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pearl-beach-soel-catamaran



Electric Ship

Electric boat: Pearl Beach Resort French Polynesia Bora-Bora

Structured Data

This webpage QR code

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Le Pearl Beach in Bora Bora was one of the first early adopters for the Soel solar powered electric carbon fiber catamaran back in 2018. My comments are provided in the review.

PDF Version of the webpage (first pages)

Pearl Beach Resort and Spa Solar Cat Review

Overall Impressions: Silent. Sleek. Beautiful. I had the pleasure to do two sunset charters, and a daytime transfer between Pearl Beach Resort and the Conrad Hilton Resort, in Bora Bora. During the first charter, we electrically cruised for sunset, did some power ramp-up and ramp-down tests. Beverages were served in the center bar for our charter of four. The night LED lighting onboard, and underwater are very impressive and mood setting.

The second charter was a transfer between resorts, midday. This session I was able to take drone images and video of the cat in operation. It was in this session that we saw the solar panels on top had turned white due to UV degradation.

The last charter was another sunset charter, running with the port electric propulsion only, since the right (starboard) side motor was overheating. Operation of the cat was unimpaired. While we launched from the Bora Bora Hilton, we docked at The Yacht Club for dinner. All seamless operation, and without any noise from the engines.

The craftsmanship is incredible. I would put this in the luxury yacht category for fit and finish of the beautiful fiberglass (carbon) hulls. This is the perfect platform for luxury charters (both day and night). There is plenty of protection (both freeboard and from the wind), for the lagoon operations in and around Bora Bora. It was a thrill to ride, and even the non electric-propulsion-fan guests were very impressed (silent operation, and no smell from a hydrocarbon fueled engine).

Comfort: Excellent for both crew and passengers. Very comfortable bench seating on the partially enclosed deck. There is a net/trampoline forward of the steering station on the bow. Seating was very comfortable. The basic design could easily be multi-platform (hauling, cruising, patrol, etc.) with minor modifications.

Seaworthy: The electric boat catamaran tracked well, and has good handling qualities. The light weight might of the hulls did not seem to adversely effect motion, even with large wake/waves from other boats, the craft performed well. While the craft was only operated in the lagoon area (on my charters), it appears to be well suited for any lagoon and near-island activities. It's an extremely comfortable and stable ride.

Access: Engine and systems access is poor. While the bathroom in the port hull is nicely tucked away below, the access is poor, and somewhat of a challenge (you have to climb down a vertical ladder/stair). There is a side ama boarding access for occupants on both port and starboard. As a luxury charter craft, a single level access is desired. There is a hinged (retractable) water ladder at the stern. The anchor is in the front middle, between the amas.

Wet Bar: The bar was centrally located, and efficient. Even though the catamaran platform is stable, there is a need for drink holders (none seen). These are not only great for drinks, but for iPhones and other devices. There is a sink and plenty of counter space. I would add a few top access Dometic coolers (very efficient refrigeration 12/120V for both drinks and ice storage) and a countertop small ice machine (like the Opal which makes nugget ice). If the use is limited to evening sunset charters, everything can be carry in (no need for appliances, since a few hours can easily store ice for drinks).

Overall Design: The overall design is solid. As mentioned before, it's a good standard platform, which can be reconfigured for multiple missions.

Solar Panel Type Considerations: For a mobile application, power output, efficiency, surface area, and weight are important. You want to optimize the power output, for the weight. In this case, flexible panels are huge weight savings (less power needed to move a boat with less weight), however if any glazing contamination occurs, then efficiency drops. The overhead drone shots indicate the white glazing has turned the panels from a dark color, to white, which reduces collection efficiency. This is over the course of less than one year. Whether this is from salt accumulation, or polymer degradation from UV damage, is unclear. A routine part of maintenance might include a fresh water wash of panels every few days, and limited any saltwater washing of the top structure.

Solar Panel Optimization - Stationary Versus Tracking: You can reduce the amount and surface area of panels, if you have active tracking. While this may not be possible on a mobile application, you may consider putting a land-based tracker, or boat garage roof mount, or hybrid mount. If the mission is only short term luxury charter, then you can base the panels at the dock or on land, to charge batteries.

Since sunset cruises are at the end of the day, the solar panels won't be producing any power at that time of the day anyhow.

Use and Applications: If you are using your electric boat for late afternoon, or evening charter, consider leaving the solar panels on land (at the dock) and build into your boat lift, or covered boat garage. This allows you to take advantage of longer-lasting glass covered panels, which weight more, but cost less. Most of these type panels have better efficiency, and less susceptible to UV damage (color changing of the glazing). In this case, you would charge your batteries during the day, disconnect from the solar panel charging, then utilize the power through the battery storage. Since most of the effective solar charging is in the 4 hours from before and after noon (zenith of Suns movement across the sky), hauling around solar panels in late afternoon and evening doesn't make much sense. Land based solar panels are less prone to salt-water glazing coating through evaporation, as the mobile mounted units would be (proximity of panels to the water and evaporation of the water which leaves the white salt residue behind).

How to Increase Solar Panel Output: There are a few ways to increase the solar panel output. Other than buying a higher efficiency panel, you have the option of installing the panels on a active tracker, software/hardware optimization devices, or putting up active light weight reflectors, to reflect light onto a stationary solar panel array. A electric boat ferry service in Sydney, actually uses solar panels as sails, to provide additional wind assist power.

Measure Output of Solar Panels: Try to set up some metrics when you first get your panel array for your electric boat. More likely than not, this type of system has solar power available and collection data available through an app or data logger. Take measurements at solar noon for panel output in volts and amps. Do this periodically to see if there are any panel issues, or solar glazing contamination (from salt water or UV degradation). For the Pearl Beach electric boat, they already had some significant glazing color change, and the boat has only been active for around 9 months.

Safety: Anything electric and water immediately brings up the issue of safety. While traditional gasoline or diesel engines have a fire hazard (second to sinking in major hazards at sea), the electric boat is a different risk, which includes to a lesser part fire (from batteries), but the issue of electrical shock. I would install, or make sure it's factory standard, a in-water sensor which indicates any possibility of electrical shock hazard, or on-board, any electrical short indicator. If the boat is primarily made from composites, this helps lessen any on-board shock issues, but regardless I would install a ground fault circuit on any 110/220V outlet which may have exposure to water, and be sure to have protection (fuse or fault) on the main panel. If there are no bilge or in-water indicators (exterior to the hull), then I would have a live bait well with a motion-sensor, to act as a Canary in a coal mine.

Operational Considerations for the Perfect Electric Boat in this Tropical Charter Application:

Instead of one luxury electric boat, have the following combination, which will be less cost, and more use:

(a) Shuttle Cat: from the resort to the mainland (5 minutes by gas outboard or 10-15 by electric). Instead of converting heavy cat you have now, purchase a lightweight used sailing cat hull, install outboards and solar panels.

(b) Low Cost Charter Cat: I believe everybody at the resort desire a ride on the electric boat for a day cruise (anchor in shallow water and offer swimming, snorkeling, or island tour). Offer a \$100 Euro per person ride for a few hours. Make drinks and food a-la-cart. Since guests already have a resort account, bring a iPad and charge drinks/food as needed. Build your own cat with a deck made of low-weight polymer deck boards, and a partial solar roof. You may also use this electric boat for airport to resort shuttle (which is normally during the day).

(c) Luxury Charter Cat (Evening or Airport Pickup):

Consider a Solar Garage: Instead of panels on the boat, use the money to put in more battery storage on board (use the battery pack from a used electric car such as a Tesla, Nissan Leaf), and invest in heavy (lower cost and better efficiency) glass PV panels, which can be used both for resort power and e-boat battery charging. The heavier panels are stationary, not prone to UV Sun damage (such

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light weight portable panels on the roof of the boat now) better efficiency, and there for the long term. The garage (or just roof with panels) protects your boat while providing a charge station

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