



Any Ship Carrying **BALLAST WATER** is a Potential **INVASION SOURCE!**

■ ■ The introduction of invasive marine species into new environments through a ship's ballast water, attached to ships' hulls and via other vectors has been identified as one of the four greatest threats to the world's oceans. For nearly a decade now, the IMO and a number of authorities that cooperate in the shipping industries are acting in response to the problem and searching for methods to solve the problem, or at least to reduce the effects.

The Cause of the Problem

It is estimated that at any one time, between 3000 and 4500 different species are being carried in the ballast tanks of ships around the world. Although not harmful when taken on board, the vessel may have travelled across several oceans before releasing the species in environments as total aliens. The vast majority do not survive the journey, and for those that do,

the chances of surviving in new environmental conditions are further reduced. However, when all factors are favourable, a species that has been introduced can survive and establish a reproductive population in the host environment, out-competing native species and multiplying into pestilent proportions.

The consequences are that whole eco-systems are being changed. Just to mention a few, the European Zebra Mussel has infested over 40 per cent of the internal waterways in the U.S. It is causing damage to water pipes, boat hulls and other hard surfaces, and the cost in the Great Lakes alone is estimated at more than

USD five billion. In Australia, Asian Kelp is rapidly invading new areas, displacing the native seabed communities. In the Black Sea, a North American jellyfish has occasionally reached densities of one kg biomass per m², and has contributed to the collapse of the entire Black Sea commercial fisheries industry. In several countries, filter-feeding shellfish such as oysters have absorbed the 'red tide' algae (toxic dinoflagellates) while they were being introduced into the environment. This can cause paralysis or even death when humans consume the shellfish. There are numerous other examples of major ecological and human health impacts, and it is

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▶ even feared that diseases such as cholera could be transported in ballast water.

The Response

In response to the threats, the International Maritime Organization (IMO) and other international bodies, including the International Chamber of Shipping (ICS) and INTERTANKO have taken action to address and find solutions to the problem. The IMO has developed voluntary Guidelines for the control and management of ships' ballast water. The Guidelines, directed to the member states, are constructed as a tool, which can help Government authorities, ship masters, operators, owners and Port authorities to minimise the risk with ballast water discharge.

The guidelines recommend, inter alia, that every ship that carries ballast water should

- Be provided with a ballast water management plan, specific to each ship. The aim of the plan should be to provide safe and effective procedures for ballast water management
- Have a responsible officer appointed to maintain appropriate records and to ensure

that ballast water management and/or treatment procedures are followed and recorded

- Have ballast management procedures aimed at minimising the uptake of organisms during ballasting, cleaning of ballast tanks, and to avoid the unnecessary discharge of ballast
- Exchange ballast water at sea, replacing it with 'clean' open ocean water

So far, the guidelines issued by the IMO are voluntary and not legally binding. As a next step, IMO member countries have agreed to develop a mandatory international working method to regulate and control ballast water. The Ballast Working Group within the IMO is well advanced with the development of this working method, and it is hoped that member countries will agree to the new international convention in 2003.

Meanwhile, and to assist ship owners, the International Chamber of Shipping (ISC) and INTERTANKO have published a Model Ballast Water Management Plan. This provides practical guidelines for the implementation of the IMO voluntary guidelines on board ships. The model can be purchased from ICS.

Despite the efforts of the IMO and its member countries for developing an international legal instrument for the regulation of ballast water, many countries have unilaterally developed, or are developing, their own national or even local legislation. These include: Australia, Canada, Chile, Israel, New Zealand, United Kingdom (Orkney Islands), USA (including different measures in different states).

Various ports around the world have also adopted regional legislation. Among these are Buenos Aires, Scapa Flow (Scotland) and Vancouver.

Many of the unilateral responses are for the most part consistent with the IMO guidelines, while others introduce new and different requirements. Needless to say, unilateral regimes are a major concern to the shipping industry, which operates world-wide and may be severely impacted if requirements differ from port to port.

Methods to Reduce the Effect

The IMO Guidelines and the Model Ballast Water Management Plan mentioned above, recommend re-ballasting at sea as the best available method for reducing the risk of transferring

HERE WE HAVE listed summaries of ballast water requirements in Australia, Canada and the U.S.

Please note however, that different regimes applies in different states and different territories.

The information has been collected courtesy to INTERTANKO from their "Ballast water database" available to INTERTANKO members at www.intertanko.com.

If you are not an INTERTANKO member, the Club may be able to assist.

General information on the problem and development of legislation can be found via IMO's homepage at www.imo.com.

The Global Ballast Water Management Programme (GloBallast) is a three-year initiative under the International Waters portfolio of the Global Environment Facility. Useful information can be found on their homepage as well at <http://globallast.imo.org> (or click your way through IMO's homepage to get there).

AUSTRALIA

National Authority:	Australian Quarantine and Inspection Service (AQIS)
Ports Affected:	All
Ships Affected:	All ships entering Australian ports from overseas territories. No exceptions specified.
Implementation:	Voluntary compliance, but mandatory reporting (Reporting Form Required – see website, address below)
Date of Start:	1992
Acceptable Methods:	Ballast water exchange in deep ocean areas: 1. Tanks to be drained until pump suction is lost. 2. Flow through method with 3 x tank volume pumped through. 3. Compliance regime in agreement with AQIS 4. Other in-tank treatment agreed with AQIS (only AQIS heat treatment method approved as yet for cross equatorial voyages. Further information available from AQIS – see website, address below).
Unwanted Organisms / Pathogens:	Target list available from AQIS (see website, address below). Sediment unwelcome.
Uptake Control:	Minimise uptake of silt. Where practicable, avoid taking ballast: 1. in shallow water. 2. in vicinity of dredging operations 3. where there is a known out-break of disease communicable through ballast water 4. where phytoplankton blooms are occurring
Sampling:	Targeted, random and mandatory, under supervision of AQIS officer.
Records:	Record time, location, volume and salinity of all ballast water loaded, exchanged at sea, and discharged.
Alternatives to en route management procedures:	1. Normal discharge based on risk assessment taking into account type of vessel, origin, risk factors at port of entry, e.g. fish farms. 2. Withholding discharge until analysis of samples found to be free of harmful organisms. 3. Ship proceed to designated area or open sea to exchange ballast.
Procedure for unacceptable ballast water:	Ship proceed to designated area or open sea to exchange ballast.
Detailed information:	AQIS Australian Ballast Water Management Guidelines, and IMO Resolution A.868(20)
Notes:	AQIS web site: http://www.aqis.gov.au It is suggested that a copy of the 'Ballast Water Requirements Australia' be obtained for vessels visiting Australia.

harmful organisms. Other methods are also being developed. In brief, the various methods are:

Ballast Water Exchange: This is deemed the most practical method and is the recommended method in most legislation. However, even when fully implemented, the method is less than 100 per cent effective and it also gives rise to serious ship safety limits. The exchange of ballast water at sea in sometimes difficult weather conditions could impose stresses and strains and operating limits beyond what the vessel was designed for, hence causing problems with stability and strength. It is likely that the IMO will consider these problems in the new regulations, thus opening the way for other techniques and methods.

Fresh Water Ballast: The use of freshwater ballast instead of seawater could have great effects but has serious practical and economic impacts. Thus far it has received very little attention.

Mechanical Treatment: Could be filtration or separation. A filter placed over the ballast water intake pipe will reduce the amount of sediment taken on board, but it requires secondary treatment to eliminate bacteria and vi-

ruses and it also considerably slows the ballasting procedure. Centrifugal separators have successfully been used in a joint Canadian/Norwegian project to separate the sediment and the water. This method also requires secondary UV treatment.

Physical Treatment: Heat treatment has been developed in Australia where heated salt water from the engine is re-routed to the ballast tank. The method has been tested successfully. Other methods are sterilisation by ozone, ultra violet light and electric currents.

Chemical Treatment: Biocides are added to the ballast water to kill organisms. Germany is developing a biodegradable ballast water treatment chemical. Approximately 50 litres of the chemical, costing USD 150, are needed to treat 1000 tons of water.



USA	CANADA
US Coast Guard (USCG)	Canadian Coast Guard (CCG).
All	St Lawrence River and Great Lakes ports west of 63°W. longitude.
All ships carrying ballast and arriving from outside the U.S. exclusive economic zone (EEZ). Except: 1. Passenger ships equipped with systems that can kill aquatic organisms in ballast water. 2. Crude oil tankers engaged in U.S. coastwise trade.	All ships transiting the Eastern Canada Vessel Traffic Services Zones (ECAREG VTS Zone) that are proceeding towards St Lawrence River beyond 63°W longitude.
Voluntary compliance for at least three years.	Voluntary application. (But note that mandatory U.S. regulations apply past Massena in New York state, United States.)
1998	May 1st 1989
1. Ballast water exchange at sea, outside U.S. EEZ. 2. Ballast water exchange in designated sea area within U.S. EEZ. 3. Environmentally sound alternative ballast water management methods that can include modifications to a ship.	Ballast water exchange at sea, as far from land as practicable, in ocean depth greater than 2000 metres. In exceptional circumstances and for ships that have not left the North American continental shelf on their inbound voyage, the exchange may be made in internal Canadian waters, within the Laurentian Channel and in water depths exceeding 300 metres. Such exchanges should be restricted to the area southeast of 63°W.
Not defined	Not defined, but sediment unwelcome.
None specified.	When pumping out ballast tanks during exchange, the pump should be run until it loses suction.
Not defined.	None required by ship. Samples of ballast water may be taken by local authorities to assess the effectiveness of the guidelines.
The U.S. has issued a format for recording the status of ballast. A copy can be obtained from the National Ballast Water Clearinghouse at SERC, http://www.serc.si.edu/invasions/ballast.htm	An entry should be made in the ship's logbook, or other suitable documentation, recording the salinity of the ballast water to be discharged in the Great Lakes, and the location, date and time of the ballast water exchange at sea. The pilot boarding at Les Escoumins will provide a Ballast Water Exchange Report Form. It must be completed and passed to the lockmaster at St Lambert Lock or to the CCG if not transiting through that lock.
[not yet known]	Nothing in the Canadian guidelines should be construed on the responsibility of a ship's master for the stability and safety of the ship.
Not yet known; controls are still voluntary.	Not applicable.
U.S. Invasive Species Act. 1996	Voluntary Guidelines for the control of Ballast Water Discharges from Ships Proceeding to the St Lawrence River and Great Lakes, published by the Canadian Coast Guard. Note that special rules apply to ships departing from ports in Lake Superior, with ballast that has been taken in Lake Superior. Information can be obtained from the Canadian Coastguards website: www.ccg-gcc.gc.ca or from Transport Canada's website: www.tc.gc.ca