



AKAMA REPORT 7
20 March 2003

Today we got a packet from our forwarding service, containing nearly 2-months worth of mail. In addition to the usual statements, bills and magazines, it contained a bunch of Christmas cards and letters, birthday cards and photos of our new grandson. What a cutie! Even though the mail that we receive is always old, opening all the envelopes is like Christmas for us.

The packet also contained an important notice. Please check your records and ensure that you have our mailing address down correctly. It should be: Maurice & Louise-Ann Nunas, 411 Walnut Street #1672, Green Cove Springs Florida, USA 32043-3443. It is **essential** that you include the pound sign before the digits 1672. The US postal service has informed our mail forwarder that if the pound sign is missing or if any other character (e.g., a dash) is substituted they will return the item to the sender with a note stating that the pound sign is missing, even though they know perfectly well where to deliver the letter. This is not a joke. Apparently the U.S. Government requires that letters posted to private post offices, mail forwarding service, and the like bear either '#' or the letters 'PMB' before the box number, just one more example of how our governments do really useful things with our tax dollars.

We are still at the Royal Langkawi Yacht Club, where we assisted with the first, annual Royal Langkawi International Regatta. It was a big success, with about 70 boats racing for four days, followed by a huge party every evening. We were assigned to be the Sponsor Boat, which means that we were to take sponsors to the race sites each day, so that they could see what they paid for. The trouble was the sponsors were not very interested. So we only went out twice and had a total of only five persons on board all week. Anyway, as a reward for that, and for transporting some race buoys from Phuket to Langkawi, we got a week of free docking, 40-beer, 3 cases of soft drinks, 3-cases of water, free meals, and full passes to all the parties...works for us!

We are staying on here for an extra week to do a little minor boat maintenance, most notably varnishing the teak. AKAMA never had much teak in the first place and we painted out a strip that ran all the way around the boat, and another narrow one around the bow. This leaves only the wide railing that runs around the rear half of the boat, and it is still too much trouble! In the tropics teak must be varnished every six to eight months; wait too long and it must be sanded back to bare wood. One needs the proper materials, a good technique, good weather and plenty of patience. The latter is not one of Maurice's major attributes, as evidenced by the steady stream of cursing. Anyway, we've got half of it done, with LA supervising, and it sure looks nice.

We'll devote the rest of this report to fresh water needs on AKAMA. We thought that many of our readers might be interested in this, as this is one of the things on the boat that is strikingly different from what one has on land. It's also timely, as the international conference on water is just winding up.

Obtaining sufficient quantities of potable water can be a problem on a cruising yacht. Often, yachts, especially smaller sailing yachts, must drastically conserve fresh water. Sometimes this is done by

using salt water for washing. We were buddy-boating with some sailing friends and noted that they bathed in salt water and then used one litre of fresh water in a pop bottle as a rinse.

On board AKAMA, we do not use salt water and our fresh water conservation is moderate. We use fresh water for everything from drinking to running the clothes washer. On the other hand, we rarely wash the boat unless we are in a marina and use the dish washer only if we have a party on board.

AKAMA is fitted with two stainless steel water tanks that hold collectively about 1900 litres. While this may sound like a lot of water, and it is for a boat, Louise-Ann and I generally consume this amount in a week to 10-days. So, sooner or later, we must fill up the tanks. There are three common sources of fresh water on a yacht: tap water, rain water and, more recently, desalination. AKAMA is rigged to use all three of these.

Our source of preference is tap water, mostly because it is cheap and quick. We process the water before it comes on board using two filters. The first filter is a standard string filter, which removes the larger particles, down to about 25 microns (one micron is a millionth of a metre). The second filter element is a carbon block, which removes finer particles and some chemicals that affect the taste, such as chlorine. Unfortunately over here, other than in Malaysia and Singapore, water from marina faucets is not usually potable.

AKAMA is set up to catch rain water, something commonly done on small yachts. The monkey island (the deck above the pilothouse) has two scuppers that can be rigged to take hoses routed to the water tank fill holes. In practice, one waits for the first part of the rainfall to wash the deck and then diverts the remaining rain water into the tanks. So far, we have never used this system; we consider this to be for emergencies only.

When we cannot obtain potable water from shore, we make our own using our on-board RO desalination unit (i.e., water maker). This is our only water source when we are at sea for more than a week. Even though they call these machines water makers they don't really "make" water; they just purify seawater by reducing the concentration of dissolved particles and salt ions. Despite the use of high tech terms, such as "reverse osmosis", to describe them, they are just another filter, albeit a very high-tech one.

To purify sea water one needs a filter that can remove things smaller than a thousandth of a micron (i.e., a billionth of a metre), it must be able to separate out the sodium ions, cysts and bacteria from the seawater. To put this into perspective, think of this particle size as being five to ten million times smaller than a grain of sand. A water maker contains such a filter, called a semi-permeable membrane.

An ordinary household water filter operates by forcing water at the tap pressure of 30 to 70 pounds per square inch (psi) through one or more filter elements. The finest element that can operate with reasonable flow rates at such pressures is about two microns. Obviously, to use the semi-permeable membrane in the water maker we must use much more pressure than is available from the faucet. Therefore, a water maker also contains a high pressure pump that can produce up to about 1500 psi. Pressure washers, such as car washes operate at about this pressure. The pump forces seawater into one end of the membrane, which is a hollow cylinder. At the other end, the seawater exits through a needle valve. The needle valve is used to adjust the operating pressure, which must be set dependent upon water temperature and salinity. Typically it is set to around 800 psi. Fresh water molecules pass through the membrane to the outside surface, while excess salt water and impurities go straight through, and then through the needle valve, to be discharged overboard. The fresh water that seeps through the

membrane gathers in the metal cylinder in which the membrane is located. From there it is routed to AKAMA's storage tanks.

RO water makers are very inefficient, which is why in most places domestic tap water is not produced using such a system. About 680 litres of saltwater is pumped through the system on AKAMA per hour, during which time only about 90 litres of fresh water is produced. The process uses a lot of energy. Our water maker runs off the ship's mains (230-volts AC) consuming about 3 kilowatts. That's about the same amount of power as that drawn by two large, household appliances, such as full size microwave ovens or big window air conditioners. Since it uses so much electricity it will not work unless we are running the generator. There are battery operated and even manually operated models available, but they have much smaller capacities.

To keep up with the demand for water we must run the water maker, and therefore the generator, about two or three hours a day. This is not an inconvenience though, as we must usually run the generator about three or four hours a day to recharge our house batteries (see our special report on electrical needs for details). The combined sound of the generator and the water maker is rather loud. So, we usually make water and charge the batteries when we are moving from place to place, so that the noise is not noticeable.

The water produced by water makers is of very high quality. When we tasted our first glass of it, admittedly somewhat warily, our reaction was, "Wow, this stuff is good." The first things we noticed were the absence of taste and any dusty "mouth feel" so typical of city water. Also, the water is very soft, since the membrane removes nearly all suspended solids and most of the ions present in the sea water; a little soap goes a long way.

Perhaps we are overly cautious, but all the water used aboard AKAMA is filtered again, through a string filter and a carbon block filter, when it is drawn from the tanks. We even have an ultraviolet sterilizer that we can switch on if needed (we've never needed it so far). The water aboard AKAMA is so noticeably pure that when drinking tap water, back on land, our first reaction is invariably, "Ugh"!