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Is port-based ballast water treatment a realistic option ?

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New US Coast Guard (USCG) ballast water (BW) regulations require that ships be equipped with and use a USCG-certified ballast water treatment system (BWTS) or, temporarily, an approved Alternate Management System (AMS), in order to legally discharge BW into US waters. The regulations give ship owners who have not met either of these on-board treatment requirements three other compliance options. They can retain BW on board while in US waters, use water from a Public Water Supply, or discharge BW to a port-based ballast water reception facility.

Currently there are no USCG approved BWTS, very few ships have installed AMS, and there is barely any global capacity to produce BWTS and AMS or install them on ships. This means that when US BW regulations start being implemented and enforced in 2014 many ships arriving at US ports needing to discharge BW in order to take on cargo will not have a certified BWTS or an approved AMS. Such ships will want to consider whether any of the other three compliance options make sense before applying to the USCG for a compliance extension.

Using water from a Public Water Supply may be a viable option for some ferries and small work boats, but it is not a feasible option for merchant ships. Retaining BW onboard, which often means not taking on cargo, is also not a feasible option for most merchant ships that are impacted by USCG BW regulations. So, the only potentially viable compliance option for most ships without a BWTS or an AMS is to discharge to a port-based BW reception facility.

From a regulatory perspective, allowing ships to discharge to a port-based BW treatment facility makes sense; and it is technically feasible to build such facilities, and for ships to install BW discharge couplings and related plumbing that would be required for them to use such facilities. However, my research team at the University of Maryland's Maritime environmental resource center (MERC) recently completed a study of the economic and logistical feasibility of ships using a barge-based BW treatment facility at the Port of Baltimore, US. (The report is available on the MERC website)

sustainable shipping

Based on that research, it seems extremely unlikely that merchant ships will have the option of complying with US BW regulations by discharging to port-based BW reception facilities at the Port of Baltimore. We believe we would have reached the same conclusion if we conducted our research at nearly any other US port. For a few shipping companies that operate fleets of ships that travel between specific ports and use dedicated terminals shore-based or barge-based BW treatment may be more cost effective than onboard BW treatment, but these situations will be rare.

Our study examined the cost of constructing and operating a barge-based BW treatment (BBBWT) facility, the cost of outfitting ships to use them, and the combinations of BW discharge volumes and user fees that would allow a BBBWT facility to break even financially. The study also examined potential demand for services of a BBBWT under various assumptions regarding compliance and non-compliance costs, and the likelihood that ship owners would invest in the on-board capacity to use a BBBWT facility, if one existed, and accept the risks and potential lost ship time associated with using a BBBWT facility.

It would not make sense for ship owners to rely for their compliance with US BW regulations on as yet unidentified operators of BBBWT facilities that do not yet exist. Nor would it make sense for ship owners to trust that such facilities will be available when and where they need them, which means on board investments to use such facilities would need to be made in addition to on board investments in BWTS and AMS to allow BW to be discharged legally at ports where no working BBBWT facilities are available.

For reasons described in our study BBBWT options will not be realistic until we witness an astonishing and unprecedented groundswell of mutual trust and integrated global investments by independent ship owners and potential BBBWT facility operators in standardized BW discharge and receiving technologies, and BBBWT systems at ports around the US and elsewhere.

Depending on how US BW regulations are enforced and how fledgling BWTS and AMS markets mature to allow ships to comply the situation could change. However, we think the results of our research that shows limited potential for port-based BW treatment, when combined with the results of earlier MERC research that documented how extremely limited global BWTS and AMS production and installation capacity is likely to prevent widespread compliance using on-board BW treatment, provide evidence that some new steps will be required to make US BW regulations and pending IMO BW regulations succeed any time soon.

One option would be to examine opportunities to use private public partnerships (PPPs) to coordinate the implementation of BW regulations with investments in the development of BWTS and AMS production and installation capacity. What else? Maybe shipping groups and groups concerned about ocean health should contribute to a \$100 million X-Prize awarded to the developers of the first BWTS that routinely meets or exceeds USCG BWTS certification criteria. Perhaps the prize should include a provision that the winner pay back the \$100 million technology kick start prize over twenty years or so with the significant profits that can be expected once the award winner is named and compliance-driven BWTS markets based on the winning technology begin to grow.