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October 2, 2014

Evoqua Water Technologies, LLC
Attn: Vadim Zolotarsky
2 Milltown Court
Union, New Jersey 07083

ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE

The Coast Guard has completed its review of the Alternate Management System (AMS) application submitted by Evoqua Water Technologies, LLC for the SeaCURE ballast water treatment system (BWTS). This letter grants AMS acceptance in accordance with the requirements of 33 CFR 151.2026 for twenty-one SeaCURE models or families of models, as type approved by BSH (Bundesamt für Seeschifffahrt und Hydrographie), the Federal Maritime and Hydrographic Agency of Germany, and as detailed in BSH type approval (TA) certificate No. 0800S41-4443/000/4/Siemens/Evoqua issued on February 24, 2014 and expiring December 31, 2019 (for the SC-1500 family of models) and subsequent BSH type approval certificate No. 0800S41-4443/000/4 issued on September 8, 2014 and expiring September 8, 2019 (for the SC-800, SC-1000, SC-2500, SC-3000, and SC-4000 families of models).

The following Evoqua SeaCURE models are accepted for AMS use in U.S. waters:

- SC-300-800/1 with a treatment rated capacity (TRC) of 300 cubic meters/hour (m³/h);
- SC-500-800/1 with a TRC of 500 m³/h;
- SC-800-800/1 with a TRC of 800 m³/h;
- SC-300-800/2 with a TRC of 300 m³/h;
- SC-600-800/2 with a TRC of 600 m³/h;
- SC-800-800/2 with a TRC of 800 m³/h;
- SC-1000-1000/1 with a TRC of 1000 m³/h;
- SC-1000-1000/2 with a TRC of 1000 m³/h;
- SC-1500-1 (model family) with a TRC of 1500 m³/h;
- SC-2000-2500/1 with a TRC of 2000 m³/h;
- SC-2250-2500/1 with a TRC of 2250 m³/h;
- SC-2500-2500/1 with a TRC of 2500 m³/h;
- SC-2000-2500/2 with a TRC of 2000 m³/h;
- SC-2400-2500/2 with a TRC of 2400 m³/h;
- SC-2500-2500/2 with a TRC of 2500 m³/h;
- SC-2750-3000/1 with a TRC of 2750 m³/h;
- SC-3000-3000/1 with a TRC of 3000 m³/h;

- SC-3000-3000/2 with a TRC of 3000 m³/h;
- SC-3300-4000/1 with a TRC of 3300 m³/h;
- SC-4000-4000/1 with a TRC of 4000 m³/h;
- SC-4000-4000/2 with a TRC of 4000 m³/h.

The Evoqua SeaCURE BWTS is assigned the following AMS identification number:

AMS-2014-Evoqua SeaCURE-001

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

The following conditions apply for the operation of the Evoqua SeaCURE AMS in U.S. waters:

1. The AMS manufacturer must comply with all the general conditions of certification stipulated in the TA certificates issued by BSH under the authority of the German 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 Environmental Standards Division (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

October 2, 2014

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 this AMS should not exceed the TRC for the installed Evoqua SeaCURE model, as specified on the applicable BSH type approval certificate. A historical record of flow rates is available via readouts from the control panel.
- b. **Differential pressure across the filter:** This AMS is equipped with a 40 micrometer mesh self-cleaning filter unit. The maximum pressure differential across the filter can be preset by the operator within a range of 0.35 to 0.50 bar, based on the observed sediment load of the intake ballast water. The Evoqua SeaCURE BWTS is set to automatically back flush the filter unit if the differential pressure across the filter exceeds the pre-set maximum. A differential pressure high level alarm is activated at the control panel if the differential pressure across the filter meets or exceeds 0.8 bar after back-flushing. A historical record of pressure differential alarms can be obtained via readouts from the control panel.
- c. **Design dose of active substances:** The active substance disinfecting oxidant (hypochlorite solution) for this AMS is generated in situ by electrolysis. Per the BSH type approval certificates, the maximum allowable dosage of active substance or TRO (total residual oxidant) is 6.0 mg/L or 6 ppm (measured as chlorine) in the treated ballast water. The active substance dosage level for this BWTS is automatically monitored and set via control circuitry using input from two 2 in-line ORP probes. This BWTS is designed to operate at the maximum 6 mg/L hypochlorite dosing level until input from the ORP probes establishes the appropriate dosage set point for the intake ballast water being treated. Active substance dosage is then adjusted downward, as necessary, based on input from the ORP probes. (ORP probes measure oxidation reduction potential as an indication of active substance oxidant levels in the treated ballast water.) A historical record of active substance (TRO) dosage levels can be obtained from the control panel.

The amount of hypochlorite generated is governed by a DC current control circuit that sets the output level of the electrolyzer / rectifier units. At the maximum allowable active substance dosage level of 6 mg/L hypochlorite solution, this DC current is at the maximum permitted level. Should the DC current control circuitry fail and the current level rise above the permitted maximum, an alarm will actuate at the control panel and this BWTS will shut down in order to avoid dosing at above 6 mg/L of active substance.

Additionally, when operating in waters with salinity concentrations of less than 25 practical salinity units (PSU), this BWTS is designed to switch the feed water source for the electrolysis process from the intake ballast water to a dedicated high salinity seawater tank onboard the vessel. This should occur when an in-line conductivity sensor detects that the intake ballast water has a salinity level less than 25 PSU. At that time, an alert will appear on the HMI screen on the control panel instructing the operator to switch from seawater treatment mode to freshwater treatment mode. This BWTS is designed to

October 2, 2014

not start ballast water treatment in this situation until the operator makes this freshwater treatment mode selection.

- d. **Maximum allowable discharge concentration (MADC):** Prior to the discharge of treated ballast water, the active substance or TRO concentration must be measured to ensure compliance with all applicable federal, state, and local water quality effluent levels for all discharged chemicals, including disinfectant by-products (DBP). For this BWTS, the TRO concentration in the ballast water to be discharged is monitored by a ORP probe, which measures the oxidation reduction potential of the water as an indication of TRO concentration. A sodium sulfite injection neutralizer unit uses input from both this ORP probe and the operator to achieve a TRO level in the discharged ballast water that is below the MADC. This BWTS also employs a sensor which detects changes in amount of sodium sulfite solution remaining in the neutralizer storage tank. If this neutralizer solution volume in the tank does not change during de-ballasting, an alert message signal should appear at the control panel monitor instructing the operator that there is a problem with neutralizing solution input to the treated ballast water. Additionally, the operations manual for this BWTS recommends that the crew of the vessel check the TRO of a grab sample of the ballast water being discharged with a handheld TRO analyzer. The operator can then use the results of this sample analysis to adjust neutralizer solution input, as necessary, to ensure the TRO of the ballast water being discharged does not exceed the MADC. TRO discharge concentrations and associated alarms can be obtained via readouts from the control panel.

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. 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.
5. Use of the AMS is specified in the ship's ballast water management plan (BW plan), required by 33 CFR 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.
6. 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.

7. 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.
8. 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.
9. 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-2014-Evoqua SeaCURE-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.

October 2, 2014

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.

Sincerely,

A handwritten signature in blue ink that reads "R.E. Bailey". The signature is written in a cursive style with a large, stylized "B".

R. E. BAILEY

Captain, U.S. Coast Guard

Office of Operating and Environmental Standards

By direction