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CG-OES Policy Letter
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A blue ink signature of S. T. Brady, written in a cursive style.

From: **S. T. BRADY, CAPT**
COMDT (CG-OES)

To: Distribution

Subj: GUIDANCE ON TESTING ALTERNATE COMPONENTS FOR A TYPE
APPROVED BALLAST WATER MANAGEMENT SYSTEM (BWMS)

Ref: (a) Title 46 Code of Federal Regulations (CFR) Subpart 162.060
(b) Title 33 CFR Part 151, Subparts C and D

1. PURPOSE. To provide guidance on the testing and validation of alternate components requested to be used with a type-approved BWMS in accordance with 46 CFR 162.060-16.
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 rule. It is not intended to, nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current view 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 existing statutory and regulatory requirements.
5. APPLICABILITY. This policy letter applies to the procedures for testing and approving alternate components for use with a type-approved BWMS.
6. BACKGROUND. The Coast Guard's type approval regulations provide requirements that a BWMS must meet to obtain type approval. Title 46 CFR 162.060-10(f) provides, in part, that a BWMS is eligible for type approval if it meets design and construction requirements; is evaluated, inspected, and tested under land-based and shipboard conditions; is able to consistently meet the ballast water discharge standards in reference (b); and if all applicable components of the BWMS meet component-testing requirements. Once approved, a certification number will be issued and an approval certificate will be sent to the BWMS manufacturer, pursuant to 46 CFR 162.060-10(g).

Increasingly, manufacturers seek to include alternate components in the system bill of materials to give their customers more options for the wide range of circumstances under which BWMS are used. Alternate components include any components not listed in the BWMS Operation, Maintenance, and Safety Manual (OMSM). The only alternate components addressed by this policy letter are filters.

In lieu of dictating specific testing protocols for individual alternate components, 46 CFR 162.060-16(c) defers the determination of testing requirements to the Coast Guard's Marine Safety Center (MSC). In addition, an Independent Laboratory (IL), previously accepted by the Coast Guard under 46 CFR part 159, subpart 159.010 must ensure that any alternate components meet the requirements of 46 CFR 162.060-34. The scope of work necessary for the IL to evaluate an alternate component varies widely, based on the role of the component within the BWMS and its relation to the original component.

In response to numerous informal inquiries regarding testing and evaluating alternate components, the Coast Guard offers this policy letter as guidance to ILs and manufacturers of BWMS regarding the elements necessary for the MSC to accept alternate components. Additional testing may be required depending on the situation.

7. APPROVAL OF ALTERNATE COMPONENTS.

- a. As stated in 46 CFR 162.060-16, a manufacturer of a Coast Guard type-approved BWMS must notify the MSC in writing of any changes or proposed changes to the BWMS. After this notification has been received, the MSC will respond on a case-by-case basis with any additional testing or evaluations that must be completed for BWMS recertification or modification.
- b. For alternate components, a critical consideration is the impact of the alternate component on the system's ability to achieve the required biological efficacy (for instance, reduce the concentration of living organisms to meet the discharge standard in reference (b)). For each alternate component, a design comparison between the original component and the alternate component should be performed. The results of that design comparison should be evaluated by the IL to determine the scope of the empirical testing necessary to validate that the alternate design does not negatively affect the system's ability to achieve the performance requirements established in reference (a). For some components, no testing may be needed. For components directly affecting the ability of the system to achieve the design treatment effect (for instance, core components), replicate testing is typically necessary, but may be conducted at less than full-scale, if recommended by the IL and deemed appropriate and sufficient by the MSC under 46 CFR 162.060-16(c).
- c. Alternate components should also demonstrate compliance with all applicable environmental testing requirements as determined by the MSC under 46 CFR 162.060-16(c). Additionally, once the BWMS with alternate components is approved by the MSC, 46 CFR 162.060-38(b) requires that the OMSM for the previously approved BWMS be

updated to include alternatives. Lastly, the IL should holistically re-examine the changed BWMS to confirm that the assessment performed per 46 CFR 162.060-34(a)(4) is still valid.

- d. At present, filters are the only core component of a BWMS for which the Coast Guard has found more specific and detailed alternate component guidance to be necessary. If other BWMS components, such as ultraviolet (UV) lamps or total residual oxidant (TRO) sensors, are identified by industry as requiring alternate component approvals, the Coast Guard will assess the issue and, if in agreement, issue a revised version of this guidance incorporating any new components.

8. GUIDANCE FOR ALTERNATE FILTERS.

- a. The complexity and importance of filters as core components of BWMS warrants specific guidance for the ILs on an appropriate scope of testing for alternate filters.
 - (1) Alternate filters are filters that are not included or listed within the OMSM. If differences in filter design and operation could reasonably alter the overall efficacy and functionality of the system as it was approved originally, additional testing is likely necessary, as noted in Enclosure (1). Common examples of alternate filters include, but are not limited to, different mesh design or similar design but different manufacturers.
 - (2) If the alteration to the filter is minor, in that it would not be reasonably considered to alter the overall functionality of the approved system, then it may be considered for the abridged testing procedure listed in Enclosure (2). Manufacturers and ILs are reminded that, under 46 CFR 162.060-16, preliminary notification to, and discussion with, the MSC is required if any change is proposed for a previously approved BWMS. The MSC will make the final determination as to whether any proposed changes may be considered minor.
- b. As type approval is carried out on a system-by-system basis, each filter must be specifically listed in the OMSM, as noted in 46 CFR 162.060-38. The regulations do not allow for the general acceptance of alternate filters, outside those listed in the OMSM, to be used interchangeably.

If you have questions regarding the above, please contact the Chief of the Environmental Standards Division at Environmental_Standards@uscg.mil.

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- Encl: (1) Coast Guard Standard Procedure for Testing Alternate Filters
(2) Abridged Coast Guard Standard Procedure for Testing Alternate Filters

Enclosure 1

Coast Guard Standard Procedure for Testing Alternate Filters

1. Testing of alternate filters can be conducted as part of an initial type-approval application, or as part of a change to an existing type approval under 46 CFR 162.060-16.
2. The manufacturer should identify all the differences between the primary filter and all proposed alternate filters to facilitate the design study noted below. The IL should then review the information provided and conduct a design study to assess equivalence to the original filter and compatibility with the overall BWMS. This design study should include comparisons of the following:
 - a. General arrangement of the system and filter interface;
 - b. Filter mesh type, rating, material, and design specification (ASME, ISO, etc.);
 - c. Rated minimum and maximum flow of each filter as identified by the manufacturer;
 - d. Minimum and maximum operating pressures of each filter;
 - e. Differential pressure across the clean filter at maximum flow rate;
 - f. Differential pressure set point to initiate the cleaning/back flush cycle;
 - g. Filter flow characteristics that note the effects of cleaning cycles on throughput and any other unique characteristics of the component;
 - h. Effective filtration area;
 - i. Filtration velocity (flow rate per square meter of effective filtration area); and
 - j. Backflush process characteristics (frequency, mode, etc.).
3. A commissioning test meeting the Environmental Technology Verification (ETV) Protocol should be conducted to ensure that the system is installed correctly and operated in accordance with the manufacturer's requirements. Requests to combine the commissioning test with the first biological efficacy (BE) test can be submitted to the MSC under 46 CFR 162.060-10(b)(1).
4. Three or more consecutive, valid, replicate BE land-based tests meeting the ETV Protocol should be conducted on the BWMS with each alternate filter at each salinity for which the manufacturer is requesting type approval. The IL should compare the alternate filter BE test results to the primary filter BE test results, and the review should show that

the alternate filter provides results that are consistent or better in relation to the primary filter performance. If any testing is invalid or unsuccessful, further review will be necessary.

5. Operating and maintenance testing should be conducted in accordance with the ETV protocol on the BWMS with all alternate filters.
6. Component testing, following the requirements of 46 CFR 162.060-30, should be conducted on any electrical or electronic component of the alternate filters that has not already been subject to such testing.
7. Once complete, the IL should evaluate the information obtained from the steps above to conclude equivalent performance for the overall functionality of the BWMS with the alternate filters. The IL may add criteria as needed to evaluate overall equivalence and compatibility. The IL should include the results of the design study and all other associated testing, along with a recommendation for approval or disapproval of the alternate filters, consistent with the final test report required by 46 CFR 162.060-34.

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Enclosure 2

Abridged Coast Guard Standard Procedure for Testing Alternate Filters

1. An abridged testing procedure may be appropriate for an alternate filter, if the filter is built to the same design as the primary filter, except for component alterations considered by the IL, and accepted by the MSC, to result in minor differences compared to the primary filters.
2. A validation study should address the removal rate for organisms in the $\geq 50 \mu\text{m}$ size class and the < 50 and $\geq 10 \mu\text{m}$ size class to evaluate whether the two versions of the filter have equivalent performance.
3. The validation study should consist of at least two test cycles for each version of the filter in marine or brackish water, and at least two cycles for each version in fresh water, and may appropriately replace the testing specified in paragraphs (4) and (5) of Enclosure (1). The remainder of Enclosure (1) should be followed as written.
4. The challenge water, sampling, and analysis for this testing should meet the ETV Protocol, except the requirements for culturable heterotrophic bacteria and volumes of challenge water. The volume of challenge water processed should be chosen with due consideration of the time necessary to build up filter cake, and the length of backflushing cycles, to ensure that the results accurately represent an average of the entirety of the filter's operations.
5. The number of test cycles necessary to show equivalence depends on how variable the measured removal rates are. Generally, manufacturers and ILs have stated that they expect those rates to be very consistent, so two tests per salinity range may be sufficient. If the rates are more variable than expected, submitters should be cautioned that the data may not support their conclusions, even if the average performance of the two filters is relatively close.

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