

Solar Sal 44

USCG Inspection

by David Borton

Solar Sal 44 is the first continuously and exclusively solar powered commercial tour boat being inspected by the US Coast Guard. With the concept and general design by David Borton of Sustainable Energy Systems, this 44-foot passenger vessel was built in Kingston, NY by the Riverport Wooden Boat School which is under the auspices of the Hudson River Maritime Museum. She, with Coast Guard inspectors on board, recently passed a speed/range endurance test on the Hudson River using only reserve battery power – enough for fifty miles at night with no solar input.

There are no Federal Regulations for the new concept of solar electric boats. Therefore, the Coast Guard is in the process of certifying her as an electric boat. This process started with the boat wood even before construction started and followed her construction from framing, stripping, waterproofing and outfitting to meet all the requirement of a "Section T" boat (approved for carrying paying passengers).

Solar panel technology has increased the efficiency of solar electrical output to over 22% providing more power on the roof area of boats. Note that cars and airplanes do not have enough area for practical solar only transportation. Efficiency improvements in electronics and electric motors also contribute to practical solar electric marine propulsion.

Most boats these days are planing boats that have enough combustion engine power to lift these boats to planing speeds. Solar Sal boats are displacement boats, as are most sailboats, and limited by the wavelength of the boat moving through the water. Historic hull designs from before steam and combustion engines are best suited to solar electric designs.

David Borton's previous boats using this Patent Pending technology include Sol, a 25 foot launch operating on an Adirondack lake where there is no road and no electricity, and the 40 foot Solar Sal. Solar Sal went from the Hudson River out to the Niagara River and picked up 4 tons of baled cardboard from Cascades Recovery at Lockport for



Photo by P. Kricker

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the return trip to the Hudson and up to the papermill in Mechanicville for recycling into paper products. This 750 mile solar only round trip followed the historic and beautiful Erie Canal both ways.

Pete Bardunias, President/CEO of the Chamber of Southern Saratoga County arranged for the cargo along with partners Cascades Paper and Hullspeed Coatings and says, "Solar Sal was the first vessel to ever carry a bona fide cargo the length of the Erie Canal and deliver a commercial cargo to its destination without the use of any fossil fuels or mules. The boat proved that this could safely be done, and the design continues to be refined to efficiently carry people and/or materials in an effective, affordable package. Not only does the Solar Sal line of boats never need fuel, they never need an engine mechanic either, further reducing operating costs."

Some folks scoffed at these boats as Borton's homemade toys. Solar Sal 44 can not be scoffed at. Her detailed design was by Marine Architect and boatbuilding author Dave Gerr. This is a commercial design, meeting all Coast Guard regulations for commercial passenger carrying vessels. Dave Gerr comments: "Our recently completed speed and endurance trials demonstrated that the Solar Sal 44 exceeds our expectations. Borton's solar-boat concept is opening a new, greener and more cost-effective course for the future of marine transportation."

David Borton chose Jim Kricker, Master Shipwright at the Riverport Wooden Boat School to build Solar Sal 44. Jim may be best known for

rebuilding the Hudson River Sloop Clearwater. Besides boats he is known for rebuilding water mills and other timber-framing projects. Jim chose John O'Donovan a passionate wooden boat builder from Maine, along with a skilled RWBS team, to build the hull, frames, stripping, and waterproofing through painting. Jim was an excellent choice and is enthusiastic about this build. "I just wanted to express my appreciation for the way the Solar Sal works, the entire propulsion system is nothing short of amazing. It has been a real treat to have traveled up and down the river using just the power from the sun."

Alex Borton, David's son, wants to use these boats in Puget Sound and the San Juan Islands. He has commissioned Sam Devlin Designing Boat Builders of Olympia Washington to build a 27 foot version Solar Sal. Sam has started construction and says "this is a very good looking boat, and we are very excited to see a true solar electric launch on Puget Sound Waters. We are incorporating wheelchair access into this first model with the intention of being capable of handling any type of passenger needs."

These wooden Solar Sal boats are beautiful and wood is the best way to build one-off boats. However, wooden boats require a large amount of hand labor. To accommodate a wider audience of boaters, these designs need to be implemented in composite materials. Because Solar Sal 44 has a fiberglass and epoxy coating the Coast Guard considers her a composite boat. The next big step for Solar Sal is an all composite design.

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