



TECHNICAL CIRCULAR No. 476 of 06th April 2018

To:	All Surveyors/Auditors
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Applicable to flag:	All Flags
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Ballast Water Treatment Rollout Revised	
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Reference:	BWM Convention
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Ballast Water Treatment Rollout Should be Revised

After over 20 years of research and negotiations, the International Maritime Organization (IMO) and the U.S. Coast Guard (USCG) are starting to implement and enforce ballast water (BW) regulations. Based on the phase-in schedule, between now and 2024 about 60,000 ships will need to spend an average of \$1 million to \$2 million each to purchase and install ballast water management systems (BWMS). This is resulting in eye-popping predictions about enormous growth in global BWMS markets to well over \$100 billion. One global market intelligence report projects these markets “will grow at a compound annual rate of 39.4% starting in 2018 and reach \$395.65 billion by 2026.”

Unfortunately, using insights from recent economic research results in different predictions. Based on this view, global BWMS markets will not grow significantly for as many years as it takes for the current strategies that IMO and USCG are using to implement BW regulations to fail and be replaced by ones that nurture BWMS markets.

IMO and USCG BW regulations impose two basic compliance requirements on ship owners. Ships need to purchase and install a type of BWMS that has been tested and officially certified by either IMO or USCG or both as being capable of killing or removing enough potentially harmful organisms in BW for the ship’s BW discharge to meet allowable standards. And, when the BW discharged by those ships is monitored and tested for compliance by port state authorities it must actually meet those allowable BW discharge standards.

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As of February 2018, over 70 separate BWMS have been “type approved” by IMO and six by the USCG. However, evidence is mounting that a significant percentage of these type approved BWMS that have been installed on ships are not functioning properly in a mechanical sense. Additional evidence is mounting that a significant percentage of those that are functioning properly are not likely to be able to meet allowable BW discharge standards.

What this means in terms of BW regulations and BWMS markets depends on why certified BWMS are not performing as expected when they are installed on ships. There are three basic possibilities:

- (1) the units installed on ships had manufacturing defects;
- (2) they were not scaled correctly to the ballast water discharge rate of the ship on which they were installed, or were not installed or operated or maintained properly; or
- (3) the certified BWMSs were installed and scaled properly but passed IMO and/or USCG certification testing when they should have failed.

Evidence of BWMS failures that result from (1) or (2) can be eliminated over time, during what IMO refers to as an “experience building stage,” as ship owners work with BWMS manufacturers and installers and improve crew training to get their BWMS units operating and performing properly. Evidence that BWMS failure is a result of (3), certification testing problems, creates bigger challenges for BWMS markets and the implementation of BW regulations that cannot be worked out by industry. They can only be addressed by IMO and/or USCG regulators, and when that happens will determine when BWMS markets develop and when BW regulations will be enforceable.

To put the situation in context, it is useful to view both IMO and USCG BW regulations as enormously ambitious and complex attempts at what economists’ call “technology forcing regulations (TFRs)” and consider each of the five stages of the strategies IMO and USCG are using to implement them:

- (1) *Set a biological BW discharge standard that cannot be achieved with technologies that are available at the time;*
- (2) *Establish a time in the future when these biological standards will be enforced;*

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(3) Trust that potential profits in markets for BWMS technologies that can meet these standards will attract enough investments in research and development for them to be developed in advance of the time the regulations are scheduled to be enforced;

(4) Trust that those same market profits will result in enough investments in BWMS manufacturing and installation capacity to allow widespread shipping industry compliance by the time the regulations are enforced;

(5) Start enforcing the regulations.

The fact that IMO and USCG have both certified BWMS implies that Stage 3 is complete.

In the case of regulation-driven markets, like markets for BWMS, this is particularly important, because buyers and sellers in regulation-driven markets are only as quality conscious as regulators require them to be. This implies that ship owners, if they are forced to purchase and install a certified BWMS, will purchase the least-cost units they believe will put them in compliance.

There is mounting evidence that “quality uncertainty” has been introduced into BWMS markets by inadequate IMO and USCG testing and certification standards and is preventing buyers and sellers from entering BWMS markets. For a variety of reasons, statistics about the numbers of certified BWMS that have been purchased and installed on ships are very difficult to obtain.

A 2016 survey by the American Bureau of Shipping (ABS) indicated that certified BWMS installed on 220 ships, when tested, were inoperable or had significant operating problems 43% of the time. However, that failure rate was defined in mechanical terms (e.g., did it turn on, did the UV bulbs light up, how quickly did the filters clog) and not in terms of whether the BWMS was capable of achieving allowable BW discharge standards. Data regarding the ability of certified BWMS that are operating properly to meet specific discharge standards are not generally available. However, some unofficial reports from limited BW discharge testing indicate that about half of certified BWMS that are operating properly may fail to routinely achieve allowable BW discharge standards.

In any case, there is mounting evidence that some certified BWMS that were scaled and installed properly on ships cannot routinely meet allowable BW discharge standards. Fundamental economic research shows: (a) how this is likely to inhibit the development of BWMS markets; and (b) how it will be used by the shipping industry to avoid or delay compliance costs by preventing BWMS markets from developing.

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Based on the economic fundamentals of TFRs described earlier, it now seems clear that IMO and USCG moved too quickly to certify BWMS in Stage 3 which created “market uncertainty” in Stage 4. This is inhibiting the development of BWMS supply (Stage 4), and also means that ongoing attempts by USCG and IMO to stimulate BWMS supply by moving ahead to Stage 5 and attempting to stimulate BWMS demand by promising to enforce BW regulations is unlikely to succeed.

A better strategy would be for both IMO and USCG to return to Stage 3 and reduce “quality uncertainty” in BWMS markets by retesting and recertifying available BWMS using more reliable, more uniform, and more transparent testing protocols and certification standards. That will stimulate BWMS supply (Stage 4) and allow BW regulations to be enforced (Stage 5).

REFERENCES:

- BWM and Dennis King UOM

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