

Special Operations Craft – Riverine (Next Generation)

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Asymmetric warfare continues to be the predominant form of combat in the 21st century. Small-scale, high-intensity conflicts demand the application of special operations forces (SOF), who in turn require specialized equipment to accomplish their elite mission. For naval special operations missions, the Special Operations Craft - Riverine (SOC-R) has been a mainstay of actions in contested riverine and littoral waterways. However, the craft is aging and will soon exceed its lifespan and utility. Special Operations Command (SOCOM) therefore requested concept exploration for a replacement to sustain the vital SOC-R mission. Beyond simply reiterating the features of the SOC-R, the new vessel was to incorporate enhanced capabilities and innovative features in order to amplify the original craft's already-considerable prowess.

This report explores the design for such an advanced craft to succeed the SOC-R. The concept vessel meets or exceeds the detailed performance requirements tailored specifically for the insertion and extraction of SOF personnel in hostile areas. Concurrently, it maintains its predecessor's strict limitations on displacement, draft, and dimensions, driven largely by operational and transportability considerations. Most significantly, the new craft improves upon the original SOC-R in three key areas: speed, lethality, and maintainability. These improvements are realized through leveraging state-of-the-art technologies that have been developed in the time since the original SOC-R's inception. The resultant design, termed SOC-R(X), is a fast, maneuverable, lethal, survivable platform ready for the naval special warfare mission.

The design team conducted its primary analysis using the MAXSURF suite of naval architecture tools, following a design spiral specific to planing craft. Further analysis for arrangements used Rhino computer-aided design software, and a structural analysis was conducted in MAESTRO Marine. The team consulted numerous subject-matter experts for operational and technical insight, including: SOCOM, NSWC Carderock Combatant Craft Division, NSWG-4 Special Boat Team 22, USNA Naval Architecture and Ocean Engineering, and various MIT departments. Overall, this study resulted in a feasible design concept for a SOC-R replacement that balances proven characteristics with advanced features in an effort to maximize the efficacy of this high-performance vessel.

Notable design specifics include:

- **Hullform:** **deep-vee-cutoff** improves seakeeping ability while maintaining high speed and maneuverability
- **Propulsion:** **diesel outboards** provide substantial weight savings over waterjets as well as improved maintainability in-theater through ability to swap engines; **surface-piercing propellers** provide efficient high-speed propulsive force while maintaining draft limitation
- **Armament:** **three stabilized mounts** significantly increase accuracy of fire and may be locally or remotely controlled, providing greater flexibility in operation (Rafael Mini-Typhoon mount or similar, armed with up to .50-caliber guns); **two standard mounts** with miniguns provide high volume-of-fire; overlapping fields of fire achieved in all directions

Principal characteristics :

- Length: 38 feet
- Beam: 9.5 feet
- Draft: < 2 feet
- Speed: > 40 knots
- Acceleration: 25 knots within 14 sec
- Displacement: 17700 lbs
- Transportable via C-130
- Strengthened for airdrop, beaching
- Seating for 8 SOF passengers + gear
- Seating is removable and stowable for maximum space when necessary

