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# Information Paper on The Use of Ballast Water in Antarctica

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**Submitted by:**
**The Council of Managers of National Antarctic Programs (COMNAP) and**
**The International Association of Antarctica Tour Operators (IAATO)**

## INTRODUCTION

1. ATCM XXVIII (Cape Town – 2004) discussed the *possible introduction of non-native organisms into Antarctic waters through the discharge of ballast water* and *requested SCAR, with the support of other appropriate organisations, to investigate the environmental and technical issues associated with the question of ballast water*.

2. COMNAP, through its Working Group on Ship Operations (SHIPOPS), and the International Association of Antarctica Tour Operators (IAATO) conducted a survey on the ballast water practices in the Antarctic Treaty area of ships currently operated or chartered by their members. The two organisations prepared a technical note including results of the survey and some relevant information on technical issues associated with ballast water and provided this note to SCAR in support of their ongoing work on the issue. The content of this note is provided below for information.

## BALLAST WATER PRACTICES IN THE ANTARCTIC TREATY AREA

3. A survey was conducted on the ballast water practices in the Antarctic Treaty area of ships operated by both National Antarctic Programs and those tourist operators that are members of IAATO. It captured half of the vessels estimated to be operating in the area, and the information collected is deemed to be generally representative of the current state of practices.

4. The survey captured the practices of 40 of the 72 vessels currently operated in the Antarctic Treaty area by both the National Antarctic Programs and IAATO members.

5. Of those 40 vessels:

- 35 vessels (87.5%) do not discharge any ballast water in the Treaty area

- 3 vessels (7.5%) do not discharge any ballast water brought from outside the Treaty area; and
- 2 vessels (5%) only exchange ballast water in the open ocean;

**BACKGROUND - BALLAST WATER AND THE INTRODUCTION OF INVASIVE MARINE SPECIES.**

6. The use of ballast water is essential to the safe and efficient operation of shipping, providing balance stability to ships that are not fully loaded. However it may also pose a serious problem and health threat as the practice transfers approximately 6 to 10 billions tonnes of ballast water globally every year, often between distant regions.

7. Thousands of marine species may be carried in ships ballast waters. These include bacterias and other microbes, small invertebrates, and the eggs, cyst and larvae of various species.

8. The problem is compounded by the fact that virtually all marine species have life cycles that include a planktonic stage. Even species in which the adults are unlikely to be taken on in ballast water can see younger individuals taken and reintroduced in distant regions.

9. The Problem of the introduction of invasive marine species into new environments through ballast water transported in ships' hulls has been identified as one of the greatest threats to the world's oceans together with land base sources of marine pollution, oil spills, and overexploitation of living marine resources and physical destruction of marine habitats.

10. Studies carried out in several countries have shown that many species of bacteria, plants, and animals can survive in a viable form in the ballast water and sediment carried in ships, even after journeys of several months duration.

11. Subsequent discharge of ballast water or sediment into the waters may result in the establishment of harmful aquatic organisms and pathogens which may pose threats to indigenous human, animal plant life, and the marine environment.

12. Although other media have been identified as being responsible for transferring organisms between geographically separated water bodies, ballast water discharge from ships appears to have been among the most prominent.

13. Near-coastal (including port and estuarine) organisms released in mid-ocean, and oceanic organisms released in coastal waters, do not generally survive. The length of time during which ballast water is within an enclosed ballast tank may also be a factor in determining the number of surviving organisms, because of the absence of light, decreasing nutrients and oxygen, changes of salinity and other factors. However, the maximum length of survival of organisms in ballast water varies, and in many cases is not known. Water of an age of 100 days should be considered the minimum for applying this consideration. Ballast water and sediments may contain dinoflagellate cysts and other organisms capable of surviving for a much longer length of time.

14. In these conditions the following practices are recommended by IMO guidelines:

- Where practicable, ships should conduct ballast exchange in deep water, in open ocean and as far as possible from shore. The ballast water should be discharged until suction from the tank is lost. Where this is not possible, regional agreements about ballast water treatment may be needed, particularly in areas within 200 nautical miles from shore.

- Where the flow-through method is employed in open ocean, by pumping directly ballast water into the tank, it must allow the water to overflow pumping at least three times the tank volume, taking into account that air pipes are not designed for continuous ballast water overflow. Current research indicates that pumping of at least three full volumes of the tank capacity could be needed to be effective when filling clean water letting it overflowing from the top. Ballast water exchange at sea should be avoided in freezing weather conditions.

- Where neither form of open ocean exchange is practicable, ballast exchange may be accepted by the port State in designated areas. Port States are encouraged to carry out biological baseline surveys in their ports and to disseminate the results of their investigations.

-A ballast water management plan should include a list of circumstances in which ballast water exchange should not be undertaken.

15. Reballasting at sea currently provides the best-available measure to reduce the risk of transfer of harmful aquatic organisms, but is subject to serious limits because this technique is less than 100% effective in removing organisms from ballast water.

16. Some parties even suggest that reballasting at sea may itself contribute to the wider dispersal of harmful species, and that island states located 'down-stream' of mid-ocean reballasting areas may be at particular risk from this practice.

17. It is therefore extremely important that alternative, effective ballast water management and treatment methods are developed as soon as possible, to replace reballasting at sea.

18. Significant research and development efforts are underway by a number of scientific and engineering research establishments around the world, aimed at developing a more complete solution to this problem.

19. Options being considered include:

- Isolated ballast water tanks
- Mechanical treatment methods such as filtration and separation.
- Physical treatment methods such as sterilization by ozone, ultra-violet light, electric currents and heat treatment.
- Chemical treatment methods such adding biocides to ballast water to kill organisms.
- Various combinations of the above.

20. All of these possibilities currently require significant research effort. Major barriers still exist in scaling these various technologies up to deal effectively with the huge quantities of ballast water carried by large ships (e.g. about 60,000 tonnes of ballast water on a 200,000 DWT bulk carrier). Treatment options must not interfere unduly with the safe and economical operation of the ship and must consider ship design limitations. Any control measure that is developed must meet a number of criteria, including:

- It must be safe.
- It must be environmentally acceptable.
- It must be cost-effective.

- It must work.

21. One of the problems currently faced by the global community is that apart from the general criteria above, there is currently no internationally agreed and approved performance standards or evaluation system for the formal acceptance of any new techniques that are developed. In addition, many groups are working in isolation from each other, and there are no formal mechanisms in place to ensure effective lines of communication between the community, governments and ship designers, builders and owners.

**PRESENT BALLAST WATER LEGISLATION**

22. The potential for ballast water discharge to cause harm has been recognised not only by the International Maritime Organization but also by the World Health Organization, which is concerned about the role of ballast water as a medium for the spreading of epidemic disease bacteria.

23. It is therefore extremely important that alternative, effective ballast water management and/or treatment methods are developed as soon as possible and significant research and development (R&D) efforts are underway by a number of scientific and engineering research establishments around the world, aimed at developing a more complete solution to this problem.

24. As a specialised agency of the United Nations, responsible for the international regulation of ship safety, construction, operation and the prevention of marine pollution, IMO is the most appropriate body to address this issue.

25. In line with this, the member countries of IMO have developed "Guidelines for the control and management of ships ballast water, to minimise the transfer of harmful aquatic organisms and pathogens". These Guidelines were adopted by the IMO Assembly in 1997, by resolution A.868 (20). They replace earlier, less comprehensive Guidelines adopted in 1993. Management and control measures recommended by the Guidelines include:

- Minimising the uptake of organisms during ballasting, by avoiding areas in ports where populations of harmful organisms are known to occur, in shallow water and in darkness, when bottom-dwelling organisms may rise in the water column.
- Cleaning ballast tanks and removing muds and sediments that accumulate in these tanks on a regular basis, which may harbour harmful organisms.
- Avoiding unnecessary discharge of ballast.

26. Vessels operating in the Antarctic Treaty Area must follow these current IMO Guidelines, for the control and management of ballast water; to minimize the introduction and transfer of harmful aquatic organisms and pathogens, and ensure that the ship crew is aware of and complies with these regulations.

27. The World Summit on Sustainable Development (WSSD) took place in Johannesburg, South Africa, from 26 August to 4 September 2002. The WSSD re-affirmed its commitment to Agenda 21 and in its Plan of Implementation the WSSD called for acceleration of the development of measures to address invasive species in ballast water and urged IMO to finalize the 'IMO BALLAST WATER CONVENTION, Assembly Resolution and Guidelines'.

28. At the diplomatic Conference at IMO in London, February 2004, was adopted the 'International Convention for the Control and Management of Ships Ballast water and Sediments', with an annex which includes technical standards and requirements on ballast water management and requirements.

29. Based on this new conventions ships will be required to implement Ballast Water Management Plans, maintain reliable records of ballast water operations and carry out ballast water management procedures to given standards.