

RED SUN FOIL PATROLLER 35™

FOIL-ASSISTED HIGH-SPEED MARITIME PATROL
PLATFORM

More Patrol Capability
From Every Horsepower.

Concept platform: hydrofoils improve the patrol boat
without making the patrol boat dependent on them.

PRELIMINARY CONCEPT



Speed Gets Expensive Fast.

Conventional high-speed patrol craft pay a steep resistance penalty as speed rises.

Resistance climbs

Pushing a hull faster increases hydrodynamic resistance and fuel burn.

Power snowball

More speed often means bigger engines, added mass, heat, cost and maintenance.

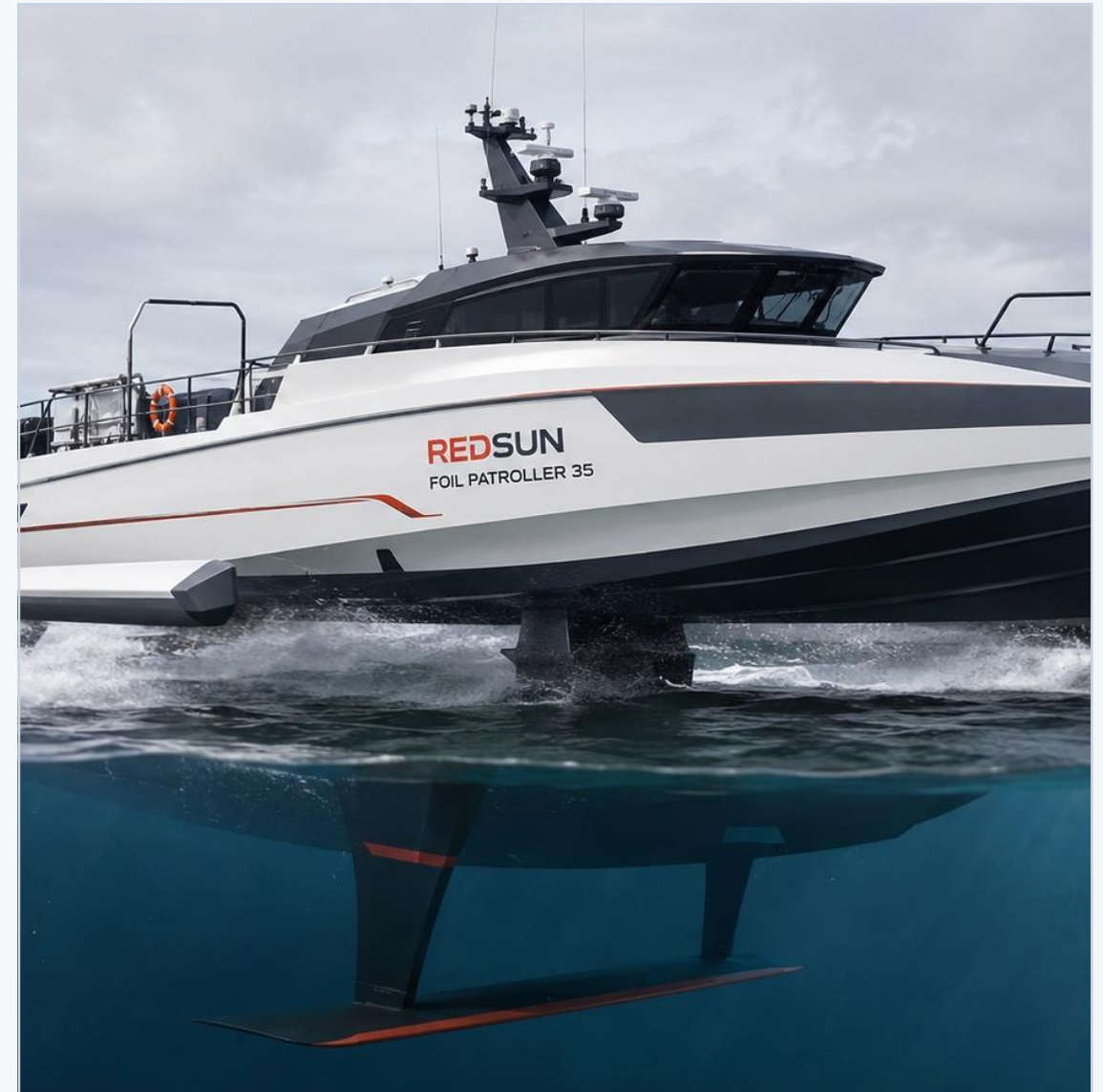
Endurance penalty

Long intercept runs can reduce available patrol range and station time.

Crew fatigue

Slamming and impact loads matter as much as top speed in real missions.

The engineering goal is not a stunt boat. It is a more efficient patrol platform.

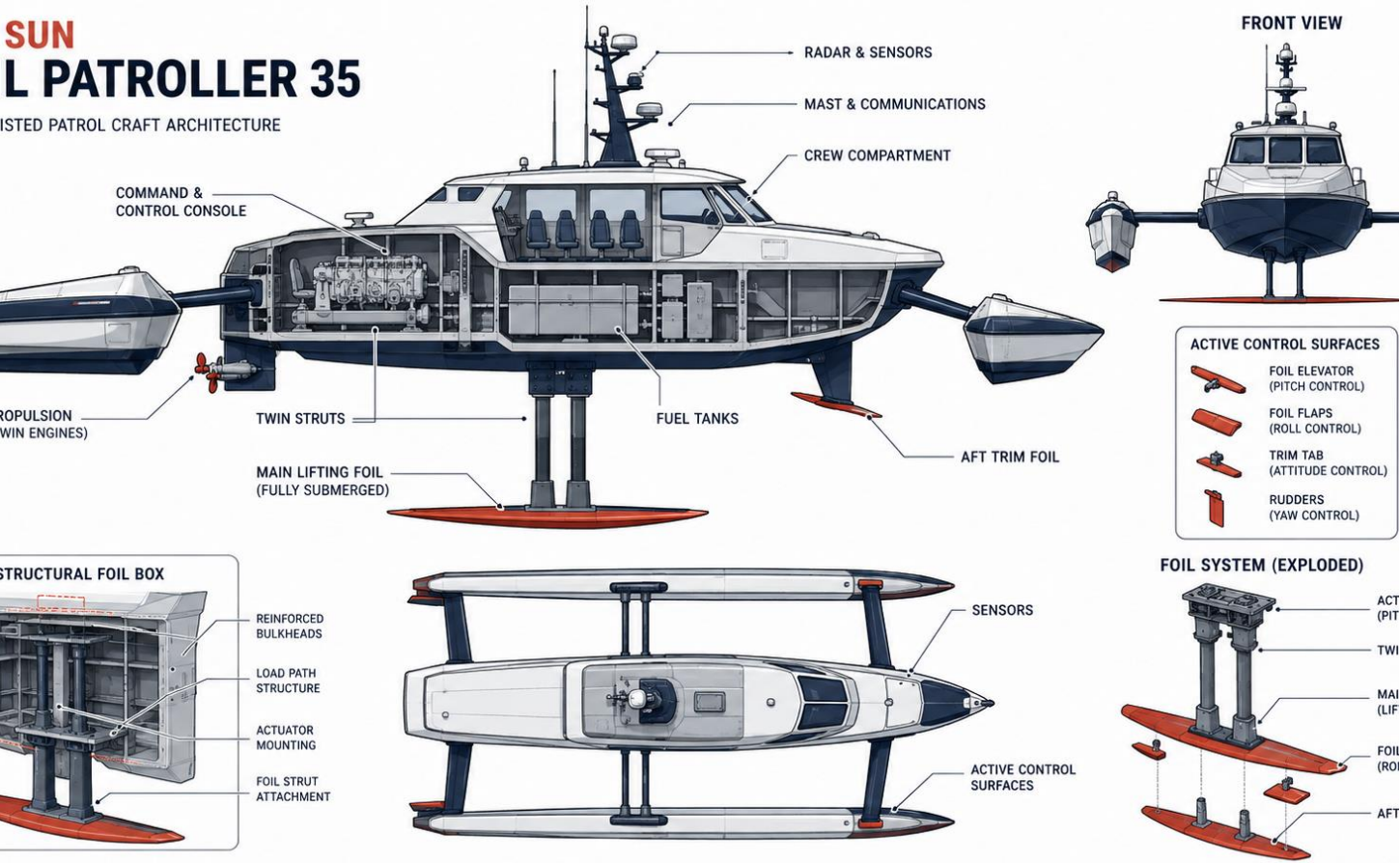


Unload the Hull.

Use hydrodynamic lift to reduce effective displacement instead of simply adding horsepower.

SUN L PATROLLER 35

LISTED PATROL CRAFT ARCHITECTURE



Central hull + amas

The boat retains buoyant stability in harbor, patrol, degraded and foil-off modes.

Main foil near LCG

Primary lift stays near the longitudinal center of gravity to reduce pitch instability.

Aft trim foil

Smaller stern foil manages pitch, ride height and transition back to hull-supported operation.

TBD — final geometry requires actual hull CAD, displacement, CG and propulsion data.

One Vessel. Three Hydrodynamic States.

The concept transitions progressively; it does not require binary “float or fly” operation.

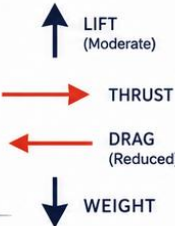
1 HARBOR / LOW SPEED DISPLACEMENT MODE

- Hull and amas floating conventionally
- Foils generating minimal lift



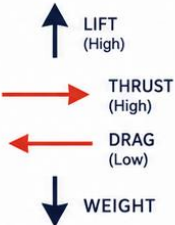
2 PATROL / PARTIAL FOIL TRANSITION MODE

- Foils begin generating lift
- Hull is lighter in the water with reduced resistance



3 HIGH-SPEED FOIL ASSIST FOIL MODE

- Main foil fully lifting hull clear of water
- Stern trim foil contributing significant lift for stability and control



RED SUN FOIL PATROLLER 35 | THREE-STAGE HYDRODYNAMIC MODE TRANSITION

SCALE: 1:1 (ALL STAGES)

01 Harbor

Hull and amas provide normal buoyancy and dockside stability.

02 Patrol

Foils generate modest lift while the hull remains primary support.

03 Intercept

Foils carry significant dynamic load; stern foil trims attitude.

The safer thesis: progressive assistance, controlled descent, conventional recovery.

Submerged Lift. Controlled Stability.

A central main foil and aft trim foil form the working hydrodynamic system.

Main lifting foil

Primary load carrier near LCG

Twin struts

Load transfer into structural foil box

Control surfaces

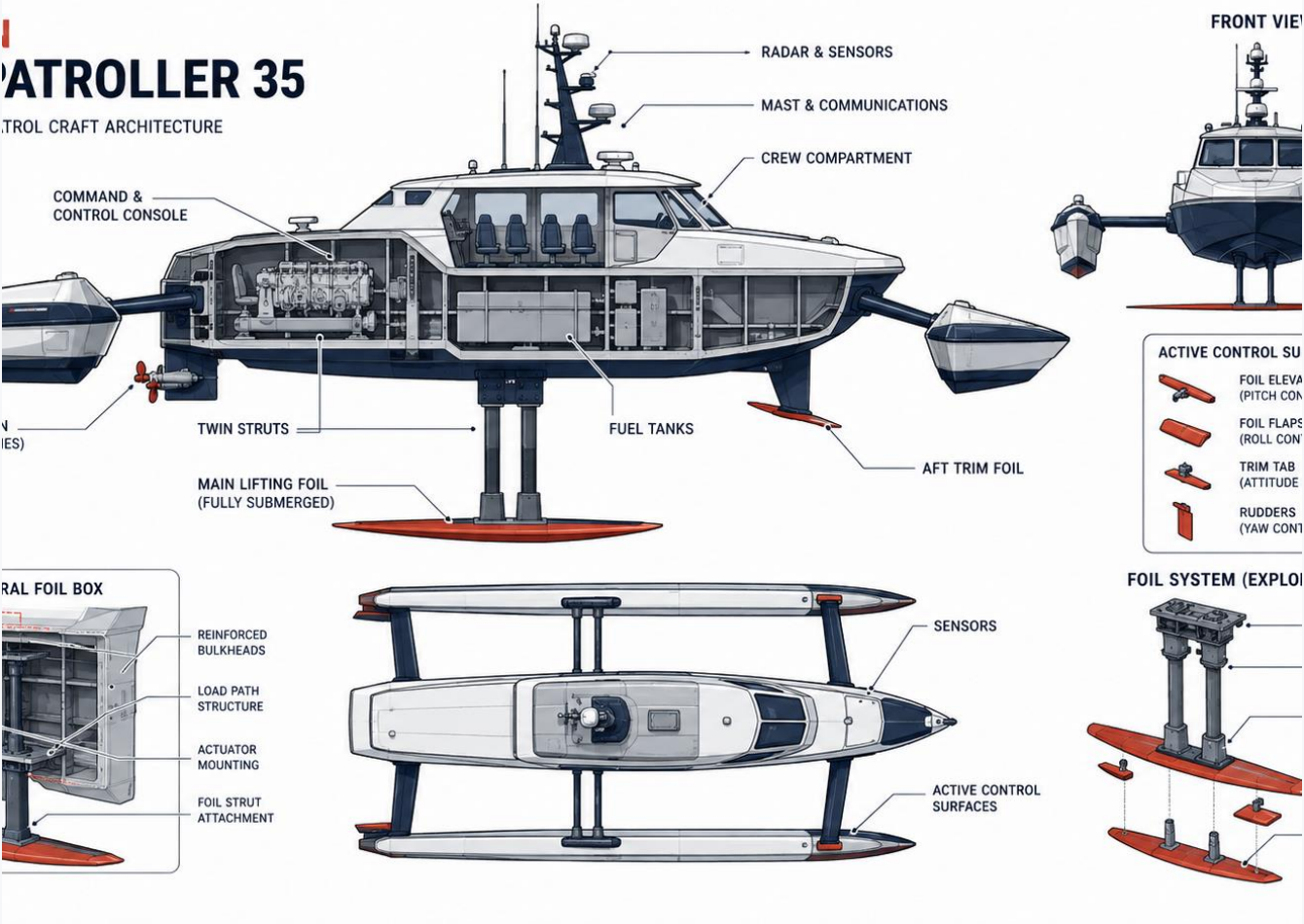
Pitch and roll assistance

Aft trim foil

Ride-height and pitch control

Sensors + actuators

Active control with safe fallback



Unknown dimensions must stay labeled TBD until verified by engineering.

The Physics of Foil Assistance.

The system trades foil drag for reduced hull immersion and wetted surface.



THRUST

FOIL LIFT

DRAG

WEIGHT

Conservative claim

Increasing foil lift can reduce hull-supported displacement and wetted area. Final savings require CFD and sea trials.

Built for Missions, Not Stunts.

Benefits are framed as hypotheses until verified by simulation and sea trials.

35 kn

baseline target

Lower power

at same speed

More range

same fuel load

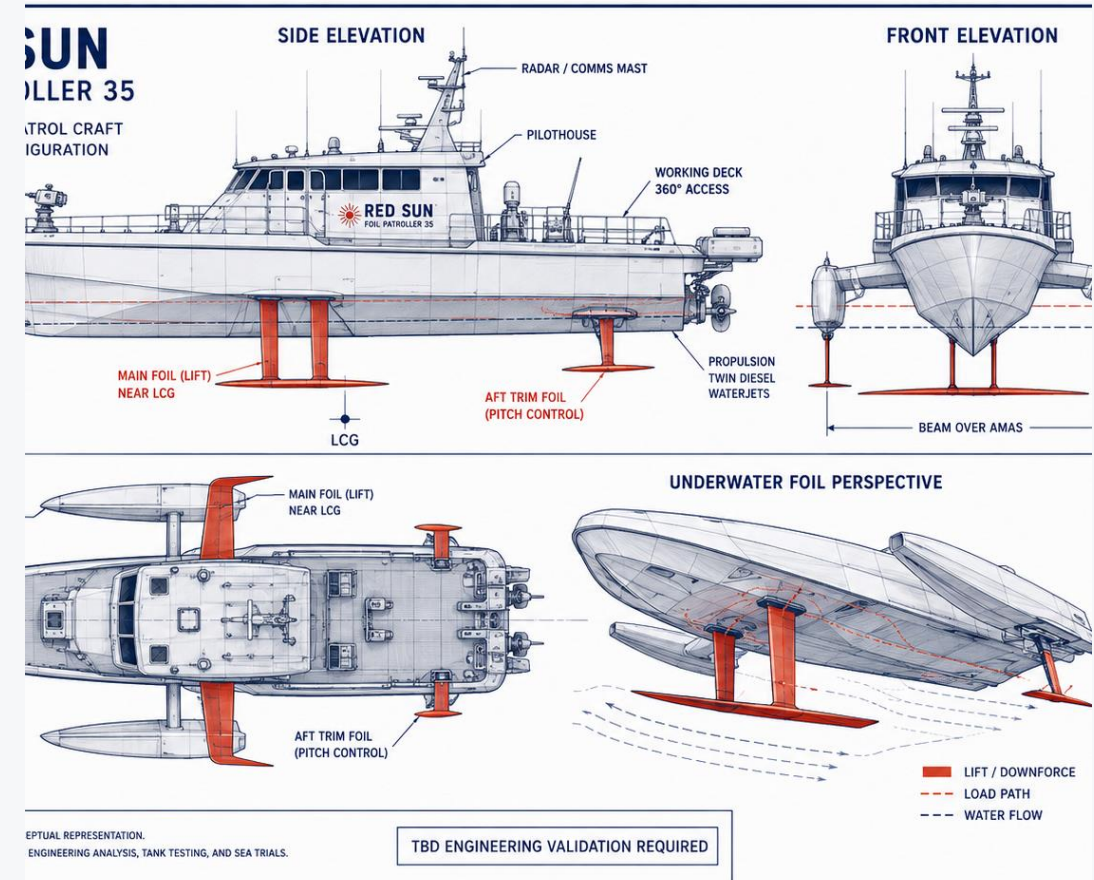
Safe foil-off

hull recovery

Potential advantages:

- lower propulsion demand at 35 knots
- greater operational range
- improved high-speed ride
- reduced slamming and fatigue
- conventional low-speed handling
- dynamic stability potential

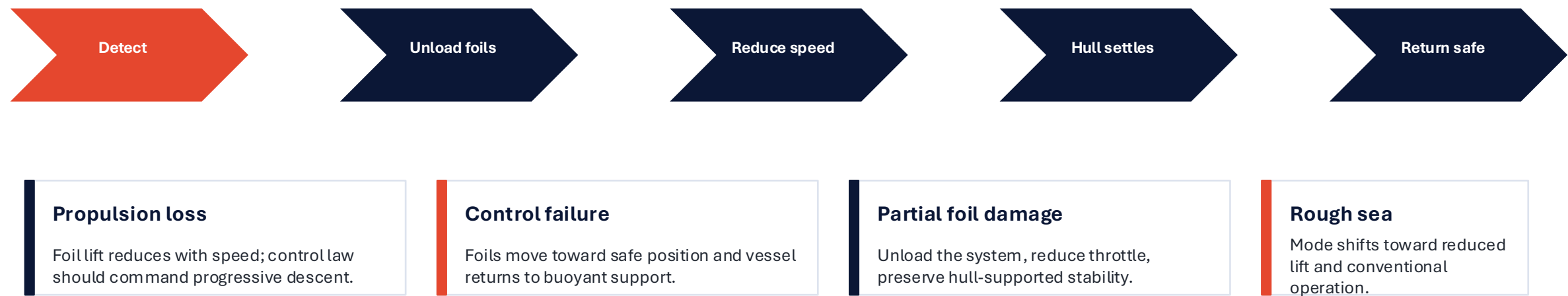
SUBJECT TO CFD / SEA-TRIAL VALIDATION





Fail Safe, Not Fail Fancy.

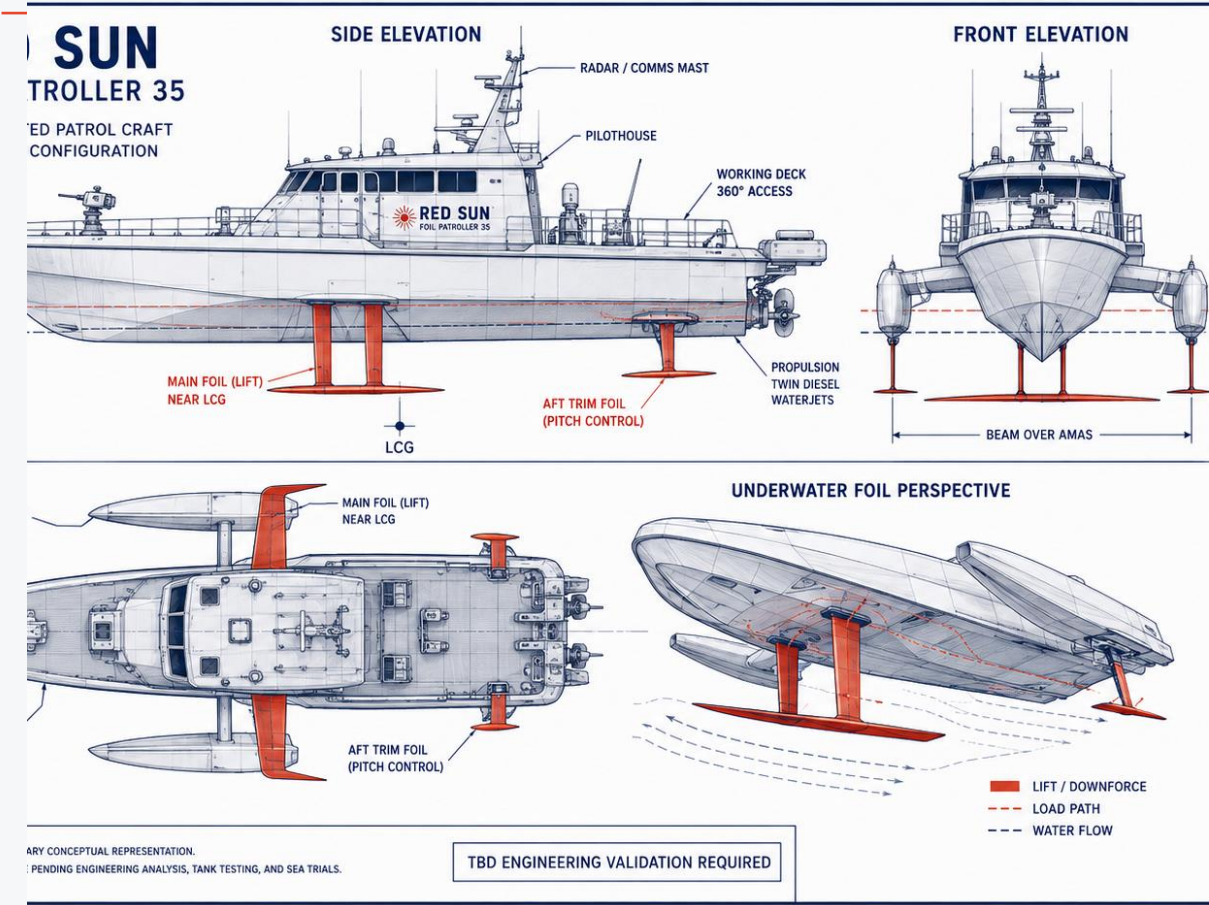
Loss of foil lift must result in controlled return to hull-supported operation.



Design rule: the patrol boat must remain seaworthy when the hydrofoil system stops helping.

Designed for Real Coastal Waters.

Foils must survive the messy places patrol vessels actually operate.



Risk field

Floating debris, ropes, nets, shallow water and beaching constraints are design drivers.

Mitigations

Swept leading edges, replaceable protection, inspection access, impact sensing, optional retractability.

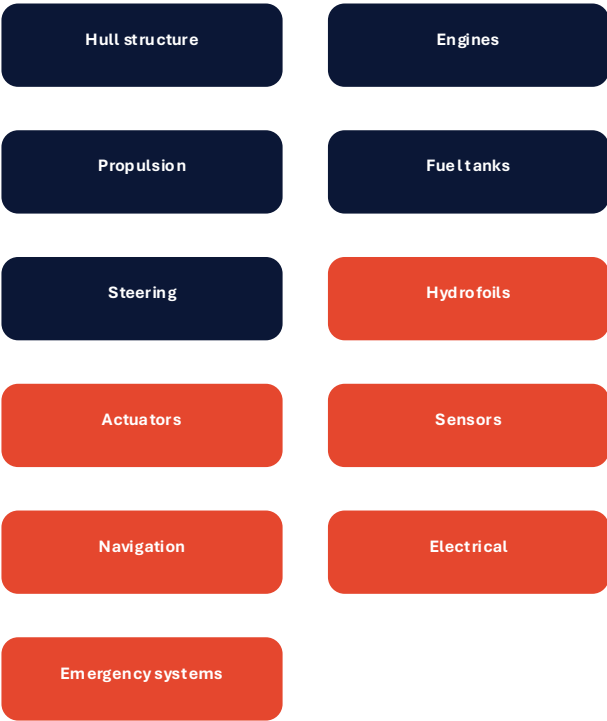
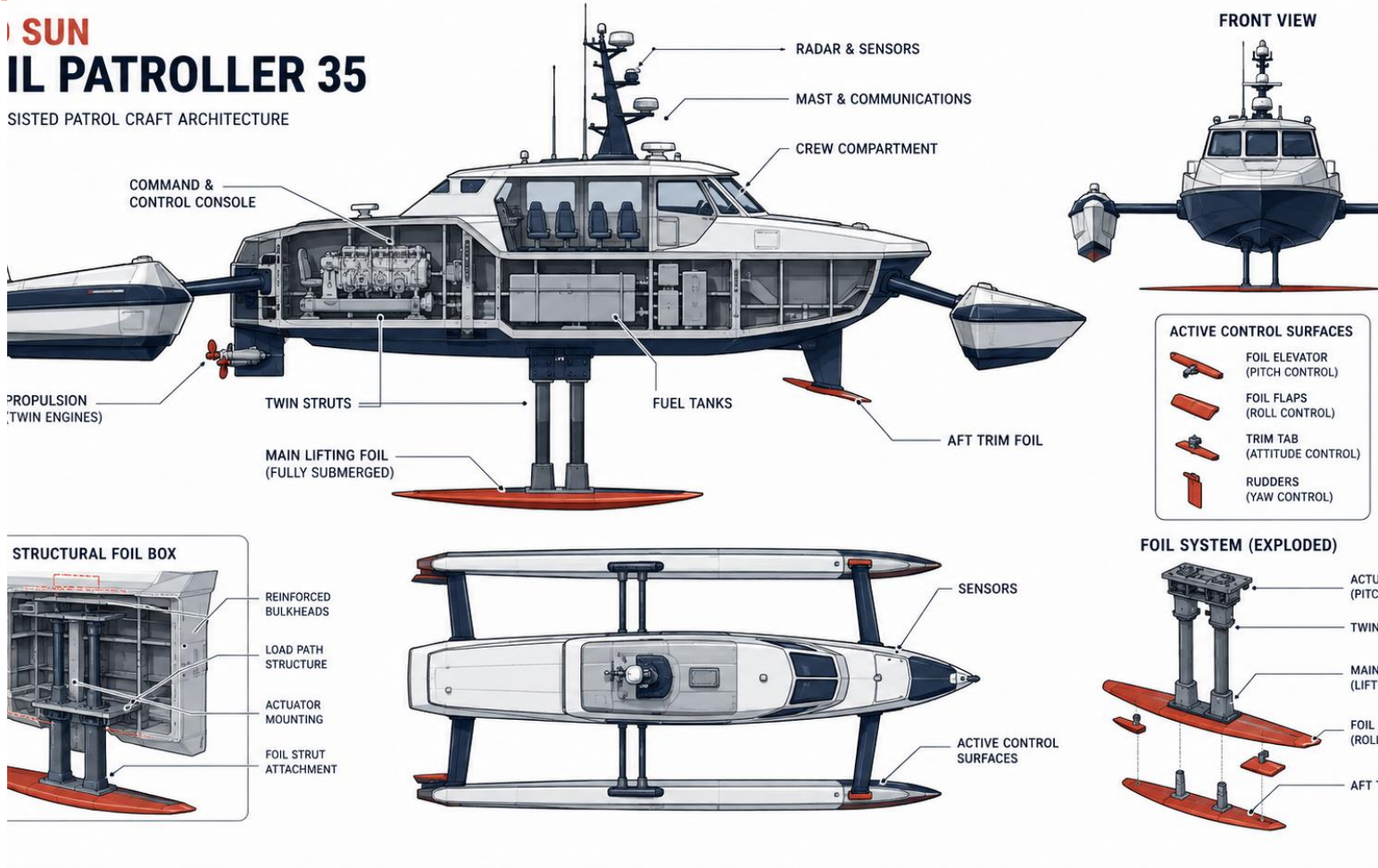
Reality check

Retractable foils require separate structural and mechanical validation — not a free upgrade.

Operational practicality beats showroom drama.

Integrated Patrol Platform.

Major systems must be designed as one naval architecture problem.



Propulsion configuration and detailed machinery layout remain TBD until verified from Dr. J's vessel data.

From Concept to Class-Ready Prototype.

A gated program prevents beautiful slides from outrunning the engineering.



2

PATROL / PARTIAL FOIL
TRANSITION MODE

- Foils begin generating lift
- Hull is lighter in the water with reduced resistance

↑

LIFT
(Moderate)

→

THRUST

←

DRAG
(Reduced)

↓

WEIGHT

No production commitment before validated hydrodynamic, structural and operational testing.

35 KNOTS IS THE STARTING POINT.

EFFICIENCY IS THE ADVANTAGE.

The program should prove whether foil assistance can deliver one of three outcomes:

- same speed with less power
- more speed with the same installed power
- greater range from the same fuel load

RED SUN FOIL PATROLLER 35™

