

Class keeps its act together

Classification societies are under more pressure than ever to improve the performance of their classed fleets, both from the industry at large and the legislators. But the need to get politically involved hasn't prevented them from continuing with their research into technical issues

Has class bashing become the shipping industry's favourite pastime? One could argue that it has, when the managing director of one of the world's biggest shipmanagement companies takes the podium at a conference and bluntly states that he believes that class - along with flag - is no longer to be trusted.

The lack of trust among the various parties involved in the shipping industry - owners, charterers, class, flag and port state control, to name just a few - is the result of a few high profile casualties which have focused the public's and, more importantly, the legislators' attention on the inner workings of the industry. In this respect, the Erika sinking, as in so many other matters pertaining to the tanker sector, was the major turning point. The Italian classification society Registro Italiano Navale (RINA), as the society that classed the Erika, became the focus of much criticism in the immediate aftermath of the incident, and by extension, the entire institution of class came under increased scrutiny. Significantly, the Erika I regulatory package that the European Union (EU) put into place post-Erika involved a Directive mandating the increased transparency and accountability of classification societies.

In the midst of the recriminations and the passing of blame, however, it is often forgotten that class continues to be the single most authoritative source of technical information with respect to the ships of today and those of tomorrow. And while an increasing amount of the societies' time is absorbed by politically motivated pursuits, they continue to carry out innovative, far-reaching research and development projects related to the design of tankers and other technology designed to deliver timely class-related information to those who require it - owners and regulators alike.

RINA

RINA, as the focal point in the post-Erika debate about class, has striven to re-establish its good name and to demonstrate its commitment to quality in the intervening years. Part of this drive is the society's Green Star logo, awarded to vessels which comply with a set of environmentally conscious, voluntary class notations which include guidelines for garbage disposal, the strategically located installation of bunker tanks and the reduction of NOx and SOx emissions, among other features.

According to Roberto Cazzulo, manager of RINA's newbuildings and technical services department, the society began to think about ways of recognising owners who went above and beyond what was required by existing environmental regulations when it sat down to revise its Rules in the year 2000. "We thought it was important to have some voluntary notations present in these Rules that would be an indication of a shipowner or a ship design which complied with standards going beyond the strict compulsory requirements and that took into account the standards of design or operation or a combination of both that achieved the highest possible standard for different kinds of vessels," he says.

The Green Star logo, he says, is a "compilation" of many different environmental standards, drawn from recommendations and from parts of MARPOL not yet adopted by the International Maritime Organisation (IMO) (MARPOL Annex IV, which deals with emissions from ships at sea, being one example), as well as guidelines for sewage treatment and shipboard incinerators. Originally, says Caluzzo, the notation was intended for the cruise sector - one of the few sectors in the shipping industry

that interacts directly with the public - but it is of course applicable to other kinds of ships.

RINA recently awarded the Green Star logo to the Shogun, a 35,000 dwt chemical/product tanker delivered to Italian owner Mediterranea di Navigazione by Hyundai, the first tanker ever to achieve the standard. "Tanker design already has a set of standards concerning double-hull design, but we thought it was also important for some operators to have the ability to demonstrate that their design and operation were beyond these minimum standards," says Cazzulo.

He points out that, for instance, the requirement for the bunker tanks to be installed over double bottoms in order to avoid a bunker spill in the event of a collision or a grounding is just as relevant for tankers as for other types of ships. (Although it is worth pointing out that over the past year, the International Tanker Owner' Pollution Federation's (ITOPF) figures have shown that incidences of bunker spills from non-tankers have increased in recent years.)

"Another area for tankers is the matter of air pollution," says Cazzulo, "to adopt a type of engine that reduces emissions, as well as the containment of refrigeration gases."

In light of the extensive newbuilding going on in the tanker sector at the moment, Cazzulo believes that there is a significant opportunity to ensure that fully environmentally friendly tankers are built. "We are aware that other societies and port state control authorities have similar awards, and we think it is a good trend because it is a demonstration that the industry wishes to voluntarily apply the highest standards."

Working together

In spite of the failed merger between RINA and its French counterpart Bureau Veritas (BV), the two societies continue to cooperate on research and development.

According to Cazzulo, the two societies worked together to develop a set of new guidelines for tanker design, to be published in the near future.

The guidelines are based on direct numerical and finite element calculations and are "very specific about the loads to be applied to the ship's structure, corrosion margins to be considered, the structural response to loads and strength criteria", says Cazzulo. The guidelines will be applicable to Very Large Crude Carriers (VLCCs), Aframax and product tankers.

It is hoped that the publication will aid owners, designers and yards in selecting the most appropriate solutions in order to comply with classification Rules and also provide a guide for coating preparation and maintenance, providing means of access to tanks for the purposes of inspections and surveys and anticipating structural response in the event of a flooded compartment in a double-bottom design.

Beyond Erika

RINA hopes to extend this spirit of cooperation to the other members of the International Association of Classification Societies (IACS). "It is the future for us to cooperate and to have a relationship with other societies," says Cazzulo. "We are also cooperating with Germanischer Lloyd [GL] on the development of a computer training package for surveyors."

RINA has learned its lesson the hard way, through the media frenzy that engulfed it after the Erika sinking. "Erika was an unprecedented situation for a classification society. The pressure from the media and the politicians was immense. We have learned a lot in the last three years about what we should do," says Cazzulo. "We are working on proving to the industry that having the highest quality is our top priority and showing that we are improving substantially all the potential elements that were at risk."

As part of this initiative, RINA is paying closer attention to measurable performance indicators such as port state control detention statistics and recently announced its

intention to increase access to information about its PSC performance by publishing the data on its website. RINA's quality drive, known as the Special Surveillance Scheme (SSS), under which classed vessels are monitored according to several performance related parameters and treated accordingly depending on whether or not their owners show a willingness to address any shortcomings highlighted by the society, has also included the withdrawing of class from 312 ships totalling 2.7 million gt since 2000.

Lloyd's Register

Lloyd's Register (LR) has also placed a renewed focus on PSC data. The London-based classification society announced in June of this year that it would publish information on PSC detentions for all of its classed vessels on its online class information service, ClassDirect Live.

According to Alan Gavin, marine director of LR and newly elected chairman of IACS, the data will be used to identify trends across the fleet, enabling LR to raise awareness among its owners of specific detention items. The data will be presented in groupings of ship type, flag, age and detention item.

The information currently consists of raw data from the PSC authorities, but LR intends to analyse the data in order to determine which detention items occur most frequently and the ways in which they are combined, in order to assess the hazards to vessels.

The move is part of a wider drive towards transparency, an issue that is much on Gavin's mind as he assumes the chairmanship of IACS. He highlights the two issues that he feels are the most important going forward: ongoing safety requirements and transparency. As Gavin points out, these are not new concepts and both are subject to ongoing work both within IACS and the individual classification societies themselves, but they are both worth emphasising in light of the current focus on standards for bulk carriers and the ongoing implementation of the EU Directive on class.

The initial Directive was adopted by the EC in 1994, but was amended following the Erika incident, as part of the Erika I package. The amended Directive was adopted in December 2001, almost two years after the Erika went down off the coast of France. This new amended version will be effective as of July 1, 2003.

According to a representative of the European Commission, the amendments were intended to change the grounds on which class societies are recognised as authoritative bodies and to firm up the procedures for suspending a classification society in the event of non-compliance. Under the amended Directive, the decision to withdraw recognition from a classification society will fall under the aegis of the Commission, to be based on compliance with the Directive and the performance of the society with respect to pollution and safety matters. The Directive also establishes criteria for the transparency of class information; the establishing and maintaining of clear lines of command between headquarters and regional offices; and restricts surveyors from carrying out work on vessels other than those for which they have specific training.

The Directive-mandated drive towards transparency requires classification societies to make information about suspensions, overdue recommendations and surveys, withdrawals of class, conditions of class and transfers of class publicly available.

According to Gavin, Equasis will play an instrumental role in delivering this information to those who require it. An IACS initiative ensuring that access to this information is available through a 'hot-link' on the Equasis website is currently underway. Viewers will be able to click through to a vessel's class record via its IMO number from January 1, 2003, says Gavin. In LR's case specifically, users will be taken directly to the society's ClassDirect Live class information website.

The second issue on Gavin's agenda is that of fostering better relations between class and the industry. IACS has approached a number of industry associations,

including the International Chamber of Shipping (ICS), the Baltic and International Maritime Council (BIMCO) and the International Association of Independent Tanker Owners (INTERTANKO) among many others, in the interests of opening up a dialogue about how class can be more effective as an authority within the industry and has already received a number of positive responses, says Gavin. The Association is currently in the process of setting out agendas and timetables for meetings for the next two to three years. Gavin points out that most of the big industry associations have the same safety aims, but that they sometimes choose different routes towards those aims; indeed, four of the big industry associations - ICS, BIMCO, INTERTANKO and INTERCARGO - recently came to the conclusion that by working together and avoiding the duplication of effort, they could achieve their goals much more efficiently and formalised the agreement by scheduling leadership meetings at regular intervals during the year. Gavin's hope of solidifying IACS' relationship with industry during his time as chairman is very much in the same spirit.

Bureau Veritas

The French classification society Bureau Veritas has been working on a number of tanker-related projects. In a speech delivered at INTERTANKO's Rotterdam Tanker Event this year, Bernard Anne, head of marine for BV, made the point that although tankers are much less likely to experience hull failure than other types of ships due to the complete lack of deck openings, the industry must ensure that tankers are maintained properly and that machinery is installed properly.

According to Anne, BV has been called in to consult on a number of instances of tailshaft misalignment on VLCCs over the past two years. "We have recently been called in to analyse problems experienced with several Korean-built VLCCs," says Claude Andreau, head of the structural analysis department of BV's consultancy arm, Tecnicas. "They were all built to major class standards, but they suffered stern tube bearing problems right from delivery. We were able to calculate and measure the deflection of the hull structure relative to the tailshaft and crankshaft assembly and use our specially developed software to come up with structural modifications. Basically, they have to beef up the ship's aft end structure, which is too flexible in relation to the tailshaft and crankshaft."

BV says that the problem has become more commonplace as a result of the optimisation of aft end structures and the increasing size and power of propulsion systems. Proper vibration analyses and shaft alignment are required at the time of newbuilding in order to avoid problems in the future, says Anne.

With respect to the future of tankers, BV believes that full redundancy of propulsion and steering systems - "two engines, two shafts, two propellers, two rudders, two steering gears" - will be required from a safety point of view, although the society admits that the additional cost of installing such systems will be offputting to most owners. Indeed, Anne admits that redundancy "may not be economically realistic today", but he also believes that the industry will simply "not cut out major tanker accidents until [it starts] duplicating machinery installations".

American Bureau of Shipping

The American Bureau of Shipping (ABS) is another classification society that has predicted the advent of redundancy. Dr Donald Liu, executive vice-president and chief technology officer, believes that there are two ways of approaching tanker safety - from without, the legislative route and from within, the application of risk management principles to ship design and operation.

Dr Liu believes that the next 'Brussels-type' response to a serious tanker incident will be the mandating of redundant ship systems. "The Exxon Valdez provides us with a classic example of the manner in which regulators respond to human error," said Dr

Liu at the INTERTANKO Rotterdam Tanker Event. "They look for technical solutions that will protect the ship and its cargo against the failings of human nature."

He points out that 'human factor' issues are harder for legislators to deal with and that in the event of a tanker incident, they will most likely to turn to a 'hardware'-based solution, similar to the mandating of double hulls that ensued after the Erika incident.

"What then is the likely response of these regulators to the next high profile tanker casualty and the resultant pollution, especially if a double-hull tanker is involved?" asks Dr Liu. "It may be influenced by the specific circumstances, but I think it can be summed up in one word: redundancy.

"We now have a redundant hull. The next step will be redundant engine rooms, possibly double-hull engine rooms, redundant steering gear, two propellers, twin rudders, redundant navigation systems, perhaps even double collision bulkheads." Dr Liu feels that it is inevitable that the next Amoco Cadiz or Erika type of incident will result in mandated redundancy. However, there is a proactive approach that the industry can pursue now, before the legislators get hold of the issue and that may obviate the need for fully redundant systems, he says, and that is the application of risk management principles to the shipping industry.

"The risk approach is to apply formal safety assessments whereby you determine what Rules you need based upon the risks involved. Applying the risk approach will help us as a classification society to determine what Rules are needed, for example, those that could be related to tanker structure, tanker machinery or even tanker surveys," explains Dr Liu.

The methodology involves identifying the hazards, examining the possible consequences and how likely they are to occur and finally working out a strategy to manage those risks.

ABS is currently working on several tanker-related projects involving the risk management strategy. According to Dr Liu, the society is running an integrated risk management programme which is designed to evaluate the risks inherent in certain kinds of tanker machinery, including main engines, steering gear, power distribution, emergency power distribution and support systems such as cooling systems. The idea is to carry out a quantitative risk assessment, based on historical performance data and the failure rates of particular components within each of the systems under study and once the study is complete, to use the findings to revise or fine-tune the societies' Rules.

"From a class or regulatory perspective, you want to be sure that you have requirements that will mitigate the risks, so that in the end the Rules are still prescriptive, yet based upon a risk assessment. We want to be sure that the Rules that we have do mitigate the higher risk items," says Dr Liu.

Furthermore, ABS is looking to extend this approach to its surveyors by developing a risk-based inspection procedure. The risk-based inspection would be more qualitative, i.e. looking more at the actual performance of various pieces of machinery rather than following a prescribed, set procedure that might dictate the dismantling of a piece of equipment that has shown no sign of malfunctioning.

According to Dr Liu, ABS has already applied the risk-based inspection to Floating Production, Storage and Offloading (FPSO) units and is now in the process, with its surveyors, of developing a procedure for seagoing vessels.

Det Norske Veritas

The focus on newbuilding standards and the pressures of competition on the performance of yards and classification societies came to the forefront of the industry's collective mind earlier this year, but the Norwegian classification society Det Norske Veritas started work on its newest software offering, Nauticus Construction over two years ago. The new module, introduced in April of this year, aids owners in monitoring the newbuilding process and in the sharing information

about the process with the other parties involved. Tankers and gas carriers were used as the ship models on which Nauticus Construction was built.

"The shipowner's team, those who are to protect the interests of the owner during the construction, is changing - it is getting bigger and it is becoming quite a challenge for the manager of such a team to control and monitor the actions of each individual in the team during construction. And the focus has changed quite a bit - owners have to pay more attention to things like coatings, and the time it takes for the yard to build a ship has reduced quite drastically. Therefore, there are more things happening in a much shorter amount of time. The owner's team needs some tools and systems to be able to make sure that they are in control of that process all through the project," says John Lyng, head of marketing and business development for DNV's tanker department.

It is DNV's belief that Nauticus Construction will aid owner's teams in taking greater control of the newbuilding process. The functions of the software include preparation for inspection; the establishment and monitoring of 'milestones'; the entering and monitoring of inspection comments; the review of project progress; and reporting to home office. 3-D models, photos and text are all used as means of delivering information about the newbuilding process.

The political animal

According to Lyng, DNV is also attending to the political side of the industry by backing and even going beyond the IACS initiative to foster better relations with the industry. "We've started to talk to the oil companies, to the oil companies' organisations, together with people like INTERTANKO, to find out how we can improve communications between ourselves and the industry at large," he says. "We have approached a number of companies within the industry, and the intention is to find out how we can share information, how we can utilise each other's work, how we can utilise each other's knowledge in a better way."