AOC
Engineering Solutions

HM&E OPEN SYSTEMS ARCHITECTURE & SYSTEMS ENGINEERING

The Navy asked for ships that could change. Somebody had to write down what “change” means.

Modular vessel integration, interface control, and systems engineering. For any vessel carrying interchangeable equipment, mission modules, ROV suites, survey spreads, cable gear, containerized systems, AOC defines the interface once, controls it and verifies it at delivery, so the next package comes aboard without changing the ship. We have done this for the Navy's Littoral Combat Ship (LCS) since 2002, as prime contractor to NSWC Carderock Division.

$60M
Prime contract funding awarded, NSWC Carderock Division

Since 2002
Supporting the LCS and Mission Modules programs

70,000+
Interface requirements verified, LCS 1-38

700+
Engineering Change Proposals (ECPs) authored or contributed to

6,000+
Proposed ship changes reviewed for interface impact

What open architecture actually buys you

Modularity saves time, manpower, money and technology cycles across a hull's service life, but only if the interfaces are defined, controlled and verified with discipline. Otherwise “open” just means “undefined.” AOC has provided HM&E OSA expertise to the LCS and Mission Modules program since 2002 and co-authored the Navy's modular-zone and Modular Adaptable Ship design guides.



Interface control & ICD development

One document that says how everything connects.
Developer and maintainer of the LCS Interface Control Document (Rev 2.2): 1,000+ HM&E, communications and C2 requirements. Also developed the LUSV C4I ICD for PMS 406 and a small-USV ICD generated from the system model.

Requirements & traceability

Every requirement traced to its source.
An in-house traceability matrix maps each interface requirement to the capability document, performance specification, Naval Vessel Rules, and build specification, so a program office can answer, on demand, whether a specific ship can accept a specific package.

Configuration management

Changes reviewed before they reach the ship.
Author of the MSSIT Configuration Management Plan; 6,000+ proposed changes reviewed across LCS 1-38; board adjudication supported. One review caught out-of-scope shipbuilder costs ($300,000); another cancelled a duplicate fix ($364,000).

Verification, validation & test

We check the ship before the package arrives.
35 interface test procedures and 15+ physical test kits, executed before the mission package embarks; 200+ ship visits since 2011; In addition, we perform shock, vibration and environmental qualification to MIL-DTL-901, DDS 072-1, MIL-STD-167 and MIL-STD-810.

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Woman-Owned Small Business

AOC Engineering Solutions

SBA U.S. Small Business Administration WOSB CERTIFIED

HM&E OSA & SYSTEMS ENGINEERING

Flexible & modular ship design

How much flexibility to buy, and where.
Flexible Warship Roadmap for PEO Ships and OPNAV N96; LUSV modular C4I insertion study for PMS 406; sectional dry dock open-architecture study for COMNAVSEA; cost-based business cases across carrier, surface combatant and amphibious classes.

System integration

When a new system meets an existing ship.
Integration studies for DDG-51 laser and kinetic weapons; ONR's Maritime Laser Demonstrator on the Self Defense Test Ship and the Laser Weapon System Demonstrator aboard USS Portland; 30mm gun and missile module integration on LCS.

Lifecycle & sustainment

Keeping the baseline true after delivery.
Life Cycle Sustainment Plans, reliability and maintainability analyses, training curricula and technical manuals; post-delivery interface inspection every one to two years; cost estimates supporting Independent Government Cost Estimates.

Technical data & logistics

Drawings the yard can build from.
Ship Installation Drawings on both LCS variants; technical manuals developed and verified with NSWC Panama City; provisioning, nomenclature, ILS certification and sparing updates. Peer, management and government review drafts on every product.

Proof in practice, a fix that touched no ship

When mission package support container fire and smoke alarms failed to interface with damage control systems on both LCS variants, AOC wrote the white paper, built the risk matrix, and identified a container-level fix; no ship modifications were required. When a mine-detection UUV needed vital power and firemain water at a station the architecture never anticipated, AOC developed two design options and supported the change approval. The UUV went to sea.

Why AOC

- Continuity. AOC has supported the LCS interface baseline since 2002 and has held the Carderock HM&E OSA prime contract through successive recompetes.
- Prime contractor, consistently rated Exceptional and Very Good in CPARS on this contract.
- Independent. No shipbuilder or OEM affiliation; we don't build or sell what we evaluate.
- Every product traceable to a requirement and a source document.

Program reach

Navy. NAVSEA 05D, 05T and 05Z · PMS 300, 317, 321, 406, 420, 495, and 501 · PAE Maritime · DRPM RAS · NSWC Carderock, Panama City and Port Hueneme
Also. U.S. Coast Guard and commercial vessel operators

Certified Woman-Owned Small Business (SBA / WBENC) · Secret facility clearance · ~40 staff, all cleared Secret, 2 PEs · CMMC Level 2
Prime: NSWC Carderock HM&E OSA & Systems Engineering · GSA OASIS+ SB 47QRCA25DS049 · SeaPort-NxG
CAGE 1W6Y9 · UEI EYBHQ5ULU8C9 · NAICS 541330 / 541715 / 541340 / 541380 · DCMA-approved accounting system

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