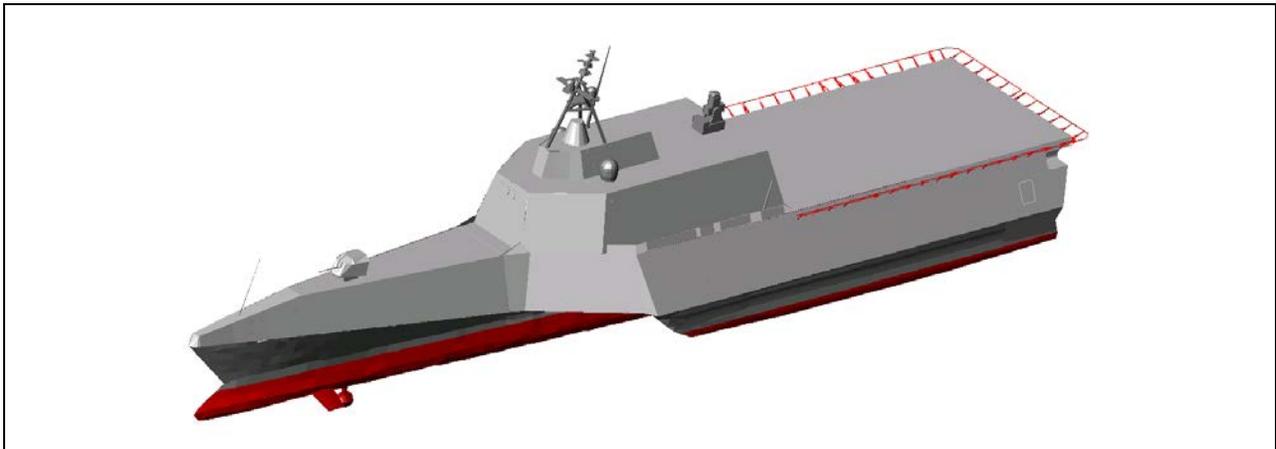


3D Ship Graphics

Technology Description

NAVFAC EXWC has created new unclassified 3D CAD models of U.S. Navy ships, and developed standards for creating future models that are used in the planning of weapons platform integration with shore-based infrastructure. EXWC began the process to collect, create, and standardize 3D ship models in FY10 and continued with Phase 2 in FY11 and Phase 3 in FY12. During that time, EXWC engineers have developed a 3D AutoCAD ship model standardization document, provided standardization of new NAVSEA ship models for facilities modeling, and produced 17 ship models to those standards.



3D CAD Model of LCS 2

A section located on the NAVFAC Portal, was created to house this library of ship models. Each ship class has a separate tab on the portal containing a 3D AutoCAD model, a 3D VRML model, 2D AutoCAD and PDF drawings (when available), source documentation for the models, the most recent Facilities Planning Criteria Document (when available), and a set of ship characteristics. The goal of the project was to provide all NAVFAC teams with access to these models and information through the NAVFAC portal, and to develop standardized procedures and requirements for 3D ship models for facilities planning use.

The Ships Graphics project has:

- Developed 3D CAD and VRML models of CVN 68, CVN 78, FFG 7, CG 47, DDG 51, DDG 1000, LCS 1, LCS 2, LHA 6, LPD 17, LHD 1, LHD 8, SSGN 726, SSN 688, SSN 774, SSN 21, and SSN 23
- Provided models and standards to NAVSEA PEO Carriers, PEO LCS, PEO Subs, and PACFLT

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- Provided a library of VRML models that will be used in a new collaborative 3D visualization tool for facilities planning (Spiders 3D)
 - Simplified and modernized the development of ship berthing models used by facilities planners and Port Operations groups.

The challenges for the Ships Graphics project are:

- 3D modeling technologies change rapidly
- Not all NMCI computers and software are capable of viewing these models effectively
- The 3D ship models are only useful if a 3D model of the pier or wharf is also available

Value to the Warfighter

The project supports identifying and planning appropriate homeports, safe berthing locations and mooring arrangements for weapons platforms and helps planners and Port Operations groups minimize or negate delays of weapons platforms delivery by avoiding unplanned critical support infrastructure modernization. For example, dry docking requirements for the newest aircraft carrier were defined and validated through use of 3D virtual environment review capturing infrastructure modifications that would have resulted in years of operational delay. Planners avoid repeated costly site visits saving funds that can be used for operational requirements.

Economics of the Technology:

Developing the 3D CAD models was economically beneficial given the level of detail and the fast transition of the technology into a useful product. When developing facilities plans or berthing models, having these verified 3D ship models ready will save facilities engineers and Port Operations personnel up to three weeks of labor per model plus travel to visit the ships. The development of the 3D ship model standards document also saves considerable labor, as each new NAVSEA ship program will provide these models directly to NAVFAC.

Technology Transition Documentation

This is a Transition 4 category; by improving technology capability and knowledge for NAVFAC. Technology transfer documentation is available to DoD employees and their contractors.

Site Implementation

Site implementation consisted of posting the 3D ship models on the NAVFAC Portal, which allows all NAVFAC facilities planners to access the information.

Waterfront Home | Reports | **Ship Drawings** | Links | Technical Discipline Leader | Subject Matter Experts

Information | Carriers | Surface Combatants | Amphibious Assault Ships | Submarines | MSC Ships

DDG 1000 | LCS 1 | LCS 2 | CG 47 | DDG 51/79 | FFG 7 | JHSV 1



[DDG 1000 USS Zumwalt class - 3D AutoCAD Model](#)
[DDG 1000 USS Zumwalt class - 2D AutoCAD General Arrangement Drawings](#)
[DDG 1000 USS Zumwalt class - 2D PDF General Arrangement Drawings](#)

DDG 1000

Overall Length: 600 ft
Max Beam: 80 ft
Max Draft: 28 ft
Full Displacement: 14564 tons

(Data Source: [Naval Vessel Registry](#))

For more ship characteristics, including the location of mooring fittings, access [Fixmoor](#).

For details on shore utilities and locations, see Appendix C of [UFC 4-150-02](#).

NAVFAC Portal Website for Ships Graphics

Specific Applications

The 3D ship models and information has already been used by NAVFAC Integrated Product Support and Port Operations, NAVSEA program offices and the Pacific Fleet, and NAVFAC EXWC moorings engineering group.

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