

Sir

The use of copper in biofouling coatings has a long and successful history and current regulatory actions point toward a continuation of this application. Inaccuracies in the article in the September 2014 issue of *The Naval Architect* entitled "Smooth Operator – Roadmap for Antifouling" are corrected in this letter.

First the worldwide regulatory status for the use of copper was inaccurate. The statement "*Washington and California in the USA, The Netherlands, Sweden and Denmark for the Baltic Sea have banned copper based coatings for recreational craft*" is false. Of all of those locations only Washington State has a ban and that will not take effect until 2018.<sup>1</sup> In fact a ban in The Netherlands was removed when the European Commission's Scientific Committee on Health and Environmental Risks concluded, "*the risk assessment performed by the Dutch government to justify the draft measure notified to the Commission does not provide sufficient sound scientific evidence to show that the use of copper-based antifouling paints in leisure boats presents significant environmental risks.*"<sup>2</sup> Sweden and Denmark allow copper based antifouling coatings to be used on recreational vessels.<sup>3,4</sup> California did not ban copper on recreational vessels. Instead the coatings manufacturers worked cooperatively with legislators to draft a bill to mitigate copper input while maintaining the availability of these coatings.<sup>5</sup>

The statement, "*Some organisms have developed copper resistance.*" is also inaccurate. Some organisms have more **tolerance** to copper than other organisms. However, that is true of every biocide. It is also true of salinity, temperature, pH and any number of natural and manmade challenges. But, having tolerance and developing resistance are not the same scientifically. The fact that some organisms have natural tolerance to copper is why coatings have the co-biocides mentioned in the article. This misunderstanding has created an emotional reaction that occurs with a comparison to antibiotic resistance of human pathogens. Quite the opposite is true; copper is used in hospitals to control human pathogens.<sup>6</sup>

The statement, "*One can only speculate about a global ban on the currently*

*popular copper-based antifouling paints*" demonstrates a lack of a thorough understanding of current worldwide regulations. Copper antifouling coatings are allowed in every country in the world, have never failed a rigorous scientific risk assessment and were, for instance, just recently reapproved for use by New Zealand EPA after an extensive risk assessment.<sup>7</sup> The most significant recent regulatory actions regarding ship biofouling are focused on preventing nonindigenous species transport and improving the energy efficiency of commercial transport vessels. Examples of this are the New Zealand biofouling standard and the IMO's guidelines for biofouling control and ship energy efficiency.<sup>8,9,10</sup>

Copper based coatings continue to be the preferred method for biofouling control coatings on over 90% of marine vessels with foul control coatings worldwide because they are effective and are safe.<sup>11</sup> The more significant environmental concerns of invasive species introduction and the unnecessary use of carbon fuels from fouled hulls point to copper antifouling coatings being around for a long time to come.

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- 1) Washington State Legislature. (2011-2012). *Certification of Enrollment, Substitute Senate Bill 5436*. Retrieved at <http://apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Senate%20Passed%20Legislature/5436-S.PL.pdf>
- 2) European Commission Scientific Committee on Health and Environmental Risks. (Jan. 30, 2003). *Risk arising from the use of copper-based antifouling paints used in leisure boating, Dutch notification 2003/0201/NL*. Retrieved at [http://ec.europa.eu/health/ph\\_risk/committees/04\\_scher/docs/scher\\_o\\_051.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scher/docs/scher_o_051.pdf)
- 3) KEMI Swedish Chemicals Agency. (June 27, 2011). *Approval of copper paints in the Baltic Sea*. Retrieved at <http://www.kemi.se/en/Content/News/Approval-of-copper-paints-in-the-Baltic-Sea/>
- 4) Danish Ministry of the Environment; Retrieved at <http://mst.dk/virksomhed-myndighed/kemikalier/regulering-og-regler/faktaark-om-kemikalierreglerne/bundmaling/>

- 5) American Coatings Association. (October 15, 2013). *Gov. Brown Enacts ACA-Supported California AB 425, Antifouling Paint Registration and Mitigation*. Retrieved at <http://www.paint.org/news/industry-news/item/1320-gov-brown-enacts-aca-supported-california-ab-425-antifouling-paint-registration-and-mitigation.html?tmpl=component&print=1>
- 6) Copper Development Association. (2012). *Live Experiment Shows That MRSA Dies on Antimicrobial Copper Surfaces*. *Infection Control Today*, 12 April, 2012. Retrieved at <http://www.infectioncontroltoday.com/news/2012/04/live-experiment-shows-that-mrsa-dies-on-antimicrobial-copper-surfaces.aspx>
- 7) New Zealand Environmental Protection Authority. (May 2013). *Evaluation and Review Report, APP201051 – Antifouling Paints*. Retrieved at [http://www.epa.govt.nz/search-databases/HSNO%20Application%20Register%20Documents/APP201051\\_APP201051\\_Evaluation\\_and\\_Review\\_Final.pdf](http://www.epa.govt.nz/search-databases/HSNO%20Application%20Register%20Documents/APP201051_APP201051_Evaluation_and_Review_Final.pdf)
- 8) New Zealand Ministry for Primary Industries. (May 15, 2014). *New Zealand Craft Risk Management Standard, Biofouling on Vessels Arriving to New Zealand*. Retrieved at <http://www.biosecurity.govt.nz/files/regs/ships/crms-biofouling-standard.pdf>
- 9) International Maritime Organization. (July 15, 2011). *2011 GUIDELINES FOR THE CONTROL AND MANAGEMENT OF SHIPS' BIOFOULING TO MINIMIZE THE TRANSFER OF INVASIVE AQUATIC SPECIES*. Retrieved at [http://www.imo.org/blast/blastDataHelper.asp?data\\_id=30766](http://www.imo.org/blast/blastDataHelper.asp?data_id=30766)
- 10) International Maritime Organization. (March 2, 2012). *2012 GUIDELINES FOR THE DEVELOPMENT OF A SHIP ENERGY EFFICIENCY MANAGEMENT PLAN (SEEMP)*. Retrieved at [http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Technical%20and%20Operational%20Measures/MEPC.213\(63\).pdf](http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Technical%20and%20Operational%20Measures/MEPC.213(63).pdf)
- 11) Multiple conversations with major biofouling control coatings manufacturers including AkzoNobel, Hempel, Jotun and PPG.