JFE BallastAce Receives Final Approval from IMO
– Complete Lineup for All Ships, Acceleration of Sales –

20 April 2010
JFE Engineering Corporation
Toagosei Co., Ltd.

The JFE BallastAce ship ballast water management system*[1], which was developed by JFE Engineering Corporation (Chiyoda-ku, Tokyo; President and CEO: Sumiyuki Kishimoto), received final approval at the 60th Session of the Marine Environment Protection Committee (MEPC60) of the International Maritime Organization (IMO) in March of this year. At the same time, the IMO also granted final approval for the chemical agent to be used with the JFE BallastAce system, which was developed jointly by Toagosei Co., Ltd. (Minato-ku, Tokyo; President: Futoshi Hashimoto) and two group companies.*[2]

JFE BallastAce is a system which treats aquatic organisms and bacteria contained in ballast water using a composite process comprising filter elements, chemical agents,*[3] and Venturi tubes.*[4] The system was created by combining the JFE Group's extensive range of technology/know-how in the areas of water treatment, mechanical systems, and shipbuilding, and the chemical technologies and know-how of the Toagosei Group. The features of the system include high performance that reliably satisfies ballast water discharge standards*[5] and a simple, compact layout. A complete lineup is available, from a 3,500m^3/h model, which boasts the world's largest treatment capacity in a single unit, to small-scale models, answering the need for installation on ships of all sizes. In addition to installation during ship construction, the system is also easily retrofitted on existing ships. Furthermore, the chemical agent used with the system is safe. In cooperation with the Toagosei Group, JFE Engineering has already established a chemical agent supply system which covers all parts of Japan, as well as Shanghai and Singapore, and plans to expand this supply network to approximately 20 bases worldwide within 1 year.

In the near future, JFE Engineering expects to receive type approval for the system from Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT). With MLIT's approval, the company will actively accelerate its sales development effort,

with the aim of receiving orders for more than 300 ships annually by 2012. JFE Engineering will be an exhibitor at the International Maritime Exhibition "SEA JAPAN"(April 21-23; Tokyo Big Sight Exhibition Center), which is the largest maritime industry exhibition in Japan, and introduce the JFE BallastAce system at that event.

JFE Engineering and the Toagosei Group are contributing to protection of the marine environment with advanced technologies.

[Explanation of Terminology]

*1 Ballast water management system

System used to control the levels of aquatic organisms and bacteria contained in ship ballast water to within certain standards.
Ballast water is sea water which tankers and cargo ships take on in tanks in the ship's bottom at an unloading port in order to maintain balance when sailing empty, and then discharge at the loading port. Because disruption of ecosystems by the aquatic organisms and bacteria transported with ballast water has become an international problem, in 2004, the International Maritime Organization (IMO) adopted the "International Convention for the Control and Management of Ships' Ballast Water and Sediments." Under this Convention, all ocean-going ships which are subject to its requirements are obligated to control the levels of aquatic organisms contained in the ballast water used in operation to the D-2 discharge standard.

*2 Two group companies (subsidiaries) of Toagosei Co., Ltd.

Tsurumi Soda Co., Ltd. (Tsurumi-ku, Yokohama; President: Souji Hattori)
TG Corporation (Minato-ku, Tokyo; President: Hideo Kato)

*3 Chemical agents

The chemical agent (active substance) used with the JFE BallastAce system is a chlorine-based biocide, "TG ballast Cleaner®" (main ingredient: sodium hypochlorite), which kills aquatic organisms and bacteria mixed and transported in ballast water. This chemical agent was developed by the Toagosei Group. A

reducing agent, TG Environmentalguard®" (main ingredient: sodium sulfite) is also used at the time of ballast water discharge to reduce, neutralize, and detoxify any biocide remaining in the treated ballast water.

*4 Venturi tubes

The JFE BallastAce system includes a system of Venturi tubes, which greatly enhance the disinfection performance of the biocide by intense agitation and uniform mixing of the biocide in the ballast water, employing vortices generated by constriction/expansion of the flow passage.

*5 Reliably satisifies ballast water discharge standards

In 2008, JFE Engineering and Monohakobi Technology Institute (MTI; Chiyoda-ku, Tokyo; President: Yutaka Yasunaga), a subsidiary of Nippon Yusen Kabushiki Kaisha (NYK Line), began trials to verify the applicability of the JFE BallastAce system to actual ships, and confirmed that the system reliably achieves the relevant international standards.

Standard Product Lineup

	Treatment capacity (/h)	Unit dimensions		
		Length(mm)	Width(mm)	Height (mm)
BallastAce 500	500	3,000	1,900	2,200
BallastAce 1000	1,000	3,700	2,400	2,200
BallastAce 1500	1,500	4,700	2,700	2,300
BallastAce 2500	2,500	5,600	3,100	2,500

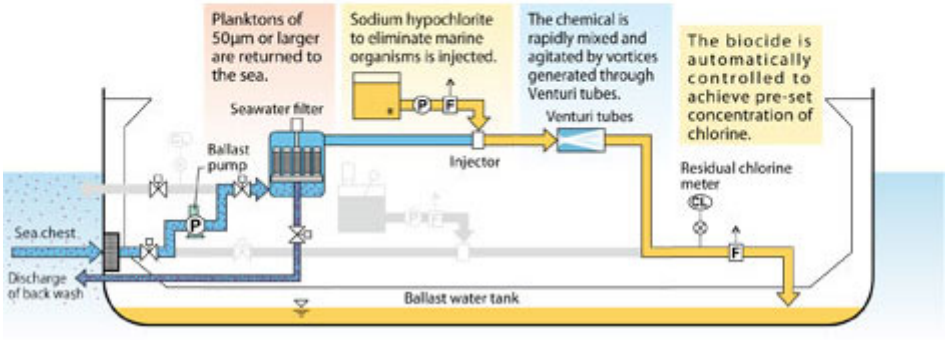
BallastAce 3500	3,500	6,600	3,500	2,600

- Upon request, it is also possible to provide systems with other treatment capacities.
- Although the above dimensions assume "unit installation" (installation of the equipment as a unit in one location), other layouts are also possible by separately installing the individual equipment (modular installation).

Ballast Water Treatment Flow

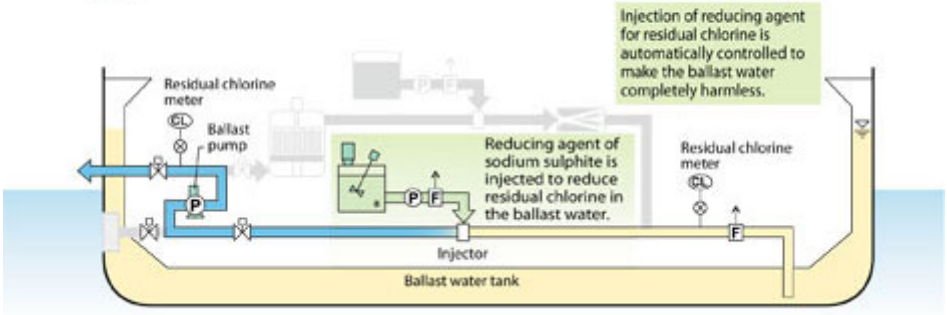
At ballasting (at unloading ports)

1. Marine organisms in the seawater are retuned to their habitats when the seawater passes through the high-performance filter elements.
2. Small plankton and bacteria, including colon bacilli, contained in the filtered seawater are treated by appropriate chemical agents, and by mixing and agitation in the venturi tubes.



At de-ballasting (at loading ports)

1. Residual chemical agents in the ballast water are neutralized and made harmless by a reducing agent before discharging to the sea.



* TG BallastcleanerR (biocide, sodium hypochlorite) and TG EnvironmentalguardR (reducing agent; sodium sulphite) are both registered trademarks of Toagosei of Japan.

For further information, please contact:

Ship Machinery Division
Industrial Machinery Sector
JFE Engineering Corporation.