of the shipping industry. It suffers from permanent overcapacity. It is fiercely competitive and the competition which it faces is international in character.

A report commissioned by the Netherlands government in 1999 calculated that a substandard operator enjoyed significant cost advantages, typically 14%, over one who met minimum international standards and the advantage was much greater in the case of high standard operators such as our own P&O and their equivalents in the older maritime nations. A 14% advantage may not sound a killer, but as President Carter of the United States might have said "It certainly ain't peanuts". The daily running costs of a sizeable ship are very large.

The lesson is, of course, that we must do everything which we can to eliminate this advantage by massively increasing the costs of the operators of substandard ships, whilst as far as possible reducing the burden on operators who put safety first.

The second line of responsibility lies with flag states, that is to say the state with which the ship is registered and whose flag she wears. This state will have signed up to the international conventions setting safety standards and it is its responsibility to see that they are met. Incidentally flag states have the supreme advantage over all other regulators in that

they can order the ship to be emptied of cargo and dry docked for inspection.

Some flag states are both efficient and conscientious. Some are conscientious, but inefficient. The spirit is willing but for one reason or the other, usually but not always money, the flesh is weak. With some the question of efficiency never arises. They regard having a national maritime register as a nice little earner. You can take the registration fees, but no one will require you to earn them by inspecting the ships and insisting that they be made safe.

Some years ago I met a man who told me that his job was to help shipowners to get their ships on to a particular register. I asked what steps were taken to inspect these as a condition of entry. "There are far too many applicants for us to do that" he said "but we do try to look at them within the next 5 years" Needless to say, that country has an appalling safety record. One of its ships was detained in this country as being wholly unsafe, yet the master was able to produce a certificate from the flag state dated the previous day certifying that it complied with all the international standards.

As each flag state enjoys sovereign immunity, it would take a supranational body to bring them into line. That body is the International Maritime Organisation, a UN agency based in London. It should of course resolve that the certificates issued by these rogue states need not be recognised by other nations, thus making it impossible for its ships to trade internationally and forcing them to re-flag. Sadly this has not proved possible. The errant states are all voting members of the IMO and you cannot expect a police authority to be very effective in preventing burglary if a significant number of members are burglars.

All that has been possible in this regard is to introduce a system of self-certification which requires the members to certify to IMO that they are fully discharging their Convention, i.e. treaty obligations. Given some administrations' capacity for mendacity, I would have expected certificates from all the members. Not so. Only something like 32 out of 159 have bothered to reply and there are almost certainly more states than that who could conscientiously have submitted certificates of compliance.

But all is not lost. There are signs that flag states may not always remain immune to sanctions. On the occasion of the 1995 revision of the STCW Convention, member states were persuaded to delegate to the IMO authority to assess which of the signatories were fully complying with their obligations under that Convention. The result has been an IMO "White List" of 100 states whose certificates of compliance with that Convention are *prima facie* to be given their face value. This is the reverse of a "Black List" but may well achieve the same end result so far as member states not on the list are concerned. The Secretary-General is pressing hard for its extension to other Conventions.

The IMO may be surprisingly toothless, but it is far from useless. Under its outstandingly successful Secretary General, the Canadian engineer Bill O'Neill, it has since 1994 made tremendous strides on the technical side of safety at sea producing recommendations for improved designs for bulk carriers, specifications for black boxes which will become mandatory in accordance with a phased programme beginning in July next year and many other matters too numerous to mention to-night. In the longer term it may be held that its greatest achievement has been the introduction of a mandatory requirement under the SOLAS Convention for the adoption by all concerned of the ISM (International Safety Management) Code. To that I must return.

Apart from the crews, whose safety is all important, the likely victims of accidents involving sub-standard ships are not the inhabitants of the flag state concerned, but those of countries to whose ports these ships are bound and other coastal states which they will pass on their voyages. This has led to the introduction of a defensive system called Port State Control under which a proportion of ships entering port are inspected, deficiencies are recorded and, if they are sufficiently serious to constitute a threat to safety, the ship is detained until they have been remedied. Given the international character of shipping, this cannot provide any deterrent to sub-standard shipping unless shipowners know that they will receive similar treatment by any other state whose ports can constitute an alternative destination for the cargo or a convenient transhipment port. This being so, it is only Australia and the United States, supported by Canada, who are in a position to institute a unilateral Port State Control policy. All other port states must combine to produce a comprehensive regional policy.

North West Europe was the first to introduce a comprehensive regional agreement known as the Paris Memorandum of Understanding – the PMOU. It is now somewhat wider, consisting of 19 nations including Spain, Portugal, Greece and Italy in Southern Europe, Iceland in the far north and Finland and the Russian Federation in the North East. It also includes Canada which at first sight may appear anomalous but is in fact advantageous in recognition of the volume of shipping sailing between North America and Europe and as a link with the United States system.

It is supported, but not controlled by, the EU. It is open to application for membership from other countries in or around the region, but they will have to demonstrate that they enforce acceptable standards for their own shipping. This stems from a suspicion that in other parts of the world some states are seeking to join emerging port state control systems with a view, in their own interests, to delaying the introduction of an effective control system. Poachers are not so much turning gamekeepers as making a take-over bid for the gamekeepers business.

The PMOU has been copied by the Tokyo (Asia and Pacific) and Caribbean MOU's. Both are recognised by the PMOU and accorded observer status. I am told that there are 4 other regional systems in varying states of evolution.

Each member of the Paris MOU undertakes to inspect and report on not less than 25% of ships entering its ports. This is quite an undertaking. It is estimated that last year there were 6457 ship calls at UK ports. The ugly expression “ship calls” is used because some ships will have called more than once. There were 1788 inspections or 27.7% of all calls. Most members recorded inspections around or above the 25% mark, two notable exceptions (for reasons unknown to me) being France at 12.2% and Ireland at 14.6%.

It is figures derived from Paris MOU reports which enable us to create a league table of Flag State performances. Incidentally they are fully confirmed by the Tokyo MOU reports. This table is used by the PMOU members to target vessels for inspection which, on the basis of flag or previous inspection history, are more likely to require detention. It should also enable the authorities to refrain from too frequent inspections

of other ships. The United States Coastguard has this year formalised a preferential system for above standard ships by awarding them the status of "Quality 21" ships. The "21" refers to the century.

The PMOU flag state performance table has a black zone, a grey zone and a white zone. The black, which includes the states with the worst records over a rolling three year period, is divided into four sub-zones of "very high risk", "high risk", "medium to high risk" and "medium risk".

In 1994, which I have taken as my base line, no one published the results of port state inspections for fear of being sued for libel. Happily in that year the UK government took the plunge and issued monthly lists of ships which it had detained. No one sued and progressively individual countries and then the PMOU itself started publishing full details. Its own website is [www.parismou.org](http://www.parismou.org). An even more comprehensive data base which gives the inspection history of individual ships by name is available free to all (subject to initial registration) on [www.equasis.org](http://www.equasis.org). This is a European initiative whose sources of information are the PMOU, the Asia-Pacific (Tokyo) MOU, the US Coastguard, IACS classification societies, the International Group of P & I Clubs, private vetting schemes and representative organisations of industry and seafarers. It deserves to be, and is, visited by ever increasing numbers of people who have a direct interest in the safety of shipping.

Targeting of potentially sub-standard shipping for more frequent inspection is fine so far as it goes, but it does not go very far. It has only nuisance value for the shipowner unless the deficiencies are so numerous or serious that the ship is detained. But there are few cost implications. Remedyng the defects may not cost any more than would have cost if, as should have been the case, it had been done much earlier as and when the defects arose. Even detention may not be burdensome. Proper maintenance can well demand a gap in engagements. Detention merely involves this happening later than it ought and at a time of someone else's choosing. A ship was detained in Southampton until a deck cargo which effectively prevented forward vision from the bridge had been discharged. But that cargo was destined for Southampton anyway.

Not only should detention be very costly for the errant shipowner, but it should be highly profitable for the port authority which is compelled to host the ship. Ports are not geared to accepting immobile shipping which neither loads nor unloads and in the case of some smaller ports a detained ship or ships can be a real obstacle to its normal and proper trade. Unfortunately I understand that at present such assistance for port authorities is on no one's agenda.

Whilst I deplore this, I welcome a recent and much more draconian remedy which has just been adopted by the PMOU. This involves banning ships from entering PMOU ports except as ports of refuge. A ban is liable to be imposed if a detained ship "does a runner", as has happened, or fails to call at an agreed repair port. At the present there are 16 banned ships whose names can be found on the PMOU web site. I would hope that in future the criteria for banning would be much extended. Ships can have the ban revoked if they can show that all deficiencies have been remedied. This is far too easy. They should be required to undertake a full survey at their own expense and thereafter wait for 3 months before the ban is lifted.

It has to be accepted that a sub-standard ship is no less dangerous to the coastal environment if it is merely in transit and does not intend to enter port. It is not possible to ban such ships from national territorial waters, although the UAE appears to have done so temporally, because the Law of the Sea Convention guarantees all shipping an unfettered right of "innocent passage" through territorial waters as well as on the High Seas. In practical terms this may not matter greatly since if a ship is banned from entering any port in a region such as that of the PMOU, there is no commercial point in its exercising its right of innocent passage.

So we now have a situation in which no one who insures a ship or its cargo, charters a ship, is a shipper of goods, is a purchaser of goods afloat or even is contemplating a holiday on a cruise liner has any excuse for remaining ignorant of the likely reliability and even the safety of the ship concerned. If the ship wears the Turkish flag (Black, very high risk) don't. If it wears the Panamanian or Cyprus flag (Black, medium risk) make some enquiries. But you can be confident of UK registered ships (White with a record which in the list of 79 flags is only bettered by Finland and that by a very narrow margin).

I am delighted to report that the number of ships on the UK register is now at long last increasing, due in part to the introduction of the tonnage tax regime although that regime is itself “flag blind”. It is also a source of legitimate pride that whilst the UK has a relatively small national fleet, it has remained throughout a major and highly influential player in the international drive for safer shipping and accordingly cleaner seas.

Two others who are major players in the regulatory scene, although not officially regulators, are the International Group of P & I (Protection and Indemnity) Clubs and the members of IACS (the International Association of Classification Societies). The P & I Clubs are mutual insurance bodies controlled by their shipowner members whose dominant interest is the reduction of claims by improving the safety standards of ships entered with them. There are other P & I clubs and liability insurers but the International Group dominates the market

The role of classifications societies is twofold and each is slightly different. Their staffs are naval architects and marine surveyors. On request they act for Flag States advising on whether their ships should or should not be certified as compliant with the international minimum standards. Recently this has been extended to advising whether shipowners and their individual ships can be certified as compliant with the ISM Code. Historically their role was to act on behalf of underwriters regularly surveying and classifying ships insured or intended to be insured by them.

Thus the highest classification of Lloyds Register was the well known “100 A1 at Lloyds”. Nowadays they are employed by shipbuilders to advise on and supervise new buildings and by shipowners to regularly survey and classify ships in service. It is a highly competitive business and this can undoubtedly imperil the quality of their work. Suffice it to say that the 10 full members and 1 associate member of IACS have come to appreciate that they have a mutual interest in maintaining their reputation for high standards of professionalism. It is no doubt for this reason that they are employed to classify the majority of the world’s shipping. Their enthusiasm for self regulation will no doubt be encouraged by a recent decision by the PMOU to monitor the performance of societies which have classed detained ships and to

investigate whether there appear to have been class failings which should have been detected.

No shipowner can do without liability cover and most obtain this cover through one of the P & I Clubs. The members of the International Group exercise a regulatory influence in the interests of the members by making compliance with the ISM Code a condition of cover and withdrawing cover if classification is not maintained.

But what of other underwriters on hull and cargo? I am told that they enthusiastically study the information available to them via the Equasis web site. This should enable them to discriminate against sub-standard ships and their cargoes by jacking up the premiums. I am not sure that it works like that. Underwriting is a highly competitive business. If you decline to take any risks you do not get very rich. But you do not have to enter the competition to insure known sub-standard shipping at unrealistic premiums. Too many underwriters seem to echo the cry of the fairground salesman “Everyone a winner”, without appreciating that in the case of sub-standard shipping the “winner” is more likely to be the shipowner than the underwriter unless he is obtaining a much enhanced premium.

That leaves only the charterer, the shipper, the goods owner and the purchaser of goods afloat to co-operate in driving sub-standard shipping from the seas. This they can do by making it a term of the contract that the ship shall be ISM compliant and has not been the subject of Port State detention in, say, the last 3 years. They should be able to get reduced insurance premiums and will know that whilst all carriage by sea involves some risk, the risk in their case is that much less.

Thus far I have been dealing, at some length I fear, with the various layers of responsibility for the existence of sub-standard shipping and what can be done by others to reduce or remove the cost advantage which it at present enjoys. However sea safety can be improved in other ways and this is being done.

It is often said that most marine accidents are caused by human error. The finger of blame then points to deck and engineering officers and crew. What nonsense! Virtually all accidents, marine or otherwise, are indeed caused by human error. But the real issue is what was the precise nature

of the error and when did it occur. It may have been historic or it may be current. In a marine context it may have occurred at the stage of design, construction, operation, supervision or whatever. Unless you answer these questions and a good few more, you are unlikely to know what to do to improve safety.

Herein lies the vital importance of thorough and meticulous accident investigation. This is fully accepted in the context of aviation accidents but not to the same extent in the context of marine accidents unless they have involved passengers. Yet finding and publicising the cause of an accident may prevent countless other accidents.

In the UK we are fortunate in having a very efficient and forward looking independent Marine Accident Investigation Branch. It is based here in Southampton. It receives some 1500 accident reports a year but its limited resources enable it to investigate only about 50, the choice depending to some extent upon the likelihood of lessons being learnt. Its purpose is solely to find the facts and to learn lessons. It does not apportion blame and still less is it concerned directly or indirectly with prosecutions. It publishes a full report of all investigations and also periodical safety digests which tell the story of accidents or "near misses" which have come to the notice of the Branch and are of general interest and then lists the lessons to be learnt. It is all most attractively presented and makes compulsive reading.

"Near misses" are often even more instructive than accidents themselves but those involved are rarely completely blameless and will not report them unless they themselves are protected. The Nautical Institute has developed a completely voluntary and confidential reporting system (the MARS system) which operates with considerable success. The end product is periodical MARS reports which tell the story of important near misses in an anonymous form and point the lessons to be learnt. They too make compulsive reading and are very widely read. The UK hopes to institute a similar system by late 2002.

Flag states have a regrettable tendency to overlook their obligations under Article 94 of the International Law of the Sea Convention to investigate and report on the loss of vessels wearing their flag. This robs the industry

of information of the greatest value in terms of reducing loss of life and loss of vessels.

In this respect it needs to be recorded that the UK government's investigation and reports into the loss of the British OBO bulk carrier "Derbyshire" has probably been the most thorough and expensive (something over £3.5 million) in the history of the sea. The direct and indirect results in improvement to the safety of these very large vessels will more than repay the cost, albeit the beneficiaries will not be the taxpayers who funded it. My only regret is that, despite the priority now being given to improving the safety of bulk carriers, there is no statistically significant reduction in the rate of loss of life (74 per year) or in the rate of loss of such vessels (13 ships of over 10,000 dwt.)

However much safety may improve, there will always be accidents and it is important that everything possible is done to minimise their seriousness. Time was when there was always a major salvage tug stationed at Falmouth ready to render assistance throughout the Channel and the Western Approaches. The decline in the size of the international salvage industry led to its disappearance long before 1994 and a new approach was badly needed. This has taken the form of the MCA chartering emergency towing vessels (ETV's) to be stationed at strategic positions around the UK coastline. They do not have the capacity of a major salvage tug, but they can render a "first aid" service which suffices for many incidents and in other cases may be able gain valuable time whilst reinforcements are summoned. Initially there were three ETV's and they were on station only during the winter months. They have proved so valuable that there are now four of them stationed all the year round in the Dover Strait (in co-operation with the French), in the Minch, in the South West Approaches and in Fair Isle.

The Sea Empress incident at Milford Haven gave rise to a review of the powers and duties of the UK government to intervene in salvage operations in the public interest. Suffice it to say that an entirely new system is now in place which is working well in the context of medium sized incidents and will without doubt be seen to be a vast improvement if and when another major incident occurs. Essentially it involves meticulous pre-planning, getting rid of control by committees and putting one man in charge. He is the Secretary of State's representative

(SOSREP). His remit extends to oil industry marine platforms as well as shipping.

Allied to salvage is the problem is where do you take the damaged vessel. We have had recent experience in Australia and the Mediterranean of salvors being refused permission to take the vessel to a port or place of refuge. This is in no one's interest. The solution lies in extending the international law which requires states to accept responsibility for life saving search and rescue in specified areas to providing ports and places of refuge in the same areas.

I am very conscious that constraints of time have prevented my presenting a full account of the progress being made in the last 8 years towards improved safety at sea. I want however to conclude with a word about the introduction of the ISM Code which, in my belief, has the potential for immeasurably improving safety at sea, although it will take time.

There has for years been controversy over whether the way forward lies with ever more, and more detailed, prescriptive regulation or with the evolution of a safety culture in the industry. The ISM code has resolved this controversy by, in effect, requiring that every shipowner or operator shall create a specially tailored safety culture appropriate to the company and to each individual ship. It also, and this is of fundamental importance, makes ingenious provision for monitoring compliance. Let me explain briefly how this is achieved.

The required safety management objectives for the shipowner are three in number. First, there have to be systems in place both ashore and afloat which will achieve safe ship operation and a safe working environment. Second, the system must establish safeguards against all identified risks. Third, it has to provide for its own continuous improvement in the light of the experience of others in the industry. What is of fundamental importance is that the Code does not tell the shipowner how to achieve these objectives, although it does require that the Master's authority and responsibility be clearly defined and that there be a designated person, with "direct access to the highest level of management" with personal responsibility for continuously monitoring the operation of the system

and ensuring that adequate resources and shore based support are provided.

In creating the appropriate organisational structure for the system in the light of widely different ship owning companies and trading patterns, there will be relatively little scope for “off the peg” solutions. Furthermore, the system in fact adopted has to be approved by the flag state or by someone, usually a classification society, acting on its behalf. If approved, the flag state issues a “Document of Compliance”. This is valid for 3 years subject to annual confirmatory assessment.

The shipowner then has to create an individual system for each of his ships. This too has to have flag state approval in the form of individual “SMS” (Ship Management System) certification. The ships own system is not static. It is a living thing which is required to report on and analyse all non-conformities with its own system, accidents and hazardous occurrences.

The system is already being criticised as a purely paper exercise of no practical value. I profoundly disagree. A brief look at the monitoring reports of either the ship owner’s or the ship’s safety system will reveal whether they are working properly. If the reports contain no record of anything going wrong or of any lessons to be learnt from the experiences of others, there is something badly wrong. If the designated person has found nothing to criticise in the way the systems are working in practice, he simply is not doing his job. No system is that perfect. Yet if such matters are recorded, those concerned will have had to consider and record what remedial action has been taken.

The system will not be 100% effective at least in the initial stages. Forgery of some certificates is to be expected. You can already buy a mate’s or master’s ticket. Mr. David Cockcroft, General Secretary of the ITF, has proved it by buying such a ticket for himself. Some flag states will be reluctant to withdraw certificates, since if they did so it would make it difficult or even impossible for some of its own ships to trade. However the backsliders will become known and ships of those states will find that it is more expensive to obtain insurance or engagements or both. If major incidents occur, it will often be possible to bring home responsibility to the Designated Person and, through him, to the Board

itself which, in turn, may raise the possibility that the owners right to limit liability will be questioned and underwriters start talking about repudiating liability because of a failure to disclose that there had been no real compliance with the ISM Code.

I end as I began by asserting with confidence that much has been achieved in the last 8 years in the quest for safety at sea, but much still remains to be done. May I also thank the many experts who have helped to bring me up to date for the purpose of delivering this lecture.