

U.S. Department of
Homeland Security

United States
Coast Guard



Commandant
United States Coast Guard

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CG-OES Policy Letter
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From: 
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To: Distribution

Subj: MEASUREMENT OF CHLOROPHYLL *a* AS A WATER QUALITY PARAMETER
DURING TYPE APPROVAL TESTING OF ULTRAVIOLET BALLAST WATER
MANAGEMENT SYSTEMS

Ref: (a) Title 46 Code of Federal Regulations (CFR) Subpart 162.060
(b) EPA/600/R-10/146, Generic Protocol for the Verification of Ballast Water Treatment
Technology, version 5.1, dated September 2010

1. PURPOSE. To provide guidance to Independent Laboratories (ILs) on the use of chlorophyll *a* as a testing parameter for Ultraviolet (UV) Ballast Water Management Systems (BWMSs) under reference (a).
2. ACTION. The Coast Guard will follow this policy when implementing the BWMS type approval program. Internet release is authorized.
3. DIRECTIVES AFFECTED. None.
4. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a regulation. It is not intended to, nor does it impose legally-binding requirements on any party. This guidance represents the Coast Guard's current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other Federal and State regulators, in applying statutory and regulatory requirements. Alternative approaches for fulfilling this policy may be acceptable if the approach satisfies the requirements of the applicable statutes and regulations.
5. BACKGROUND. As per reference (a), the Coast Guard type approves BWMS. Prior to gaining certification, a BWMS must pass certain testing requirements, including land-based testing. This land-based testing is conducted at a USCG approved IL, who follows the procedures in references (a) and (b). Table 8, Section 5.4.6 of reference (b) identifies 12 core parameters that are used to verify treatment efficacy for approving BWMSs at ILs. Core parameters are the measurements that are required to determine biological efficacy (BE) for each test cycle and are the minimum measurements required to verify treatment efficacy and the validity of the BE test cycle. Reference (b) defines chlorophyll *a* as a core parameter,

which is used as a bulk measure for testing the presence of phytoplankton. The USCG has received numerous requests from ILs questioning the applicability of chlorophyll *a* as a core parameter when testing UV BWMS for type approval.

6. DISCUSSION.

- a. The Coast Guard finds that chlorophyll *a* can be omitted from the core parameters for the testing of UV BWMS for the following reasons:
 - i. The measurement of chlorophyll *a* by *in situ* fluorescence is used as a bulk measure of phytoplankton. However, chlorophyll *a* measurements are not an appropriate indicator of treatment efficacy of UV BWMSs. Measurements of *in situ* fluorescence of chlorophyll *a* do not distinguish between dead, non-viable, or viable organisms;
 - ii. Treatments using UV radiation target cellular DNA, but are not expected to affect cellular chlorophyll *a* concentrations; and
 - iii. Measurements of chlorophyll *a* based upon *in situ* fluorescence do not delineate among the size classes of organisms, nor do they reflect the variations in per capita cellular concentrations of chlorophyll *a*.

For these reasons, the Coast Guard finds that the chlorophyll *a* parameter can be omitted from the core parameters for UV BWMS testing, however, it is still applicable to the BE verification of existing BWMS technology.

- b. Even though the Coast Guard finds that chlorophyll *a* can be omitted as a core parameter for UV BWMSs, sometimes it may be necessary to test for it as an auxiliary parameter. The measurement of auxiliary parameters are not required during tests unless particular conditions are met in accordance with the references (a) and (b). Generally, the manufacturer will determine if an auxiliary parameter is a good indicator of a core parameter and may subsequently require the measurement of chlorophyll *a*, because it is critical to the system operation. For example, a UV BWMS that measures chlorophyll *a*, as part of the control and monitoring system, to adjust the treatment cycle would require measurement of chlorophyll *a* during the initial testing phase to ensure proper operation. Also, an IL may measure chlorophyll *a*, as doing so might provide useful information in interpreting the results of test cycles.
- c. Lastly, a manufacturer may recommend measurement of an auxiliary parameter, such as chlorophyll *a*, to assess test validity. The Coast Guard will only require testing for chlorophyll *a* if the manufacturer or the IL requires it to be measured to ensure system operation. If a manufacturer or IL determines that measurement of chlorophyll *a* is required because it is critical to the system operation, then it shall be noted and explained in the Operation, Maintenance, and Safety Manual and the IL report for type approval.

7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.

- a. The development of this guidance and the general policies contained within it have been thoroughly reviewed by the originating Office in conjunction with the Office of Standards Evaluation and Development, Commandant (CG-REG). Pursuant to Department of Homeland Security Directive 023-01, Rev.1, associated implementing instructions, and Environmental Planning COMDTINST 5090.1 (series), which guide the Coast Guard in complying with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4370f), we have determined that developing this guidance and enacting its associated policies is categorically excluded (CE) from further environmental analysis under paragraphs #A3, L5, L52 and L58 in Appendix A, of Table 1 of DHS Directive Instruction Manual 023-01, Rev. 1. Our rationale for applying these categorical exclusions is as follows. “Promulgation of rules, issuance of rulings or interpretations, and the development and publication of policies ... and other guidance ... that implement, without substantive change, statutory or regulatory requirements” or “...that interpret or amend and existing regulation without changing its environmental effect “ are covered under DHS CE #A3 . Similarly, “Preparation of guidance documents that implement, without substantive change, the applicable Commandant Instruction or other Federal agency regulations, procedures, manuals, and other guidance documents” is covered by Coast Guard CE #L5. Finally, the policy letter includes elements that pertain to Coast Guard regulations dealing with vessel operation safety standards, as well as equipment approval and carriage requirements. These aspects of the policy letter and its associated guidance are covered under Coast Guard CEs #L52 and #L58, respectively. A final Record of Environmental Consideration (REC) supporting this determination has been generated and is available from the originating program office
- b. This guidance will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this guidance must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates.

8. REQUEST FOR CHANGES. All requests for changes and questions regarding implementation of this policy and/or requests for changes should be directed to the Office of Operating and Environmental Standards (CG-OES), at (202) 372-1430 or environmental_standards@uscg.mil

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