

**STATEMENT BY  
THE AMERICAN BUREAU OF SHIPPING (ABS)  
FOR THE  
HEARING ON PROTECTING OUR SHORES FROM OIL SPILLS – OPERATIONAL  
PROCEDURES AND SHIP DESIGNS**

**COMMITTEE ON COMMERCE, SCIENCE AND TRANSPORTATION**

**SUBCOMMITTEE ON SURFACE TRANSPORTATION AND MERCHANT MARINE  
INFRASTRUCTURE, SAFETY, AND SECURITY**

**UNITED STATES SENATE  
WASHINGTON D.C.  
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Presented by  
ABS  
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Mr. Chairman, Members of the Committee, good afternoon.

My name is Dr. Kirsi Tikka. I am Vice President, Global Technology & Business Development of the American Bureau of Shipping or ABS, as we are more commonly called.

I am appearing before you today, at your request, to provide you with factual information relating to the international requirements, both statutory and those required by the self-regulating mechanism for international shipping known as classification, for the protective location of fuel oil tanks on ships.

ABS is a not-for-profit organization. Founded in 1862, it is one of the world's leading classification societies. 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.

The U.S. Merchant Marine Act of 1920 officially recognized ABS as the classification body for U.S. government owned vessels. We continue to act in this manner to this day.

### **International Maritime Standards**

Technical standards for the international shipping industry are principally established through two complementary mechanisms. Paramount is the International Maritime Organization (IMO) the specialized agency of the United Nations charged with responsibility for the development and maintenance of a comprehensive regulatory framework for shipping. Its remit includes both safety and environmental concerns. It is an inter-governmental agency with 167 Member States, including the United States of America.

It has long been accepted that it is the role of government to determine the overall level of risk to which its citizens should be exposed from the conduct of international shipping.

Because of the international nature of shipping, this evaluation has been carried out within the IMO which has developed, and amended as necessary, the principal Conventions that apply to the industry, most notably the Safety of Life at Sea (SOLAS) Convention, the International Convention on Load Lines (ICLL) and the International Convention for the Prevention of Pollution from Ships (MARPOL), the provisions of which are then adopted into national law, as appropriate, by the individual member States. This international approach is essential if commercial ships are to be able to trade across all oceans and to all nations under a consistent set of statutory requirements.

Complementing this regulatory approach is the self-regulatory practice of classification which can trace its history back more than 200 years. Growing out of a need of the marine underwriting community to have an impartial, independent mechanism for establishing detailed technical standards for the design, construction and maintenance of ships, classification societies such as ABS work closely with governments and industry to establish these standards, known as Rules.

In view of this, and responding to the request of this Committee for information with respect to the current regulatory requirements relating to the protective location of fuel oil tanks on commercial vessels, ABS is pleased to provide the following summary.

It should be noted that, for the sake of clarity, the following remarks address the standards for ships. The IMO requirements also consider specialized offshore units, such as some of those in operation in the US waters of the Gulf of Mexico. Information relating to these units can be found in the text of the MARPOL amendment that appears as an appendix to this statement. ABS would be pleased to provide subsequent written information on this specialized application if the Committee deems it useful.

### **IMO Regulations**

Concerned about the potential for pollution from a ruptured fuel oil tank, in 2006 IMO's Marine Environment Protection Committee (MEPC) adopted an amendment to the revised MARPOL Annex I (Prevention of Pollution by Oil) that includes a new regulation (12A) on fuel oil tank protection. (The full text of the amendment is attached to this statement as Appendix I.)

It applies to all new ships and major conversions with an aggregate fuel oil capacity of 600 m<sup>3</sup> (158,502 US gallons<sup>1</sup> or about 570 tons of Marine Fuel Oil (MFO)) and above for which either the contract for construction between shipbuilder and shipowner was placed on or after 1 August 2007 or, if no contract, the keel is laid on or after 1 February 2008 or the ship is delivered on or after 1 August 2010.

The initiative to develop this regulation started with a proposal by the Netherlands in the Working Group on Oil Tanker Safety and Environmental Matters at a meeting of the IMO's Maritime Safety Committee (MSC), in December 2000; one of many safety and environmental initiatives taken up by IMO following the sinking of the oil tanker ERIKA off the coast of France in 1999.

The Netherlands pointed out that:

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<sup>1</sup> 264.17 US gallons/ m<sup>3</sup>

- large ships often carry quantities of fuel oil that exceed the cargo oil deadweight limits of MARPOL for the protection of cargo tanks in oil tankers.
- in the case of a pollution incident involving a ship carrying a large quantity of fuel oil in its fuel oil tanks it would therefore be appropriate to require a similar degree of protection against collision or grounding as in oil tankers.
- those affected by oil pollution will not accept any distinction as to the source of the oil pollution.

The Netherlands proposed double-side and double-bottom protection for fuel oil tanks in line with those required for cargo oil tanks of oil tankers. The proposal was subject to several years of investigation, review and debate, ultimately culminating in the new Amendment, the objective of which is to reduce the frequency and volume of fuel oil spills in the event of a collision or grounding.

The regulations, as adopted, apply to tanks greater than 30 m<sup>3</sup> (7,925.1 US gallons) in capacity in which fuel oil is carried but excludes those tanks which would not contain fuel oil in normal operation such as overflow and sludge tanks.

Designers and owners are given two alternative approaches to comply with the new requirements. In both approaches a maximum individual tank capacity of 2,500 m<sup>3</sup> (660,425 US gallons) is imposed.

It is expected that most owners of most ship types will opt for the first, prescriptive alternative which protectively locates the fuel oil tanks inboard of and above double side and double bottom spaces respectively. The double bottom height ranges, as a function of ship breadth, from a minimum of 0.76 meters to a maximum of 2.0 meters, in line with newly adopted SOLAS regulations. The double side width ranges, as a function of total fuel oil capacity, from a minimum of 1.0 meter to a maximum of 2.0 meters; with the exception of a minimum double side width of 0.76 meters for individual fuel oil tanks with a capacity of less than 500 cubic meters (132,085 US gallons).

The second alternative is an accidental fuel oil outflow performance standard that allows the designer to locate fuel oil tanks based on a calculated “mean oil outflow parameter”, in the event of a collision or grounding, as compared to a maximum allowable value. Specific procedures are given for the calculation of the oil outflow from each tank, due to side damage and bottom damage, based on its probability of being breached in the event of a collision or grounding.

This probabilistic approach also takes into account the density of the fuel oil, the location of each fuel oil tank relative to the side shell and bottom shell and the tank size. These

are used to determine the mean oil outflow parameter for the ship. In the event that a double bottom or double side is fitted to reduce the mean oil outflow, the dimensions of those spaces are to be not less than those required under the prescriptive alternative.

Mr. Chairman, I realize that while the protective location under the first approach is easy to grasp, this very brief explanation of the probabilistic approach may sound complex. It was adopted by the IMO, after discussion with industry, in order to give designers the freedom to optimize fuel oil tank arrangements and to deal with the design constraints encountered in different ship types. The approach was developed by a Panel of the U.S.-based Society of Naval Architects and Marine Engineers (SNAME) based on, and in line with, the recently adopted accidental oil outflow performance requirements related to spills from cargo oil tanks in the event of collisions or groundings contained in MARPOL Annex I regulation 23.

It is inherent in the new regulations that the fuel oil piping shall also be located in protected positions. Where the piping must be placed closer to the ships bottom or side than specified, MARPOL Annex I regulation 12A requires the fitting of valves or similar closing devices within, or immediately adjacent to, the protected fuel tank. The valves must be capable of being operated remotely from either the bridge or machinery control position, they must fail in a closed position in the event of a remote control system failure and they are to be kept closed at sea except during the transfer of fuel oil.

On the basis of the new designs that have been reviewed by ABS, it appears that the most common approach adopted by shipyards for tanker designs is to provide protected locations in the engine room and in way of the pump room. For oil tankers, it is noted that in accordance with MARPOL Annex I, regulation 19.3, double bottom and double side tanks that are used to protect cargo oil tanks are not allowed to hold oil of any kind, including fuel oil, even if the probabilistic approach were to indicate otherwise.

To date, bulk carrier designers are largely choosing to locate fuel oil tanks in the engine room, in protected locations in topside tanks and in protected spaces between the engine room and the aftermost cargo hold.

LNG carrier designers are tending towards providing protected space in the engine room or in protected locations between the collision bulkhead and the cofferdam bulkhead of the No. 1 cargo tank.

Large containerships pose a particular challenge given the very large quantity of fuel oil that must be carried to maintain the preferred high service speeds. The most common arrangement to date is to use protectively located deep tanks between the transverse bulkheads between the cargo holds. An alternative arrangement is to provide fuel oil

tanks above the double bottom in one or more cargo holds which, however, reduces cargo capacity.

For all ship types, incorporating the required protectively located spaces will incur additional bulkheads and associated structural costs. With the possible exception of containerships, cargo carrying capacity is not expected to be materially affected.

### **ABS Standards**

To encourage owners to consider incorporating protectively located fuel oil tanks into new ship designs, ABS introduced the optional class notation POT (Protection of Fuel and Lubricating Oil Tanks) effective 1 July 2003, more than four years in advance of the implementation date of the new MARPOL regulation. ABS has been gratified that several shipowners have chosen to adopt the ABS optional notation in advance of the regulatory requirements taking effect.

Mr. Chairman, it has been my pleasure to address you today. I am more than happy to answer any relevant questions the Committee members may have.

Thank you.

Appendix I: IMO Resolution MEPC.141(54), Amendments to the Annex of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, (Amendments to regulation 1, addition to regulation 12A, consequential amendments to the IOPP Certificate and amendments to regulation 21 of the revised Annex I of MARPOL 73/78), adopted 24 March 2006.