TECH TALK

by

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Winterizing Your Boat's Electrical Systems

Simple tips to prevent fires, freezing and drained batteries over the winter

IT'S THAT TIME OF YEAR again when the heaters, fans and Dri-Z-Air come out of the lockers. It is also the time when we start to hear about boat fires caused by faulty electrical systems or defective heaters.

If you leave your boat in the water over the winter season, you want to try and keep the indoor temperatures at 11°C or 52°F, which is about the ambient water temperature in our local waters. If the boat is too warm, you increase the electrical draw which increases the risk of fire. Secondly, if the boat temperature is warmer inside than outside, you are creating lots of condensation inside the boat. This condensation not only creates mildew but also causes electrical components to corrode prematurely. If the boat is too cold, you risk the bilge and pipes freezing.

Products like Dri-Z-Air dehumidify a boat's interior, reducing the buildup of mildew.

If you are using a portable heat source, choose an oil-filled radiant heater as a safer alternative to your typical electric space heater. They look like radiators, are filled with oil and have heating elements inside that warm and circulate the oil through the radiator chambers. These heaters have a thermostat that regulates the maximum temperature so there is no danger of overheating. As well, oil-filled radiant heaters do not get hot enough to burn paper and will automatically shut off if they are knocked over, making them a safer choice for the marine environment. They do, however, draw between nine and 13 amps at 120 VAC. You will want to plug the heater into a ground fault circuit interrupter (GFCI) outlet to reduce the chance of an electrical short. Although we do not like extension cords, sometimes they are necessary. If this is case, ensure you have the correct size.

The second component is to ensure that the air is circulating in your boat as heat alone will not prevent mold and mildew. It is a good idea to run a low-voltage fan, open locker doors and prop up any mattresses or cushions to prevent moisture from collecting.

Check your batteries to make sure they are charging, clean the terminals and add water if required. Next, check your bilge pumps to ensure they are working and that the float switches properly activate the pumps and are not blocked by debris. This a good time to confirm that your bilge pumps run even when the battery switch is turned off. Make sure the bilges are clean and dry, you may add a small amount of environmentally-friendly, non-toxic anti-freeze to prevent any shallow water from freezing.

As we discussed in a previous Tech Talk article ("Winter Maintenance for Your AC System," December 2012, available at *www.pysystems.ca*), make sure your inverter or the inverter portion of your inverter/charger is not in stand-by mode. Stand-by mode basically means that the inverter will create AC from DC the moment AC power is lost on board. Losing AC power during the winter months is a definite possibility. Leaving the inverter on stand-by when it is not needed could mean that your batteries will be drained quickly when you lose AC shore power, since any AC appliance connected to your AC outlets will be powered from the inverter by the batteries.

As an example, on a 40-foot boat you would put one heater in the engine room and another in the galley with the stateroom doors open. Each heater draws about 12 amps 120 VAC, if you add a small fan on the galley counter, you will be looking at another two amps. On shore power, you are drawing a total of 26 amps, but once you lose shore power this 26 amp supply needs to come from your batteries. Remember that power equals current times voltage. In this instance: 26 amps X 120 VAC = 3120 watts. After converting the 12 VDC and allowing for 10 percent inefficiencies, you will probably be drawing about 286 amps at 12 VDC. How long can your batteries provide 286 amps? Within an hour or two most battery banks will be drained. At this point, you have a boat with no AC, no heat and no DC. No alarms will ring and the bilge pumps on that battery will not function until the AC from shore comes back.

Electrical cables should be run neatly and secured without any slack. They should also be dry, clean and tight. Moisture on electrical connections results in high resistance and consequently heat.

Check your in-line fuse holders. If they are slightly warm to the touch, it is a sign of resistance and may be caused by a loose fitting fuse, bad connection or corrosion. Corrosion can also cause overheating, so clean the corroded contacts thoroughly or replace the fuse holder.

You should stop by your boat every week or so to check the shore-side connection, charging system, the interior temperature and, if you have flooded batteries, top them up with distilled water.

"An ounce of prevention is worth a pound of cure." Ben Franklin must have been a responsible boater.

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