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July 3, 2014

Shanghai Cyeco Environmental Technology Co., Ltd.  
Attn: Ji Ming  
Building 2  
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Shanghai 200129  
China

#### ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE

The Coast Guard has completed its review of the Alternate Management System (AMS) application submitted by Shanghai Cyeco Environmental Technology Company, Ltd. for the Cyeco ballast water treatment system (BWTS). This letter grants AMS acceptance in accordance with the requirements of 33 CFR 151.2026 for sixteen Cyeco BWTS models, as type approved by the China Classification Society (CCS) on behalf of the government of China and as detailed in CCS type approval (TA) certificates No. SH13T00064\_02 through No. SH13T00064\_17 issued on November 04, 2013.

The AMS accepted Cyeco models are:

- B200 with a treatment rated capacity (TRC) of 200 cubic meters/hour (m<sup>3</sup>/h) approved under TA certificate SH13T00064\_02.
- B250 with a TRC of 250 m<sup>3</sup>/h approved under TA certificate SH13T00064\_03.
- B300 with a TRC of 300 m<sup>3</sup>/h approved under TA certificate SH13T00064\_04
- B400 with a TRC of 400 m<sup>3</sup>/h approved under TA certificate SH13T00064\_05.
- B500 with a TRC of 500 m<sup>3</sup>/h approved under TA certificate SH13T00064\_06.
- B600 with a TRC of 600 m<sup>3</sup>/h approved under TA certificate SH13T00064\_07.
- B750 with a TRC of 750 m<sup>3</sup>/h approved under TA certificate SH13T00064\_08.
- B800 with a TRC of 800 m<sup>3</sup>/h approved under TA certificate SH13T00064\_09.
- B1000 with a TRC of 1000 m<sup>3</sup>/h approved under TA certificate SH13T00064\_10.
- B1200 with a TRC of 1200 m<sup>3</sup>/h approved under TA certificate SH13T00064\_11.
- B1500 with a TRC of 1500 m<sup>3</sup>/h approved under TA certificate SH13T00064\_12.
- B2000 with a TRC of 2000 m<sup>3</sup>/h approved under TA certificate SH13T00064\_13.
- B3000 with a TRC of 3000 m<sup>3</sup>/h approved under TA certificate SH13T00064\_14.
- B4000 with a TRC of 4000 m<sup>3</sup>/h approved under TA certificate SH13T00064\_15.
- B5000 with a TRC of 5000 m<sup>3</sup>/h approved under TA certificate SH13T00064\_16.
- B6000 with a TRC of 6000 m<sup>3</sup>/h approved under TA certificate SH13T00064\_17.

The Cyeco BWTS is assigned the following AMS identification number:

AMS-2014-Shanghai Cyeco-001

Coast Guard acceptance of the Cyeco 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 Cyeco BWTS as an AMS indicate that the BWTS meets requirements for Coast Guard type approval.

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

1. The AMS manufacturer must comply with all the general conditions of certification stipulated in the TA certificates issued by CCS under the authority of the Chinese government, 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)  
United States Coast Guard Stop 7509  
2703 Martin Luther King Jr. Ave SE  
Washington DC 20593-7509  
Tel: 202-372-1402  
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 TA certificates and with the manufacturer's 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 Cyeco model, as stipulated on the associated CCS type approval certificate. The control panel (PLC) provides real-time and historical records of ballast flow rates.
- b. **Differential pressure across the filter:** The Cyeco BWTS is equipped with an automatic self-cleaning filter. The filter consists of two different types of filtering mediums with a coarse screen used to remove large physical debris and a four layer 50 um fine screen employed to remove sediment and organisms. The Cyeco BWTS is preset to automatically back flush when the pressure differential across the 50 um filter membrane exceeds 0.35 bar (0.035 MPa). Alarms should actuate at the main control panel (PLC) and any installed remote panels if the differential pressure across the filter membrane exceeds this maximum level for a pre-set number of back flush cycles. The PLC provides real-time and historical records of filter pressure differentials and associated alarms.
- c. **UV intensity, transmittance, and dosage:** The UV dose for the CYECO BWTS has a design mean or average level of 250 milli-Joules per square centimeter (mJ/cm<sup>2</sup>). The UV dose operating range of this system is from 220 mJ/cm<sup>2</sup> to 280 mJ/cm<sup>2</sup> (per the Cyeco operations manual). System operations within this UV dosage range are necessary to ensure compliance with the efficacy results cited in the CCS type approval certificates. The CYECO BWTS PLC uses input from a UV intensity sensor located in the UV reaction chamber to maintain the UV dose within the acceptable operating range under varying ballast water flow and turbidity conditions. This BWTS also uses input from this UV intensity sensor to control an automatic UV lamp cleaning apparatus. When ballast water conditions result in a UV dose of less than 230 mJ/cm<sup>2</sup>, as measured at the UV sensor, the PLC of this BWTS should actuate an apparatus that cleans accumulated sediments from the UV lamps and quartz lamp sleeves. The Cyeco BWTS will alarm at the control panel and remote panels if UV dose is not maintained within the preset operating range due to ballast water conditions or other factors. The system will automatically shut down the UV reaction chamber if UV dose falls below the minimum preset operating level. UV dose can be read via data readouts from the PLC.
- d. **Ballast water temperature:** This BWTS employs a temperature sensor within the UV reaction chamber that monitors ballast water temperature at the UV lamp / water interface to ensure the lamps do not overheat. This temperature sensor transmits data to the PLC to maintain this temperature at or below 45 degrees C. If this temperature is exceeded, alarms should actuate at the PLC and remote control locations, followed by automatic shut down of the UV reaction chamber module.

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 Cyeco 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 is specified in the ship's ballast water management plan (BW plan), required by 33CFR 151.2050(g). The BW plan must identify the following: (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 the following: (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, as provided by 33 CFR 160.

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 33CFR 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-2014-Shanghai Cyeco-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 installed AMS 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 Mr. John Meehan of my staff at [John.A.Meehan@uscg.mil](mailto:John.A.Meehan@uscg.mil).

Sincerely,

  
R. E. BAILEY

Captain, U.S. Coast Guard  
Office of Operating and Environmental Standards  
By direction