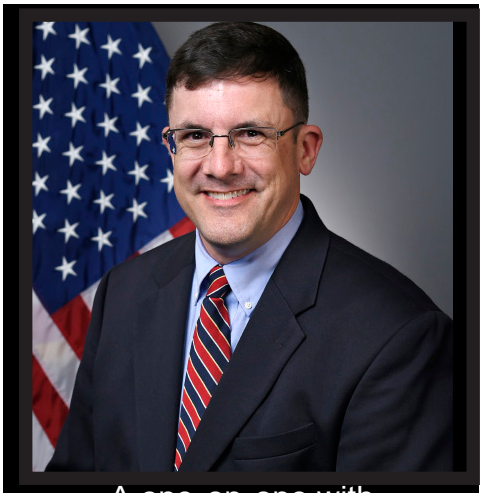


A one-on-one with

Erik Oller

Erik Oller, ONR's newest Navy Manufacturing Technology (ManTech) program officer, answers questions about the Center for Naval Metalworking (CNM) and its contributions to Navy manufacturing.

Q: What is CNM and what is its mission?

Erik Oller: The Center for Naval Metalworking, or CNM, is one of the ManTech program's seven Centers of Excellence (COE). CNM works with ship and aircraft manufacturers to develop and deploy innovative metalworking and related manufacturing technologies to reduce the cost and time to build and repair key U.S. Navy submarines, ships and aircraft. The ManTech investment strategy supports the Columbia-class submarine, the Virginia-class submarine, the Arleigh Burke-class destroyer, the Ford-class aircraft carrier, the F-35 Joint Strike Fighter and the CH-53K heavy-lift helicopter.

Q: Why is having a metalworking center important to the Navy?

EO: A metalworking center—focused on improving methods of working with metals to design and create individual parts, assemblies or large-scale structures like ships and aircraft—is of significant interest to the Navy because of the convergence of two key factors.

First, metals are ubiquitous on Navy platforms. Huntington Ingalls Industries – Newport News Shipbuilding estimates that **4 million pounds of weld metal were used to build USS Gerald R. Ford (CVN 78)**, and the American Iron and Steel Institute maintains that **USS George H.W. Bush (CVN 77) contains 47,000 tons of structural steel**. Steel and other metals are also used for pumps, piping and machinery.

Second, new technologies and innovative ways to use existing technologies are revolutionizing how we build and repair Navy weapons systems. Advances in robotics, automation, metrology and additive manufacturing are enabling more efficient designs, improving product quality, reducing acquisition and maintenance costs and enabling manufacturers to meet the Navy's increased demand for weapons systems. The combination of the extensive use of metal and recent technology innovations means that there is enormous potential for the Navy to dramatically advance the state of manufacturing. CNM is the focal point for making these advancements happen and sharing the results throughout industry. In addition, CNM provides technical advisory services to supplement the Navy's laboratories.

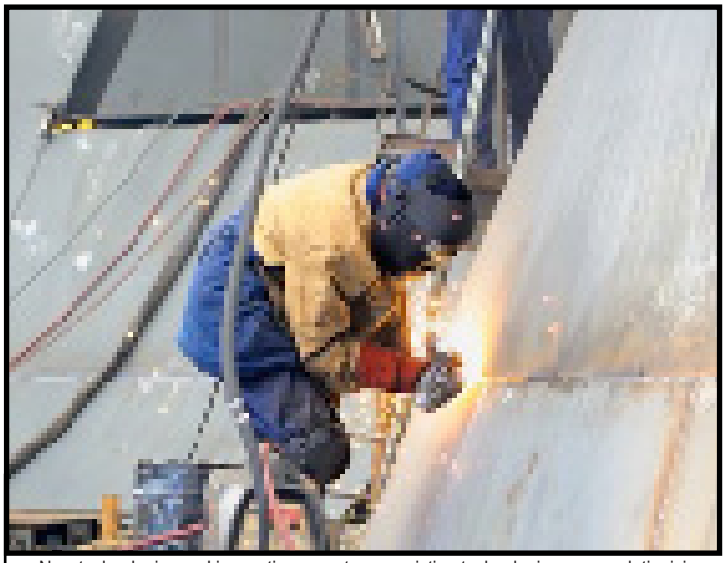
Q: How does CNM operate?

EO: CNM leverages its extensive network of industry experts and in-house technical expertise to build strong project teams that identify, develop, select and execute metals-centric projects and transition the results to industry. Any stakeholder can identify a potential project by contacting CNM or by contacting me directly. I can be reached at or at **erik.oller1@navy.mil**.

Projects are accomplished by tailored integrated project teams (IPTs) that typically include a project manager, technical experts, a technology provider, the weapons system manufacturer, the Navy program office and a Navy laboratory. These IPTs maintain strong communication among the stakeholders and the technical warrant holder to ensure that the requirements for implementation are properly identified and met. CNM is managed by Advanced Technology International of Summerville, South Carolina, and partners with Edison Welding Institute (EWI) of Columbus, Ohio, to leverage EWI's member-based organization that provides applied research, manufacturing support and strategic services.

Q: What are some of the projects CNM is working on now?

EO: ONR recently awarded CNM a project with General Dynamics Electric Boat and Bath Iron Works for a combined Virginia-class submarine and Arleigh Burke-class destroyer initiative to assess the feasibility of a high-speed, rotating, welding arc technology called SpinArc for platform weld joints. The IPT will



New technologies and innovative ways to use existing technologies are revolutionizing how we build and repair Navy weapons systems. Photo courtesy EWI.

A CNM team developed a new inspection technology that reduces the number of joints that need to be tested by manually applying soap and water to the weld joints. Photo courtesy CNM.

develop and test weld processes using this technology, and the shipyards will test the processes in their respective environments to gain technical warrant holder approval. The project, which is also applicable to the Columbia-class submarine, has the potential to save nearly $15M over a five-year period for all three platforms.

CNM recently completed an effort for Huntington Ingalls Industries - Ingalls Shipbuilding that evaluated a variety of non-destructive testing methods as alternatives to using soap bubbles to detect leakage paths through welds. The new inspection technology reduces the number of joints that need to be tested by manually applying soap and water to the weld joints. The technology, which is on track to implement by the first quarter of FY19, could potentially save an estimated $121K for the DDG 51 class, $38K for the LPD class, $136K for the LHA class and $309K for Coast Guard National Security Cutters over five years.

Q: How can I learn more about CNM's current projects?

EO: The **Navy ManTech Project Book** is an excellent source for more information about CNM projects and all of the other projects in ManTech's current portfolio. It's published annually, accessible on the ONR web site and highlights active projects or projects completed in the previous fiscal year.

Q: Where will I be able to find technical reports for these projects?

EO: As a first step, I recommend searching the **Defense Technical Information Center** (DTIC) database. All Navy ManTech technical reports that are not restricted are submitted to DTIC. Another suggestion is to contact CNM directly. The complete **list of Navy ManTech Centers of Excellence**, with a link to their respective web sites, is accessible from the ONR web site. In addition to providing contact information for each center, the web sites offer limited project information and a description of COE capabilities.

Q: Can I work with CNM for projects that aren't ManTech?

EO: As with all ManTech Centers of Excellence, all CNM projects must address a manufacturing issue within CNM's scope of work and support a weapon system in the ManTech investment strategy. In select cases—and with approval from ManTech director John Carney, ONR contracts and others at ONR—projects that don't meet these criteria can be executed. This happens infrequently. Feel free to contact me directly to discuss your metalworking issue.

Q: How do you see CNM affecting the Navy in the future?

EO: In the past, metalworking projects have reduced cost and schedule; improved safety, product quality and ship designs; and enabled the manufacture of very difficult shapes. CNM will continue these types of improvements to enable us to build a larger Navy and to expand our advantages over our potential adversaries.

Interview conducted by Denise Piastrelli, a contractor for ONR Navy ManTech.

CNM

CENTER FOR NAVAL METALWORKING

Scope of Work

- metals and advance metallic materials
- metal-based composites
- ceramics
- metallic materials-based systems
- metal/non-metals interfaces issues
- primary metal materials manufacturing processes (e.g. additive manufacturing)
- joining techniques
- surface and heat treatments
- metalworking systems engineering activities
- material characterizations and testing
- process design control
- product design and structural performance
- environmental issues and recycling
- information and data handling and transfer
- manufacturing technology / industrial base infrastructure
- inspection technologies