Electric Ships Office
PMS 320
Directing the Future of Ships Power

Surface Navy Association

January 13, 2016

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NAVSEA Naval Sea Systems Command
ONR Office of Naval Research
PEO Ships
PEO IWS
SEA 21

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Setting the Scene

"In FY2030, the DON plans to start building an affordable follow-on, multi-mission, mid-sized future surface combatant to replace the Flight IIA DDG 51s that will begin reaching their ESLs [Estimated Service Life] in FY2040."

Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for FY2015

Big differences from DDG 51:

- High-energy weapons and sensors
- Flexibility for affordable capability updates

Photo by CAPT Robert Lang, USN (Ret), from site http://www.public.navy.mil/surfor/swmag/Pages/2014-SNA-Photo-Contest-Winners.aspx

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The Capability We Need

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Technology Transition

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ONR
Office of Naval Research

DARPA

U.S. DEPARTMENT OF ENERGY

Industry

Academia

NAVSEA
WARFARE CENTERS
Philadelphia

Warfare Centers

- Silicon Carbide
- High Temperature Superconductors
- Energy Recovery
- Advanced Thermal Management
- Synthetic Hydrocarbons & Alternative Fuels
- Bio-Energy Conversion
- Advanced Battery Technology
- Fuel Efficient Turbine
- Compact Power Controls
- Highly Distributed Agent Based Controls
- 400 hz Point-of-use Power Conversion
- Electric Auxiliaries

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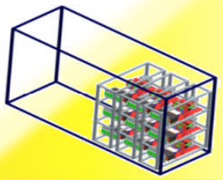
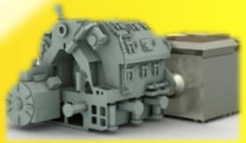
AMDR PCM

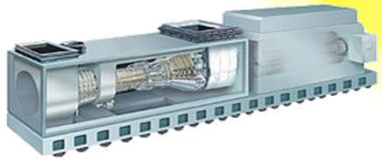


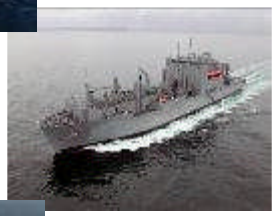
HED



ESM

Advanced Generator Sets





Transitioning Technology into Affordable Products

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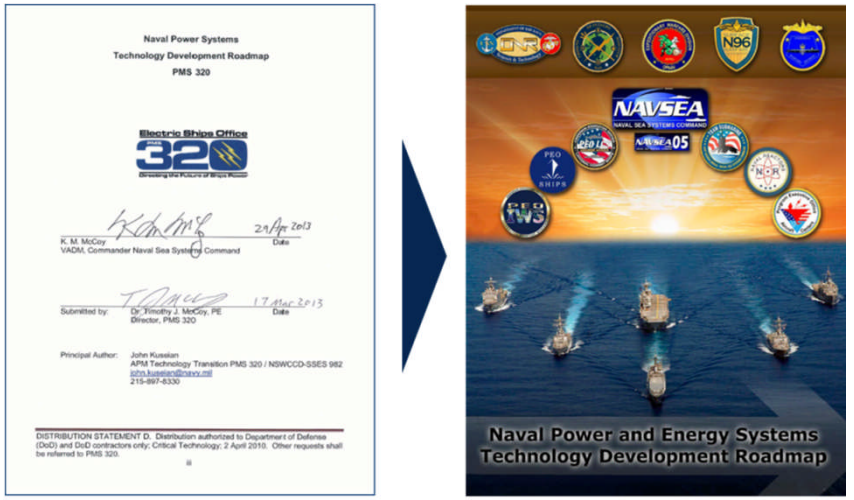
Naval Power & Energy Systems Technology Development Roadmap (NPES TDR)

Periodically updated to maintain relevance with Navy missions and emerging Fleet requirements – issued in 2007 as the NGIPS TDR and previously updated on 29 April 2013.

Main Objectives

- To align electric power and energy system developments with warfighter needs and to enable capability based budgeting
- Establish planning information in order to provide appropriate, mature technologies to meet platform timelines – providing the right technology to the Fleet at the right time
- Establish a common thread for electric power and energy systems requirements across Navy platforms
- Guide and coordinate Navy and DoD investments in affordable electric power and energy technologies and products
- Develop common terminology and increase communication with industry
- Influence investment decisions by government agencies, academia, and private industry



Issued on 08 October 2015

NPES TDR
Enabling Technologies to meet Requirements

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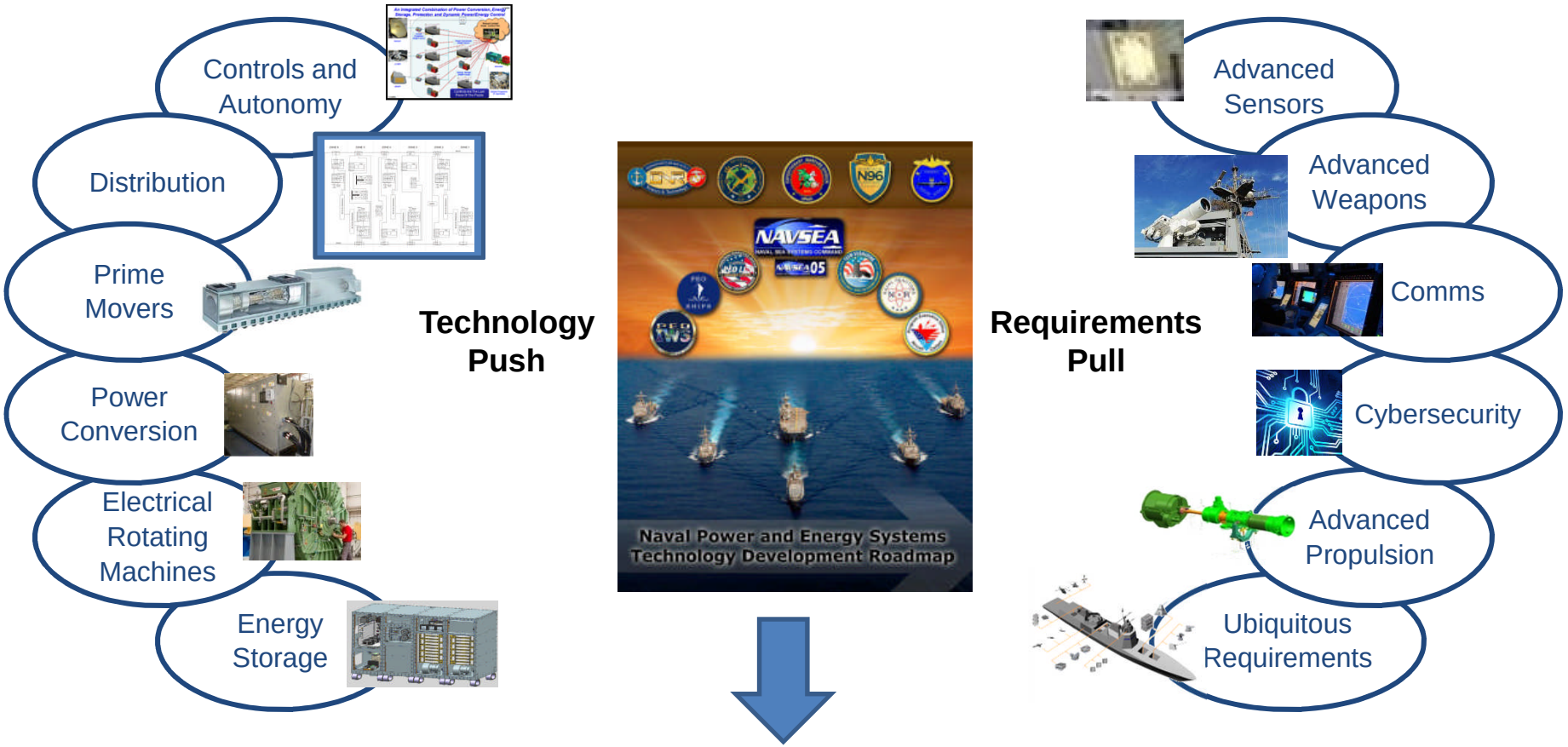

Influencing investment decisions by Government Agencies, Academia, and Private Industry

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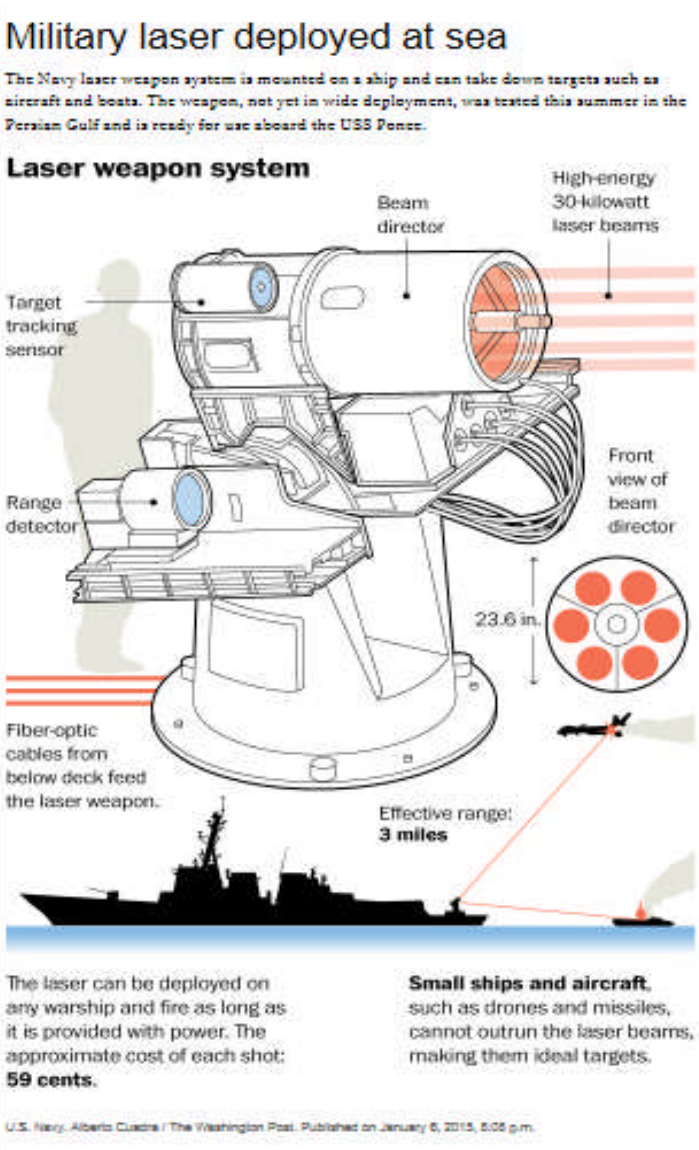
Shipboard Laser System



Shipboard Laser Weapon System (LaWS)

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Electromagnetic Rail Gun

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Testing at NSWCDD

A Future Tomorrow?

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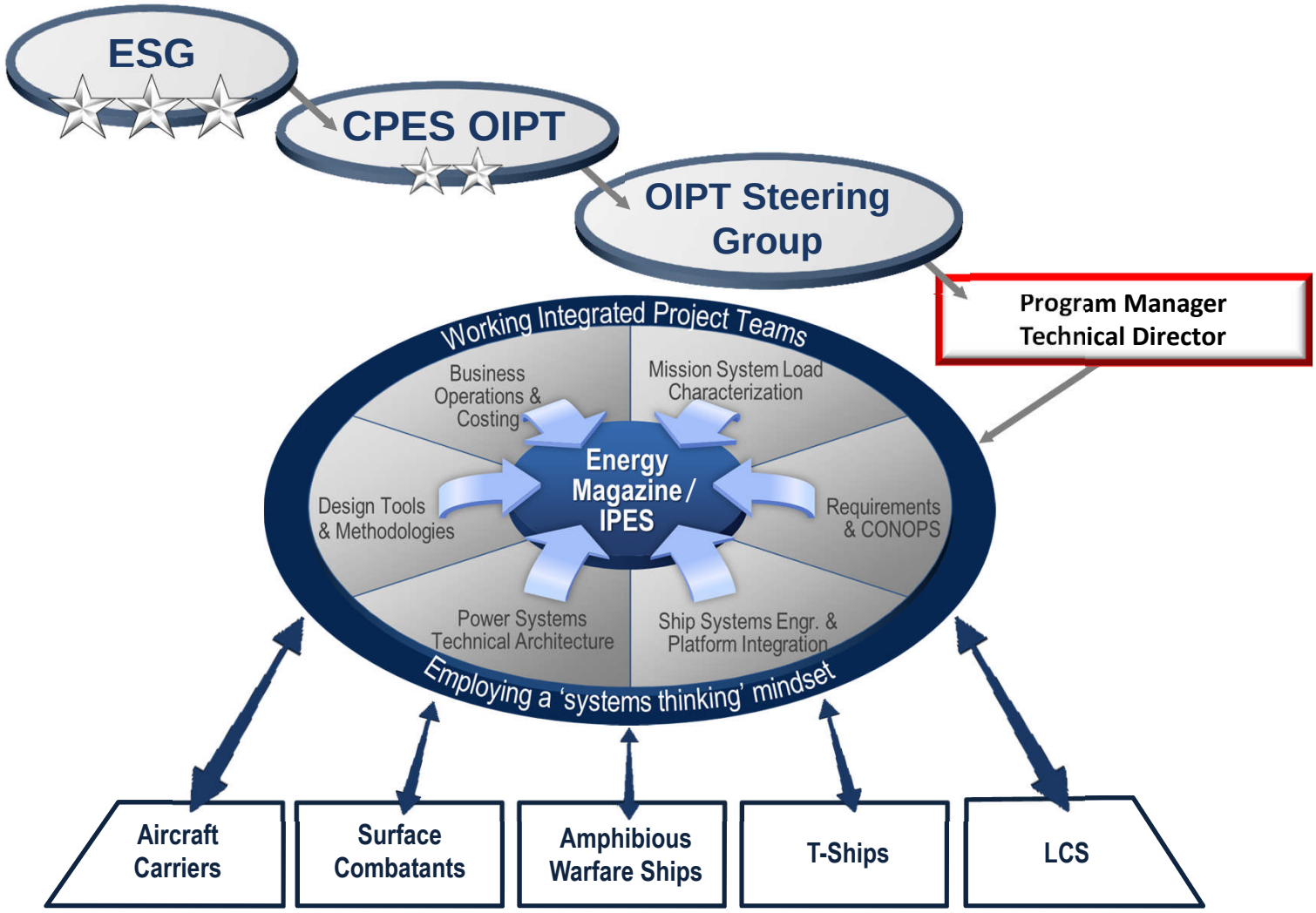
CPES OIPT Organization



WIPTs work to facilitate organizational integration and collaboration

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CPES OIPT WIPTs Focus

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Requirements and CONOPS	Mission System Load Characterization
Focus: Integration of Mission System CONOPs with Ship CONOPs	**Focus:** Defining mission capability and SWAP-C requirements
Design Tools and Methodologies	**Power Systems Technical Architecture**
Focus: Develop Design and Analysis Tools to support backfits and future surface combatants	**Focus:** Power System design, Interface validation and active power and energy management
Ship Systems Engineering and Platforms Integration	**Business Operations and Costing**
Focus: Integration of Advanced Weapons and Sensors for future surface combatants	**Focus:** Industry Engagement and ability to cost developmental machinery

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Takeaway

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PMS 320 is…

- Maturing technologies in support of SECNAV and CNO goals
- Transitioning systems to power emerging mission loads effectively and efficiently
- Guiding Navy Power & Energy Systems investments to develop smaller, simpler, and more affordable ships power systems for the US Navy's fleet
- Promoting affordability through prudent application of commercial standards

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