REINTJES
POWERTRAIN SOLUTIONS

Golden Gate Ferry

A REINTJES success story



Courtesy of Aurora Marine

QUALITY
MADE IN
GERMANY

Golden Gate Ferry

Innovative Engineering. Compact Integration. Buy America Compliance.

REINTJES and Karl Senner deliver an innovative, Buy America-compliant gearbox solution for Golden Gate Ferry's next-generation passenger vessels.

From a Design Challenge to an Innovative Solution
Engineering innovation through collaboration

The Golden Gate Ferry project demonstrates how close collaboration between vessel designers, equipment manufacturers, and technical integration partners can transform a challenging concept into a practical marine engineering solution. The story began at the International WorkBoat Show, where Karl Senner, LLC was presented with a unique design challenge: develop a compact gearbox-integrated electrical machine arrangement capable of reducing the space and installation requirements traditionally associated with marine power generation. Working closely with REINTJES and Danfoss, Karl Senner helped advance an innovative concept that integrated a permanent magnet electrical machine directly onto the gearbox. Within approximately one month, the team developed a design concept and produced a 3D model demonstrating the solution. This collaborative approach helped establish the foundation for the innovative power generation arrangement selected for Golden Gate Ferry's new passenger vessels.

Rethinking Marine Power Generation
The challenge: Maximizing efficiency within limited machinery space

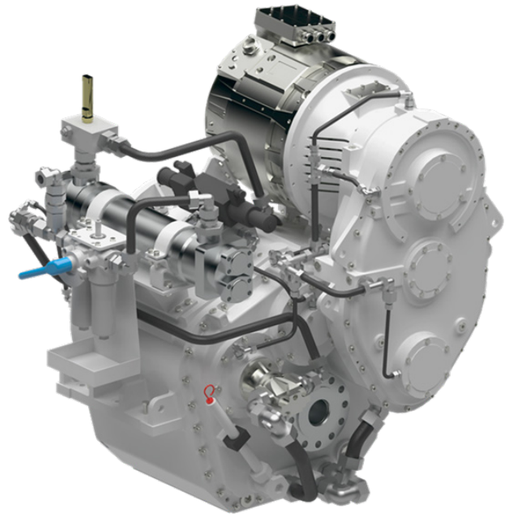
Golden Gate Ferry's next-generation high-speed passenger vessels require a dependable electrical power generation system while meeting demanding operational, environmental, and machinery integration requirements. Conventional shaft-generator arrangements can require additional machinery space, dedicated mounting foundations, and precise alignment between the gearbox and electrical machine. The engineering challenge was to develop an integrated system that would reduce installation complexity, maximize available engine room space, provide operational flexibility, and maintain the redundancy necessary for passenger vessel service.

The solution: REINTJES WVS 440 with integrated top-mounted PTO

The selected solution features REINTJES WVS 440 reverse reduction gearboxes equipped with top-mounted, clutchable power take-offs (PTOs) and integrated holding devices. The flanged PTO arrangement allows the shaft generator to mount directly to the gearbox, eliminating the need for a separate generator foundation and independent alignment. The integrated PTO clutch and holding device allow the shaft generators to be completely disengaged when not required, reducing unnecessary operation and providing additional operational flexibility. The vessels' six-screw propulsion arrangement provides a high level of redundancy, an essential consideration for passenger ferry operations.

Meeting FTA Buy America Requirements
German Engineering. American Compliance.

The Golden Gate Ferry project presented an additional challenge beyond the innovative propulsion system design: meeting the Federal Transit Administration's (FTA) Buy America requirements.



As REINTJES' North American distributor, Karl Senner, LLC leveraged its in-house capabilities to deliver REINTJES gearboxes compliant with applicable FTA Buy America requirements. This achievement demonstrates Karl Senner's ability to combine world-class German engineering with domestic manufacturing and compliance capabilities, enabling advanced REINTJES propulsion solutions to be incorporated into federally funded U.S. vessel construction projects. The result reflects the strength of the REINTJES–Karl Senner partnership in delivering technically innovative solutions while satisfying the regulatory requirements of the American marine market.

Delivering Practical Benefits
Compact design. Simplified installation. Operational flexibility.

The innovative REINTJES arrangement offers several important advantages:

- Space optimization: Direct mounting of the shaft generator reduces overall installation length and preserves valuable engine room space.
- Simplified installation: Eliminating separate generator foundations and alignment requirements reduces installation work and complexity.
- Efficient power generation: The shaft generators allow the Tier 4 main propulsion engines to supply the vessels' electrical house loads.
- Operational flexibility: Clutchable PTOs enable shaft generators to be disconnected when not required.
- System redundancy: The six-screw propulsion arrangement supports operational resilience.
- Buy America compliance: Karl Senner's in-house capabilities enable delivery of REINTJES gearbox solutions that meet applicable domestic procurement requirements.
- Lifecycle support: Karl Senner provides North American technical expertise and ongoing service support throughout the vessels' operating lives.

Together, these features demonstrate how thoughtful mechanical and electrical integration can simplify vessel design while supporting efficiency, maintainability, and long-term reliability.

A Collaborative Approach to Marine Innovation

The Golden Gate Ferry project reflects the value of combining specialized engineering expertise with close coordination among project stakeholders. Aurora Marine Design and One2three Naval Architects developed the vessel design, while Mavrik Marine is responsible for construction. REINTJES provides the gearbox technology, with Karl Senner supporting equipment selection, engineering coordination, technical integration, and Buy America compliance. The collaboration with Danfoss further demonstrates how complementary technologies and engineering expertise can be combined to develop innovative marine power solutions. Rather than treating mechanical propulsion and electrical generation as separate systems, the project highlights the advantages of considering integration from the beginning of the design process.

Project Partners

Owner / Operator: *Golden Gate Ferry*
Naval Architects: *Aurora Marine Design, Inc. and One2three Naval Architects*
Shipyard: *Mavrik Marine Inc.*
Gearbox Manufacturer: *REINTJES*
North American Distributor / Technical Support: *Karl Senner, LLC*
Electrical Machine Partner: *Danfoss*

Customer Testimonial

"Karl Senner and Reintjes have a track record of unmatched reliability and performance. Aurora came to the Karl Senner Team with our concept for a hybrid power generation drive. Reintjes and Karl Senner brought it to life far better than we could have ever hoped for. Building boats is a difficult business and we rely on high quality partners like Karl Senner to help us design and build the best quality boats."

Vice President | Aurora Marine Design