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May 23, 2014

AQUA Eng. Co., Ltd.
Attn: Mr. Kim Chung-il
#2-62, Sandan-4-ro,
Jeonggan-myeon, Gijang-gun, Busan
Republic of Korea

ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE

The Coast Guard has completed its review of the Alternate Management System (AMS) application submitted by AQUA Engineering Company, Ltd., for the AquaStar™ Ballast Water Management System (BWMS), which is also known as the MacGregor Water Ballast Treatment System (BWTS). This letter grants AMS acceptance in accordance with the requirements of 33 CFR 151.2026 to the MacGregor-AquaStar™ ballast water treatment system (BWTS) models listed below, as type approved by the Ministry of Oceans and Fisheries of the Republic of Korea under type approval certificates No. 2014-1 through 2014-12, issued March 7, 2014.

The following MacGregor-AquaStar™ BWTS models are accepted as an AMS for use in U.S. waters:

- H-150 with a treatment rated capacity (TRC) of 200 cubic meters per hour (m^3/hr), as detailed in type approval certificate 2014-1
- H-200 with a TRC of 200 m^3/hr , as detailed in type approval certificate 2014-2.
- H-200S with a TRC of 350 m^3/hr , as detailed in type approval certificate 2014-3.
- H-250 with a TRC of 500 m^3/hr , as detailed in type approval certificate 2014-4.
- H-300 with a TRC of 800 m^3/hr , as detailed in type approval certificate 2014-5.
- H-350 with a TRC of 1,100 m^3/hr , as detailed in type approval certificate 2014-6.
- H-400 with a TRC of 1,400 m^3/hr , as detailed in type approval certificate 2014-7.
- H-450 with a TRC of 1,800 m^3/hr , as detailed in type approval certificate 2014-8.
- H-550 with a TRC of 2,600 m^3/hr , as detailed in type approval certificate 2014-9.
- H-650 with a TRC of 3,000 m^3/hr , as detailed in type approval certificate 2014-10.
- H-700 with a TRC of 4,000 m^3/hr , as detailed in type approval certificate 2014-11.
- H-750 with a TRC of 5,000 m^3/hr , as detailed in type approval certificate 2014-12.

The MacGregor-AquaStar™ BWTSs are assigned the following AMS identification number:

AMS-2014-MacGregor-AquaStar-001

Coast Guard acceptance of the MacGregor-AquaStar™ 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 MacGregor-AquaStar™ BWTS as an AMS indicate that the BWTS meets requirements for Coast Guard type approval.

The following conditions apply for the operation of the MacGregor-AquaStar™ BWTS in U.S. waters:

1. The AMS manufacturer must comply with all general conditions of certification stipulated in the previously listed type approval certificates issued by the Korean Ministry of Oceans and Fisheries. 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. Because the MacGregor-AquaStar™ BWTS has not been tested in waters with salinities less than or equal to 10 practical salinity units (PSU), its use as an AMS is limited to marine and brackish waters with salinity concentrations greater than 10 PSU.
4. Operation and maintenance of this AMS must be conducted in accordance with all specifications and limiting conditions stipulated on the certificates of type approval and with the manufacturer's instructions, including any limitations posed by 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 MacGregor-AquaStar™ model. According to the operations manual for this BWTS, the minimum flow rate is 10% of the TRC for the installed model.
- b. **Design dose of oxidants:** The MacGregor-AquaStar™ BWTS produces oxidant (sodium hypochlorite solution) through seawater electrolysis to achieve a dosage concentration of 8 to 10 milligrams per liter (mg/L) or parts per million (ppm) total residual oxidant (TRO). A TRO probe automatically monitors the oxidant dose in the treated ballast water flowing to the ballast tanks, and the dose is adjusted by control unit signals to the rectifier module. If the TRO probe indicates that TRO levels in the treated ballast water are less than (<) 8 ppm or greater than (>) 10 ppm for 2 readings, audio and visual alarms will occur at the control panels. If the TRO probe indicates that TRO levels in the treated ballast water are less than (<) 8 ppm or greater than (>) 10 ppm for 3 recurring readings, the BWTS will automatically shut down.
- c. **Maximum allowable discharge concentration (MADC):** Prior to the discharge of treated ballast water, the oxidant residual must be measured to ensure compliance with all applicable Federal, state, and local water quality limits for all discharged chemicals, including disinfectant by-products (DBP). The oxidant residual for this BWTS is measured by the de-ballasting TRO probe, which sends signals to the sodium thiosulfate neutralizer unit to maintain a discharge TRO concentration less than the MADC. If the probe measures a TRO concentration that equals or exceeds (\geq) 0.15 ppm in discharged ballast water, audible and visual alarms will occur at the control panels. If the probe measures a TRO concentration that equals or exceeds (\geq) 0.20 ppm, the AquaStar™ / MacGregor BWTS will automatically shut down.
- d. **Holding time:** To achieve biological efficacy results comparable to those reported in the type approval tests for the MacGregor-AquaStar™ BWTS, treated ballast water must be held for a minimum of 1 day (24 hours) prior to discharge from the vessel's ballast tanks.

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.

- 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:

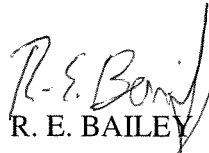
- a. In Section 4, report the number of tanks treated by the AMS in the space labeled “Underwent Alternative Management,”
- b. In Section 4, write the AMS identification number (AMS-2014-MacGregor-AquaStar™-001) in the space labeled “Please specify alternative method(s) used, if any,” and;
- c. In Section 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 Ms. Regina Bergner of my staff at (202) 372-1431 or Regina.R.Bergner@uscg.mil.

Sincerely,



R. E. BAILEY

Captain, U.S. Coast Guard

Office of Operating and Environmental Standards

By direction