



MARITIME SAFETY COMMITTEE  
83rd session  
Agenda item 5

MSC 83/5/9  
31 July 2007  
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## GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

### Comments on the report of the Correspondence Group on Safety Level Approach

#### Submitted by Japan

#### SUMMARY

**Executive summary:** This document provides comments on the report of the Correspondence Group on Safety Level Approach (SLA). This document provides historical trends of individual risks for some ship types and current individual risks, in order to accelerate the SLA work of the Committee.

**Action to be taken:** Paragraph 4

**Related documents:** MSC 83/5, MSC 83/5/3 and MSC 83/INF.2

#### Introduction

1 In the Correspondence Group on Safety Level Approach, Japan submitted a comment that casualty and ship characteristics data provided by Lloyds Register Fairplay (LRFP) are available data, due to plenty of available information, to progress the SLA work on the evaluation of the current safety level. By using these data, in particular four types of ship, i.e., crude oil/oil product tanker, bulk/ore carrier, general cargo ship and container ship, Japan estimated historical trends of individual risks for every five years as a time window. The result of the trial is shown in the annex to this document.

2 According to this trial, it was found that the adequate determination of a time window makes it possible to evaluate the current safety level for each type of ship.

#### Statistical data and evaluation of the current safety level

3 Since relations among ship types and rule requirements to be applied during a time window seem to be complicated in general, ship types would be determined in a clear and simple manner. Therefore, Japan is of the opinion that the SLA work with regard to categorization of ship types and evaluation of the current safety level should be progressed taking into account the following:

- .1 LRFP data is an available, today, to evaluate current safety level;
- .2 in considering the overall current safety level for each ship type, ship types to be considered in IMO should be limited at first. The SLA approach should prioritize

its work on such types of ship as passenger ship, oil tanker, bulk carrier and other cargo ship; and

- .3 in considering the required minimum safety level of each function (life-saving appliances, fire protection, stability, etc.), which would be linked to the overall current safety level, the assessment method contained in the report of the Correspondence Group on Safety Level Approach (MSC 83/5/3, annex 5, paragraph 2.3) would be useful for further consideration. On this selection, it could be considered whether the value of each function is required for every ship type, or only to distinguish between passenger/cargo ships, or for all data without regard to ship types.

#### **Action requested of the Committee**

- 4 The Committee is invited to consider the above comments and take action as appropriate.

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## ANNEX

## HISTORICAL TREND OF INDIVIDUAL RISKS FOR EVERY FIVE YEARS AND CURRENT INDIVIDUAL RISKS

### Introduction

Historical trend of individual risks for every five years and current individual risks were evaluated. The types of ship evaluated in this document are highlighted in Table 1. The evaluation method on individual risks is the same as that introduced in document MSC 83/5/3, annex 5. It is assumed that the average number of crew members per ship is 20. Table 2 shows the casualty category code defined in the LRFPP.

**Table 1: Ship types (according to LRFPP)**

C a r g o  C a r r y i n g  S h i p s	Tankers	Liquefied Gas	LNG Tanker
			LPG Tanker
		Chemical	Chemical Tanker
			Chemical/Oil Products Tanker
		Oil	Crude Oil Tanker
			Oil Products Tanker
		Other Liquids	Water Tanker
			Bitumen Tanker
			Wine Tanker
			Vegetable Oil Tanker
			Fruit Juice Tanker
			Molasses Tanker
			Oil-Sludge Tanker
			Edible Oil Tanker
			Fish Oil Tanker
	Coal/Oil Mixture Tanker		
	Latex Tanker		
	Beer Tanker		
	Bulk Carriers	Bulk Dry	Bulk Carrier
			Ore Carrier
		Bulk Dry / Oil	Bulk/Oil Carrier
			Ore/Oil Carrier
		Self Discharging Bulk Dr	Self-Discharging Bulk Carrier
		Other Bulk Dry	Cement Carrier
			Wood Chips Carrier
			Urea Carrier
			Aggregates Carrier
			Limestone Carrier
			Alumina Carrier
			Refined Sugar Carrier
			Powder Carrier
		Mud Carrier	
		Dry Cargo / Passenger	General Cargo
			Palletised Cargo Ship
			Deck Cargo Ship
	Passenger / General		Passenger/General Cargo Ship
Container	Container Ship		
	Passenger/Container Ship		
Refrigerated Cargo	Refrigerated Cargo Ship		
Ro-Ro Cargo	Ro-Ro Cargo Ship		
	Vehicles Carrier		
	Container Ro-Ro Cargo Ship		
	Landing Craft		
Passenger / Ro-Ro Cargo	Passenger/Ro-Ro Cargo Ship		
	Passenger/Landing Craft		
Passenger	Passenger (Cruise) Ship		
	Passenger Ship		
Other Dry Cargo	Livestock Carrier		
	Barge Carrier		
	Heavy Load Carrier		
	Nuclear Fuel Carrier		
	Log-Tipping Ship		
	Pearl Shells Carrier		
Stone Carrier			
Pulp Carrier			

**Table 2: Casualty category code (according to LRFP)**

Casualty code	Definition
1.FD :Foundered	Includes ships which sank as a result of heavy weather, springing of leaks, breaking in two etc., and not as a consequence of categories 2-7 or 9.
2.WS :Wrecked / Stranded	Includes ships reported hard and fast for an appreciable period of time and cases reported touching sea bottom. This category includes entanglement on under water wrecks.
3.CT :Contact	Striking or being struck by an external substance but not another ship or the sea bottom. This category includes striking drilling rigs/platforms, regardless of whether in fixed position or in tow.
4.CN :Collision	Striking or being struck by another ship, regardless of whether under way, anchored or moored. This category does not include striking underwater wrecks.
5.FX: Fire & Explosion	Where the fire and/or explosion is the first event reported(except where first event is a hull/machinery failure leading to fire/explosion). Casualties involving fires and/or explosions after collisions, stranding etc., are categorized under 'Collision', 'Stranding'.
6.MG:Missing Vessel	After a reasonable period of time, no news having been received of a ship and its fate being therefore undetermined, the ship is posted as "Missing" at the Corporation of Lloyd's and is included in the Missing category in the data base with similar cases reported by other reliable
7.LT :War Loss/ Damage during Hostilities	This category is intended to encompass damage or other incidents occasioned to ships by hostile acts.
8.HM :Hull/Machinery Damage	Includes ships lost or damaged as a result of hull/machinery damage or failure which is not attributed to categories 2-7 or category 9.
9.MS :Miscellaneous	Includes ships which have been lost or damaged which, for want of sufficient information, or for other reasons, cannot be classified.

### Historical trend of individual risks

Figure 1 shows that the individual risks for every ship type, as total casualties, have been decreasing.

The individual risk for crude oil/oil product tankers tends to decrease. For every five-year period, the individual risk per person year is less than  $10^{-3}$ , which means within ALARP (as low as reasonably practicable) region (see MSC 83/INF.2, appendix 5). It was found that the major factor of individual risk for oil tankers is “fire/explosion”.

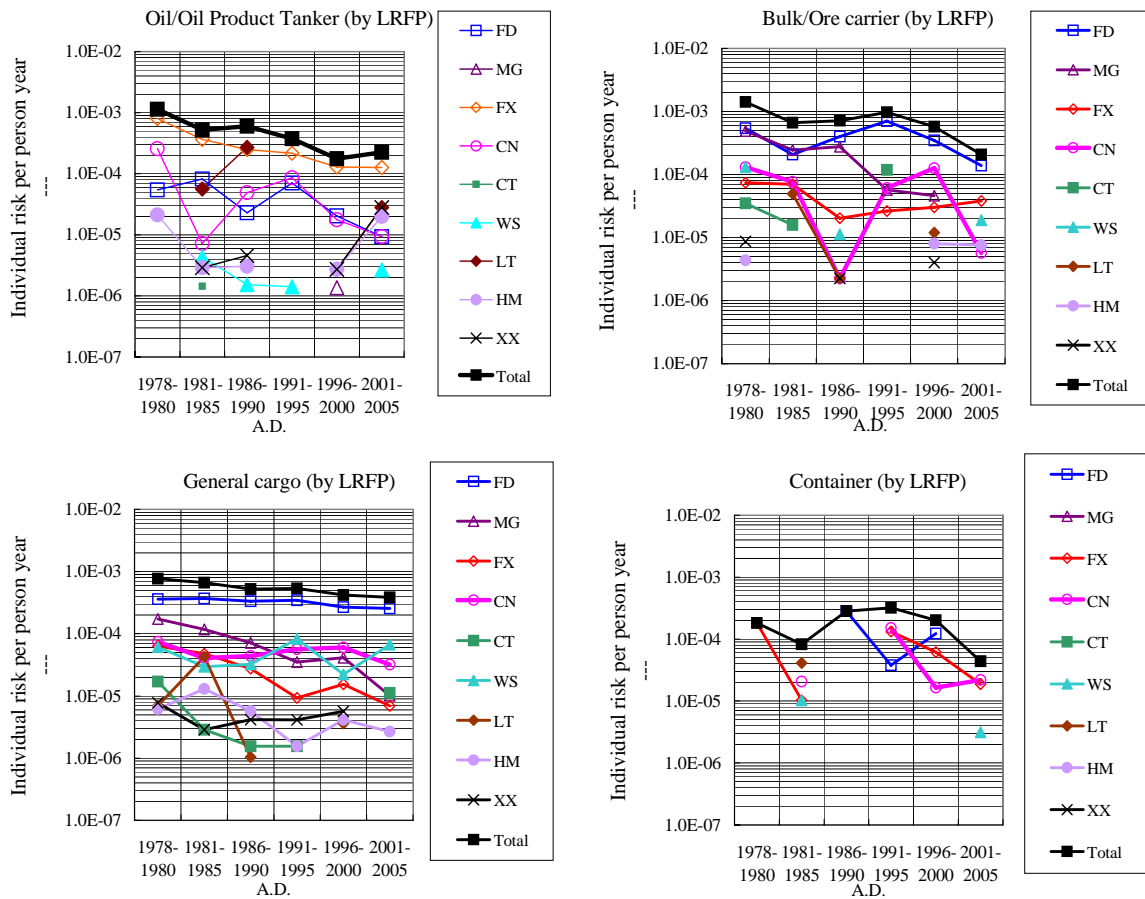
The individual risk for bulk/ore carriers has been decreasing, with a peak during 1991-1995. Recently, the individual risk for bulk/ore carriers is within the ALARP region, while during 1978-1980, it was found that individual risk levels indicated intolerable levels. The major factor of individual risk for bulk/ore carriers is “foundered”, as defined in Table 2.

The individual risk for the general cargo ships has been decreasing and is also within the ALARP region. The major factor of individual risk for general cargo ships is also “foundered”.

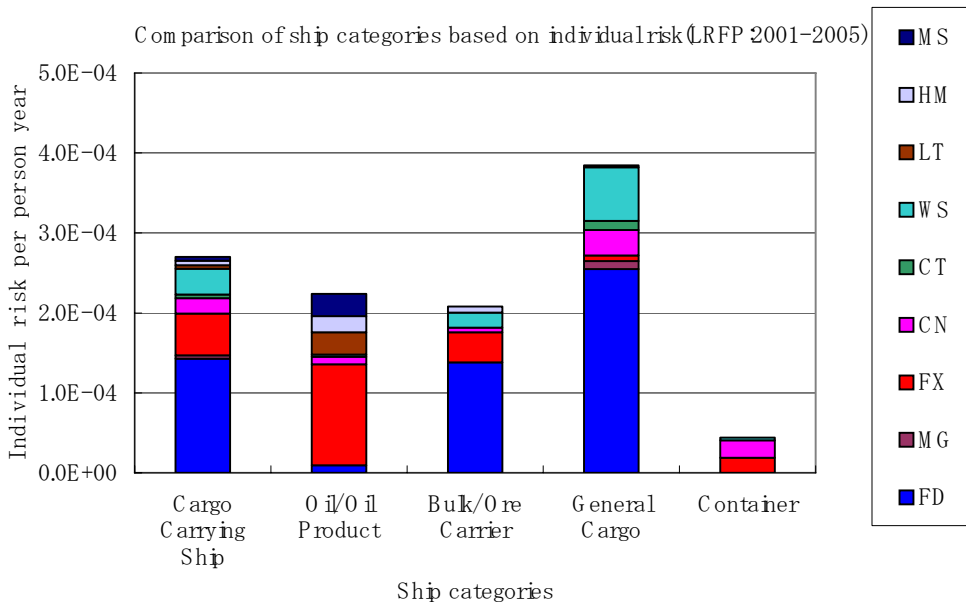
The individual risk for container ships has also been decreasing, with a peak during 1991-1995. The individual risk value is much lower than that of any other type of ship. But the individual risk level for container ships is also within the ALARP region.

### Current individual risks

Current individual risks were evaluated by using the LRFP data as shown in Figure 2. It is shown that the individual risk for every type of ship is within the ALARP region as indicated in the Guidelines for Formal Safety Assessment (FSA) (MSC/Circ.1023-MEPC/Circ.392).



**Figure 1. Time histories of individual risks (ships of 100 GT and above)**



**Figure 2. Comparison of ship categories on individual risks (2001-2005)**

**Note:** For detailed information, please contact F. Kaneko (E-mail: [kaneko@nmri.go.jp](mailto:kaneko@nmri.go.jp)) at the National Maritime Research Institute.