Australian Government

Australian Quarantine and Inspection Service

Australian Ballast Water Management Requirements

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DEPARTMENT OF AGRICULTURE, FISHERIES AND FORESTRY

Contents

Introduction

On July 1 2001, Australia introduced mandatory ballast water management requirements (the requirements) to reduce the risk of introducing harmful aquatic organisms into Australia's marine environment through ship's ballast water.

Background

The Australian Quarantine and Inspection Service (AQIS) is the lead agency for the management of ballast water taken up overseas. Part of AQIS' charter is to ensure that foreign ballast water has been managed in accordance with the requirements before permitting its discharge inside Australia's territorial sea (12 nautical limit generally applies).

The requirements incorporate a 'Ballast Water Decision Support System' (BWDSS) - a computer application that can provide vessels with a risk assessment of their ballast water and deem it to be acceptable for discharge or otherwise. Use of the BWDSS is not mandatory.

Any ballast water that has been exchanged at sea by an approved method is deemed to be acceptable for discharge in Australian ports / waters.

Revised ballast water reporting and verification systems also form an integral part of Australian requirements.

Australian ballast water management requirements are consistent with International Maritime Organisation (IMO) Guidelines for minimising the translocation of harmful aquatic species in ships' ballast water.

Safety of vessels and crews are of paramount importance. Vessels undertaking ballast water management to comply with Australian requirements should do so in accordance with the IMO Guidelines.

Australia's new ballast water management requirements have legislative backing and will be enforced under the *Quarantine Act 1908*.

What the new arrangements mean for the shipping industry

Mandatory ballast water management requirements

All internationally trading vessels are required to manage their ballast water in accordance with AQIS requirements. **The discharge of high-risk ballast water in Australian ports or waters is prohibited.**

High Risk Ballast Water

AQIS deems all salt water from ports (or coastal waters) outside Australia's territorial sea to present a "high-risk" of introducing exotic marine pests into Australia. The discharge of high-risk ballast water from ships is prohibited anywhere inside Australia's territorial seas (12 nautical mile limit generally applies).

Ballast water of the following types is deemed by AQIS to be "low-risk":

- Fresh Water from any source
- Ballast Water that has been assessed as "low-risk" for discharge (at specified ports / locations on specified dates) by the BWDSS
- Ballast Water that has been exchanged at an approved location (mid-ocean) by an approved method
- Ballast Water taken up in mid-ocean
- Ballast Water taken up inside Australia's territorial seas*.

**AQIS is a Federal Government agency. AQIS ballast water management requirements do not regulate ballast water taken up inside Australia's territorial sea. Victoria, one of six Australian States, has additional requirements for the management of ballast water. These additional requirements are enforced by the Victorian State Government and involve management and reporting of ballast water taken up in Australian waters. At the time of printing, Victorian State requirements regulate the discharge of Australian domestic ballast water only in the port of Hastings (Western Port). The Victorian State Government plans to roll out the Hastings requirements to each of its other three commercial ports (viz: Melbourne, Geelong and Portland) later in 2004. Australia's other State / Territory Governments may enact similar laws in the future to regulate the movement of Australian domestic ballast water.*

Mariners should ascertain if any State / Territory Government ballast water management requirements (over and above AQIS' requirements) need to be met for calls at any Australian port on their vessel's itinerary.

Ballast water management options

Mariners may elect to use any of the following ballast water management options – which have all been approved by AQIS:

1. Ballast Water Decision Support System (BWDSS)

Receive a tank-by-tank risk assessment from the BWDSS that deems the ballast water on board to be low-risk. Instructions for the use of the BWDSS may be found in the BWDSS Instruction Guide included in this information package.

2. Non-discharge of 'high-risk' ballast water in Australian ports or waters

Vessels that do not need to discharge any ballast water in Australian waters do not need to carry out any management of foreign ballast water. Mariners are cautioned that permission to discharge high-risk ballast will not be given under any circumstances. It is therefore considered prudent to manage all ballast water on board a vessel as if it may need to be discharged in Australian waters. In the event of unforeseen circumstances, whereby it becomes necessary to discharge some ballast water, permission to do so may be sought and granted provided the ballast water in question has been managed to make it low-risk prior to arrival in Australian waters.

Vessels carrying high-risk ballast water through Australian ports may be required, at their own expense, to employ independent marine surveyors on arrival and departure from Australia to formally certify that no high-risk ballast water has been discharged during the vessel's visit to Australia.

3. Tank-to-tank transfer

It is permissible to move high-risk ballast water around from tank-to-tank within a ship. Masters of vessels that use this procedure must be vigilant to ensure that the risk of unauthorised ballast discharge, during ballast transfer operations, is assessed and managed appropriately.

4. Full ballast water exchange at sea

- Sequential exchange (empty/refill) method
- Flow through method
- Dilution method.

Each of these methods has been tested and has demonstrated results of achieving the necessary 95% (or better) volumetric exchange of high-risk ballast water. Ballast exchanges ***must*** be conducted outside the Australian 12 nautical mile limit. It is also ***recommended*** that ballast exchanges be conducted as far as possible away from shore and in water at least 200m deep.

• **Sequential Exchange (empty / refill):** This method involves emptying tanks (a few at a time) of high-risk ballast water at sea before refilling them with clean water from the deep ocean. It is important to ensure that the ballast mix achieved by this method contains no more than 5% of high-risk ballast water.

Soundings of tanks should be recorded at the end of the 'emptying phase' so that the make up of the ballast mixture may be verified by AQIS on arrival in an Australian port.

Not all ships are able to empty ballast tanks at sea for safety reasons. Masters should ensure their ships' safety at every stage of a sequential exchange operation.

• Flow-Through Method:

300% of a tank's full capacity of clean water from the deep ocean must be pumped into each tank to achieve an acceptable 95% volumetric exchange.

Even when, at the start of a flow through operation, a tank is only partially filled with high-risk ballast water, **300% of full capacity** must still be pumped into the tank to comply with Australian requirements. The 300% capacity is measured from when water begins to flow into a tank. In the case of a tank that is not completely full at the commencement of a flow through operation, 300% of the tank's full capacity still starts to be measured from when the pumps are started – not from when the tank starts to overflow.

AQIS will seek to verify that ballast exchanges have been properly carried out in accordance with the law. The verification process is an examination of records about ballast exchange operations that are kept by the ship.

Masters should pay attention to the following when conducting flow-through ballast exchanges:

Tanks may be flushed one at a time or in similar pairs. For example: Double Bottom Tanks 1 Port and Starboard may be pumped simultaneously using the same pump. It is not acceptable to flush dissimilar pairs of tanks (e.g. DBT1 P and DBT 2S) together. The reason for this is that dissimilar tanks being flushed together using a single pump would receive unequal quantities of water from the pump.

Estimating the quantity of water flushed through each tank involves estimating the delivery rate of ballast pumps and timing the hours of running of those pumps. It should be noted that pumps might not deliver their rated capacity – due to wear and tear on pumps / pipes etc. Masters should ensure that the pump delivery rate used in exchange calculations is the rate that has been experienced during recent ballast operations.

Actual pump delivery rates may be determined by observing the time it takes to pump a known quantity of water (eg. timing how long it takes from starting to fill an empty tank until it overflows).

Masters should ensure that ballast tanks are not pressurised beyond design specifications when using the flow-through method.

• Dilution Method:

Some vessels (mainly tankers) are fitted with extra piping / pumping arrangements. On some of these vessels, ballast may be pumped in through one side of a tank and out through the other simultaneously (pumping in / pumping out - as opposed to pumping in / simply overflowing out).

Flushing using two pumps is acceptable. As for "flow-through", 300% of each tank's full capacity must be flushed through for an acceptable exchange.

Safety Considerations

Where full ballast water exchange has not been undertaken due to safety reasons (weather, sea conditions or operational impracticability), the Master should report this to AQIS as soon as possible and certainly prior to entering Australia's territorial sea (12 nautical mile limit generally applies). Under no circumstances should this information be sent to AQIS any later than

transmission of the *Quarantine Pre-Arrival Report (QPAR)*. The QPAR must be forwarded to AQIS between 12 and 48 hours prior to arrival at an Australian port (see addresses at the end of this document).

Alternative Ballast Water Management Methods

Vessels wishing to use alternative methods not specified above should apply in writing to AQIS before the event. Vessels arriving in Australian ports without having managed their ballast by an approved method (see above) are likely to be refused permission to discharge their ballast water in Australian waters.

Ballast Water Reporting

All vessels arriving in Australia from international waters are required to submit a *Quarantine Pre-Arrival Report (QPAR)* to AQIS. The QPAR requires details about the vessel including:

- Vessel particulars
- Human health
- Pet animals / birds on board
- Recent visits by the vessel to places where organisms of concern to Quarantine are known to exist.

The QPAR also requires reporting of ballast water management procedures undertaken.

Masters are required to send the QPAR to AQIS between 12 – 48 hours prior to arrival in Australia – usually via ships' local agents. This timing allows for efficient processing of the QPAR to assist in avoiding any disruption to a vessel's schedule.

Masters / agents that do not submit the QPAR to AQIS will not be given formal quarantine clearance to enter port. This will cause delays to the vessel and additional AQIS charges to the vessel will be incurred.

No ballast water may be discharged from internationally trading vessels in Australian waters without express **written** permission from AQIS. Such permission may be given following lodgement of the QPAR with AQIS – provided acceptable ballast water management is reported on the QPAR. If details / intentions about discharge of international ballast water (as originally submitted to AQIS) change for any reason, a revised QPAR must be sent to AQIS prior to discharging any ballast water that has not already been specifically authorised.

Masters must also complete the *AQIS Ballast Water Log* with details about ballast water uptake ports, BWDSS usage, ocean exchanges and intended Australian discharge locations.

This form needs not be sent to AQIS under normal circumstances – AQIS Officers will examine it during their physical attendance on board each vessel. Completed forms must be retained on the vessel for a period of two years and produced to AQIS on request.

Verification Inspections

AQIS Officers will conduct ballast water verification inspections on-board vessels to ensure compliance with Australia's ballast water management requirements.

AQIS Officers will use the QPAR, BWDSS results (if available), AQIS ballast-water logs and the vessel's deck and engineering logs to verify that the information supplied to AQIS is correct.

The verification inspection will take around 30 minutes to complete and in most cases will be conducted at the same time as a routine vessel inspection.

Co-regulation

It is envisaged that, in the future, Co-regulatory Agreements covering all aspects of Australian Quarantine requirements will be available to vessels that regularly visit Australian ports and have demonstrated a good quarantine compliance history.

Co-regulatory Agreements will set out the details of Quarantine concerns, how they will be managed and who will bear responsibility for ensuring that subject vessels comply with AQIS requirements.

Co-regulatory Agreements will be subject to formal audit by AQIS on a regular basis.

Co-regulatory Agreements are not available at the moment. Due to the recent outbreaks of Foot and Mouth disease around the world, AQIS will inspect every vessel arriving in Australian ports from overseas, until further notice.

Tank stripping

Sediments from ballast tanks must not be discharged in Australian waters.

Ballast tank stripping using pumps that are permanent fixtures on a vessel is acceptable. The use of portable pumps to strip out ballast tanks or manual removal and dumping of sediment in Australian ports / waters is not permitted.

Access to sampling points

Masters must provide access to safe ballast water sampling points on board their vessels.

Ballast water samples may be required to ensure compliance with Australia's ballast water management requirements or for further ballast water research.

Where a ballast water sample is required, AQIS Officers will avoid delays to vessels wherever possible. AQIS will endeavour to give prior warning to vessels – via their Australian agents – in the event that the necessity to obtain a ballast water sample is anticipated.

Ballast Water Exchange Calculations

Acceptable ballast water exchanges must achieve at least a 95% dilution of high-risk ballast water with clean seawater from the deep ocean.

Sequential Exchange (Empty / Refill) Operations:

At least 95% of the water in a given tank must have been drawn from the deep ocean on arrival in Australia. Residual high-risk ballast that remains in a tank at the end of the "Emptying" phase of an exchange operation must be less than 5% of the total volume contained in the tank on arrival in Australian waters.

Masters are requested to record a sounding and corresponding volume of residual water at the end of the emptying phase of sequential exchange operations. Masters are also requested to record

times, dates, locations and methods used (gravity / pumps / combination of gravity and pumps) to empty and refill all tanks managed by this method.

Sequential Exchange Calculation Example 1:

A vessel has a Fore Peak ballast tank with full capacity 2000m^3. The vessel's Master wishes to arrive in an Australian port with the Fore Peak only half full (1000m^3). Regardless of how much "high-risk" water is in the tank before the exchange, the water in the tank must be exchanged so that after refilling, not more than 5% of the resulting mixture in the tank is "high-risk" water. After pumping out (when suction on the pump is lost), a sounding of the tank is taken and this shows that only 5 m^3 remains.

In this situation, provided at least 95 m^3 of deep ocean water is added to the FPT, the resultant mixture will be acceptable for discharge in Australian waters. The Master may fill the tank only to his desired volume of 1000 m^3 and the ballast water in the tank requires no further management.

Sequential Exchange Calculation Example 2:

A vessel has a centre line, double bottom tank beneath No.1 Cargo Hold (DB1C) with full capacity 6000 m^3. The vessel's Master wishes to arrive in an Australian port with DB1C only filled to one third of its capacity (2000 m^3).

After pumping out (when suction on the pump is lost), a sounding of the tank is taken and this shows that 250 m^3 remains in the tank.

To achieve a 95% volumetric exchange in this tank, the Master has two options:

i) Fill the tank up to 5000 m^3 and then pump out water until his desired level of 2000 m^3 is reached.
ii) Strip the tank until only 100 m^3 remains before refilling the tank to 2000 m^3

Flow-Through and Dilution Operations:

300% of the full capacity of every tank exchanged by either of these methods must be pumped into the relevant tank - using clean seawater from the deep ocean.

Critical to the efficiency of this method are the following:

- Only similar pairs of tanks may be flushed through simultaneously
- Pumping hours to achieve the required 300% exchange should be calculated using the experiential pumping rate of ballast pumps rather than the "pumping capacity" of the new pumps as stated in manufacturers specifications. A pumps' efficiency usually decreases with age.

If a tank initially contains more than 5% of its full capacity of high-risk ballast water, 300% of the tanks **full** capacity must be pumped in to achieve the required 95% volumetric exchange.

Flow Through / Dilution Calculations:

A cape sized vessel (150,000 DWT) with nine cargo holds, has the following ballast tanks:

Tank / Hold	Capacity	Contents
Fore Peak	2000 m^3	1000 m^3
WBT 1P	3000 m^3	Full
WBT 1S	3000 m^3	Full
WBT 2P	4200 m^3	Full
WBT 2S	4200 m^3	Full
WBT 3P	3000 m^3	1200 m^3
WBT 3S	3000 m^3	Full
WBT 4P	4200 m^3	Full
WBT 4S	4200 m^3	Full
After Peak	1200 m^3	800 m^3
CH #5	21750 m^3	20150 m^3

The ten-year-old vessel is fitted with two main ballast pumps each with a rated capacity of 2500 m^3/hr when the vessel was new. From experience, the Chief Officer believes that each of these pumps now delivers about 2000 m^3/hr. The Chief Officer has timed (and recorded details of) a number of ballast filling / emptying operations to determine this pumping rate.

Example 1:

Fore peak tank initially contains 1000 m^3 of high-risk ballast water. Master wishes to exchange the tank's contents in mid-ocean using the flow through method.

300% of the tanks full capacity (i.e. 3 x 2000 m^3) = 6000 m^3.

Using only one pump, the Master must pump clean seawater into the tank for 3 hours. Using two pumps together, the required pumping time would be halved (90 minutes).

1 Pump delivers 2000 m^3/hr = 6000 m^3 in 3 hours = 300% of tank's FULL capacity.
2 Pumps deliver 4000 m^3/hr = 6000 m^3 in 1.5 hours = 300% of tank's FULL capacity.

Example 2:

Master wishes to use flow through method on WBT 1P, WBT 1S, WBT 2P and WBT 2S.

a) Acceptable:

Using both ballast pumps together the master simultaneously flushes WBT 1P and 1S simultaneously for 4.5 hours (combined capacity of 1P&S = 6000 m^3, 4.5 hours pumping @ 2 x 2000 m^3/hr = 18000 m^3 = 300% of each tank's full capacity).

After the ballast exchange in WBT 1P and S, those tanks are closed off and a new exchange begins on WBT 2P and S simultaneously.

b) Unacceptable:

Master uses both pumps to flush WBT 1P&S and WBT 2P&S simultaneously for 21.6 hours: The pumps deliver the same quantity of water but it is impossible to say how much water each tank received if this procedure is used.

Further Advice & Information

Further information can be obtained by contacting AQIS.

Log on to our web site

Home page address: **www.aqis.gov.au/shipping**

AQIS Seaports Program address: **seaports@aqis.gov.au**
dssadmin@aqis.gov.au

Contact us by phone or fax

Calling within Australia	Phone:	(02) 6272 4363
	Fax:	(02) 6272 3276
Overseas enquires:	Phone:	+61 2 6272 4363
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(Addresses – re: page 5 ‘Safety Considerations’)