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International Regulation News Update

February 2002

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OPENING REMARKS

The 74th session of the MSC met at IMO Headquarters in London from May 30th to June 8th 2001 under the chairmanship of Mr. Tom Allan from the United Kingdom. Opening statements by the Secretary General William A. O'Neil focused on IMO's STW *white list* stressing that the list should not be used by the maritime community as the sole criterion for determining the competency of seafarers.

Rather, he indicated that it is imperative that the Administration's training and certification procedures, approved by IMO's Panel of Experts as a prerequisite for the *white list,* be independently audited every 5 years as per the STCW Code to verify full implementation and maintenance. The first evaluations are to be made by 1 August 2002 for the 94 Member States and one Associate Member that now comprise the *white list*.

Following the opening statements, Governments progressed the development of several safety initiatives and approved numerous sets of guidelines pertaining to the application of SOLAS.

BULK CARRIER SAFETY

Several Formal Safety Assessments (FSA's) and research projects, including model testing, are continuing to be progressed by various governments and organizations. The following provides an update of the interim results presented to IMO. The MSC agreed that when these efforts have been completed and final reports submitted, a comparative analysis and validation of results should be carried out prior to initiating any regulatory action.

Recommended Safety Provisions

Based on the Re-opened Formal Investigation (RFI) presented in the UK concerning the 1980 sinking of the *MV Derbyshire*, a number of additional safety provisions were recommended by the U.K. on which the MSC took action as presented below. Action taken by the MSC on the U.K. recommendations took into account that the sinking was determined to have been initiated by progressive flooding of forward spaces through air pipes and ventilators damaged by wave impact loads followed by flooding of the forward cargo hold due to failure of its hatch cover.

- Compulsory active reporting system of the position of all ships – *is to be considered by the COMSAR and NAV Sub-Committees*;
- Extent of information provided to masters by weather routing services – *is to be considered by the NAV Sub-Committee*;
- Review of minimum strength standards for ventilators and air pipe fittings and the sealing of spurling pipes to prevent chain locker flooding – *IMO, noting that the main concern is preventing progressive flooding rather than preventing locker flooding, will await the outcome of this effort which has been taken on by IACS*.
- Electronic indication on the bridge of the status of deck closures – *is, for the time being, considered to present too many practical difficulties and should be subject to trial application in order to determine its feasibility. The MSC also considered that more reliable securing devices, as opposed to electronic indication of hatch cover closure, would provide for a more effective means to increase safety.*
- Remote monitoring of water levels in spaces forward of the collision bulkhead – *is to be considered by the SLF and DE Sub-Committees*.
- Ship yard repair and quality standards to avoid construction discontinuities and misalignment – *MSC noted IACS Members' application of IACS Shipbuilding and Repair Quality Standards which address the concerns raised and encouraged all parties to work collectively towards improving construction workmanship.*
- Maintain on board ship and ashore, as-built construction drawings – *MSC considered this to be an ISM issue but tasked the DE Sub-Committee with the assistance of IACS to assist ship owners to develop effective maintenance programs*.

At the urging of the UK and in light of the RFI, the MSC approved Circ/MSC.995 which urges ship masters to regularly check; the securing of closures leading to spaces routinely accessed; bilge alarms; and pumping arrangements. The Circular also urges the fitting of bilge alarms, with audible and visual indication at the bridge,

in spaces forward of the forward-most cargo hold.

International FSA Collaboration

A progress report of the formal safety assessment to facilitate IMO's work on measures to improve the safety of bulk carriers was presented by the U.K. Maritime and Coastguard Agency (MCA), coordinators of this work. An International Project Steering Board, consisting of representatives from ten IMO member states and two IMO observer organizations monitor this effort. The final outcome of the entire FSA study is to be reported to MSC-76 in December 2002.

The progress report provided the results of the 1st of 5 steps of FSA, *hazard identification*. To optimize resource allocation, Step 1 had been completed by screening out generic hazards to which all ship types are prone and considering only those hazards unique to classed bulk carriers $\geq$ 500 gt built since 1960. As a result, over 1100 recorded hazards were compressed to 248 identified hazards. The statistics presented showed that although Capesize (>80k dwt), Panamax (50k-80k), and Handysize (10k-35k) bulk carriers were less prone to accidents than the mean for all types of ships, Handymax (35k-50k) were markedly higher with an accident occurring once every 12.5 ship-years.

The remaining 4 steps of FSA are underway and recommendations are due to be submitted to MSC-76 in December 2002. The results will address the following issues:

- Extending the structural survivability aspects of SOLAS XII to the bulkheads and double bottoms of bulk carriers <150m in length and lowering the limit of high density cargoes for existing bulk carriers from 1789 kg/m^3 to 1000 kg/m^3, the limit used for new bulk carriers.
- Retroactive application of IACS structural requirements for forward hatch covers on new bulk carriers to existing ships.
- Risk mitigation afforded by double hulls.

FSA by Japan

Concurrent with this effort, Japan completed preliminary FSA on certain types of bulk carriers with the aim to facilitate IMO's actions for increasing the safety margin for bulk carriers and, in particular, with respect to the three issues that are set to be addressed by the International Collaboration noted above.

The MSC held in abeyance any detailed consideration of the interim report until MSC-75 when a report is due to be submitted. However, it is interesting to note that Japan's FSA finds that the total risk level of bulk carriers is judged to be *as low as is reasonably practicable* (ALARP) based on casualty records from 1978 to 2000. Japan noted that this was in great part due to the Enhanced Survey Program and SOLAS Chapter XII which are considered to be very effective risk control options (RCO's). The interim report goes on to recommend:

- Double side shell arrangements could be an acceptable RCO in lieu of SOLAS XII.
- Possible RCO's for single side skin construction might include increased corrosion margins and periodic, mandatory paint renewal. This was found to be appropriate for bulk carriers in the coal trade where structural failures arise from the excessive corrosion caused by coal.
- Application of the transverse structural requirements of SOLAS XII to bulk carriers <150m in length is not appropriate as the flooding of a single cargo hold is usually fatal for this size of ship.
- Further evaluate accidents of bulk carriers carrying dense (1789 kg/m^3 - 1000 kg/m^3) cargoes, recognizing that approximately 70% of the serious casualties have occurred to bulk carriers while carrying high density cargoes (1789 kg/m^3).
- The reduction afforded by RCO's for hatch cover failures are considered to be low, as failures constitute a small portion of flooding casualties and are linked to securing effectiveness rather than hatch cover strength.
- Enhanced and more robust arrangements for operating personnel to gain access to the bow in severe weather conditions are not considered to be a useful RCO as access to forward spaces during heavy weather incurs significant danger and risks to personnel. *Contrary to this, the SLF Sub-Committee is of the view to extend to bulk carriers the access arrangements required for tankers in MSC.62(67). A permanently constructed gangway at least a meter wide and with one-*

man shelters placed at intervals not exceeding 45 meters when the distance to be traversed exceeds 70m would be required.

- Weather routing for bulk carriers needs to be further investigated taking into consideration that for the period 1978 to 1982, unrouted ships of all types suffered a casualty rate 32% greater than ships with weather routing.

FSA-Fore-end Weathertight Integrity by IACS

IACS submitted the results of its FSA to provide IMO with documentation to further enhance the safe operation of bulk carriers. An overall risk assessment was carried out on three flush deck bulk carriers operating with a B-60% freeboard: Handymax, Panamax and Capesize. Ingress of water to fore end spaces was based on the following scenarios:

- Side shell failure of No.1 cargo hold
- Forepeak flooding due to failed deck fittings
- No.1 hatch cover failure

To establish the present base risk, three risk control options (RCOs) already implemented were assessed:

- Structural survivability standards in SOLAS Chapter XII
- Enhanced Survey Program
- Forward Hatch cover strength (UR S21)

New RCOs were considered for new and existing bulk carriers of more than 150m in length:

- Focsle and bulwark protection
- Strengthening of bulkheads
- Hatch cover strengthening and user friendly closure systems
- Reduced operating drafts
- Water ingress alarms in holds and forepeak
- Strengthening of deck openings/closures
- Double skin structures
- Cargo hold coating and maintenance

Cost effectiveness and ranking of the RCO's were determined in terms of Cost of Averting a Fatality. CAF compares the cost of the RCO - after considering economic improvements afforded to the ship by the RCO - to the number of averted fatalities. The following RCO's were identified:

<u>Existing Bulk Carriers > 150m</u>

- Deck fittings – evaluate retroactive application of enhanced strength standards
- Focsle or bulwark – evaluate cost and protection relative to enhanced deck fittings
- Water ingress alarms in holds and forepeak
- Accelerated implementation of Structural survivability standards in SOLAS XII

<u>New Bulk Carriers > 150m</u>

- Increased deck fitting strength standards
- Water ingress alarm for all holds and forepeak
- Focsle or bulwark for Panamax and smaller
- Double side shell arrangement

The RCO's for new bulk carriers were also considered to be advantageous for new and existing bulk carriers < 150m in length subject to a more thorough evaluation.

Evacuation FSA by Norway/ICFTU

A joint submission by Norway and the ICFTU recommended that all new and existing bulk carriers be fitted with:

- Free-fall lifeboats with a float-free mode;
- Water level alarms with continuous indication of water level in all holds and forepeak; and
- Personal immersion suits for all personnel.

Although the above recommendations would increase the success rate in case of evacuation by approximately 30%, the MSC indicated that it was more imperative to improve the ship's survival capability. Administrations were requested to submit comments to the recommendations, particularly for free-fall lifeboats to MSC-75, May 2002.

Sea Load Model Tests

In May 2000 the MSC was presented with an initial set of model test results carried out in association with the 1998 UK/EC Assessors' Report on the MV Derbyshire casualty. The report and tests were aimed to determine the sensitivity of green sea loads on hatch covers and deck wetness in storm and hurricane sea states as a function of bow height and forward reserve buoyancy.

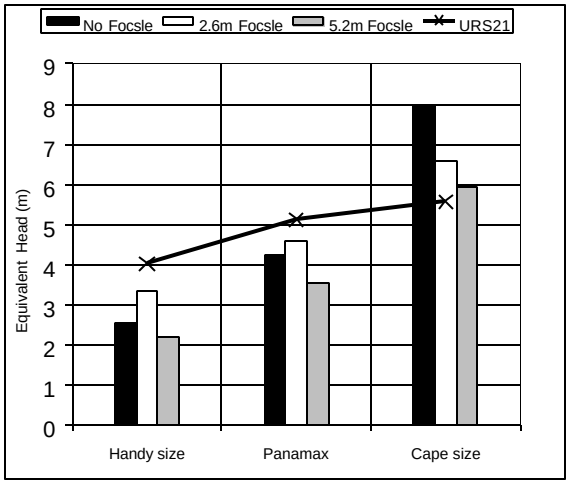
The tentative conclusions of these initial tests carried out on bulk carriers with B-60% freeboards using a 2m hatch coaming height included:

- Capesize bulk carriers operating in severe storm conditions are more likely to

experience loads on their forward hatch covers in excess of those prescribed in IACS UR S21.

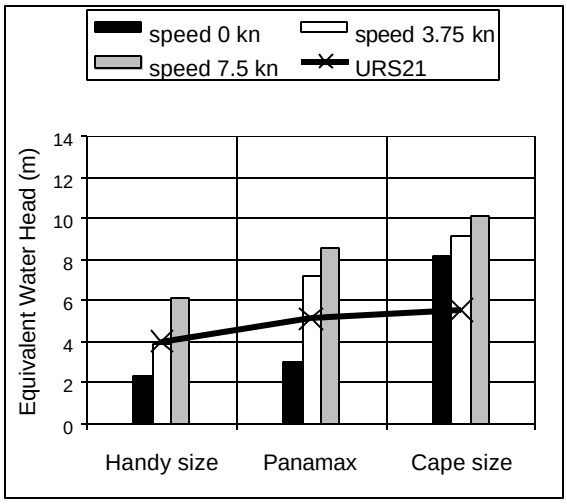
IACS noted that account should be taken of the nominal pressures used in UR21 which are established to obtain the hatch cover scantlings and that safety factors to ensure the structural integrity of hatch covers in extreme weather conditions are applied).

- Increasing bow height can reduce fore deck wetness and green sea loads, but as shown below not to the extent needed in all cases to avoid pressures specified by IACS Unified Requirement (UR) S21.



No.1 Hold – Maximum Measured Load vs Bow Height (H_S >> 12.78^{++}m)

- Relative forward speed was determined to be the most influential factor affecting frequency and magnitude of green water on deck. As shown below, green sea loads forward, in some cases, exceeded those specified in IACS UR S21.



No.1 Hold – Maximum Measured Load vs Forward Speed (H_S = 12.78m)

- The Load Line Convention hatch cover loads should, for hatches aft of the foremost hatch, incorporate margins that more directly take into account buckling and load effects and the actual height of the hatch coaming;
- Hatch cover loads from severe storm beam seas do not appear significant in terms of an equivalent water head. However, substantial horizontal wave impact loads on the coamings may occur.

Several questions concerning the possible conservatism of the model test results were raised and IACS and the UK agreed to collaborate and conduct additional tests, with the view to resolving the following issues:

- Proper simulation of hurricane wave patterns and steepness;
- Use of extreme events and identification of corresponding probability of occurrence;
- The generalization and application of relatively large hurricane waves to smaller bulk carriers, recognizing that each ship has its unique critical wave length and period and that smaller ships will likely experience maximum loads in more moderate environments.

Additional model test results, including extreme value prediction analysis, were scheduled to be presented to MSC-74, but the UK advised that the results would not be available until 3rd quarter 2001 and therefore would be presented to MSC-75, May 2002.

Japan's model test results were not available for MSC-74, but were reported to the SLF Sub-Committee in July 2001. The tests showed the same general trends as those contained in the 1998 UK/EC Assessors' Report. Although direct comparison of the results is difficult, it was noted that the magnitude of the green sea loads reported by Japan was slightly less. This is primarily due to the smaller wave heights (10.6_m vs 12.78_m $H_{1/3}$) applied during the tests coupled with the greater bow height of the tested model. Final test results will be reported this May to MSC-75.

FIRE SAFETY

The MSC approved a number of circulars which contain recommendations and guidance relative to the application of fire safety regulations contained in SOLAS and the Fire Test Procedures (FTP) Code as summarized below.

Pressure/Vacuum Valves

The MSC approved MSC/Circ.1009 which recommends that pressure/vacuum valves installed on/after 1 July 2002 to prevent the passage of flame into cargo tanks should be designed, tested and fitted in accordance with ISO standard 15364.

Interpretations

The MSC approved a set of interpretations in MSC/Circ.1004 which clarifies the application of the Fire Test Procedures (FTP) Code and applies to materials tested on/after 1 June 2001. The circular addresses application of test results for surface flammability to non-combustible substrates, the fire test duration of primary deck coverings and the integrity of fire division penetrations other than steel. Application of the FTP Code relative to the measurement of sulphur dioxide emissions from the testing of floor coverings was clarified in MSC/Circ.1008.

New MSC/Circ.1006 provides acceptable criteria (minimum ignition time > 40 secs) and test procedures for determining the acceptability of fire-retardant materials used for the hull and the rigid cover of life boats required to be fire-retardant by the Life Saving Appliance (LSA) Code.

The MSC, in approving this new circular (MSC/Circ.1005), clarified that materials of light-weight (e.g., honeycomb) construction, as referred to in SOLAS II-2, may be used as a non load-bearing internal "A" class division for accommodation and service spaces. The circular goes on to state that it cannot be used as an integral part of the main fire zone bulkhead and stairway enclosures on passenger ships.

HSC Evacuation Analysis

Under the 2000 High Speed Craft (HSC) Code which is expected to enter into force on 1 July 2002, passenger craft are to be subject to an evacuation analysis based on IMO's guidelines. This analysis, used in connection with the Code's prescriptive requirements for means of escape and structural fire integrity, will provide for a secondary check of the adequacy of the overall evacuation time taking into account reaction time, degrees of passenger mobility and egress time for different types of arrangements (stairs, corridors) and spaces.

The newly approved interim guidelines (MSC/Circ.1001) recognize that computerized simulation techniques are not yet available and therefore include a simplified analysis methodology including a sample application for an 800 person craft.

Fixed Gas Fire-Extinguishing

MSC/Circ.1007 contains approved guidelines for testing and approving fixed aerosol fire-extinguishing systems for use in category A machinery spaces. The tests aim to establish both the effectiveness of the agent and the distribution of the agent (either by *condensed aerosols*, created by combustion or by *dispersed aerosols*, stored in pressurized containers with inerted carrier agents) to fully flood the space's volume at all points with an adequate concentration.

Within 120 secs, the volume of the space is to be occupied by the agent having a density of at least 85% of its required design density for extinguishing. The system is to be tested for different types of fuels (heptane, light diesel oil and commercial fuel oil).

Fire Safety Design Alternatives

The MSC approved MSC/Circ.1002 which outlines the methodology to carry out an engineering analysis of a specific fire safety system, design or arrangement alternative to the prescriptive requirements contained in the

revised SOLAS Chapter II-2 which is scheduled to enter into force on 1 July 2002.

A preliminary qualitative analysis report of a trial alternative design based on thoroughly developed fire scenarios carried out by a design team must first be accepted by the flag (and possibly port) State.

The fire scenarios, which normally use Hazard and Operability (HAZOP) studies to identify fire hazards, should take into account ventilation conditions, ignition sources, quantity of combustible materials to determine fire load and the effects of fire: detection, protection, control and suppression.

Identified hazards are grouped into three classes, *localized* – within a specified area; *major* – within the boundaries of the ship; and *catastrophic* – beyond the ship affecting surrounding structures as in the case of offshore production platforms.

The next step of the evaluation requires a quantitative comparison of the prescriptive vs proposed performance criteria to be carried out. The objective is to verify the acceptability of proposed safety margins for evaluating the trial alternative design against the prescriptive performance criteria from fire initiation to control or suppression.

The performance criteria can include measurable limits such as smoke obstruction, temperature, and height of the smoke and hot gas layer for an acceptable evacuation time.

NAVIGATION SAFETY

HSC Code Amendments

The MSC adopted amendments to the 1994 High Speed Craft (HSC) Code in order to harmonize the standards for existing HSC with the standards for HSC contained in the 2000 HSC Code. The amendments contained in resolution MSC.119(74) enter into force on 1 January 2003 and address the following navigational equipment provisions.

Automatic Identification Systems, AIS, will be required to be fitted on all HSC's certified under the 1994 Code. AIS provides to shore-side stations the ship's identity, type, position, course, speed and navigational status of the ship's command and engines.

Compliance dates according to the type of HSC and its gross tonnage are shown below. 3.21

HSC Type	Gross Tonnage	Compliance Date
Passenger	all sizes	1 July 2003
Cargo	≥ 3000	1 July 2006
Cargo	< 3000	1 July 2007

Voyage Data Recorders - VDR's are to be fitted to all HSC's certified under the 1994 HSC Code as per the following:

1994 HSC Craft Type	Date for Compliance
RoRo-Pass	1st survey after 1 January 03
Passenger other than RoRo-Pass	on or before 1 January 04

Administrations may exempt passenger craft from this provision where it has been determined to be unreasonable or impracticable to fit a VDR.

The VDR should provide a secure means to store and retrieve information concerning the craft's position, movement, physical status, command and control. Resolution A.861(20) recommends continuous and sequential recording of the following data:

- Ship's heading, speed and position
- Bridge and VHF communications
- All information presented by the radar
- Water depth
- Wind speed and direction
- Status of bridge alarms
- Closure status of all watertight and fire doors;
- Accelerations and hull stresses of the ship, if being monitored.

The performance standards applied to such equipment shall, to the extent practicable, be not less that those developed by IMO. A performance test to verify the accuracy, duration and recoverability of data recorded as per resolution A.861(20) shall be carried out annually. 3.21

SAR Plans

SOLAS requires Search and Rescue (SAR) cooperation plans to be developed and provided

on board all passenger ships irrespective of either trading route or itinerary by 1 July 2004. The objective of the plan is to enable: (1) early contact in the event of an emergency; and (2) ready access to up-to-date information on the distressed ship and the available SAR service which can also include another passenger ship acting as the SAR facility. The plan's effectiveness is to be tested periodically as agreed by the passenger ship's operator and the relevant SAR service for the regions transited.

To facilitate the development of these plans, a set of guidelines, including a model SAR plan, was approved by the MSC and is contained in MSC/Circ.1000. For ships operating in more than one of the six *cruising areas*, the circular acknowledges the impracticality of maintaining SAR plans for each area and recommends use of the SAR data provider as defined in the International Aeronautical and Maritime SAR Manual.

MISCELLANEOUS

Permanent Survey Access Arrangements

A new SOLAS regulation, requiring tankers ≥ 500gt and bulk carriers ≥ 20,000 gt built on/after 1 January 2004, was approved by the MSC. Subject to the development of mandatory technical specifications by the DE Sub-Committee in March 2002, the approved regulation is scheduled for adoption at MSC-75 in May 2002.

The draft regulation calls for each ship is to be provided with an approved Ship Structure Access Manual that details dimensions and locations of permanent access arrangements.

Maintenance procedures for these access arrangements as well as an inventory of portable access arrangements are also to be included in the manual.

The regulation requires the arrangements for general and close-up survey of the internal structure to be permanent insofar as practicable. To mitigate the dependence on temporary rigging for access and to achieve greater consistency of the regulation's application, IACS has submitted its position to the DE Sub-Committee proposing that a minimum amount of access for close-up surveys be provided by a permanent arrangement of ladders, platforms and rungs.

Of primary importance is the need for fitting permanent access on:

- bulk carriers - at least 25% of the cargo hold side shell frames - each frame, in the first cargo hold; and
- for oil tankers, the top perimeter of each cargo tank giving access to athwartship platforms at each transverse.

Ship Design - Ballast Water Treatment

A draft circular containing recommended design considerations and suggestions for new ships to more effectively carry out ballast water treatment was tentatively approved.

Subject to further consideration of requirements and safety implications for the storage of chemicals that may be used to treat ballast water, final approval is set for MSC-75 in May 2002.

Although significant work remains before a set of regulations on BW management and treatment techniques are completed, the draft circular offers advice to ship yards on various means to mitigate sediment uptake and internal entrapment and recommends arrangements to facilitate sediment removal in a safe and efficient manner. Examples include:

- the fitting of air or steam cleaning systems to sea chests;
- the use of stainless steel suction strainers;
- arranging internal structural members to facilitate drainage and mitigate the formation of stagnant pools of water; and
- installing Butterworth-type tank washing systems in ballast tanks

Equipment and systems used on ships to treat ballast water should be provided with a means for recording the process and monitoring its performance so that a ready assessment can be rendered.

Ships intending to treat ballast water by one of the three exchange methods (*dilution, flow-through* and *sequential*) are recommended to be designed to complete the exchange sequence with a minimum number of operational steps; in as little time as possible to complete such steps; and with a minimum number and duration of partially loaded tanks. In such cases, the Circular recommends that the maximum sea state in which ballast water can be safely exchanged is to be established and included in the BW Management Plan.

Safety of Large Passenger Ships

The MSC continued its work to develop strategic goals, objectives and guiding philosophy in order to undertake a global, holistic evaluation of potential risks associated with ships carrying large amounts of passengers, in some cases, to remote destinations.

It was recognized that there may be some measures that are equally applicable to passenger ships regardless of size.

In reviewing matters, the MSC reaffirmed that operational issues should be considered for both new and existing ships, whereas design issues should apply to future ships, unless recommended otherwise by the relevant sub-committees tasked to undertake relevant parts of this effort.

The current draft of the guiding philosophy places emphasis on casualty prevention, improved survivability of the ship (following collision, grounding, fire or equipment failure) and its passengers (as a safe haven) and providing improved security and medical assistance considering areas of operation and climatic conditions.

Efforts will also focus on facilitating the development of alternative designs and arrangements to prevent accidents as opposed to continuing the use of prescriptive requirements which aim more at mitigating the consequences of serious accidents.

This effort, which was initiated at MSC-73 in January 2001 at the urging of the Secretary General will be progressed intersessionally by a correspondence group, coordinated by the U.S. Coast Guard. 4.7

Human Fatigue

In an effort to assist all parties that have a direct impact on vessel safety, the MSC approved a set of practical guidelines that discuss the nature of fatigue, its causes and preventative measures and countermeasures. Recognizing that fatigue affects everyone, regardless of skill, knowledge and training, the MSC/Circ.1014 urges ship owners and companies to recognize impaired performance and diminished alertness caused by fatigue and to take it into account in a holistic manner in order to improve safety management systems under the ISM Code.

The captive work environment of the seafarer, where there is little or no clear separation between work and recreation, as well as the extended work periods on board ship often with seafarers of varying nationalities and backgrounds, present unique challenges to the marine industry. The circular focuses on these and other aspects which separate the seafarer from other shore-side industries.

Damage Stability Interpretation

The MSC approved a new MSC/Circ.998. It recommends standards to be applied in determining compliance with the probabilistic damage stability requirements of SOLAS for ships carrying and stowed timber deck cargoes in accordance with the Load Line Convention and the Timber Deck Cargo Code.

For such ships, the Circular allows the buoyancy (at 25% permeability) of the cargo up to the standard height of superstructure to be

credited in the stability calculations. Two limiting GM curves should however be provided to such ships; one applicable for carriage of timber deck cargo and another GM curve, developed without the beneficial effects of the cargo's buoyancy, applicable for all other loading conditions.

Note - Items in [brackets] refer to the agenda items. For further information concerning the above information, please contact ABS Regulatory Affairs Department at: tel: 201-226-5320; fax: -5314; Email: gshark@eagle.org