

PREFECTURA NAVAL ARGENTINA
(ARGENTINE COAST GUARD - PNA)

ORDINANCE No. 7-98 (DPMA)

BOOK 6

“REGULATION ON ENVIRONMENT PROTECTION”

BUENOS AIRES, November 2nd, 1998.

**PREVENTION OF POLLUTION BY AQUATIC ORGANISMS
IN THE BALLAST OF SHIPS DESTINED TO
ARGENTINE PORTS IN THE RIVER PLATE BASIN**

HAVING CONSIDERED what was informed by the Environment Protection Direction;
and

WHEREAS:

Section 41 of the Argentine National Constitution sets forth that authorities shall ensure the protection of the right granted to all inhabitants to enjoy a healthy and balanced environment, proper for human development and for productive activities to satisfy current needs, without risking those of future generations, and have the duty to preserve it.

The Convention of the United Nations On the Right of the Sea, ratified by Act No. 24,543, requires the States to take all the necessary measures to prevent, reduce and control the pollution to the marine environment caused by willful or accidental introduction in a determined sector of strange or new species which may cause considerable and harmful changes (Section 196.1.), and it sets forth that they may, within the exercise of sovereignty, pass laws and regulations to prevent, reduce and control the marine environment pollution caused by foreign ships, including those exercising the right of innocent passing, without any obstruction thereto (Section 211.3.).

The transfer and introduction of strange aquatic species through the ballast water of ships, threatens the conservation and sustainable use of biological diversity, stated as purposes in the International Convention On Biological Diversity of 1992, ratified by Act No. 24,375.

Resolution A.774 (18) – Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships’ Ballast Water and Sediment Discharges, of the Assembly of the International Maritime Organization (IMO), acknowledged that the uncontrolled discharge of such elements from ships has caused the transfer of biotic components causing damages to public health, goods and the environment.

The referred International Agency enhanced the above mentioned guidelines through Resolution A.868 (20) - Guidelines for the Control and Management of Ships’ Ballast Water to

Minimize the Transfer of Harmful Aquatic Organisms and Pathogens, requesting the governments to take urgent measures in order to apply them, considering them as a basis to reduce the risks of introduction of such organisms.

Section 5, subsection a), paragraph 23 of the Organic Law of Prefectura Naval Argentina No. 18,398, specifies, among the functions of PNA, that the Institution shall be involved in the rules adopted tending to prohibit pollution in lake, river and sea waters, and in subsection c), paragraph 2., it determines that PNA shall guarantee the internal security of ports and waterways.

Section 4 of Act No. 22,190, Prevention and Surveillance Regime for Waters and Other Environmental Elements Pollution, by Pollutants from Ships and Naval Constructions sets forth that certain obligations shall be complied with, among other, observing the operative rules for prevention of, and response to pollution, pursuant to the requirements set forth by the regulation.

Decree No. 4,516/73 (Article 6 of REGINAVE - Chapter 1) defines, among other, the Maritime Agent and Decree No. 1,374/87 (Chapter 99 - Section 699.0101. thereof) sets forth certain administrative penalties for acts occurring during the execution of the activity for which the persons included in such Article are qualified, in the event they imply actions or omissions in violation of laws, regulations or ordinances in general, and in particular, of navigation, and those implying lack of professional capacity, wrongful performance, lack of expertise, imprudence or negligence.

Decree No. 1886/83 (Section 8 of REGINAVE- Chapters 1 to 5), defines ballast water in Section 801.0101. subsections 1.1. and 1.2.; and Section 802.0101. subsection a.4., sets forth the definition of dirty waters as other residual waters, blended with those of drainage (previously defined), except for the cases provided for in Section 802.0205., ruled by more rigorous provisions.

Section 802.0205. contemplates the mixtures with waste or residual waters to which different discharge prescriptions are applied in the cases of Sections 802.0201. -Operative System of Discharges in Maritime Shipping-, and 802.0202. - Operative System of Discharges in River Shipping-, among other, to which more rigorous discharge prescriptions shall apply.

In the River Plate (Río de la Plata) and its navigable tributaries, colonies of exotic species of mollusks not deliberately introduced have been found, altering the ecological balance of the environment, for not having natural predators that may regulate the population thereof, reaching the species more recently found (*Limnoperma fortunei*-1991) an average population in the Argentine Coast of the River Plate, of 14,300 individuals/m², and a top density of 130,000 individuals/m² were initially detected in less than ten years, having been scientifically evidenced that coming from very remote places, such organisms arrived in the ballast water of ships, discharged prior to entrance to port, being it defined by outstanding Argentinean experts as “pollution by species”, causing damages to diverse industrial ports and coastal facilities.

Given the above mentioned circumstances, it is not feasible to know the moment in which the exotic species with the highest growth rate shall reach climax, status from which its number shall be reduced to a balanced point, being it possible to take a considerable term and causing, in the mean time, damages difficult to be estimated, and thus causing the application of quick prevention measures to impede, to the highest extent possible, the entrance of new harmful organisms to the River Plate Basin.

Taking into account the intrinsic danger involved in the transfer of harmful aquatic organisms and pathogens that may be present in ship ballast water, this justifies including

discharges as waste or residual waters, so that the above mentioned more rigorous prescriptions of internal preventive order be applicable thereto, until specific design and equipment unified international measures are enforced.

NOW, THEREFORE:

THE ARGENTINE COMMANDANT (*PREFECTO NACIONAL NAVAL*)

INSTRUCTS:

SECTION 1.- That all the ships of international maritime shipping, coming from foreign ports and carrying ballast water on board, with destination to or calling at Argentine ports for which access they shall, at some moment, navigate along the River Plate, shall deballast or exchange ballast water, before entering such shipping waterway and the zone of polluting actions prohibition located in front of the river external limit (1). To the extent possible, they shall carry out ballast tank cleaning to remove sediments.

SECTION 2.- That ships mentioned in Section 1, which destination is to make operations of load transfer or complementation, and which for doing so, should navigate along the River Plate or along the zone of polluting actions prohibition located in front of its external limit, shall comply with the provisions of Section 1, when the load is destined to, or comes from an Argentine port.

SECTION 3.- That ships included in the previous sections that opt for deballasting and remaining in such condition, shall refrain from cleaning ballast tanks, or from removing sediments in the zone of polluting actions prohibition located in front of the River Plate external limit, and in river waters or in internal waters of Argentine ports, corresponding to the relevant basin.

SECTION 4.- That ships that could not comply with what is set forth in Sections 1 and 2, shall retain ballast water on board, until they are again outside the River Plate basin and outside the zone of polluting actions prohibition located in front of the external limit thereof.

SECTION 5.- That when the ships above mentioned approach the River Plate and the zone of polluting actions prohibition located in front of the external limit thereof, in "in coming" navigation, upon communicating by radio-electric mode with the Coastal Station of the river Plate CONTRASE (2) for the relevant coordination, the Pilot of the foreign flagged ships (3), or the Captain in the Argentine flagged ships, shall inform the radio station operator, which of the stated variants has been applied on board, and other data specified in Section 6 hereof.

SECTION 6.- For the purposes set forth in the previous section, the captains of such ships shall record in their Daily Book of Sailing, the following information on deballast maneuvers, ballast water exchange, or ballast retention on board:

- 6.1. Ship position (latitude and longitude), date and hour of operation commencement;
- 6.2. Total amount (in m³ or tons) of water discharged to sea, or exchanged;
- 6.3. Place of origin of discharged ballast (if relevant);
- 6.4. Identification and capacity (in m³ or ton.) of ballast tanks used in the operation (even in the event of emergency ballast tanks);
- 6.5. Amount (in m³ or tons) of non-exchanged ballast water, retained on board, and in which tanks;
- 6.6. Ship position (latitude and longitude), date and hour of conclusion of operation;
- 6.7. Method applied for ballast water exchange (Section 7).

SECTION 7.- The methods admitted for ballast water exchange are (see Annex 1-a):

7.1. Total deballasting and reballasting.

7.2. Flow-through.

7.3. Overflow.

SECTION 8.- Prefectura Naval Argentina may consider the possibility to allow for the application of ballast water treatment methods, complementary to those set forth in Section 7, once the viability thereof has been evidenced. When there is intention to use them as substitution alternative, these should be recommended by the International Maritime Organization. In any case, they shall be presented by note for approval, with a minimum anticipation to the date on which they are intended to be applied:

8.1. Three (3) months, if they follow a method, system, equipment or technology, approved by IMO Marine Environment Pollution Committee resolution.

8.2. Six (6) months, if they respond to studies and experiences scientifically carried out, but not approved by IMO, for which they shall be accompanied by a complete and detailed report, executed by at least two professionals evidencing expertise in the issue and registered with a professional association of the Republic of Argentina that will grant a Certificate of Professional Work.

8.3. One (1) year, when they respond to a study that has neither been approved nor scientifically checked by IMO, in which case they should include all the background and a complete technical report, to be sent to a specialized laboratory, without the approval of which, the proposed method shall not be accepted. Expenses to be supported for such approval analysis, tests and studies shall be supported by the interested parties.

SECTION 9.- The options included in Annex 1-b hereto are admitted only as a complement to the methods of ballast water treatment set forth in Section 7, since the scope of application thereof is limited, or they may have adverse collateral effects.

SECTION 10.- For compliance with this Ordinance, the "Guidance on Safety Aspects of Ballast Water Exchange at Sea", set forth by the International Maritime Organization as an integral part of the Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens, Res. A.868 (20), included in Annex 2 hereto shall be applied.

SECTION 11.- Prefectura Naval Argentina may take samples of the content of ballast tanks, pipes and pumps to control, by means of the methodology deemed more convenient, the presence of aquatic harmful organisms, and to verify that the specifications of this Ordinance have been duly complied with.

SECTION 12.- Prefectura Naval Argentina may seal ballast water tanks and/or pump control valves of ships that opt for the variant set forth in Section 4, to assure that ballast water that is not exchanged in open sea, is not discharged on the way to Argentine ports of the River Plate Basin, or inside thereof.

SECTION 13.- In ships that have carried out an operation admitted in Section 7 hereof, a degree of salinity in ballast water of less than thirty parts per thousand (30 mg/cm^3) (4), shall not be admitted, after having been exchanged. In the event that the measures carried out on the samples show a salinity inferior thereto, it shall be considered that the ballast water exchange operation was not satisfactorily carried out or that it was carried out very near the River Plate, in which case Sections 4 and 12 hereof shall be applicable, without prejudice of administrative penalties that may also be applied to the responsible persons.

SECTION 14.- Naval crafts and platforms (as per the definition thereof in Section 801.0601. subsection a. of REGINAVE), having an international maritime shipping certificate, shall

comply with the prescriptions of this Ordinance, being subject to the obligations and prohibitions set forth therein, whichever its operative condition. When they do not have a certain port as destination, but a place located under the Argentine jurisdiction, within the scope set forth in Section 1, such place shall be deemed as Argentine port for the purposes of application.

SECTION 15.- The Maritime Agencies of Argentine ports located in the River Plate and the rivers of its basin, shall inform the ships they assist and the shipping companies they represent, with the necessary anticipation, the requirements set forth in this Ordinance, through a due means of communication. Thereto, they shall keep relevant evidence thereof. If the captains allege lack of knowledge, the Maritime Agencies shall justify compliance with this provision with Prefectura. Lack of evidence shall imply concurrent liability for omission of the relevant Maritime Agent.

SECTION 16.- This Ordinance shall be enforced:

- 16.1. For ships of Argentine registration, those registered under Regulatory Orders No. 1772-91, 1493-92, 343-97 and 1091-87, and those that under any mode may incorporate in the future with a right to be considered as of Argentine Flag, sixty (60) days after the day following the date set forth in the heading.
- 16.2. For foreign flagged ships, sixty (60) days after the day following the date of publication by the International Maritime Organization.

SECTION 17.- Be these presents duly communicated, published and registered.

Buenos Aires, September 4th, 1998.

By: **Jorge Humberto Maggi**
Rear Admiral (*Prefecto General*)
Commandant (*Prefecto Nacional Naval*)

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- (1) The Treaty of the River Plate and its Maritime Front, approved by Act No. 20,645, sets forth in Section 78 a “zone of polluting actions prohibition”, marked by an imaginary line from Punta del Este (Republic of Uruguay) to Punta Rasa, Cape San Antonio (Republic of Argentina). From there to a point located in latitude 37° 32' South, longitude 55° 23' West. From there to a point located in latitude 36° 14' South and longitude 53° 32' West. From there to the place of origin in Punta del Este.
 - (2) Service of Traffic Control and Shipping Security of Prefectura Naval Argentina (CONTRASE).
 - (3) Sections 145 and 146 of Shipping Law No. 20,094.
 - (4) The salinity of oceanic waters ranges from 34 to 36 parts per thousand. The adopted value coincides with that effective in US since May 10th, 1993, through Deed of 1990 of Prevention and Control of Non Autochthonous Aquatic Organisms - P.L. 101-646.

(Provision DPMA, RE3 No. 1-98)

PREFECTURA NAVAL ARGENTINA

Annex 1 to Ordinance No. 7-98 (DPMA).

a) BALLAST WATER EXCHANGE METHODS (Section 7)

a.1. **Total Deballasting and Reballasting:** It is the simplest and most effective technique for ballast water exchange, since it guarantees that there is practically no content of the tanks on board. However, this implies risks for stability that is the purpose of ballast. Thus, operations shall be carried out in sequence, whether of a tank at a time, by pairs of tanks, or with the help of efficient proven calculation charts, in such a way that the loss of the righting coupler is not significant. Considerations referred to hogging and sagging efforts shall also be taken into consideration.

a.2. **Flow-Through:** It consists in exchanging ballast without emptying tanks, filling them at the same time with clean water in a minimum amount equivalent to three (3) tank volumes to be pumped (IMO Res. A.868(20) item 9.2.1.). This ensures stability by maintaining complete ballast, provided that equivalent inlet and outlet flows are observed. The obtained effectiveness is directly proportional to the number of "equivalent volumes" of pumped water and to design issues related to water evacuation.

a.3. **Overflow:** It is similar to the flow-through method, pumping water for a certain time and causing the excess to overflow through the superior part. This guarantees ship stability, but reduces effectiveness as to the elimination of harmful organisms in ballast water, especially when they settle in the bottom. If the flow-through is connected to pipes that take water from the bottom of tanks, with a proper number of pumped volumes, effectiveness over 98% may be achieved. Nevertheless, this requires additional installations, and overpressure caused in tank bulkheads shall be avoided.

b) OPTIONS ADMITTED AS A COMPLEMENT TO WATER BALLAST TREATMENT METHODS ON BOARD SHIPS (Section 9).

b.1. **Filtering Systems:** The filtering systems constitute a method of physical separation, very much implemented in industrial and sanitary applications. Their design is determined by size and type of the particles to be removed. Filtration systems require regular cleaning, either manually or with automatic devices for counter-cleaning. For practical effects, they are not effective for microorganism control, but using auto-clean mechanisms, it is the method that up to now has been producing the most promising results.

b.2. **Oxidizing and Non-Oxidizing Biocides:** Oxidizing biocides, mainly chlorine and ozone, are very much used in residual water treatments. Organic structures, such as cellular membranes, are destroyed by adding strong oxidizers. The use of gaseous chlorine is dangerous on board, but sodium hypo-chlorite or calcium hypo-chlorite may be used. Non-oxidizing biocides include compounds of the glutaraldehyde group, commonly used in industries to avoid the development of organisms in water cooling towers, and in other areas with sediments or biological settlements accumulation. They act similarly to pesticides, interfering in the reproductive, neural or metabolic functions of organisms, for example inhibiting breathing. Their discharge to the environment implies less danger than oxidizers.

b.3. **Thermal Techniques:** High temperatures are commonly used to sterilize water in several applications, and ships have an amount of remaining energy in form of heat available in the propelling plant cooling water. Theoretically, ballast water should warm at values

ranging from 35° to 45° C, and remain in this way for a certain time, which is not always feasible in short trips. Moreover, many microorganisms are resistant to the temperatures produced by machines cooling systems.

- b.4. **Electric Pulses and Plasma Pulses:** The application of pulsating electric fields, or energy pulses, with a tension of 15 to 45 kW/u sec., may kill organisms in water. Electric pulses systems generate a tension field; those of pulse-plasma deliver a high energy pulse to a mechanism submerged in water, generating a plasma arch. This does not produce toxic wastes, but emits carbon dioxide and theoretically this should generate chlorine.
- b.5. **Ultraviolet Treatment:** Water treatment with UV rays inactivates bacteria, and this responds to thoroughly diffused technologies. Ultraviolet radiation with an approximate wave length of 200 nanometers may destroy cellular components, but not protozoan, fungi, micro and macro algae, or dinoflagellate spores.
- b.6. **Acoustic Systems:** The acoustic systems (including ultrasound) use transducers to apply sound energy of specific length and frequency to water. Sound waves produce cavitations, and the resulting mechanic stress breaks the organism cells. It has been proven in laboratories that this could eliminate several aquatic species, but this depends on frequency and on organisms. 20 kHz ultrasound kills or inactivates bacteria and fungi, but not superior organisms, and low frequency sound signals keep fish away. High intensity acoustic sources may disintegrate young bivalve valves, causing the death thereof.
- b.7. **Magnetic Fields:** Laboratory tests have evidenced effectiveness of the magnetic treatment on invertebrates with calcareous shell. The water to be treated should pass through a specific flow magnetic field, generated by ferromagnetic or electromagnetic means. The biological and chemical effects of these systems have not yet been duly studied, but it is known that organic and inorganic constituents of the organisms that live in water, are altered by the magnetic field. Yet there are no tests for sea water.
- b.8. **Deoxidation:** Most of the aquatic species require oxygen to survive. When the oxygen is eliminated in water, those organisms die, but this does not take place with spores or with anaerobic bacteria. Some organisms that require oxygen, may also survive short periods of anoxia, though they normally remain inactive under such conditions. Oxygen may be eliminated from the water through purge with inert gas, or by capturing it with a chemical additive.
- b.9. **Biological Techniques:** These techniques for control of harmful species, introduce other additional organisms as predators, pathogens or competitors of the species to be controlled. Their use has demonstrated to be useful for the control of certain species of insects, when those used for bio-control achieve self-sustentation, reproducing their population. Biological treatment also includes the use of modern methods of biotechnology to genetically modify unwanted organisms.
- b.10. **Anti-Adherent Coatings:** Anti-adherent coating on ballast tank internal surfaces reduces biological fouling through toxicity by contact, ablation, or superficial activation. Most coatings used up to the moment, are based upon toxicity or ablation, or on a combination of both.

**GUIDANCE ON SAFETY ASPECTS OF BALLAST
WATER EXCHANGE AT SEA**

1. SAFETY PRECAUTIONS.

1.1. Ships engaged in ballast water exchange at sea should be provided with procedures which account for the following, as applicable:

1. Avoidance of over- and under-pressurization of ballast tanks.
2. Free surface effects on stability and sloshing loads in tanks that may be slack at any one time;
3. Admissible weather conditions;
4. Weather routing in areas seasonably affected by cyclones, typhoons, hurricanes, or heavy icing conditions;
5. Maintenance of adequate intact stability in accordance with an approved trim and stability booklet;
6. Permissible seagoing strength limits of shear forces and bending moments in accordance with an approved loading manual;
7. Torsional forces, whether relevant;
8. Minimum/maximum forward and aft draughts;
9. Wave-induced hull vibration;
10. Documented records of ballasting and/or deballasting.
11. Contingency procedures for situations which may affect the ballast water exchange at sea, including deteriorating weather conditions, pump failure, loss of power, etc.;
12. Time to complete the ballast water exchange or an appropriate sequence thereof, taking into account that the ballast water may represent 50% of the total cargo capacity for some ships;
13. Monitoring and controlling the amount of ballast water.

1.2. If the flow-through method is used, caution should be exercised, since:

1. Air pipes are not designed for continuous ballast water overflow;
2. 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 from the bottom and overflowing from the top; and,
3. Certain watertight and weathertight closures (*e.g.*, manholes) which may be opened during ballast exchange should be re-secured.

1.3. Ballast water exchange at sea should be avoided in freezing weather conditions. However, when it is deemed absolutely necessary, particular attention should be paid to the hazards associated with the freezing of overboard discharge arrangements, air pipes, ballast system valves together with their means of control, and the accretion of ice on deck.

1.4. Some ships may need the fitting of a loading instrument to perform calculations of shear forces and bending moments induced by ballast water exchange at sea and to compare with the permissible strength limits.

1.5. An evaluation should be made of the safety margins for stability and strength contained in allowable seagoing conditions specified in the approved trim and stability booklet and the

loading manual, relevant to individual types of ships and loading conditions. In this regard particular account should be taken of the following requirements:

1. Stability to be maintained at all times to values not less than those recommended by the International Maritime Organization (or required by the Administration);
 2. The longitudinal stress values not to exceed those permitted by the ship's classification society with regard to prevailing sea conditions; and
 3. Exchange of ballast in tanks or holds where significant structural loads may be generated by sloshing action in the partially filled tank or hold to be carried out in favorable sea and swell conditions so that the risk of structural damage is minimized.
- 1.6. The ballast water management plan should include a list of circumstances in which ballast water exchange should not be undertaken. These circumstances may result from critical situations of an exceptional nature, force majeure due to stress of weather, or any other circumstances in which human life or safety of the ship is threatened.

2. CREW TRAINING AND FAMILIARIZATION.

- 2.1. The ballast water management plan should include the nomination of key shipboard control personnel undertaking ballast water exchange at sea.
- 2.2. Ships' officers and ratings engaged in ballast water exchange at sea should be trained in and familiarized with the following:
 1. The ship's pumping plan, which should show ballast pumping arrangements, with positions of associated air and sounding pipes, positions of all compartment and tank suction and pipelines connecting them to ship's ballast pumps and, in the case of use of the flow-through method of ballast water exchange, the openings used for release of water from the top of the tank together with overboard discharge arrangements;
 2. The method of ensuring that sounding pipes are clear, and that air pipes and their non-return devices are in good order;
 3. The different times required to undertake the various ballast water exchange operations;
 4. The methods in use for ballast water exchange at sea, if applicable, with particular reference to required safety precautions; and,
 5. The method of on-board ballast water record keeping, reporting and recording of routine soundings.