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TRACKING NO.	SLS-301
PROGRAM	CEDAR
CATEGORY	Autonomy & C2
FISCAL YEAR	FY2023
CONTRACT AWARD	30 MAY 2023

CAPABILITY BRIEF

HELMSMAN

SLS-PROPRIETARY

Core Autonomy & Navigation Stack

Helmsman is the core autonomy and navigation stack that runs on every Salish vehicle. CEDAR is the software foundation of the catalog: a portable guidance, navigation, and control layer providing COLREGS-compliant maneuvering, GNSS-denied dead-reckoning, and a planner that hands off cleanly to the TIDEFALL (SLS-305) fleet C2 suite.

KEY CAPABILITIES

- Hybrid collision avoidance — rule-based COLREGS layer plus velocity-obstacle geometry, with a reinforcement-learning policy for dense traffic.
- Global and local planners (A*, D*, sampling-based) over prior and live bathymetry.
- GNSS-denied navigation via inertial plus terrain/acoustic correlation.
- Deterministic, model-checkable decision core for certification.
- Common API shared across USV and UUV hulls.
- Signed over-the-air updates with deterministic safety fallback.

PLATFORM AT A GLANCE

Level 4

AUTONOMY

6+

PLATFORMS

50 Hz

CONTROL RATE

Model-checked

VERIFICATION

PLATFORM PROFILE

ARCHITECTURE	Modular GNC	CONTROL RATE	50 Hz
LANGUAGES	C / C++ / Rust	PLANNER	A* / D* / RRT
AVOIDANCE	VO + COLREGS + RL	NAVIGATION	INS, DVL, terrain/acoustic
GNSS	Optional / denied-capable	VERIFICATION	MCMAS model checking
INTERFACES	Common SLS vehicle API	C2 HANDOFF	TIDEFALL (SLS-305)
COMPUTE	Embedded GPU / CPU	POWER	< 120 W
COMMS	Link-agnostic	HOSTS	HERON, ORCA, SALMON, ROCKFISH
UPDATES	Signed OTA	SAFETY	Deterministic fallback

CONCEPT OF EMPLOYMENT

CEDAR runs onboard each platform as the certified decision core, executing missions tasked by ALDER (SLS-305) while guaranteeing COLREGS-compliant, collision-safe behavior in GNSS-denied conditions. A common API lets a single stack drive surface and subsea hulls alike, so new platforms inherit proven autonomy at integration.