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November 18, 2015

Kwang San Co., Ltd.
Attn: Mr. Gook-Bo, Han
(618-230) 521 Gwahaksandan-ro, Gangseo-gu,
Busan, Republic of Korea

ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE

The Coast Guard has completed its review of the Alternate Management System (AMS) application submitted by Kwang San CO., Ltd., for the BioViolet ballast water treatment system (BWTS). This letter grants AMS acceptance in accordance with the requirements of 33 CFR 151.2026 for the BioViolet BWTS models with the specified treatment rated capacity (TRC) listed below. These models were type approved by the Ministry of Oceans and Fisheries of the Republic of Korea under type approval certificate No. 2015-4 issued April 3, 2015, and expiring on April 2, 2020, and type approval certificates No. 2015-5 through 2015-11 issued April 15, 2015, and expiring on April 14, 2020.

The following Kwang San BioViolet models are accepted for use as an AMS in U.S. waters:

- BioViolet-150 with TRC of 150 cubic meters/hour (m³/h)
- BioViolet-250 with a TRC of 250 m³/h
- BioViolet-350 with a TRC of 350 m³/h
- BioViolet-500 with a TRC of 500 m³/h
- BioViolet-750 with a TRC of 750 m³/h
- BioViolet-1000 with a TRC of 1,000 m³/h
- BioViolet-1250 with a TRC of 1,250 m³/h
- BioViolet-1500 with a TRC of 1,500 m³/h

The BioViolet models are assigned the following AMS identification number:

AMS-2015-KwangSan- BioViolet-001

Coast Guard acceptance of the BioViolet BWTS as an AMS does not accord or imply conformance to or compliance with any other Federal, state, or local water discharge effluent limitations that may apply to the vessel on which the AMS operates or the regulatory regimes and locations within which it operates. The owner and operator of the vessel must comply with all applicable laws, regulations, and treaties, including the Clean Water Act and associated provisions of the Vessel General Permit (VGP); the Federal Insecticide, Fungicide, and Rodenticide Act of 1972, as amended (FIFRA); other Coast Guard safety regulations and requirements; and other applicable laws and regulations.

In accordance with 33 CFR 151.2026 (a)(5), the AMS application required the submittal of a type approval application for the BWTS. The type approval information submitted with the AMS application does not have any bearing on the type approval status of the BWTS, nor does Coast Guard acceptance of the BioViolet BWTS as an AMS indicate that the BWTS meets requirements for Coast Guard approval.

The following conditions apply for the operation of the BioViolet BWTS in U.S. waters:

1. The AMS manufacturer must comply with all general conditions of certification stipulated in the type approval certificate issued by the Ministry of Oceans and Fisheries of the Republic of Korea, as referenced above. Revocation of type approval by the approving authority will result in revocation of this AMS acceptance. Copies of all reports required under the stated conditions of use must be submitted to the Office of Environmental Standards (OES-3) at the following address or email:

COMMANDANT (CG-OES-3)
U.S. Coast Guard Stop 7509
2703 Martin Luther King Jr. Ave SE
Washington DC 20593-7509
e-mail: environmental_standards@uscg.mil

2. Installation and repairs of the AMS must be performed in accordance with the manufacturer's instructions and approved by the flag administration or its representative.
3. Operation and maintenance must be conducted in accordance with all specifications and limiting conditions stipulated on the type approval certificate and with the manufacturers instructions, including any limitations posed by the environment (for example, water quality, temperature, salinity, or other parameters) or vessel operations (for example, voyage duration, pumping rates, or other constraints). The following specific conditions apply:
 - a. **Flow rates:** The flow rate of ballast water through the system should not exceed the TRC for the installed BioViolet model, as specified on the BioViolet type approval certificate. System flow is controlled by the flow meter and flow control valve. If the control system senses readings outside the normal operating range, the control system stops operation of the ballast pump and the BWTS.
 - b. **Differential pressure across the filter:** The BioViolet BWTS is equipped with an automatic back-flushing filter that is used only during ballast water uptake and is bypassed during de-ballasting. The filter consists of wedge wire type elements installed in a cylindrical housing. The quantity of the elements vary according to the model. The filter increases the disinfection efficiency of the UV system by removing aquatic organisms greater than 50 microns (μm). The BWTS controller module directs the operation of the filter. If the differential pressure across the filter element

exceeds 0.5 bar on uptake, the filter is cleaned of debris by a self-cleaning process that uses incoming ballast water.

- c. **Ultraviolet light (UV) dosage, transmittance, and intensity:** The type approval certificates for the BioViolet BWTS specify a minimum UV dosage of 45 milliWatt per square centimeter (mW/cm²). UV transmittance is a function of water quality, water flow, and UV lamp output. The BioViolet control systems has two UV sensors that measure UV intensity to compute the UV dose required and to control power to the UV lamps for optimal efficiency.

A historical record documenting that the system has been operated within these criteria, including a record of any alarm conditions, shall be made available for review onboard the vessel.

4. Because the BioViolet BWTS has not been adequately tested in freshwater, its use as an AMS is limited to the treatment of marine and brackish water with a practical salinity unit (PSU) concentration greater than 1.
5. If installed on a U.S. flag vessel, it must be shown that the system and installation comply with or provide an equivalent level of safety to the requirements of 46 CFR Subchapter F (Marine Engineering) and Subchapter J (Electrical Engineering). All electrical equipment located within hazardous areas must be explosion proof or intrinsically safe as certified by an independent laboratory recognized by USCG per 46 CFR 111.105-7.
6. Use of the AMS must be specified in the ship's ballast water management plan (BW plan), required by 33CFR 151.2050(g). The BW plan must identify: (1) the ballast water management practices to be used in the event the AMS cannot be used, and (2) the personnel responsible for the operation, maintenance, and repair of the BWTS. An up-to-date record of the operation, maintenance, and repair of the BWTS must be maintained onboard the ship.
7. Any change in design, materials, manufacturing, or intended operational conditions of this BWTS without prior notification to, and acceptance by, the U. S. Coast Guard will automatically invalidate this AMS acceptance. Prior to any such change, the manufacturer of an AMS must notify the Commanding Officer, U. S. Coast Guard Marine Safety Center (MSC), at the following address or e-mail:

Commanding Officer (MSC)
Attn: Marine Safety Center
U.S. Coast Guard Stop 7410
4200 Wilson Blvd, Suite 400
Arlington VA 20598-7410
e-mail: msc@uscg.mil

The notification must include (1) a description of the change, the reason it is required, and its intended advantages; (2) an explanation of any effect of the change on installation, operation, maintenance, or repair requirements; and (3) an indication of whether or not the original configuration of the BWTS will be discontinued.

8. If the installed AMS does not operate properly when treating ballast water intended for discharge in U.S. waters, the person directing the movement of the vessel must ensure that the problem is reported to the nearest Coast Guard Captain of the Port (COTP) or District Commander as soon as practicable. The Coast Guard shall be notified of any treatment system or component failures, irreparable damage to components of the AMS, frequent process upsets or out-of-bounds operating conditions, or other situations or process-related conditions that may reduce treatment effectiveness. The vessel may continue to the next U.S. port of call, subject to the directions of the COTP or District Commander.
9. All transport and handling of chemicals required for proper operation of the AMS must be conducted in accordance with 46 CFR 147 (Hazardous Ships' Stores), 49 CFR 171-180 (Hazardous Materials Regulations), and 46 CFR 98.30 (portable tanks), as appropriate.
10. Use of the AMS must be reported in the ship's ballast water management reports submitted to the National Ballast Information Clearinghouse, as required by 33 CFR 151.2060, as follows:
 - a. In Section 4, report the number of tanks treated by the AMS in the space labeled "Underwent Alternative Management,"
 - b. In Section 4, write the AMS identification number (AMS-2013-BioViolet MK II-001) in the space labeled "Please specify alternative method(s) used, if any," and;
 - c. In Section 5, in the middle section titled "BW MANAGEMENT PRACTICES" identify the management method as "ALT" under the heading "Method (ER/FT/ALT)" for each tank for which the AMS was used.

The Coast Guard may suspend, withdraw, or terminate the acceptance of this BWTS as an AMS in accordance with 46 CFR 2.75-40, 2.75-50(a) and 2.75-50(b), respectively.

A copy of this letter shall be provided to each vessel with this AMS installed and shall be available for review when the vessel is operating in U.S. waters.

I thank you for your dedicated efforts to seek out AMS acceptance, and we look forward to working with you throughout the type approval process. If you have any questions concerning this letter, you may contact Ms. Regina Bergner of my staff at Regina.R.Bergner@uscg.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "S. J. Kelly", with a large, sweeping flourish extending to the right.

S. J. KELLY
Captain, U.S. Coast Guard
Office of Operating and Environmental Standards