



**IMO**  
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# **CONTROL OF HARMFUL ANTI-FOULING SYSTEMS ON SHIPS ACT, 2018**

**A Legislation Drafting Project submitted in partial fulfillment of the  
requirements for the award of the Degree of Master of Laws (LL.M.) in  
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# EXPLANATORY NOTE

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## Introduction

The marine environment, despite its beauty, is earth's most valued resource. This environment includes the oceans and all seas and adjacent coastal areas. It 'forms an integrated whole that is an essential component of the global life-support system and a positive asset that presents opportunities for sustainable development.'<sup>1</sup> But the marine environment was not always envisioned through these lenses. In the early 1920s there was no real concern for the marine environment. The concern grew out of the numerous disasters at sea during and after World War II which resulted in marine pollution. Marine pollution is the 'introduction by man, ... of substances ... into the marine environment ... resulting in ... harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water ...'.<sup>2</sup>

The international community began to take notice of marine environment pollution<sup>3</sup> in the 1950s with the 'ever-increasing demand' for hydrocarbon fuels along with considerable marine pollution. This spurred the adoption of the 1954 International Convention for Oil Pollution which prohibited the intentional discharge of oil and oily mixture.<sup>4</sup> Then in 1967, the *Torrey Cannon* incident triggered the adoption of a plethora of international environmental instruments<sup>5</sup> including the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL). Subsequently, the 1970s tankers disasters<sup>6</sup> led to the Conference on Tanker Safety and Pollution Prevention which resulted in the 1978 Protocol to MARPOL (MARPOL 73/78). Today, MARPOL 73/78 has developed to prevent pollution from almost all activities that may arise from ship

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<sup>1</sup>United Nations Conference on Environment & Development AGENDA 21' [1992] <<https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>> accessed 15 April 2018

<sup>2</sup> GESAMP, 'Reducing Environmental Impacts of Coastal Aquaculture' [1991] No.47 GESAMP Reports and Studies <<http://www.fao.org/docrep/006/u3100e/U3100e00.htm>> accessed 30 April 2018

<sup>3</sup> Notably, with the adoption of the United Nations Convention on the Law of the Sea in 1982 (UNCLOS). UNCLOS was the overarching legal regime for the protection and preservation of the marine environment. Article 192 of Part XII of UNCLOS provides for the general obligation for States to protect and preserve the marine environment

<sup>4</sup> Ramat J. A. Jalloh, 'Marine Environmental Law Lecture' (IMO International Maritime Law Institute 2018)

<sup>5</sup> 1969 International Convention on Civil Liability for Oil Pollution Damage (CLC Convention); 1971 – International Convention on the Establishment of an International Fund for Oil Pollution Damage (Fund Convention); and Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter 1972 (London Convention)

<sup>6</sup> Known as the blackest period in marine pollution history - 1974 VLCC Metula, VLCC Showa Maru, Argo Merchant, Sansinena, Oswego Peace, Olympic Games, Daphne, Grand Zenith, Barcola Mary Ann, Universal Leader and Irene Challenge.

operation.<sup>7</sup> Additionally, other specialized environmental international instruments have been adopted supplementary to MARPOL 73/78 to address current marine pollution concerns not covered under MARPOL 73/78 such as compounds used in anti-fouling systems on ships.

Indeed, the purpose of this legislative draft is to implement in The Bahamas the International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001 (AFS Convention) which entered into force on 17 September 2008. The AFS Convention prohibits the use of harmful organotin in anti-fouling paints on ships and establishes a mechanism to prevent the potential use of other harmful substances in anti-fouling systems. The Bahamas acceded to the AFS Convention but, to date, it has not been enacted into domestic legislation, implementing the same.

## **1. Overview of the Problem**

### **1.1 Fouling**

The problem of fouling existed from the early days of shipping. Fouling is a natural phenomenon which describes the growth of marine organisms or species such as algae, fungi, bacteria, protozoa, barnacles, tubeworms, hydroids and mollusks on structures immersed in seawater, such as ships' hulls.<sup>8</sup> The algae overlay the hull yielding adherence of other organisms and the end result is hull fouling.

Fouling results in serious economic and environmental problems. For instance, in the shipping industry fouling increases the surface roughness of the hull, slows down the ship, makes it use more fuel and difficult to maneuver.<sup>9</sup> It is estimated that, after six months of fouling, a ship needs to burn 40% more fuel to maintain a normal speed. This problem results in a decrease in the profit margin of shipowners as they incurred additional costs in cleaning and repainting, plus loss of revenue when dry-docked.<sup>10</sup>

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<sup>7</sup> Annex I – Oil, Annex II – Noxious Liquid Substances, Annex III – Harmful Substances in Packaged Form, Annex IV – Sewage, Annex V – Garbage, and Annex VI – Air Pollution.

<sup>8</sup> Iwao Omae, 'Organotin antifouling paints and their alternatives' [2003] *Appl. Organometal. Chem* <<https://onlinelibrary.wiley.com/doi/epdf/10.1002/aoc.396>> accessed 30 April 2018

<sup>9</sup> *ibid.*

<sup>10</sup> *ibid.*, when a ship is dry-docked, it is lifted out of water and suspended in a dry-dock area with clear access to the entire hull of the ship.

Studies revealed that ‘... an estimated 50% of the operating costs of commercial vessels are from fuel consumption. ... a hull with 5% fouling cover will result in a fuel consumption increase of 5-10%; 33% fouling cover on a vessel will lead to 50% increased fuel costs. This coupled with regular dry-docking to remove biofouling organisms leads to increased shipping costs and decreased profit margins,’<sup>11</sup> and possibly land-based pollution<sup>12</sup> which almost always find its way to our seas and oceans. Other environmental problems include transport of invasive species to sensitize ecosystems, air pollution and acidification of the oceans from the combustion of fuel which can have a direct effect on the marine environment<sup>13</sup> and climate change.

Throughout maritime history, various measures have been developed to prevent marine organisms attaching to ships’ hulls. In earlier times, lime and later arsenical and mercurial compounds and DDT<sup>14</sup> were used to coat ships’ hulls. During the 1960s, the chemicals industry developed effective anti-fouling paints using metallic compounds<sup>15</sup> to coat the hull of ships to prevent sealife such as algae and molluscs from attaching to the ships’ hulls.<sup>16</sup>

## 1.2 Anti-fouling Systems

Evidently, hull fouling places an economic burden on shipowners. As a consequence, shipowners sought ‘effective methods to prevent or reduce biofouling, which occurs when unwanted marine organisms attach to ship surfaces.’<sup>17</sup> In order to prevent or

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<sup>11</sup> BaSECO, ‘Tributyltin pollution on a global scale. An overview of relevant and recent research: impacts and issues’ in IMO, *Marine Environment Protection Committee*, MEPC 55/INF.4 (7 July 2006) <[http://www.seas-at-risk.org/images/pdf/archive/MEPC\\_55-INF-4\\_WWF\\_et\\_al\\_on\\_TBT.pdf](http://www.seas-at-risk.org/images/pdf/archive/MEPC_55-INF-4_WWF_et_al_on_TBT.pdf)> accessed 31 January 2018

<sup>12</sup> Land-based pollution accounts for approximately 44 percent of environmental pollution.

<sup>13</sup> The first study, by the German researchers Astrid Wittmann and Hans-O. Portner, is a meta-analysis looking at the specific effects rising acid levels are likely to have on specific categories of ocean life: corals, echinoderms, molluscs, crustaceans and fishes. Every category is projected to respond poorly to acidification ... Bryan Walsh, ‘Ocean Acidification Will Make Climate Change Worse’ <<http://science.time.com/2013/08/26/ocean-acidification-will-make-climate-change-worse/>> accessed 4 May 2018

<sup>14</sup> DDT - dichloro dithenyl trichloroethane: a pesticide, banned from agricultural use in United States since 1973 and also prohibited in most other countries.

<sup>15</sup> International Convention on the Control of Harmful Anti-Fouling Systems on Ships <[http://www.imo.org/en/About/Conventions/listofConventions/pages/international-convention-on-the-control-of-harmful-anti-fouling-systems-on-ships-\(afs\).aspx](http://www.imo.org/en/About/Conventions/listofConventions/pages/international-convention-on-the-control-of-harmful-anti-fouling-systems-on-ships-(afs).aspx)> accessed 30 December 2017

<sup>16</sup> International Convention on the Control of Harmful Anti-Fouling Systems on Ships <[http://www.imo.org/en/About/conventions/listofconventions/pages/international-convention-on-the-control-of-harmful-anti-fouling-systems-on-ships-\(afs\).aspx](http://www.imo.org/en/About/conventions/listofconventions/pages/international-convention-on-the-control-of-harmful-anti-fouling-systems-on-ships-(afs).aspx)> accessed 30 December 2017

<sup>17</sup> James Kraska and Daniel Rittschof, ‘Toward a Global Regime of Vessel Anti-Fouling’ [2016] Vol. 26 Duke Environmental Law & Policy Forum <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2741318](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2741318)> accessed 21 February 2018

diminish the incidence of hull fouling, shipowners used anti-fouling paints which was designed to prevent the attachment of unwanted organisms<sup>18</sup> and keep the hull clean and corrosion free.

According to Kraska and Rittschof, ‘vessel anti-fouling is key to the efficient operation of ships, and essential for effective control of invasive species introduced through international shipping.’<sup>19</sup> It is for this reason that the shipping industry uses anti-fouling systems to minimize the build-up of marine life on ships’ hulls. While the use of anti-fouling systems clearly offered saving to shipowners, it was soon realized that the coatings used in anti-fouling systems were harmful to the marine environment.

Scientific studies revealed that certain anti-fouling systems used on ships posed a substantial risk of toxicity and other chronic impacts to the marine environment, marine habitat, marine organisms and possibly, human health.<sup>20</sup>

### **1.3 The effect of TBT**

TBT, a biocide, is a metallic based organotin compound which has been used in anti-fouling paints for over forty years. It is a biocide that chemically deters and destroys harmful marine and other micro-organisms. By the 1970s, most seagoing vessels had TBT painted on their hulls.<sup>21</sup> Shipowners had found the effective method to prevent or reduce fouling and thus decreased maintenance and lower fuel consumption.<sup>22</sup> Clearly, better fuel efficiencies produced fewer greenhouse gas emissions. Moreover, anti-fouling reduced the risk of ship hulls acting as a vector for the transport of invasive species.<sup>23</sup>

But, these financial and environmental benefits were short-lived. When the painted areas of the ship contact seawater, the biocide leached into the water eradicating all marine

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<sup>18</sup> IMO, ‘Anti-fouling Systems: Background, International Maritime Organization’ (2015) <<http://www.imo.org/en/OurWork/Environment/Anti-foulingSystems/Pages/Default.aspx>> accessed 31 January 2018

<sup>19</sup> Kraska and Rittschof (n 17).

<sup>20</sup> *ibid.*

<sup>21</sup> IMO, Focus on IMO <[www.imo.org/en/OurWork/Safety/Regulations/Documents/SOLAS98final.pdf](http://www.imo.org/en/OurWork/Safety/Regulations/Documents/SOLAS98final.pdf)> accessed 30 January 2018

<sup>22</sup> Stephen J. de Mora, ‘Ecotoxicology of Antifouling Biocides’ <<https://link.springer.com/content/pdf/bfm:978-4-431-85709-9/1.pdf>> accessed 24 March 2018

<sup>23</sup> *ibid.*

organisms attached to the vessel.<sup>24</sup> Furthermore, because of the controlled rate of release of the biocides, the process could extend during the life of the paint, an estimated sixty months.<sup>25</sup> It became evident that there was a price to pay for the effective anti-fouling paints containing TBT.

### 1.3.1 Threats to marine life

TBT is the most toxic substance ever consciously introduced into the marine environment,<sup>26</sup> and is known to be destructive to various aquatic organisms, including microalgae, molluscs and crustaceans, fish and some invertebrates.<sup>27</sup> For example, tributyltin (TBT)<sup>28</sup> has been proved to cause deformations in oysters and sex changes in whelks (marine snails).<sup>29</sup> In the 1970s, in France, TBT's contamination from boats was linked to high mortalities of oyster larvae and such severe malformations of the shells of adults that they were unmarketable.<sup>30</sup> Also, in the 1980s, in England, TBT poisoning was linked to the decline of the population of the dog whelk (*Nucella lapillus*).<sup>31</sup> Further, TBT was shown to cross the placenta in marine mammals and could be measured in the blood of fisher folk.<sup>32</sup>

### 1.3.2 Threats to Humans

TBT is moderately toxic when ingested and when it comes in contact with the skin.<sup>33</sup> Shipyard workers exposed to TBT (dusts and vapors) developed irritated skin, irritated eyes and nasal passages, dizziness, difficulty breathing, and flu-like symptoms.<sup>34</sup> Arguably, TBT affects most body systems – endocrine, respiratory, reproductive, integumentary, cardiovascular, digestive, and immune systems. Research on the effects of TBT in humans and on marine life is ongoing.

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<sup>24</sup> *IMO* (n 21).

<sup>25</sup> *ibid.*

<sup>26</sup> S.M. Evans, T. Leksono and P.D. McKinnell, 'Tributyltin Pollution: A diminishing problem following legislation limiting the use of TBT-based anti-fouling paints,' [1995] Vol 30(1) *Marine Pollution Bulletin* in *IMO* (n 21).

<sup>27</sup> *IMO* (n 21).

<sup>28</sup> *ibid.*

<sup>29</sup> That is, female snails exhibit traits of male snails.

<sup>30</sup> *Evans and McKinnell* (n 26).

<sup>31</sup> *ibid.*

<sup>32</sup> *de Mora* (n 22).

<sup>33</sup> M. Mergel, 'Tributyltin' <[toxipedia.org/display/toxipedia/Tributyltin](http://toxipedia.org/display/toxipedia/Tributyltin)> accessed 24 April 2018

<sup>34</sup> *ibid.*

## 1.4 Response to the problem

During the 1980s and 1990s, piecemeal regulations and laws to restrict the use of TBT developed. The initial controls were driven by financial interests and proposed to protect oyster mariculture in France. The regulations barred TBT-based paints' application on small vessels (<25 m in length) but were limited regionally. Other countries followed suit, however, as evidence grew on the severity of TBT-induced impacts on the marine ecosystem more wide-ranging protection was necessary.<sup>35</sup>

The pollution problems caused by TBT in anti-fouling paints were of serious concern to the international community and led to a number of conferences and meetings which culminated in the development and adoption of a global legal binding instrument to address the harmful effects of anti-fouling systems used on ships.

In 1988, the Paris Commission requested the International Maritime Organization's Marine Environment Protection Committee (IMO MEPC) to examine the requirement for measures to restrict the use of TBT on seagoing ships. Consequently, and for the first time, MEPC considered the harmful effects of anti-fouling systems on seagoing ships.<sup>36</sup>

In 1990, MEPC, at its 30th session adopted Resolution MEPC.46(30) on 'Measures to control potential adverse impacts associated with the use of tributyltin compounds in anti-fouling paints.' The resolution recommended that IMO Member States adopt measures to eliminate the use of: (a) anti-fouling paint which contain TBT on non-aluminum-hulled ships of less than 25m in length; and (b) TBT-based anti-fouling paints with an average leaching rate of more than 4 micrograms of organotin per square centimetre per day.<sup>37</sup>

These measures were merely interim measures pending consideration by IMO of a possible total prohibition of TBT compounds in anti-fouling systems.<sup>38</sup>

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<sup>35</sup> *de Mora* (n 22).

<sup>36</sup> IMO, 'Anti-fouling systems'

<<http://www.imo.org/en/OurWork/Environment/Anti-foulingSystems/Pages/Default.aspx>> accessed 24 January 2018

<sup>37</sup> *ibid.*

<sup>38</sup> *ibid.*

After 1990, MEPC received: (a) TBT monitoring results that confirmed the toxicity of the compounds and information on existing alternatives which included their effectiveness; and (b) the risk posed by anti-fouling systems to the marine environment.<sup>39</sup>

In 1999, the IMO Assembly at its 21st session adopted Resolution A.895(21) which urged MEPC to work towards the ‘expeditious development of a global legal binding instrument to address the harmful effects of anti-fouling systems used on ships.’<sup>40</sup> The Resolution stated that the instrument, which MEPC will develop should ensure: (a) an international prohibition of the application of organotin compounds that act as biocides in anti-fouling systems on ships by 1 January 2003; and (b) an absolute prohibition on the presence of organotin compounds that act as biocides in anti-fouling systems on ships by 1 January 2008.<sup>41</sup> A working group was constituted at MEPC to meet these goals.

MEPC at its 43rd session, pursuant to Article 2(b) of the IMO Convention, recommended, and at its 20th extraordinary session of the Council decided, ‘to convene a diplomatic conference to consider the adoption of a legal instrument on the control of harmful anti-fouling systems on ships.’<sup>42</sup>

IMO convened the International Conference on the Control of Harmful Anti-Fouling Systems on Ships pursuant to the decision of the Council, at the IMO Headquarters in London from 1 October 2001 to 5 October 2001. Consequently, the AFS Convention was adopted.<sup>43</sup>

Four Diplomatic Conference Resolutions were also adopted. These resolutions provided, *inter alia*, for (i) early and effective application of the AFS Convention and urged relevant industries to refrain from marketing, sale and application of the substances controlled by Annex 1 of the AFS Convention;<sup>44</sup> (ii) the future work of IMO relating to the AFS Convention and invited IMO to develop guidelines for brief sampling of anti-fouling systems, inspection of ships, and surveys of ships, to facilitate global and uniform

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<sup>39</sup> AFS Convention.

<sup>40</sup> *IMO* (n 21).

<sup>41</sup> *ibid.*

<sup>42</sup> *ibid.*

<sup>43</sup> *ibid.*

<sup>44</sup> *ibid.*; Resolution 1.



implementation of the AFS Convention;<sup>45</sup> (iii) approval and test methodologies for anti-fouling systems on ships;<sup>46</sup> and (iv) the promotion of technical co-operation.<sup>47</sup>

## 2. THE AFS CONVENTION –SALIENT FEATURES

On 5 October 2001, the AFS Convention was adopted in London and entered into force on 17 September 2008. The AFS Convention is futuristic. It prohibits and restricts the use of harmful organotins in anti-fouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.<sup>48</sup> The AFS Convention is a comprehensive instrument which addresses anti-fouling systems on ships engaged in international and domestic voyages. It comprises three different but related parts, the Articles, the Annexes and Regulations and is supplemented by Appendices.

The AFS Convention requires Parties to implement it to reduce or eliminate anti-fouling systems' adverse effects on the marine environment and human health.<sup>49</sup> The definitions are the building blocks of the AFS Convention and are important to its interpretation. Key terms are defined based on international best practices including 'anti-fouling system' and 'technical group'. Anti-fouling system is a coating, paint, surface treatment, surface, or device that is used on a ship to control or prevent attachment of unwanted organisms.<sup>50</sup> Technical Group is a body comprised of representatives of the Parties, Members of the Organization, the United Nations and its Specialized Agencies, intergovernmental organizations having agreements with the Organization, and non-governmental organizations in consultative status with the Organization, which should preferably include representatives of institutions and laboratories that engage in antifouling system analysis.<sup>51</sup> MEPC is mandated to establish a technical group in accordance with Article 7, to include people with relevant expertise, to review proposals

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<sup>45</sup> *ibid*; Resolution 2.

<sup>46</sup> *ibid*; Resolution 3.

<sup>47</sup> *ibid*; Resolution 4.

<sup>48</sup> AFS Convention.

<sup>49</sup> Article 1.

<sup>50</sup> Article 2.

<sup>51</sup> Article 2.

for other substances used in anti-fouling systems to be prohibited or restricted, and must determine the terms of reference, organization and operation of such group.<sup>52</sup>

Parties must be aware that the AFS Convention is far-reaching and applies to: (i) ships entitled to fly the flag of a Party, (ii) ships not entitled to fly the flag of a Party, but which operate under the authority of a Party, and (iii) ships that enter a port, shipyard, or offshore terminal of a Party, but do not fall within the preceding (i) or (ii). However, the AFS Convention does not apply to warships or naval ships or any other ship owned or operated by a government and used only on government non-commercial service.

The AFS Convention provides for ‘no more favourable treatment’ for ships of non-Parties. This means that ships of all countries (irrespective of whether they are Parties or non-Parties) will be subject to the requirements under the AFS Convention when entering a port, shipyard, or offshore terminal of a Party.<sup>53</sup> However, in its application the AFS Convention must not prejudice the rights and obligations of a State under customary international law mirrored in the 1982 United Nations Convention on the Law of the Sea.<sup>54</sup>

The AFS Convention also provides for prohibited or controlled anti-fouling systems which are listed in Annex 1 to the AFS Convention. Parties are obligated to prohibit and/or restrict the application, re-application, installation, or use of harmful anti-fouling systems on ships entitled to fly its flag or foreign ships operating in its jurisdiction. Additionally, Parties must prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flag, as well as ships not entitled to fly their flag but which operate under their authority and all ships that enter their port, shipyard or offshore terminal.<sup>55</sup>

Annex 1 states that by 1 January 2003, ships shall not apply or reapply organotin compounds which act as biocides in anti-fouling systems, and by 1 January 2008 ships<sup>56</sup> shall: (i) not bear such compounds on their hulls or external parts or surfaces; or (ii) bear a coating that forms a barrier to such compounds leaching from the underlying non-

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<sup>52</sup> Article 6.

<sup>53</sup> Article 3.

<sup>54</sup> Article 15.

<sup>55</sup> Article 4.

<sup>56</sup> Except fixed and floating platforms, floating storage units (FSUs), and floating production storage and off-loading units (FPSOs) that have been constructed prior to 1 January 2003 and that have not been in dry-dock on or after 1 January 2003.

compliant anti-fouling systems. Since, the AFS Convention entered into force after both these dates, the effective dates of 1 January 2003 and 1 January 2008 in Annex 1, have been replaced by the following entry into force date; which was 17 September 2008,<sup>57</sup> which has also expired.

Parties must take appropriate measures to ensure that wastes from the application or removal of an anti-fouling system controlled in Annex 1 are collected, handled, treated and disposed of in a safe and environmentally sound manner for the protection of the environment and human health.<sup>58</sup>

The AFS Convention outlines the process for proposing amendments to controls on anti-fouling systems and specifies how the evaluation of an anti-fouling system should be carried out. A proposal must contain the information required in Annex 2 on an initial proposal,<sup>59</sup> such as, documentation containing the identification of the anti-fouling system; an analysis of the association between the anti-fouling system, the related adverse effects and the environmental concentrations observed or anticipated. It further provides that the proposal must be submitted in accordance with rules and procedures of the IMO.<sup>60</sup> A comprehensive proposal, comprises, *inter alia*: (i) documentation containing the developments in the data cited in the initial proposal, a summary of the results of studies conducted on the adverse effects of the anti-fouling system, and a recommendation of specific control measures to reduce the risks associated with the anti-fouling system; (ii) information on the physical and chemical properties of the component(s) concerned; and (iii) the categories of data.<sup>61</sup>

The AFS Convention encourages research and requires Parties to take appropriate measures to promote and facilitate scientific and technical research on the effects of anti-fouling systems, monitor such effects, and provide relevant information, on request, to other Parties.<sup>62</sup>

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<sup>57</sup> IMO, 'Update on the Anti-Fouling Systems Convention, Notes by the Secretariat' MEPC 57/12 (15 October 2007) in Claire Hellio and Diego Yebra (eds.) *Advances in marine antifouling coatings and technologies* (Woodhead Publishing 2009)

<sup>58</sup> Article 5.

<sup>59</sup> Article 6.

<sup>60</sup> Annex 2.

<sup>61</sup> Annex 3.

<sup>62</sup> Article 8.

Remarkably, a Party must ensure that ships entitled to fly its flag or operating under its authority are surveyed and certified in accordance with Annex 4,<sup>63</sup> which specifies the surveys and certification requirements for anti-fouling systems outlined in the regulations. Regulation 1 provides that ships, except fixed or floating platforms, FSUs (floating storage units) and FPSOs (floating production storage and off-loading units), of 400 gross tonnage and above engaged in international voyages will be required to undergo an initial survey before the ship is put into service or before the International Anti-Fouling System Certificate (AFS Certificate) is issued for the first time. A survey is also mandatory when the anti-fouling systems are changed or replaced. Parties are required to provide IMO with a list of the nominated surveyors or recognized organizations authorized (including responsibilities and conditions of authority) to act on the Party's behalf in the administration of matters relating to anti-fouling systems; and inform the IMO annually about anti-fouling systems approved, restricted, or prohibited under its law.<sup>64</sup>

The AFS Convention further provides for the inspection of ships to determine whether the ship is in compliance with the AFS Convention. However, unless there are clear grounds for believing that a ship is in violation of the AFS Convention, the inspection is limited to: (i) if required, verifying that there is onboard a valid AFS Certificate or a Declaration on Anti-Fouling System (AFS Declaration); and (ii) a brief sampling of the ship's anti-fouling system that does not affect the integrity, structure, or operation of the anti-fouling system in accordance with the guidelines developed by the IMO.<sup>65</sup>

With regard to the AFS Declaration, regulation 5 provides that ships of 24 metres or more in length but less than 400 gross tonnage engaged in international voyages (excluding fixed or floating platforms, FSUs and FPSOs) must carry an AFS Declaration signed by the owner or authorized agent. Such AFS Declaration has to be accompanied by appropriate documentation such as a paint receipt or contractor invoice.

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<sup>63</sup> Article 10

<sup>64</sup> Article 9.

<sup>65</sup> Article 11.

With regard to the AFS Certificate, the Administration or any person or organization duly authorized by the Administration must not issue an AFS Certificate, unless the Administration is satisfied that an initial survey of the ship in accordance with regulation 1 has been carried out, and the anti-fouling system of the ship complies with the AFS Convention.<sup>66</sup> However, the Administration may issue an AFS Certificate for a ship transferred to its registry from another State Party if there are: (i) a valid AFS Certificate issued by the Administration of the previous State Party; (ii) the record of the ship's anti-fouling system in the form specified in Appendix 1, and if available, (iii) a copy of the relevant survey reports.<sup>67</sup> Further, the Administration may endorse an AFS Certificate, if the Administration is satisfied that an additional survey of the ship in accordance with the AFS Convention has been carried out, and the ship's anti-fouling system so changed or replaced or affected by repair complies with the AFS Convention.<sup>68</sup>

The AFS Certificate must be drawn up in the form specified in Appendix 2 and must be written at least in English, French or Spanish. It must be readily available on board the ship for inspection at all times.<sup>69</sup>

Regulation 3 provides that the Administration may, at the request of another State Party, cause a ship to be surveyed and, if satisfied that the ship is in compliance with the AFS Convention, issue or endorse an AFS Certificate, in accordance with the AFS Convention. A copy of the AFS Certificate and a copy of the survey report shall be transmitted as soon as possible to the requesting Administration of that State Party. Regulation 4 provides that a certificate issued under regulation 2 or 3 shall cease to be valid if the anti-fouling system is changed or replaced and the certificate is not endorsed in accordance with this Act; or when a ship changes flag. The Administration may by written notice to the shipowner or master, withdraw an AFS Certificate issued for the ship, if the Administration believes that (a) the ship is not compliant with the anti-fouling requirements; (b) the AFS Certificate was issued or endorsed based on false or erroneous information; or (c) a required corrective action has not been taken. When the AFS

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<sup>66</sup> Regulation 2.

<sup>67</sup> Regulation 4.

<sup>68</sup> Regulation 1.

<sup>69</sup> Regulation 2.

Certificate is so withdrawn, the shipowner or master, on receiving notice is required to surrender the AFS Certificate to the Administration.

The AFS Convention also provides that when a Party receives a request from another Party for an investigation, together with evidence that a ship is operating or has operated in violation of the AFS Convention, the Party may carry out an inspection on that ship when it enters the ports, shipyards, or offshore terminals of the Party's jurisdiction.<sup>70</sup>

Furthermore, if the Party carrying out the inspection detects that the ship is in violation of the AFS Convention, the Party may take steps to warn, detain, dismiss, or exclude the ship from its ports and must immediately inform the Administration of the ship concerned. A thorough inspection of a ship may be carried out if there are clear grounds to believe that the ship is in violation of the AFS Convention.<sup>71</sup> It is important for Parties to note that the ship's movement or departure shall not be prevented by the time required to process the results of such sampling.<sup>72</sup> In fact, all efforts must be made to avoid a ship being unduly detained or delayed.<sup>73</sup> If a ship is unduly detained or delayed while undergoing inspection that ship is entitled to compensation.

Notably, any violation of the AFS Convention is prohibited and sanctions must be established under the laws of the Administration of the ship concerned and such sanctions must be adequate in severity to act as a deterrent.<sup>74</sup> Article 12 also provides for the process of dealing with such violations.

The IMO in accordance with Article 11(1)(b) and (2), and regulation 1(4)(a) of Annex 4 to the AFS Convention, developed and adopted the: (.1) Guidelines for survey and certification of anti-fouling systems on ships - adopted by resolution MEPC.102(48), superseded by resolution MEPC.195(61); (.2) Guidelines for brief sampling of anti-fouling systems on ships - adopted by resolution MEPC.104(49); and (.3) Guidelines for

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<sup>70</sup> In maintenance facilities or in-water, the application, maintenance and removal of anti-fouling coatings on ships and movable structures can consequently contaminate the aquatic environment.

<sup>71</sup> *ibid.*

<sup>72</sup> *ibid.*

<sup>73</sup> Article 13.

<sup>74</sup> Article 12.

inspection of anti-fouling systems on ships - adopted by resolution MEPC.105(49), superseded by resolution MEPC.208(62).<sup>75</sup>

### 3. Post AFS Convention

More than fifteen years after the effective ban and phase-out of TBT in anti-fouling paints, a new range of biocidal products has been developed and used as anti-fouling agents known as ‘booster biocides’.<sup>76</sup> Cybutryne, also known as Irgarol, is a booster biocide that has been found in several scientific studies to be both toxic and persistent. When utilized as an anti-fouling agent, ‘cybutryne leaches (following the physical mechanism well known to self-polishing anti-fouling paints) and becomes then available in the environment’.<sup>77</sup> Notably, long-term exposure to cybutryne can cause reduced ‘photochemical efficiency of algae which, for corals, may lead to breakdown of the coral-zooxanthellae symbiosis (i.e. bleaching of coral reefs), demanding lengthy recovery times.’ Further, studies have shown that cybutryne potentially can accumulate in macro algae; and in fish.<sup>78</sup> Thus, also affecting human health.

In certain countries, such as Bermuda, New Zealand, the United Kingdom, Denmark and Sweden, the use of cybutryne in anti-fouling products has already been restricted or phased out. In fact, some State Parties have undertaken consequential legislation to ban cybutryne. Moreover, the European Commission (EU) adopted a decision that effectively prohibits the marketing and use of anti-fouling paints containing cybutryne in all EU Member States.<sup>79</sup> However, while actions have been taken at national and regional levels, to ban cybutryne, there are no international measures to ensure effective ban and phasing-out of this harmful substance. MEPC is currently considering a proposal to amend the AFS Convention to add cybutryne.<sup>80</sup>

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<sup>75</sup> European Maritime Safety Agency, ‘Anti-Fouling Systems’ <<http://www.emsa.europa.eu/implementation-tasks/environment/anti-fouling-systems.html>> accessed 25 January 2018

<sup>76</sup> IMO, ‘Proposal for amendment to Annex 1 to the International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001’ MEPC 71/14 (23 March 2017).

<sup>77</sup> *ibid.*

<sup>78</sup> *ibid.*

<sup>79</sup> *ibid.*

<sup>80</sup> *ibid.*

#### 4. AFS CONVENTION AND ITS IMPLEMENTATION IN THE BAHAMAS

The Commonwealth of The Bahamas is an archipelagic nation situated in the Atlantic Ocean which comprises 700 islands, 2,400 cays and islets and is located north of Cuba, and southeast of Florida (USA). However, only 30 of the islands are inhabited. The Bahamas is an independent nation and has a rich maritime heritage with a population of 397, 866. The majority of the population resides in the nation's capital, Nassau located on the island of New Providence. The territory of The Bahamas encompasses 180,000sq. miles of land and sea.

The Bahamas is a self-governing member of the Commonwealth of Nations with Queen Elizabeth as Head of State represented by the Governor-General.<sup>81</sup> The Bahamas is a parliamentary democracy nation and its political and legal traditions closely follow those of the United Kingdom and the Westminster System. The legislative authority is vested in the Parliament<sup>82</sup> of The Bahamas which comprises the Senate and a House of Assembly.<sup>83</sup> Article 52(1) of the Constitution of The Bahamas (the Constitution) provides that '... Parliament may make laws for the peace, order and good government of The Bahamas.' Further, Article 63 of the Constitution provides, *inter alia*, that 'A Bill shall not become law until the Governor-General has assented thereto'.<sup>84</sup>

##### 4.1. Why Implement AFS Convention in The Bahamas?

It would be in The Bahamas' best interest to implement the AFS Convention into its national laws. This is due to the fact that as a major tourist destination, The Bahamas must ensure protection of its natural resources where the vibrant aquatic life (around coral reefs), the blue holes, pristine waters and white and pink sand beaches attract divers, sports fisherman and other tourists to The Bahamas. Tourism is an important source of income for The Bahamas and revenue generated from tourism may be considerably reduced if marine biodiversity is degraded. Therefore, the quality of the

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<sup>81</sup> Article 32 of the Constitution.

<sup>82</sup> Article 52(1) of the Constitution.

<sup>83</sup> Article 38 of the Constitution.

<sup>84</sup> Article 63 of the Constitution.



marine environment in The Bahamas must be sustained. Undoubtedly, sustainable development must be the guiding principle.

The Bahamas is a Party to the AFS Convention. The AFS Convention is a landmark agreement which established principles of marine environment protection from harmful anti-fouling systems on ships. Therefore, as a Party to the AFS Convention and as one of the largest ship registries in the world, The Bahamas is obligated to implement the AFS Convention into its national laws to bind its courts and its people.

By implementing the AFS Convention, the reputation of The Bahamas will be protected. The Bahamas, as a member and an active participant of IMO Council, by implementing the AFS Convention, would act in utmost good faith, in the letter and spirit of Article 26 of the 1969 Vienna Convention on the Law of Treaties. Additionally, as an active participant in the IMO Council's work, The Bahamas influences the development of policies and legislation on the international stage, therefore, it is imperative that The Bahamas gives effect to the very policies and legislation it impacts.

Further, The Bahamas' oceans and seas are its greatest natural resources. Bahamians look to the sea for sustenance (food), employment (fisherman) and recreation (diving, swimming, etc.). So, it is important for future socio-economic development that the marine environment is not degraded by the harmful effects of anti-fouling systems used on ships or subjugated by invasive species.

For the reasons stated above, it is imperative that The Bahamas implements the AFS Convention.

## **5. THE PROCESS OF IMPLEMENTATION**

### **5.1 The Process**

As mentioned earlier, The Bahamas has acceded to the AFS Convention. Notably, The Bahamas is a dualist country, therefore, for an international instrument to have the force of law in The Bahamas it must be incorporated into Bahamian law. The practice for

incorporation takes place after a treaty has been signed, ratified or acceded to by The Bahamas' competent authority - the Minister of Foreign Affairs, after consultation with the Cabinet.<sup>85</sup>

In furtherance of the implementation of the AFS Convention, it is proposed that an Act entitled 'Control of Harmful Anti-Fouling Systems on Ships Act, 2018 (the 'draft Act') is drafted by the Office of the Attorney-General upon instructions from the relevant Ministry(ies) for introduction in Parliament by the Minister of Transport after consultation with the Minister of the Environment, and of course the approval of the Cabinet.

The draft Act will come into force on the 1<sup>st</sup> day of July, 2018.

The main justification for the implementation of the draft Act is that a review of existing legislation revealed that there is no predecessor to the AFS Convention and no comprehensive environmental framework (the legislation is piecemeal) in place. So, this is a step in the right direction recognizing the importance of the earth's most valued resource and indeed, the jewel of The Bahamas - the marine environment.

## **5.2 CONTROL OF HARMFUL ANTI-FOULING SYSTEMS ON SHIPS ACT, 2018**

The draft Act' implements the AFS Convention into the laws of The Bahamas. The AFS Convention seeks to protect the marine environment from the adverse effects of certain anti-fouling systems on ships.

Part I contains preliminary provisions and provides for the short title and commencement, and the application of the Act. It also defines various terms used in the Act. Part II provides for controls on anti-fouling systems. Part III addresses waste materials from anti-fouling systems. Part IV covers surveys and certification. Part V deals with Declaration on Anti-Fouling System. Part VI provides for inspection and corrective

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<sup>85</sup> Article 72 of the Constitution provides that 'There shall be a Cabinet for The Bahamas ... The Cabinet shall consist of the Prime Minister and not less than eight other Ministers (of whom one shall be the Attorney-General), as may be appointed ... .

measures. Part VII covers, *inter alia*, investigations, regulations and amendments. Schedule 1 provides for the list of controls on anti-fouling systems. Schedule 2 sets out the form for the AFS Certificate. Schedule 3 sets out the form for the AFS Declaration.

The draft Act was benchmarked against the legislation from Australia,<sup>86</sup> the United Kingdom,<sup>87</sup> and Bermuda.<sup>88</sup> The penalties were cross referenced and are bracketed and in bold as they may be subject to modification after review by the relevant authorities and Cabinet. Also, in the draft Act, a proactive approach was taken to include cybutryne or Irgarol in Schedule 1 on controls on anti-fouling systems, although it is under consideration by MEPC.

Additionally, Clause 24 of the draft Act provides that the Act binds the Crown. This is a traditional rule which has been reduced to legislative form in The Bahamas. The rule is that an enactment does not bind the Crown (Government) unless it is provided for expressly or by necessary implication.<sup>89</sup> According to Thornton, the phrase ‘necessary implication’ is vague and troublesome and it is desirable to place the matter of the application of a statute to the Crown beyond argument by means of a provision such as ‘This Act binds the Crown’.<sup>90</sup>

Further, penalty provisions were placed at the end of the relevant provisions because of its ‘simplicity and intelligibility’. According to Thornton, ‘general penalty provisions are likely to be presented much later in the Act than the offences to which they relate and may be difficult to find quickly. They are not recommended for general use. A measure of repetition is a small price to pay for the advantage resulting from presenting simply and unambiguously the penalty imposed in respect of an offence as part of the offence section, either integrated with the statement of the offence or stated immediately below it ...’<sup>91</sup>

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<sup>86</sup> Protection of the Sea (Harmful Antifouling Systems) Act 2006.

<sup>87</sup> The Merchant Shipping (Anti-Fouling Systems) Regulations 2009.

<sup>88</sup> Bermuda Fisheries (Anti-Fouling Paints Prohibition) Regulations 1989.

<sup>89</sup> G.C.Thornton, *Legislative Drafting* (4<sup>th</sup> ed. Tottel Publishing Reprint 2006)

<sup>90</sup> *ibid.*

<sup>91</sup> *ibid.*