Chapter 2
International Trends in Regulatory Aspects

Tetsuya Senda


2.1 Introduction

Fuel consumption of ships is highly dependent on frictional loss occurring between ship’s hull and sea water. Fouling of the ship’s hull by marine organisms including barnacles, algae and molluscs increases friction, resulting in an increase in fuel consumption and/or a decrease in ship’s speed. A number of chemical compounds have been used to prevent those organisms attaching to hulls. A typically used antifouling system involves coating the ship’s hull with paint containing substances preventing attachment of organisms. Organotin compounds, tributyltin (TBT) and triphenyltin (TPT) were found to be excellent in efficacy as anti-foulants and also less harmful to paint workers than traditional chemicals including mercury or arsenical compounds. Development of self-polishing organotin co-polymer has produced extremely high performance and long life with an additional effect of keeping the surface smooth by the self-polishing mechanism.

T. Senda
National Maritime Research Institute, 6-38-1 Shinkawa, Mitaka, Tokyo 181-0004, Japan

T. Arai et al. (eds.), Ecotoxicology of Antifouling Biocides, DOI: 10.1007/978-4-431-85709-9_2, © Springer 2009
In the 1970s most of the ships in the world bore organotin based antifouling paints on their hulls. The extent of the use of organotin compounds caused adverse effects on marine organisms particularly on molluscs. Legislative control of antifouling systems was introduced firstly in individual countries and since then there has been a trend towards worldwide regulation. After patient discussion for more than 10 years, an international treaty banning the use of organotin compounds in antifouling systems was adopted at the International Maritime Organization (IMO). In this chapter, the discussion at IMO is firstly reviewed and, subsequently, the treaty controls are described in detail. Finally, regulations for tin-free antifouling systems, currently being implemented in Europe and the United States, are briefly summarized.

2.2 IMO’s Effort

In the 1980s, high concentrations of organotin compounds were reported in coastal areas around the world. Because of worrying side-effects of TBT on oysters, France was the first to prohibit the use of organotin-containing paints on ships less than 25m long, in 1982. TBT-related imposex was then recorded in English coastal waters. Since then, similar legislation was introduced by the United Kingdom, in 1985, and by the United States of America, in 1988. Canada, Switzerland, Austria and Germany subsequently followed this course of action. The Shipbuilders’ Association of Japan and the Japanese Shipowners Association collaboratively decided themselves to control the use of TBT based antifouling paints in Japan.

Since shipping is a worldwide activity, controls on antifouling systems by individual states are not effective enough to prevent pollution, even in their own sea area. Therefore, the problem was brought to the International Maritime Organization. IMO is a specialized agency of the United Nations with 167 member states and three associate members, and its purpose is to develop and maintain a comprehensive regulatory framework for shipping including safety and environmental concerns. Environmental issues are normally deliberated by the Marine Environmental Protection Committee (MEPC).

At the 26th session of MEPC held in September 1988, the antifouling paints issue was discussed for first time after the Paris Commission, an organization concerned with prevention of pollution of the North East Atlantic, requested IMO to consider the need for taking measures to restrict the use of TBT compounds on seagoing vessels. Member states were invited to submit information, explaining the ecological effects that TBT compounds might be causing.

At MEPC 29 in March 1990, the antifouling paint issue was included in the agenda for the first time and the United States was appointed the lead country to collect more information. At the following session, MEPC 30, in November 1990, the Resolution MEPC.46(30) entitled “Measures to Control Potential Adverse Impacts Associated with the Use of Tributyl Tin Compounds in Anti-Fouling Paints” was adopted. The resolution included recommendations to eliminate the