The following is an article written by Vern Linkhorn, electrolysis authority.

Is my vessel safe from Stray Current in the Marina?

This question is being asked more frequently these days and basically the answer in most of New Zealand is YES. All marina complexes must have their shore power supply equipment conform to Electrical Power Supply Authority Regulations. This means that the power supply to any vessel must be through an isolation transformer or earth leakage detection outlets. As you go around marinas, this equipment is quite obvious at intervals down most marina berth fingers. In earlier type installations it was usually done with isolation transformers which proved to be expensive to operate and maintain for marina groups, but kept the vessel's hull and cathodic protection system isolated from the dock. As the earth leakage detection systems became more popular and less expensive a lot of the original equipment was replaced.

This is now where most of the recent problems have appeared for boat owners, especially those who leave their vessels permanently connected to shore power for running equipment such as battery chargers, hot water cylinders and refrigeration units. But it would be very unusual for this to cause actual stray current corrosion to vessels in the vicinity. The corrosion that is actually still occurring in these vessels is the same old Galvanic Corrosion. This type of common corrosion attack occurs on any vessel whether it is connected to shore power or not. In fact it happens to many vessels not necessarily in marina environment.

How then does shore power make any vessel more susceptible to this type of corrosion attack you may ask.

If your vessel's AC-system is wired as per current electrical regulations, as it should be, the earth wire will be connected to the DC ground or negative and in turn to the bonding of the boat's corrosion protection system. When the AC shore power lead is then connected to the vessel, EVEN WHEN NOT SWITCHED ON, you in fact connect to every other boat in the marina that is also on shore power, via the earth leakage detection system. You are also connected to the marina structure and your cathodic protection system is protecting it from attack. This will cause your zinc anodes to deplete at a much faster rate and they will not last for a period of time that they usually do. Because of variations in different boat's requirements for levels of cathodic protection, by all being connected together via the AC power, some vessels will be either under or over protected with the subsequent detrimental effects.

Random, checks have been carried out on several vessels connected to shore power in the marina complex with mixed results, but on average, most were in some way affected. So how can the boat be isolated from problems while on shore power.

Firstly, the facts:

1. The corrosion attack occurring on vessels in the marina complex is usually traced to natural Galvanic type problems.
2. As all boats are generally isolated electrically from each other by mooring lines, the only time another neighboring vessel can affect your boat is by the common connection to shore AC power.

3. There is a requirement to protect all vessels and their occupants from the chance of electric shock by way of either earth leakage detection devices or isolation transformers.
4. Any stray current problems that do occur with the AC or DC electrical systems in a boat will usually only affect the vessel that has problem. This is true electrolysis.

Secondly, the immediate answers:

1. Shore power leads to the vessel should be of heavy duty quality to preclude the possibility of stray current corrosion damage to a boat due to voltage drop problems going back to the marina structure.
2. The vessel should be checked to ensure that it's AC electrical system is safe and conforms to local regulatory requirements.
3. The AC system on the vessel should be fitted with an isolation transformer or galvanic isolator to again isolate it from other boats and the marina structure.
4. Have your boat checked for any corrosion problems that could be occurring, whether it is galvanic or stray current before accusing other vessels in your vicinity. This is normally carried out while the vessel is still in the water.
5. Corrosion problems can be prevented or at least controlled so as to allow you safe and happy boating.

If you would like to discuss your own situation, please contact direct:

Vern Linkhorn
Phone: 64 9 5200052.
Mobile: 0274 792276
Email: marinecorrosion@clear.net.nz