



OVER PROTECTION EXPLAINED

Under Protection

The issue of under protection is well understood. Quite simply too little protection results in corrosion.

The selection of sacrificial anodes for a vessel is dependent on the surface areas and type of metals to be protected with reference to their electronegative potentials (Refer to the Galvanic Series of Metals). The ABYC notes that a sacrificial anode shall induce and maintain a minimum negative shift of 200mV relative to the least noble (or most negative) metal.

Over Protection

Over protection can occur where the sacrificial anode generates a current higher than necessary to protect the more noble metallic fittings. Common issues with over protection include:

Paint Blasting – the hydrogen blistering of paint occurs because of the destruction of the adhesion between the coating and the base to which it was applied (or substrate). This can be often seen near where zinc anodes are attached to fibreglass hulls. The process of blistering is referred to as “cathodic disbondment”.

Repels Anti-Fouling and Propeller Coatings – in the same manner as paint blasting, over protection can lead to the non-retention of anti-fouling and propeller coatings due to incompatibility of the application with sacrificial anodes. This can render the application ineffective and the increased barnacle and other marine growths lead to vessel inefficiencies and costly manual maintenance.

Lure of Marine Growths – excessive cathodic protection accelerates the formation of calcareous deposits including the calcium carbonate coral-like structure commonly encountered on a vessel’s hull, rudders and propellers.

Wood Rot – cellulose is a natural polymer which gives wood its remarkable strength. Cellulose is a major component of wood where lignin holds the cellulose together. Over protection resulting from the galvanic current flowing between the anode and cathode destroys the lignin and thus the effects of wood rot are often noted.

Alkali Attack – resulting from excessive cathodic protection systems, damaging wooden or metallic hulls. Over protection can lead to the formation of alkaline conditions on metallic hulls when there is insufficient flow of water to return the water to its natural pH, resulting in accelerated corrosion. This can be accentuated as the paint blisters to create an even more alkaline condition and further lead to rapid deterioration of the submerged metal.

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