

# Policy Instruments to Enhance the Maritime Safety and Environment Protection

**Joint Seminar  
by Japan Maritime Center and  
the IOPC Funds  
October 18, 2023**

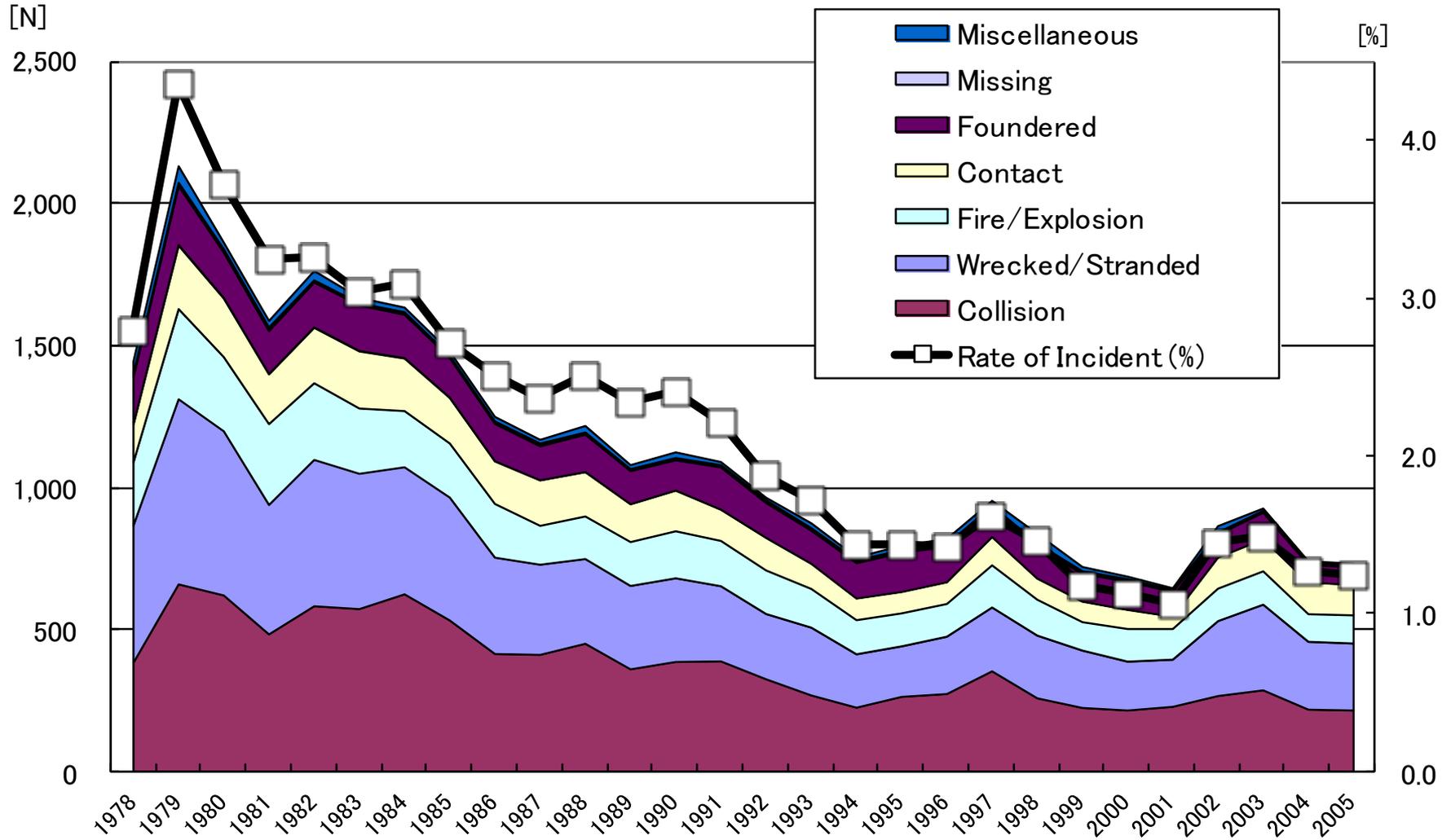
**Shinichiro OTSUBO, PhD  
Distinguished Project Research Fellow, JTTRI  
Specially Appointed Professor, Tokai University  
(Former Director-General of Maritime Bureau, MLIT)**



The safety at sea....have we accomplished the mission?

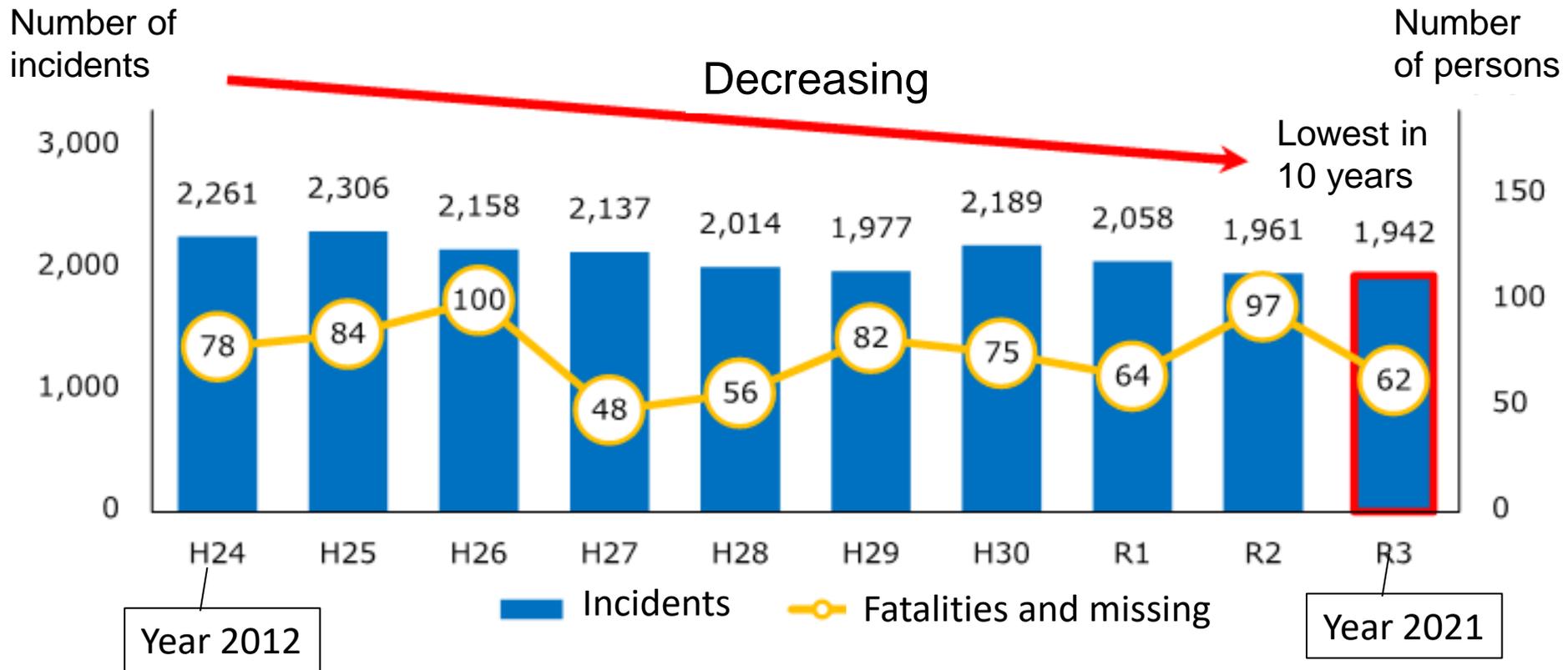
# Number of Marine Incidents

Worldwide



Lloyd's Maritime Information Service (LMIS)

# Marine Incidents in Japan

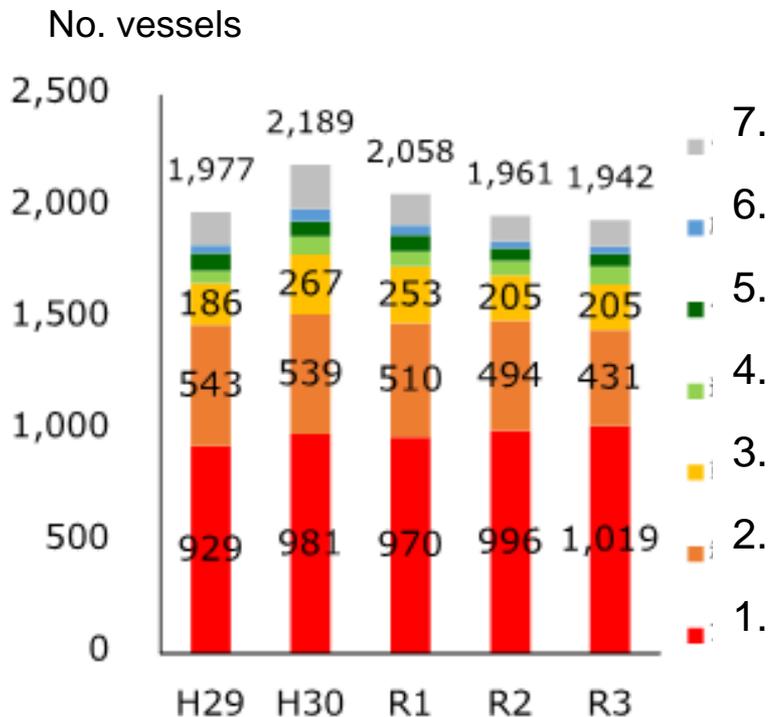


Japan Coast Guard

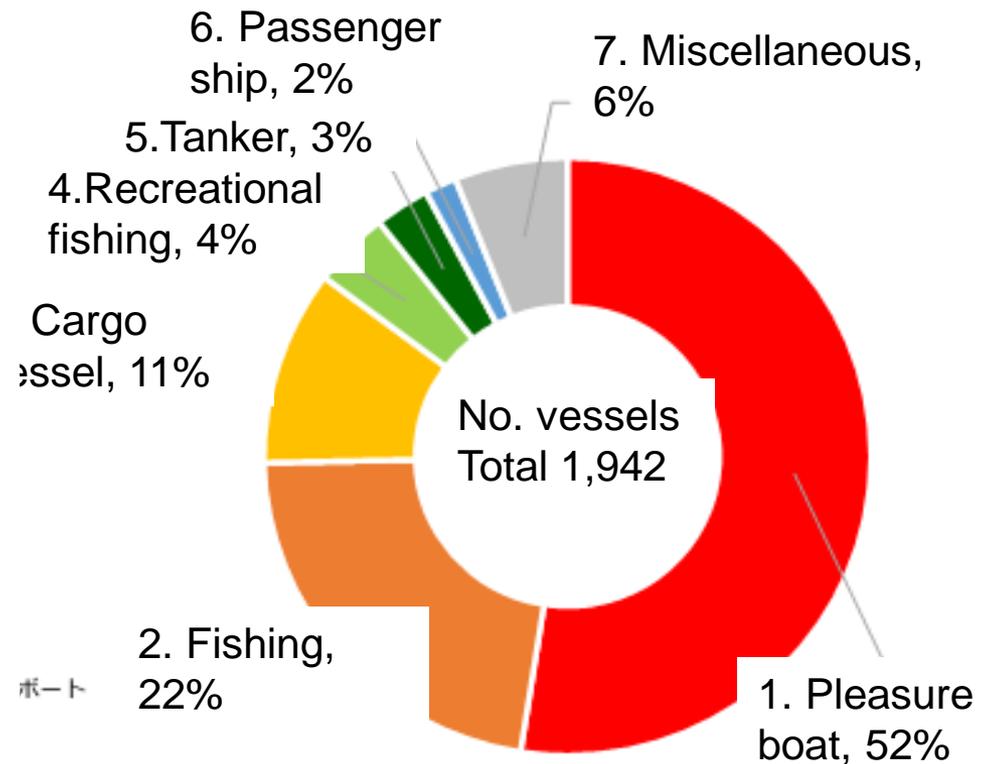
# Marine incidents In Japan by Ship Type

In terms of the number of marine incidents by ship types, pleasure boats prevail by far.

Trend in past 5 years

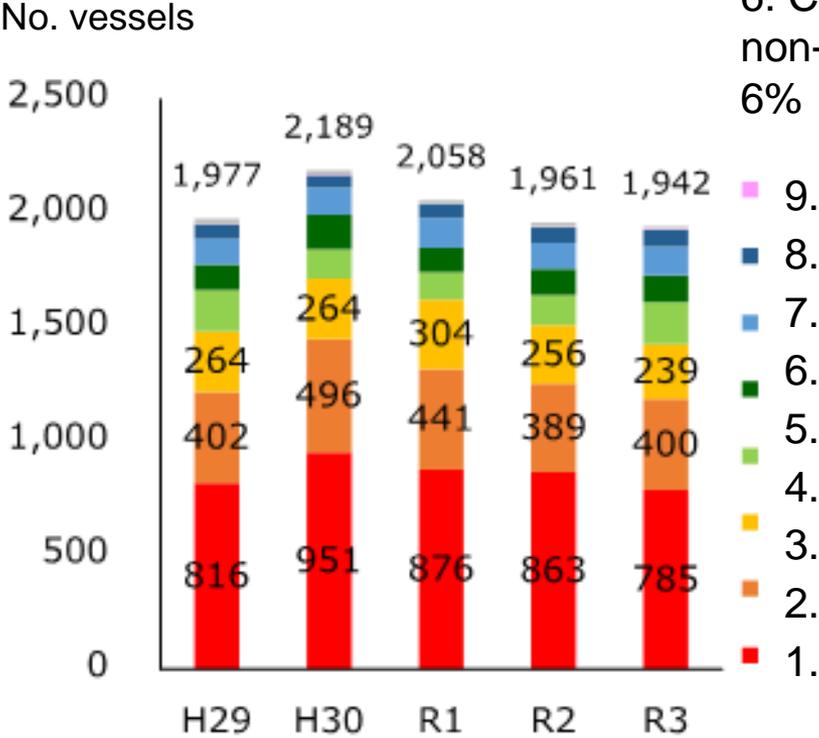


Year 2021, based on ship types

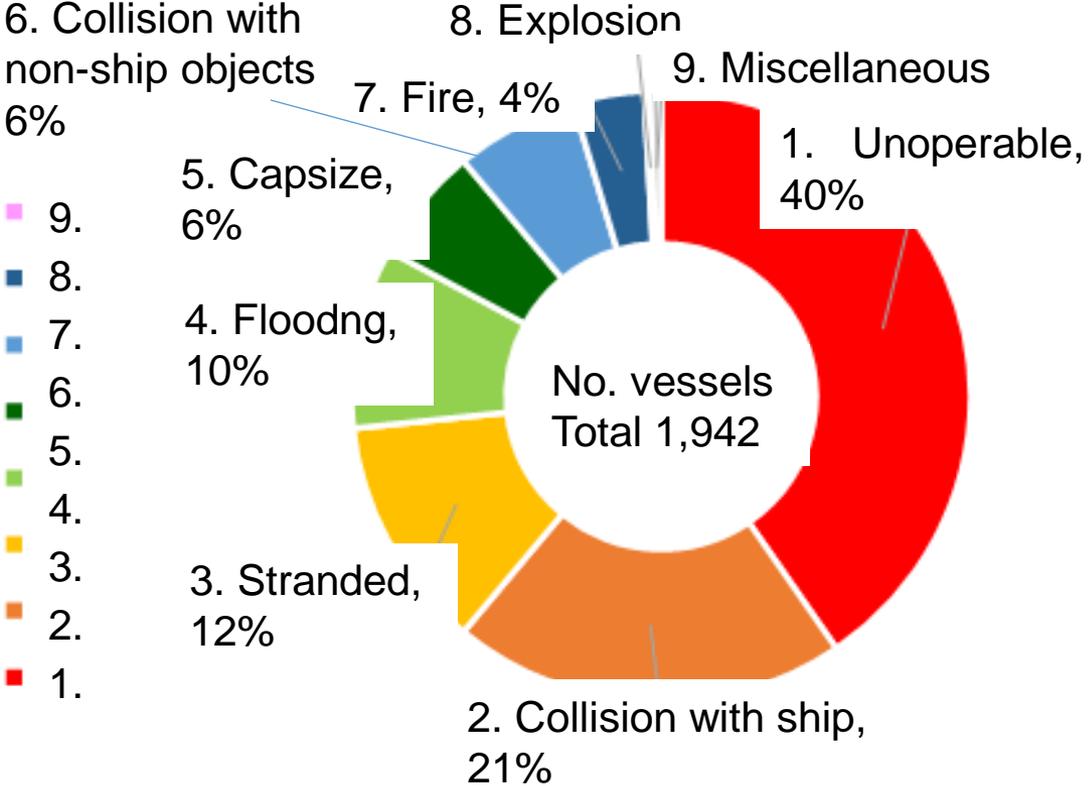


# Marine incidents In Japan by Type of Incidents

Trend in past 5 years



Year 2021, types of incidents

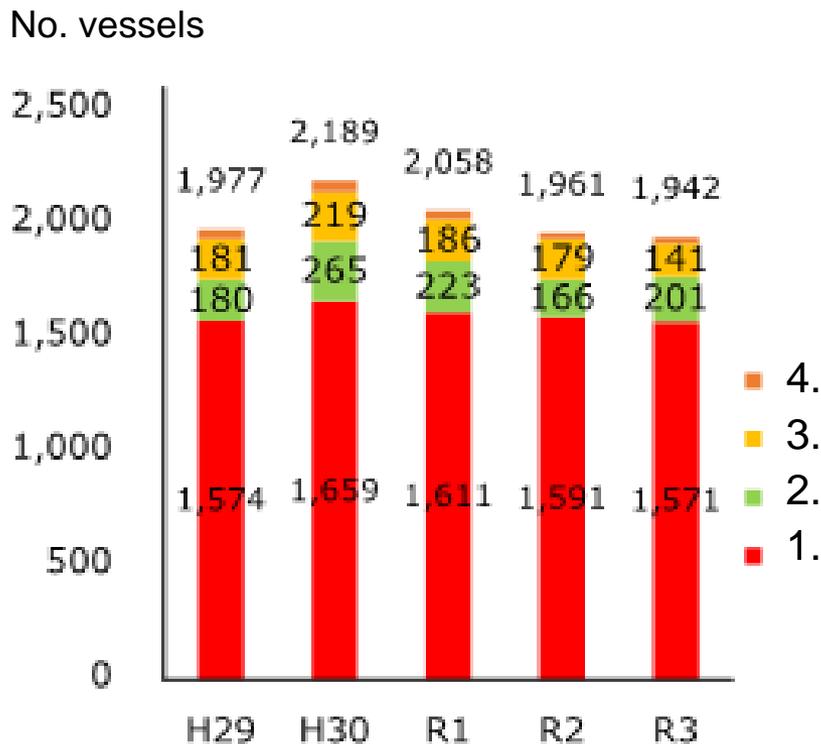


Data: Japan Coast Guard

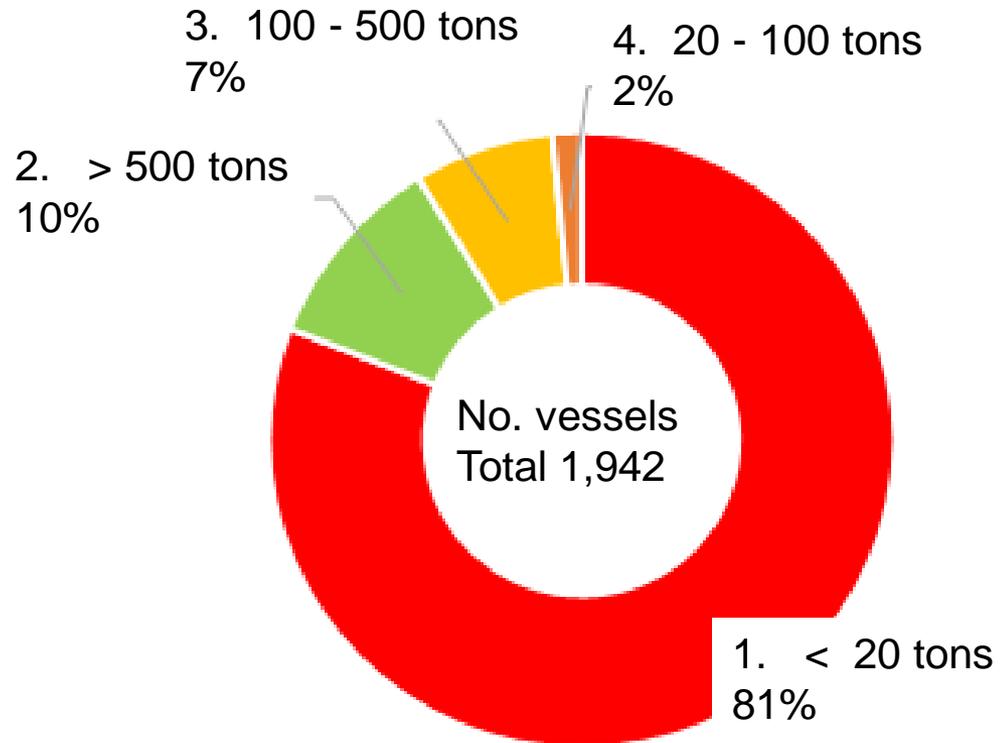
# Marine incidents In Japan by Ship Size Category

Small ships of less than 20 tons account for 80% of the incidents, as those small ships outnumber those of other size categories among existing ships.

Trend in past 5 years



Year 2021, by size categories



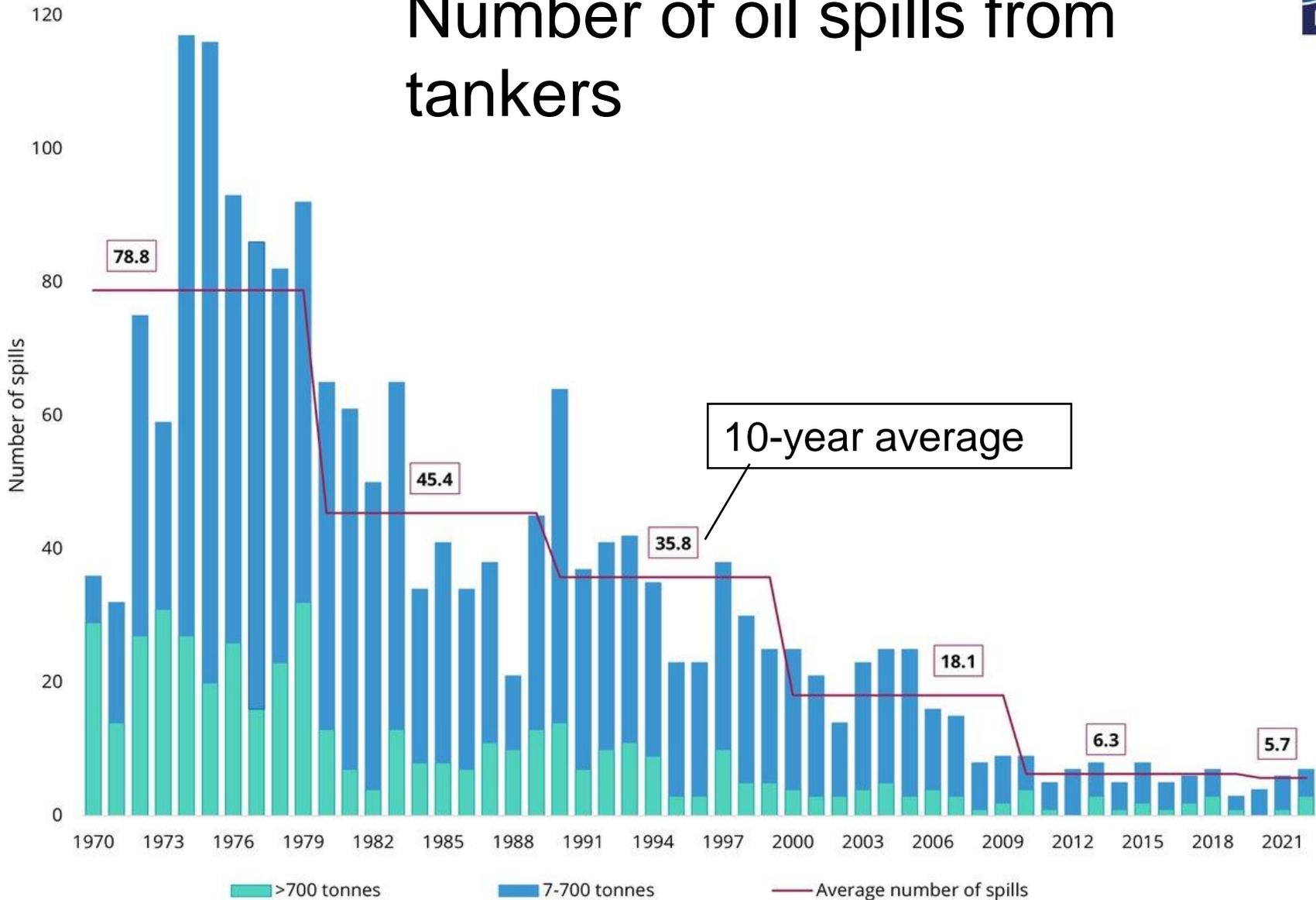
# Maritime incidents in Japan

- ✓ Approximately 2000 incidents per year
- ✓ 80% of the incidents are small-sized vessels such as pleasure boats, as this category forms an overwhelming majority in number of vessels.
- ✓ Location of incidents are mainly congested coastal sea area and port area
- ✓ 80% of incidents are caused by human factors.  
(to be explained later)

As statistics shows, we can say that the safety risk at sea has been decreasing.

However, once a large-scale incident should happen, the loss and damage could be devastating.

# Number of oil spills from tankers



Total number of incidents has been decreasing.  
We still see tragic incidents involving human losses and /or large-scale loss of assets.



2012 Italy  
Fatalities 32



2013 Indian Ocean



2014 Korea  
Fatalities 295  
Missing 9



2014 Japan  
Fatality 1



2015 China  
Fatalities 442



2015 Japan  
Fatality 1



2015 Japan  
Fatality 5



2018 China  
Fatalities 3  
Missing 29

# Various types of incidents could happen

Cargoes and ship itself could suffer large loss and damage, and human losses are possible.

Ships may carry crude oil, oil products and liquid chemical as cargoes, as well as heavy oil as fuel. Once an incident happens, there is a risk that the spill of these substances would damage the environment in nearby sea area, and such influence may spread to a wider sea area.



出典: Maritime Injury Guide



出典: Getty Images



出典: Getty Images



写真: THE FRENCH DEFENSE MINISTRY/AP/アフロ

Beside environmental damage, a large-scale incident could also disrupt maritime transport and affect international supply-chain.

If we consider only the influence on daily life in Japan, the most serious case would be the disruption at Choke Points, in particular, Holmes Strait, Straits of Malacca and Singapore, and Panama Canal.

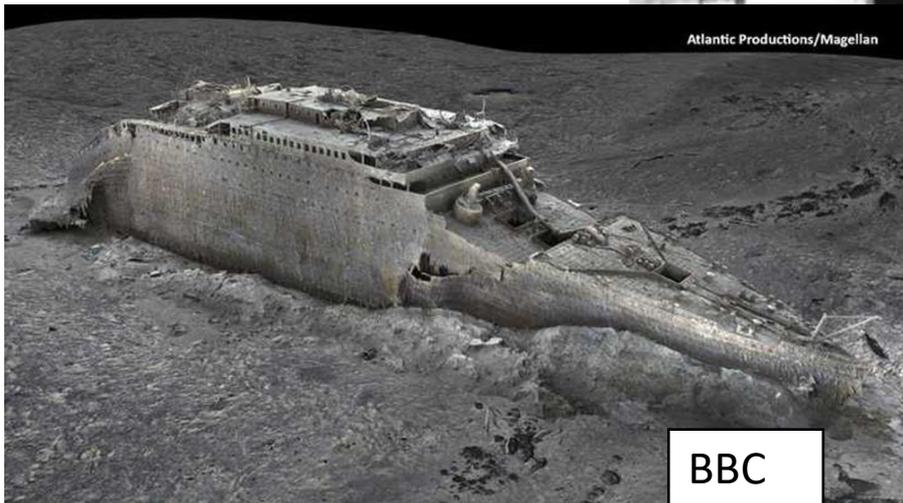
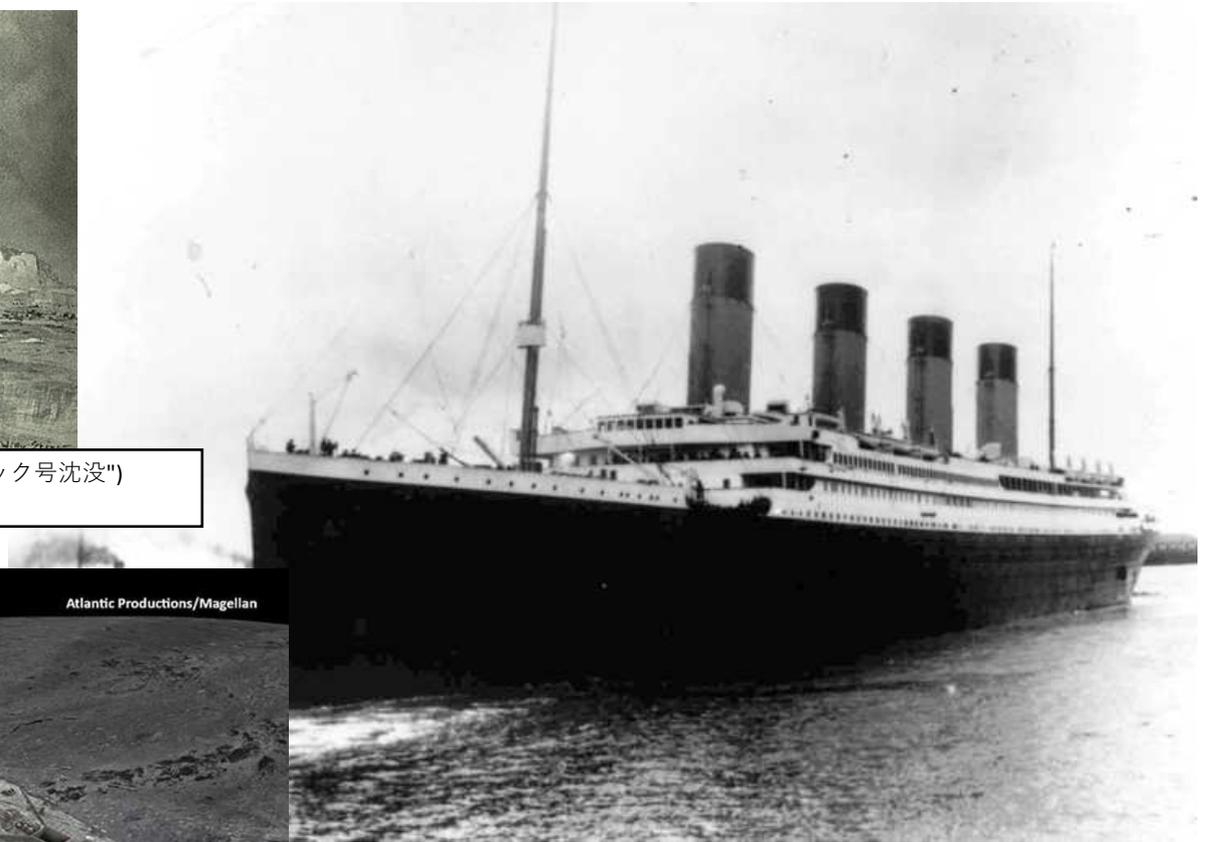
Businesses and governments in maritime field have endeavored to establish and implement better mechanism to reduce the safety risk at sea.

# International regulatory system to enhance the safety dates back...

April 1912



Untergang der Titanic ("タイタニック号沈没")  
ウィリー・ストーワー, 1912



BBC

- The International Convention for the Safety of Life at Sea (SOLAS), 1914

Only 5 countries ratified, has never been enacted due to the WW I

- SOLAS 1929, enter into force in 1933

In 1935, SOLAS 1929 became effective for Japan with the implementation of Ship Safety Act

- 1949, IMCO Convention was adopted

- 1958 IMCO Convention entered into force and IMCO was established.

- SOLAS 1948, SOLAS 1960

- SOLAS 1974 with tacit amendment procedure introduced

- IMCO reorganized to IMO in 1982

# International Maritime Organization (IMO)

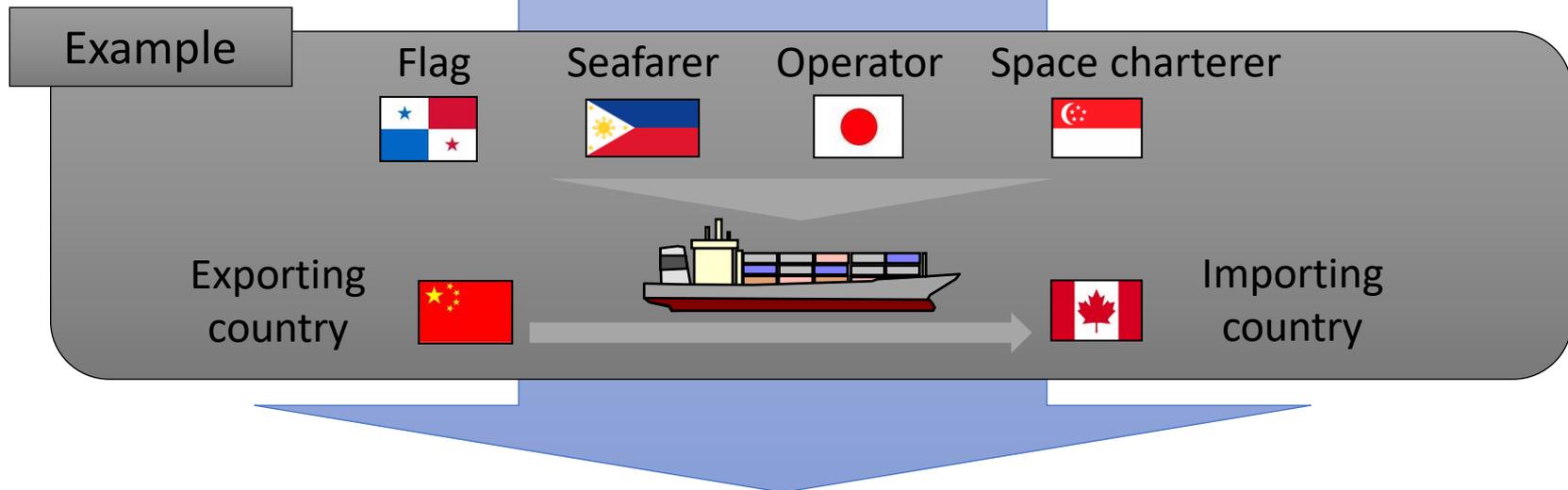
- The United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships
- Established in 1958, based in London
- Member States: 175 Associate Members: 3 IGOs: 66 NGOs: 85
- Adopted 60 International conventions



# Why we need international regulatory system for the safety at sea and marine environment protection

- International shipping forms a global single market
- Regulations should be equally and universally applied to all ships

- A Ship may go anywhere in the world, irrespective of its flag.
- Many players are complicatedly involved in shipping activities partly due to the Open registry system (or Flag of Convenience)



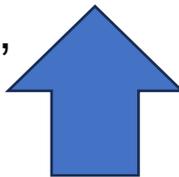
- The International Maritime Organization (IMO) has developed International regulations, under the principle of “non-discrimination” and “no-more-favorable-treatment”.

# Port State Control

**Foreign ships in national ports can be inspected** to verify that the condition of the ship and its equipment comply with the requirements of international regulations and that the ship is manned and operated in compliance with these instruments.

## Flag State Control/Implementation

Backup to flag State implementation, as “second line of defense” against substandard shipping,



## Port State Control

Governments may inspect foreign ships that visit their ports to ensure that they meet IMO standards contained in instruments to which the port State is a Party.

With the principle of **no-more favorable treatment** being applied, **ships of non-Parties are subject to PSC as well**. If the ships do not comply with the standards, they can be delayed or detained until repairs are carried out and be subject to targeting.

PSC is conducted under the relevant provisions of the mandatory instruments.

SOLAS, Load Lines, MARPOL,  
TONNAGE

AFS (Anti-Fouling System)

STCW

COLREG

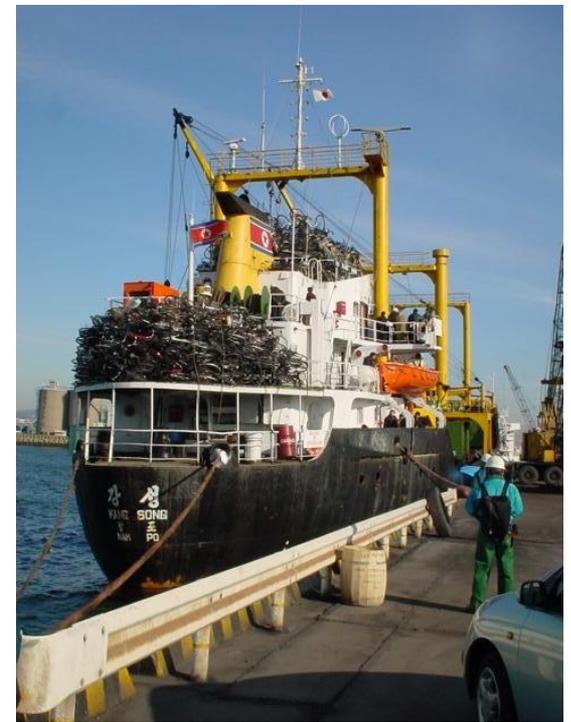
MLC

BWM (Ballast Water Management)

Ship Recycling ( 2025 and later)

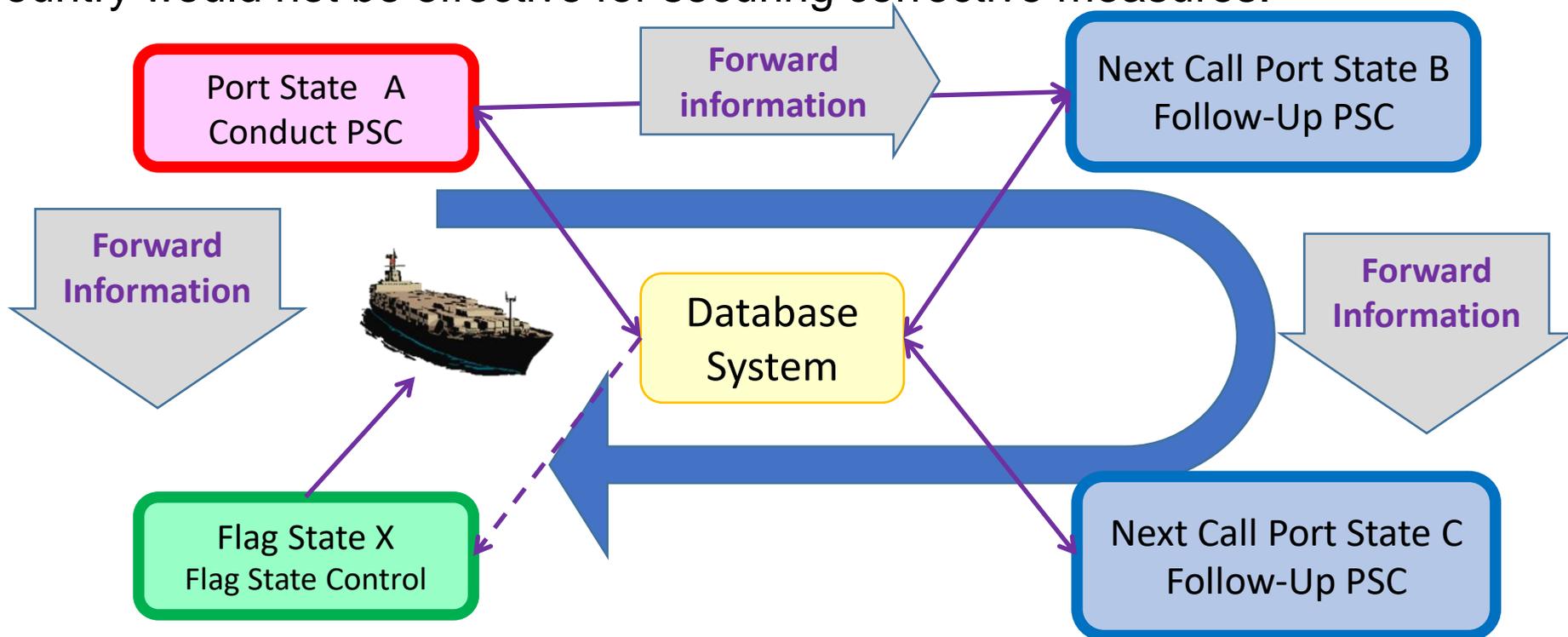


# Foreign ships subject to PSC in Japan



# Regional cooperation in PSC

Ships may voyage across the borders; control by the authority in single country would not be effective for securing corrective measures.



Based on the principle of No More Favorable Treatment  
**Seamless follow-up and tracking of sub-standard ships**

Mind that the transport activities are conducted by private companies.

If the industries cannot be competitive in globally single market, their capabilities would be limited in supporting the trade for Japan.

Japan could never survive without the stable and robust maritime transport, and thus **strong maritime industries are indispensable to mere survival of Japan.**

# Transport is not public works.

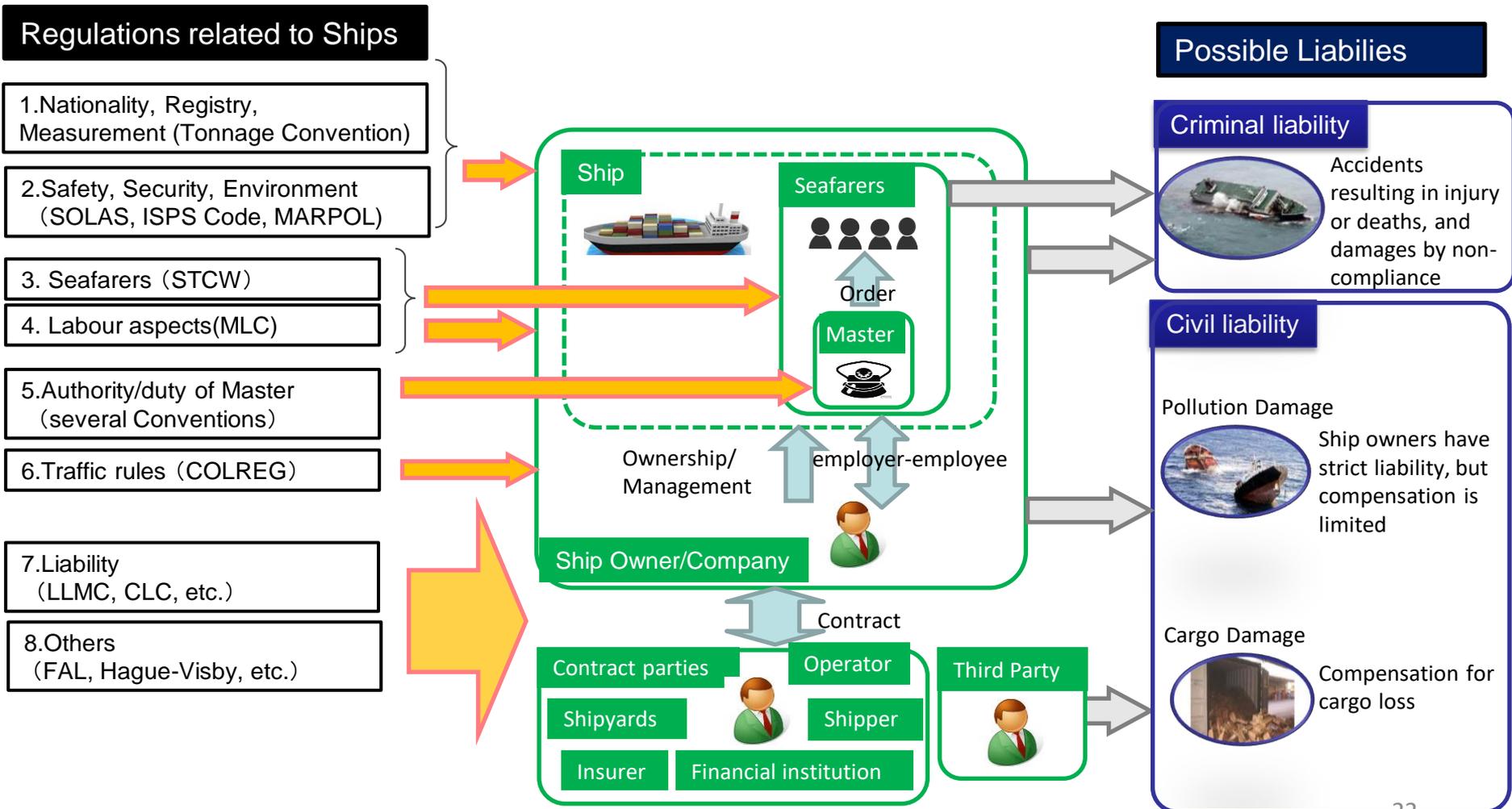
International regulatory system should be designed and operated so that it would induce private industries to make their own efforts to enhance the safety, without excessively intervening their business development.

We need:

- globally unified rules,
- inter-governmental coordination and cooperation,
- cooperation with private industries in rule-making, accommodating the latest technological development

# Regulatory Framework Overview

To operate a ship, it is required to comply with variety of regulations related to e.g., safety, security, environment protection, labor, civil liability and compensation.



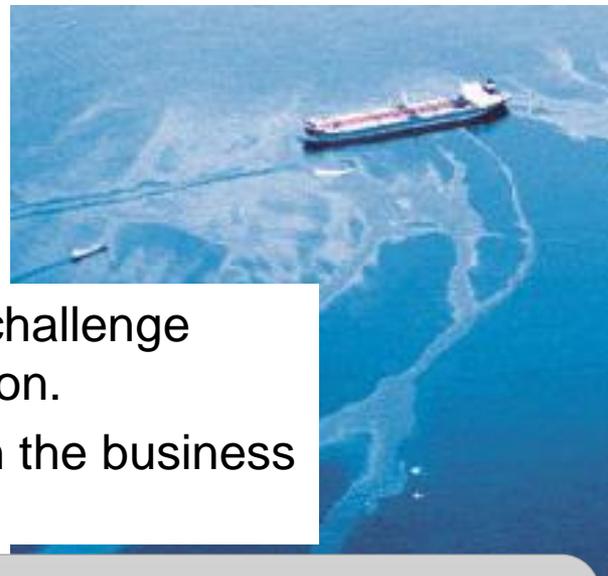
# Why international rule-making matters

Example

1989 *Exxon Valdez* incident

1992 MARPOL amendments adopted

- ✓ Double-hull requirements for newly-built tankers
- ✓ Mandatory phase-out of single-hulled tankers at fixed age



Completely new design and construction for new ships – challenge from an early phase of concept design and sales negotiation.

Mandatory replacement of existing ships: huge impacts on the business strategies of shipping

**Taking the lead in international rule-making, with the joint initiatives by business and government, mean valuable contribution to the safety and environment protection globally; at the same time, there are industrial policy aspects**

- Predictability of future regulations: positive in developing business strategies
- Fair and reasonable standards and performance assessment would duly reward the companies as well as their products and services, leading to fair competition.
- Practical implementation of rules, such as appropriate testing procedures of equipment, would avoid unnecessary costs while achieving the policy goals.
- Avoid concept-driven and excessively idealistic approach on new rules

Japan has practiced the above-mentioned principles for a long time.

Influence and transparency at the IMO: the name of the game

Harilaos N. Psaraftis<sup>1</sup> · Christos A. Kontovas<sup>2</sup>

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 © Springer Nature Limited 2020

The IMO member states that seem to be the most potent influencers of IMO policy are Japan, the USA, Germany, Norway and China, with Denmark and Korea not too far behind.

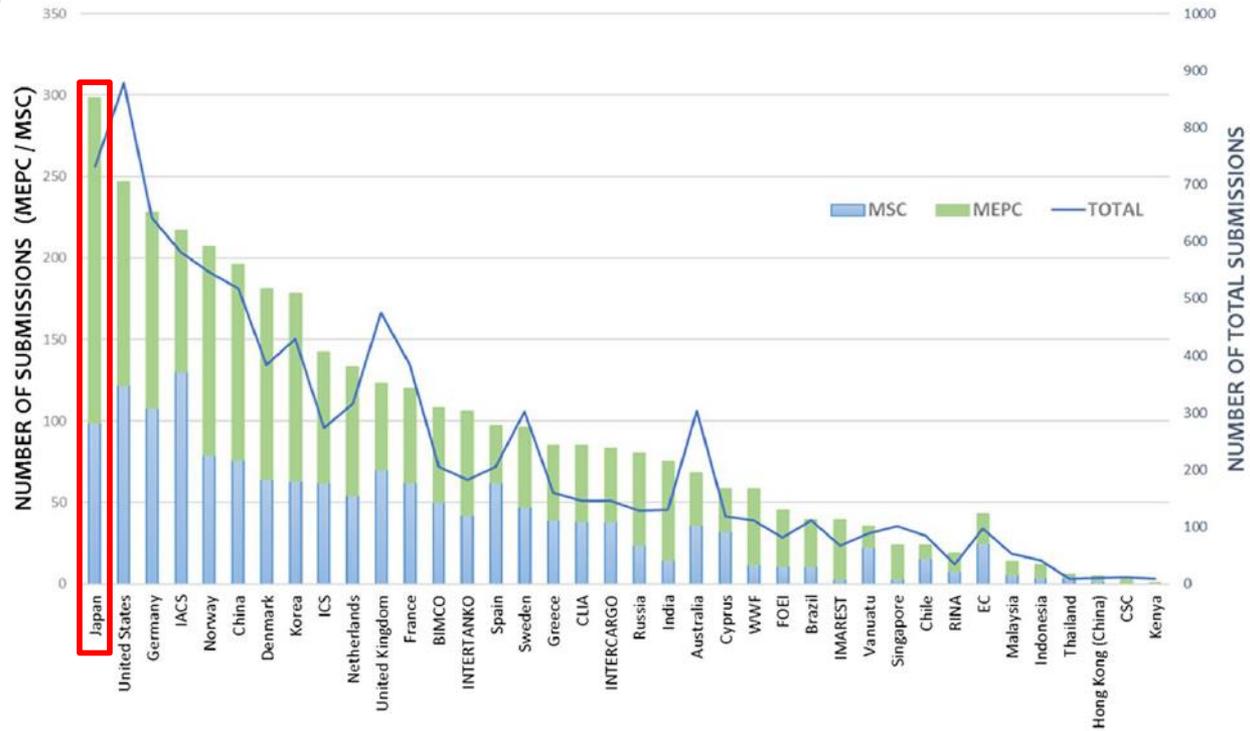


Fig. 2 MSC and MEPC (left vertical axis, bar chart) and total IMO submissions (right vertical axis, solid line) since 2010

Having understood how the international regulatory system works....

## **Back to the basics: what should we do for the safety at sea?**

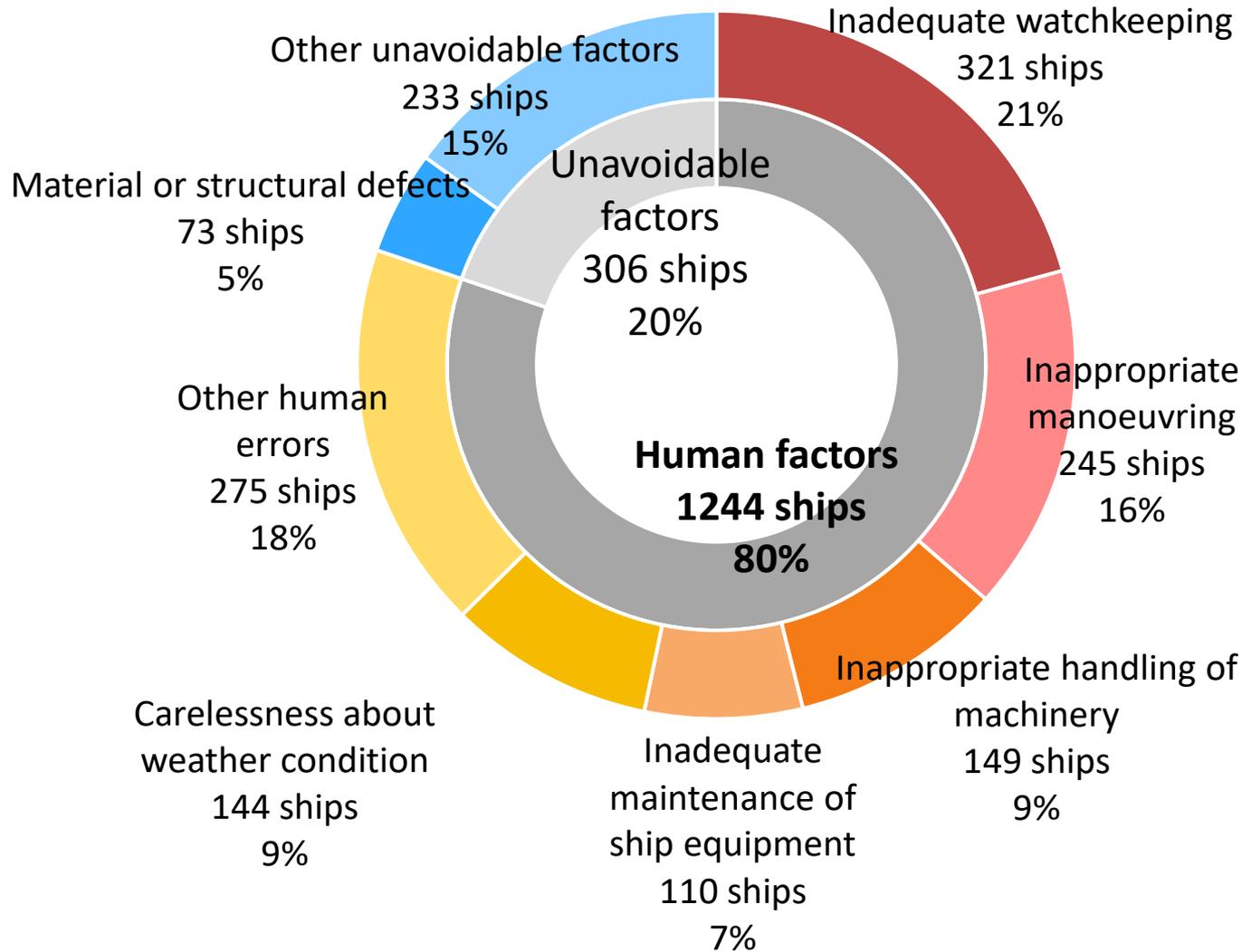
**First of all, avoid an incident:** collision, grounding, structural damage, loss of power/maneuverability, etc.

Various rules on ship structure, intact stability and equipment (its performance standard, and testing procedure, taking into account the latest technologies)

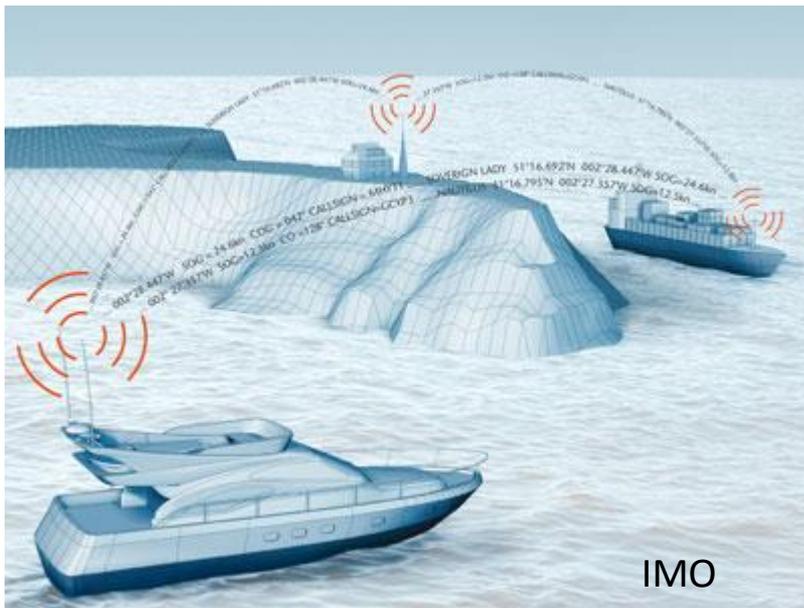
**Then, minimize the loss and damage (incl. external one)**

Damage stability, protection of oil tanks, life-saving appliances

# Human factors in Marine incidents



Data: Japan Coast Guard



In 2000, IMO adopted a new requirement (SOLAS chapter V ) for all ships to carry automatic identification systems (AISs) capable of providing information about the ship to other ships and to coastal authorities automatically.

- all ships of 300 GT and upwards engaged on international voyages,
- cargo ships of 500 GT and upwards not engaged on international voyages
- all passenger ships irrespective of size.

Effective for all ships by 31 December 2004.



Electronic Chart Display and Information Systems (ECDIS)

←ECDIS Training  
Japan Marine Science, Inc.

**After the introduction of the double-hull requirements and mandatory phase-out at the age of 25 or 30 for tankers, the requirements continued to be strengthened.**

1999 Oil spill of *Erica*

2001 MARPOL amendments were adopted to accelerate the phase-out of single-hulled tankers (by 2015)



2002 Oil spill of *Prestige*

2003 MARPOL amendments were adopted to further accelerate the phase-out of single-hulled tankers (by 2010)



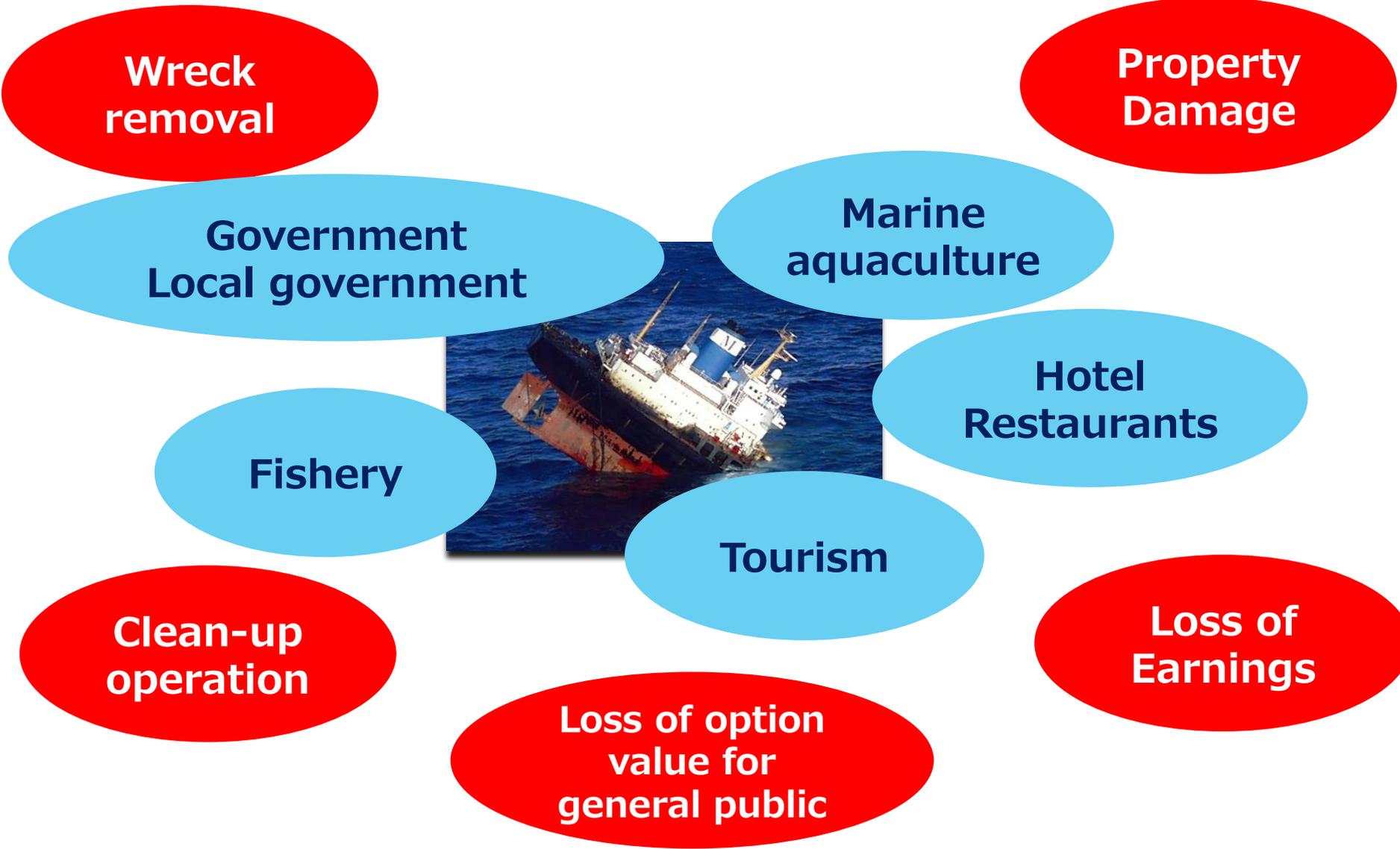
With all these efforts made,  
there is no “zero” risk in this world.

“100% safety” does not exist.

# Largest Oil Pollution Caused by Tanker Incidents

<b>Vessel Name</b>	<b>Year, Place</b>	<b>Oil spill (tons)</b>	<b>Damage /Loss</b>
<b>Torrey Canyon</b>	<b>1967 UK</b>	<b>80,000</b>	<b>USD 1.6billion</b>
<b>Nakhodka</b>	<b>1997 Japan</b>	<b>6,200</b>	<b>USD 250million</b>
<b>Erika</b>	<b>1999 France</b>	<b>20,000</b>	<b>USD 210million</b>
<b>Prestige (unresolved)</b>	<b>2002 Spain</b>	<b>60,000</b>	<b>over USD 1,000million</b>
<b>Hebei Spirit</b>	<b>2007 Republic of Korea</b>	<b>11,000</b>	<b>USD 450million</b>

# Possible Damages Caused by Oil Spill



There should be strict liability in order to provide strong incentives for safer ship operation.

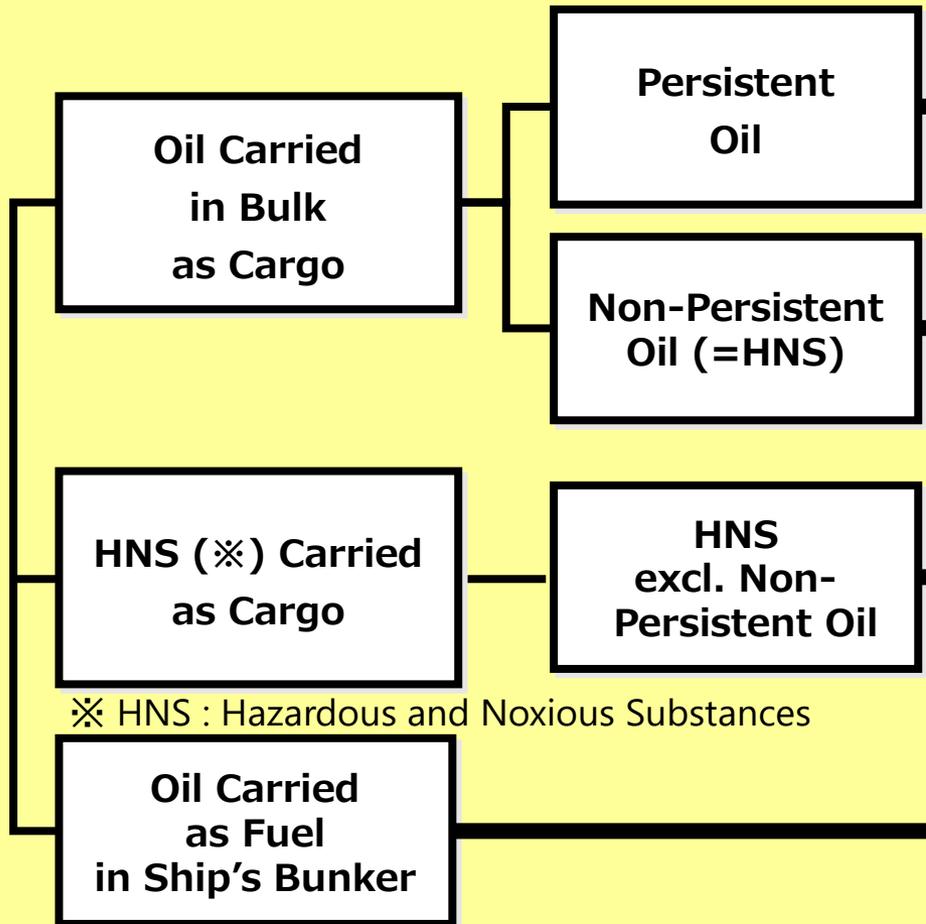
On the other hand, if the liability is unlimited, no one would dare to continue shipping business.

Incidents may cause widespread damages externally.

There should be mechanism to compensate external pollution damages.

# International Conventions related to Pollution Damage

## Cause of Pollution



※ HNS : Hazardous and Noxious Substances

## Conventions Related to Liability and Compensation

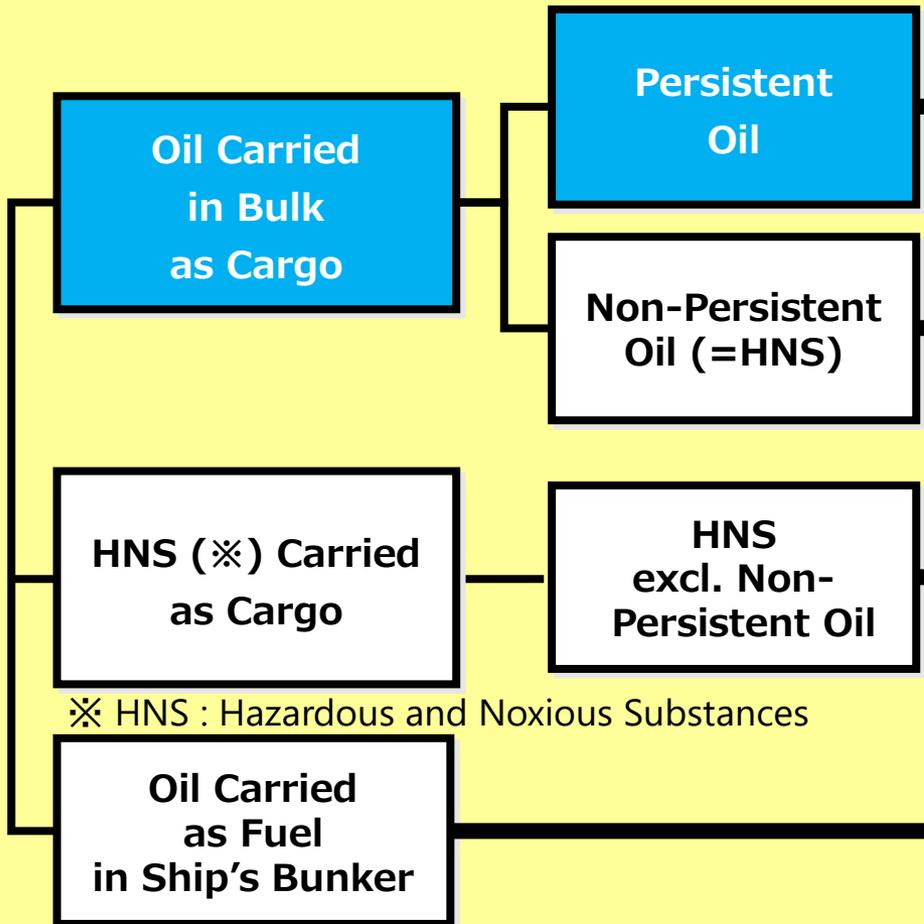
**1992 CLC**  
**The 1992 Fund Convention**  
**The 2003 Protocol**

**2010 HNS Convention**

**Bunkers Convention**

# Conventions related to Persistent Oil Carried as Cargo

## Cause of Pollution



※ HNS : Hazardous and Noxious Substances

## Conventions Related to Liability and Compensation

**1992 CLC**  
The 1992 Fund Convention  
The 2003 Protocol

**2010 HNS Convention**

**Bunker Convention**

# 1992 CLC

## ■ International Convention on Civil Liability for Oil Pollution Damage, 1992

- **Strict Liability for pollution damage** except only if the shipowner proves that;
  - the damage resulted from an act of war, hostilities, civil war, insurrection or a natural phenomenon of an exceptional, inevitable and irresistible character, or
  - the damage was wholly caused by an act or omission done with intent to cause damage by a third party, or
  - the damage was wholly caused by the negligence or other wrongful act of any Government or other authority responsible for the maintenance of lights or other navigational aids in the exercise of that function.
- **Limitation of shipowner's liability** based on the gross tonnage of the ship
- **Compulsory insurance** for ships carrying more than 2,000 tons of persistent oil and **certificate issued by the appropriate authority of the State of their registry stating that the ship's liability under the Convention is covered**

# 1992 Fund Convention, the 2003 Protocol(Supplementary Fund)

- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (1992 Fund Convention)
- Protocol of 2003 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (The 2003 Protocol)

- IOPC Funds(\*) financed by contributions from oil receivers in 1992 fund Member States

(\*)1992 Fund and Supplementary Fund

- Pay compensation when
    - claims exceed shipowner's liability under CLC, or
    - shipowner financially incapable of meeting its obligations under CLC
  - Maximum amount of compensation 750 million SDR(\*)
    - 1992 Fund: 203 million SDR
    - Supplementary Fund: 547 million SDR
- (\*) SDR: Special Drawing Rights (1 SDR = US\$1.314, as of 10 Oct, 2023)

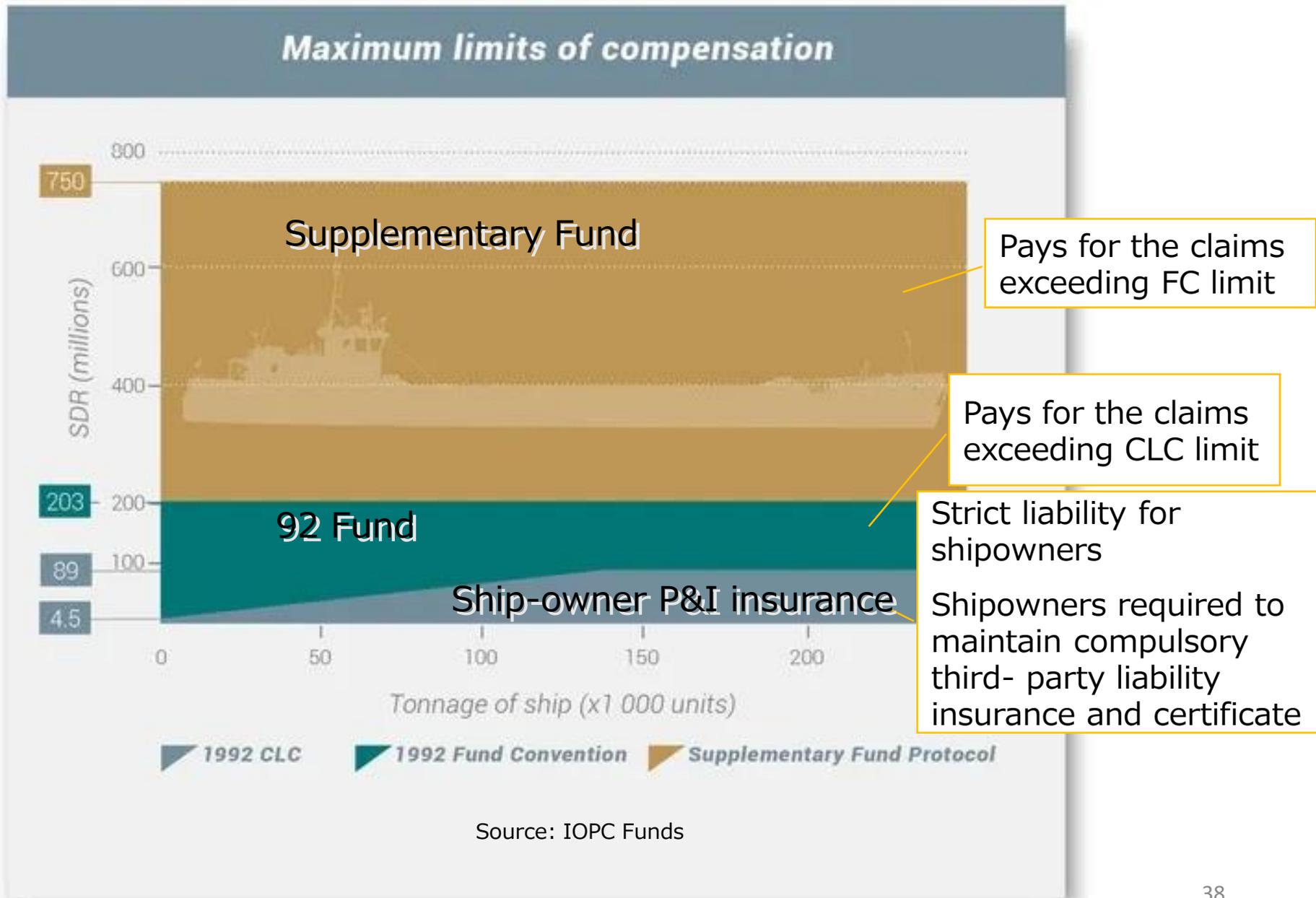
# Main Types of Claims Applicable to Funds

- **Clean-up** operations
- **Property Damage**
- **Economic losses** in fishery, marine aquaculture and tourism sectors
- **Reinstatement of Environmental damage**

To be entitled to compensation, the loss must be actual and quantifiable



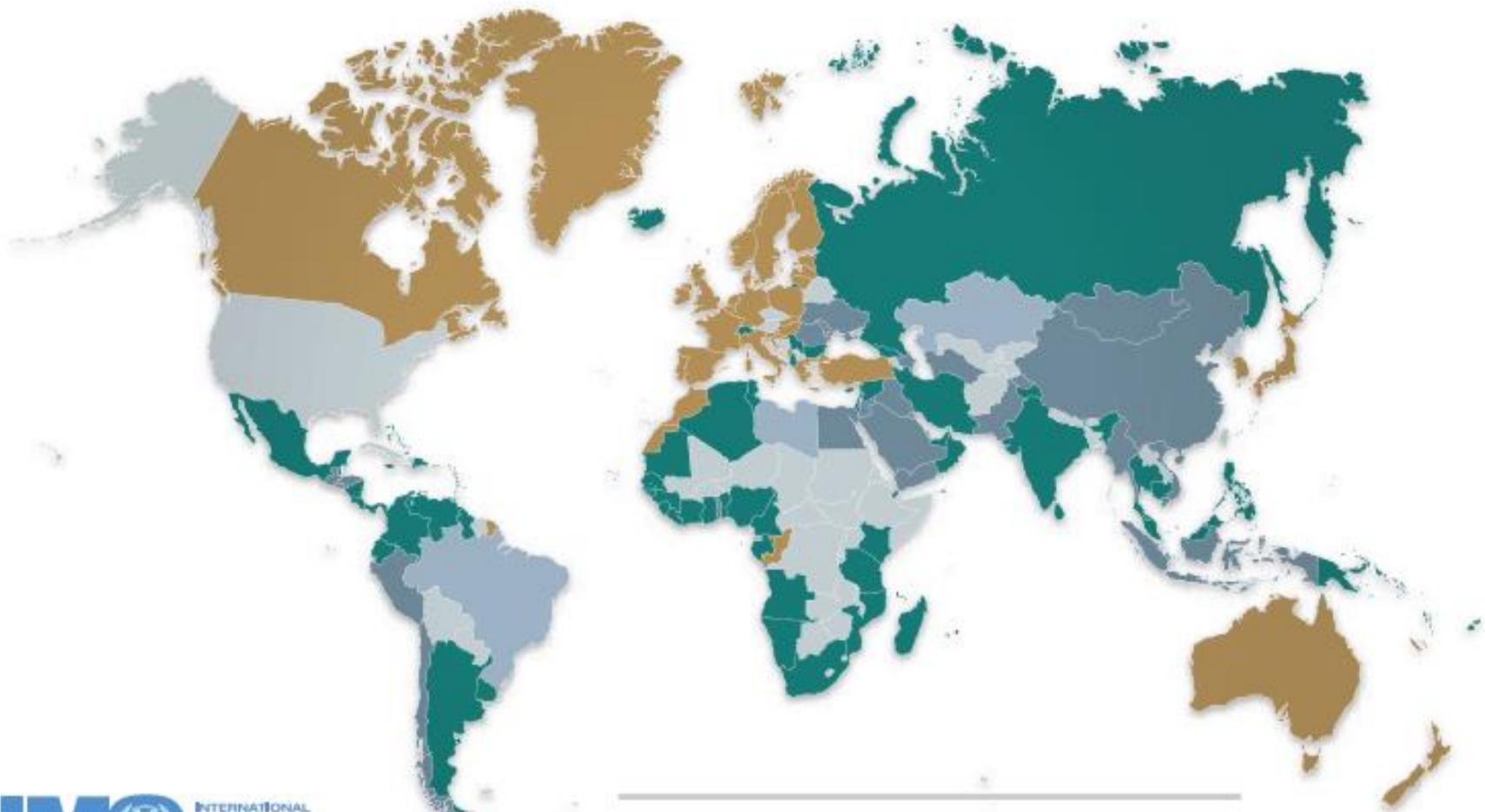
# Framework of Compensation





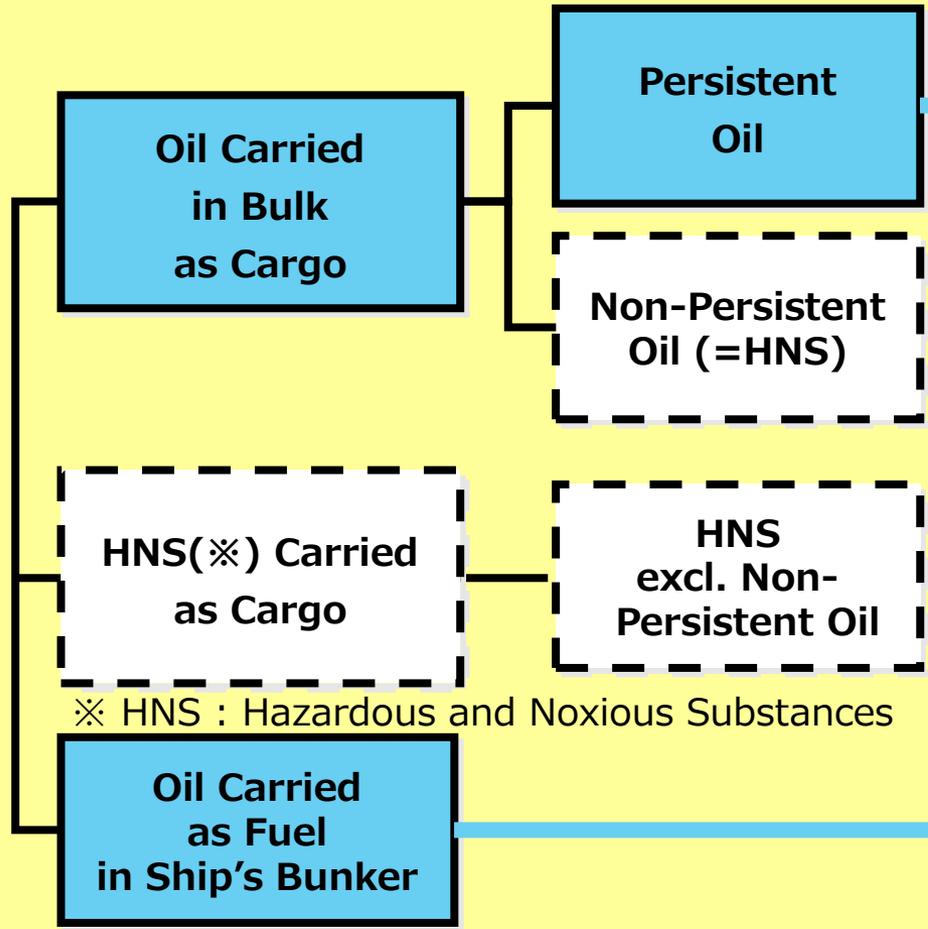
Based in London, the IOPC Funds shares its premises with the International Maritime Organization (IMO). As a specialised agency of the United Nations, IMO is the global regulatory body for the shipping industry.

-  States Parties to the 1992 Fund Convention
-  States Parties to the Supplementary Fund Protocol
-  States Parties to the 1992 Civil Liability Convention
-  States Parties to the 1969 Civil Liability Convention



# Japan's Domestic Law

## Cause of Pollution



※ HNS : Hazardous and Noxious Substances

Wreck Removal

**Act on Liability for Oil Pollution Damage**

- Strict Liability of shipowner
- Limitation of Liability
- Compulsory Conclusion of Compensation Contract
- Direct Claim Rights to Insurers

# Subsidies for Removal and Clean-up cost of spilled oil to assist local governments

## Domestic policy instrument in Japan

### • Requirements

- Oil spill occurs from a ship (with foreign flag and except oil tanker)
- the JCG Commandant requests local government to remove oil spill from polluted water
- Removal and clean-up cost of spilled oil conducted by the local government is not paid by the shipowner

### • Applicable Cost

- Removal and clean up cost including related expenses

### • Applicant

- Local government

### • Minimum Cost for Application

- **More than ¥20,000,000**

### • Subsidy rate

- **50 %**

### • Effective date

- 1 April 2004

### • Case examples

2005 (¥77,432,000) MV HELENA II (Aomori pref.)

2008 (¥15,000,000) MV AAA UFULI (Saiki city)

2009 (¥726,936,000) MV Gold Leader (Hyogo pref., Kobe city, Akashi city, Awaji city)



( HELENA II )

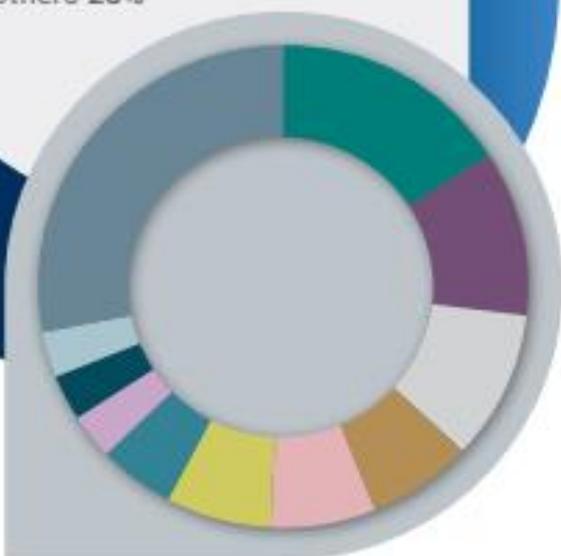
# IMO Contributions

Year 2022 Top 10 Parties

Rank	State	Contribution (GBP)	Share(%)
1	Panama	4,831,315	14.37
2	Liberia	4,088,887	12.16
3	Marshall Islands	3,578,929	10.65
4	China	1,922,417	5.72
5	Singapore	1,884,351	5.61
6	Malta	1,727,002	5.14
7	Hong Kong	1,374,268	4.09
8	Bahamas	1,248,045	3.71
9	United Kingdom	1,019,253	3.03
10	Japan	870,855	2.59

**CONTRIBUTING OIL RECEIVED  
IN 1992 FUND MEMBER STATES  
IN 2021 (AS REPORTED  
BY 31 DECEMBER 2022)**

- India 16%
- Japan 11%
- Republic of Korea 10%
- Kingdom of the Netherlands 7%
- Italy 7%
- Singapore 7%
- Spain 5%
- Thailand 3%
- United Kingdom 3%
- Canada 3%
- Others 28%



**Contributing oil received in the calendar year 2021  
in the territories of States which were Members  
of the 1992 Fund on 31 December 2022**

MEMBER STATE	CONTRIBUTING OIL RECEIVED IN 2021 (TONNES)	% OF TOTAL
India	215 482 925	16.04%
Japan	151 053 161	11.24%
Republic of Korea	132 391 350	9.85%
Netherlands***	99 041 644	7.37%
Italy	97 718 739	7.27%
Singapore	89 049 894	6.63%
Spain	64 366 473	4.79%
Thailand	46 038 943	3.43%
United Kingdom	45 567 868	3.39%
Canada	42 889 575	3.19%
France	36 417 557	2.71%
Türkiye	34 811 300	2.59%
Greece	27 316 034	2.03%
United Arab Emirates	26 816 463	2.00%
Germany	23 130 451	1.72%
Sweden	19 020 853	1.42%
Iran (Islamic Republic of)	15 141 322	1.13%
Poland	15 114 286	1.13%

- ✓ Avoid an incident (tackle the cause of incident),
- ✓ Minimize the loss and damage,
- ✓ Then, rules on the liability, and compensation to the external environment damage.

-----

Have another look on the overall picture of the policy measures to enhance the safety at sea.

# Policy-Mix

Generally, policy goals cannot be achieved by single and stand-alone instrument.

Optimum combination of different types of policies should be used to maximize the benefits/costs.

The following categorization is generally used in the context of environment policy, but applicable to the safety, as well.

## ■ Regulatory measures

- Direct regulation
- Procedural regulation

## ■ Information measures

## ■ Market-Based measures

## ■ Voluntary measures

# Policy-Mix

## ■ Regulatory measures

### ✓ Direct regulation

e.g., ECDIS installation, stability criteria, under SOLAS  
Double-Hull requirements under MARPOL

### ✓ Procedural regulation

e.g., Certification for seafarers' training and qualification  
Compulsory insurance under CLC, Bunker, Nairobi

## ■ Information measures

Disclose the information relating to the safety performance and improve the behavior through peer pressure: e.g., the safety performance assessment and rating by the third party and public report of PSC detention results

# Policy-Mix

- Regulatory measures
- Information measures

## ■ Market-Based Measures

The compensation of damage under strict liability, with mutual recognition of court judgments between Parties, could be economic incentives for safe navigation. (MBM in wider context)  
However, compared to the environmental performance (e.g., GHG emission volume) , the safety risk for a particular ship and its operation is difficult to quantify.

- Voluntary measures

# Policy-Mix

- Regulatory measures
- Information measures
- Market-Based measures

## ■ Voluntary measures

Owner/operator could develop its own corporate safety improvement plan. Industry associations could develop its guidelines and code of conducts for the safe practices.

An enterprise or a consortium of enterprises could take its own initiatives to accelerate the technological development that enhance the safety, possibly with the public support.

e.g., MASS (autonomous ship) has become closer to realization through the R&D and demonstration tests conducted under MEGURI 2040 project by the Nippon Foundation

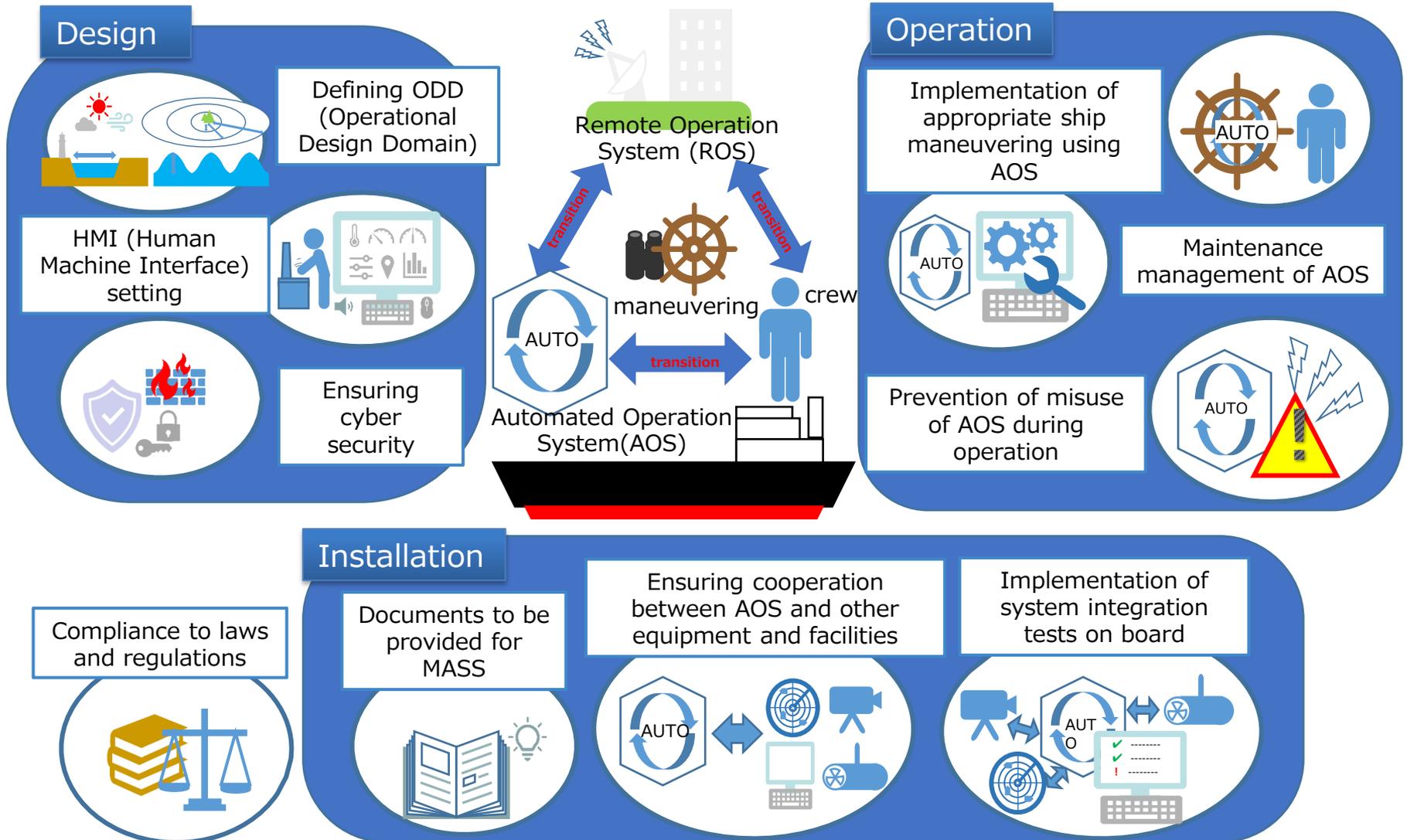
2022年2月26日～3月1日  
実証実験実施



From MEGURI2040, the Nippon Foundation

# Safety Guidelines for MASS

## Overview of the points to consider



Policy instruments should not be considered in isolation. As an overall picture, optimum policy-mix should be pursued.

Despite such efforts, the risk of damage by oil spill cannot be diminished.

Compensation scheme through the Compensation Funds will continue to function as safeguard.

The maritime transport will never disappear, as it is essential to the daily life and survival of all citizens.

The safety at sea is an eternal challenge for everyone.

Thank you!



Shimizu Port, from a Commuting Ship of Tokai University, Shizuoka Campus “Mirai” (formerly nuclear-powered “Mutsu”) of JAMSTEC is leaving the port (right), and “Chikyu” of JAMSTEC rests in the port (left).