



Where genuine persistence meets innovation.

Tortuga Robotics is laser-focused toward the commercialization of Subsea Robotics based on Nature. We believe in a methodical, incremental approach toward the automation of hull cleaning, flow assurance, and subsea valve manipulation.

For **Phase I** of Tortuga Robotics, our primary focus will be mandatory **Hull Cleaning Service** to significantly reduce marine growth for tankers, drillships, floating production storage and offloading vessels (FPSOs).



Needs

Vessel owners, specifically high-value FPSOs, Tankers, and Drillships **require clean hulls to carry insurance and reduce fuel burn when transiting, or station-keeping** (a sophisticated harmony of thrusters that make-up Dynamic Positioning, or DP).

Summary Table: Fuel Burn Increase

Fouling Severity	Tankers (Transit)	FPSOs/Drillships (Station-keeping)
Thin Biofilm (Slime)	+5% to +15%	+2% to +5% (DP load)
Medium (Seaweed/Algae)	+15% to +30%	+5% to +12% (DP load)
Heavy (Barnacles/Mussels)	+40% to +80%	+15% to +25% (Thruster/Cooling loss)

The accumulation of microorganisms, algae, and animals like barnacles on ship hulls—significantly increases hydrodynamic drag, requiring up to 40% more fuel to maintain speed.

Outcome

Clients wish to remove unneeded biofouling, prolong drydock inspection windows, and adhere to regulatory compliance without cost overruns or delays in complex schedules.



Solution

Tortuga Robotics' Phase I Hull Cleaning Service will begin with the proprietary orchestration of (3) Clien Crawler Robots equipped with dual failsafe, industrially-proven tie offs.

Following our baseline, **"Bulldozer Clean"**, Tortuga will install GreenSealQ's Everclean Robot to deliver an always-on, resident cleaning service with remote monitoring and anomaly detection for retina-level access to stakeholders.

Tortuga's workflow platform known as, **"Maestro"**, enables users to see the active status of their dispatch, estimated cleaning time, completion, and annotation-areas requiring further evaluation from class inspection authorities such as DNV, ABS, or Lloyd's Registry.



Evidence

Living organisms, known as biofouling can stick to the bottom of the ship causing cumbersome drag/resistance, not to mention... a vessel owner needs to know the state of their hull to maintain asset integrity for both insurance and local regulating bodies; an invasive species can delay an operation upward of 7 days.

Tortuga Robotics leverages industry know-how to streamline cleaning and inspection windows via immutable vessel data known as AIS (automatic identification system) which helps us determine fuel burn, estimated time of arrival, ensuring we maximize our cleaning time with measurable fuel savings our clients have come to expect.

Please reach out to our website, or your local agent to learn more.

tortuga-robotics.com/

