Task Force Energy Maritime Working Group

Naval Energy Forum

Energy Security * Energy Efficiency * Environmental Stewardship

When: 14-15 October 2009

At a Glance

What is it?

- The Maritime Working Group is one of seven working groups within Navy Task Force Energy that support the development of a Department of the Navy Energy Strategy.

What does it do?

- The Maritime Working Group is actively collaborating with the other services, government agencies, industry, and academia to develop a Maritime Energy Roadmap that will:
  - Increase mission effectiveness and fleet readiness by improving existing shipboard technologies.
  - Facilitate energy efficiency initiatives within the acquisition process, lowering total ownership costs and enabling the Navy to build an affordable future fleet.
  - Increase current fleet readiness by incorporating available technologies and incentivized energy conservation initiatives to reduce ships' dependency on fossil fuels and their impact on the environment.
  - Leverage Navy's innovative workforce to meet current operational requirements.
  - Anticipate future technical challenges for a shipbuilding program that supports the maritime missions of tomorrow.

What will it accomplish?

- The Maritime Working Group will:
  - Lay the groundwork for energy-related initiatives, technical expertise, and opportunities.
  - Provide inputs from the maritime community to shape the emerging DON Energy Strategy.
  - Share ideas and practices that can help other working groups.

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The Maritime Working Group's mission is to lay the groundwork for the maritime enterprises to meet the objectives of the emerging Department of the Navy Energy Strategy. The working group provides the technical expertise and leadership necessary to identify energy initiatives and promote the necessary culture changes.

Current energy initiatives within the maritime community include:

- Incentivized Energy Conservation Program (i-ENCON) – Engenders a culture of energy conservation through education, incentives, and facilitating the exchange of best practices
  - On pace for record energy savings in 2009
- Fleet Readiness Research and Development Program – Develops energy-saving initiatives, validates savings through shipboard demonstrations, and delivers ready-to-install technologies approved through Top Management Attention team for fleet installation
  - Five technologies are under evaluation on seven ships
- Hybrid Electric Drive for DDG-51 – Improves efficiency by using fewer gas turbines and loading gas turbines to optimal conditions
  - Land-based testing in 2010; followed by at-sea demo
- High Efficiency HVAC – The next-generation standard chiller reduces energy consumption by 30 percent and greenhouse gas emissions by more than 50 percent
  - Forward fit and back fit applications
- Smart Voyage Planning – Utilizes ship performance characteristics and real time environmental information to optimize ship route selection

. . . and many more programs and technologies!

Challenges and opportunities include:

- Achieving long-term energy security objectives by incorporating energy demand in strategic planning and acquisition decisions
- Identifying and fast-tracking potentially game-changing technologies
- Increasing efficiencies amidst expanding capabilities and requirements

Task Force Energy
Aviation Working Group

Energy Security * Energy Efficiency * Environmental Stewardship

When: 14-15 October 2009

At a Glance

What is it?

- The Aviation Working Group is one of seven working groups within Navy Task Force Energy that support the development of a Department of the Navy Energy Strategy.

What does it do?

- The Aviation Working Group will:
  - Lead development of near-term (operational and policy), mid-term (legacy system technology insertion) and long-term (acquisition/technology development) solutions to achieve Navy energy goals
  - Partner with Services, Allies, Government Agencies and industry to identify/leverage promising energy technologies and innovations

What will it accomplish?

- The Aviation Working Group will:
  - Provide the catalyst for energy-related programs, funding, and opportunities within the Naval Aviation Enterprise
  - Expand understanding and promote a culture that values energy as both a strategic resource and tactical advantage for the Naval Aviator

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The Aviation Working Group's mission is to lay the groundwork for the Naval Aviation Enterprise to meet the objectives of the emerging Department of the Navy Energy Strategy. The working group provides the technical expertise and leadership necessary to identify energy initiatives and promote the necessary culture changes.

Current energy initiatives within the aviation community include:

- F/A-18 F414 Engine Efficiency Demo –
  Tests multiple engine technologies which could reduce the amount of fuel consumed per flying hour by 3 percent for one of the Navy's largest consumers of aviation fuel.
- Aviation Simulators –
  Implements improvements in Naval Aviation simulation that will provide advanced alternative training solutions and will reduce demand of limited resources.
- Advanced Engine Technology Development –
  Partners with the other services and industry to develop game-changing energy efficient engine technologies.
- Aviation Energy Conservation R&D Program –
  Evaluates the potential benefits of existing technologies for incorporation into Navy systems. Initial technologies to be evaluated include T-56 engine efficiency improvements and aircraft flight management enhancements.

Challenges and opportunities include:

- Developing cost-effective technology insertion solutions for legacy systems
- Identifying and fast-tracking potentially game-changing technologies
- Communicating best practices and opportunities within the Naval Aviation community and industry

Naval Energy Forum

Task Force Energy Expeditionary Working Group

Energy Security * Energy Efficiency * Environmental Stewardship

When: 14-15 October 2009

At a Glance

What is it?

- The Expeditionary Working Group is one of seven working groups within Navy Task Force Energy that support the development of a Department of the Navy Energy Strategy.

What does it do?

- The Expeditionary Working Group is actively collaborating with the other Services, government agencies, and industry to identify/leverage promising energy technologies and innovative practices.

What will it accomplish?

- The Expeditionary Working Group will:
  - Lay the groundwork for energy related programs, funding, and opportunities in an expeditionary environment
  - Provide inputs from the Naval Expeditionary community to the emerging DON Energy Strategy
  - Share ideas and practices that can help the other working groups

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The Expeditionary Working Group's mission is to lay the groundwork for the Naval Expeditionary Enterprise to meet the objectives of the emerging Department of the Navy Energy Strategy. The working group provides the technical expertise and leadership necessary to identify energy initiatives and promote the necessary culture changes.

Current energy initiatives within the expeditionary community include:

- On-Board Vehicle Power –
  Improves tactical wheeled vehicle fuel economy while providing exportable electric power, leading to 40 percent fuel savings.
- Improved Environmental Control Equipment –
  Improves ECU energy efficiency up to 23 percent and reduces electrical power requirements by 10-25 percent, leading to fuel savings of about 775,000 gallons per year.
- Integrated Generator / Environmental Control –
  Provides a full 30 kilowatts of electrical power output in all environments, compared to 7 kilowatts in old units), resulting in fuel savings of 20 percent.

Challenges and opportunities include:

- Developing technology that can be used to collect fuel data in a tactical environment
- Communicating best practices and opportunities within the expeditionary community and industry

Naval Energy Forum

Task Force Energy Shore Working Group

Energy Security * Energy Efficiency * Environmental Stewardship

When: 14-15 October 2009

At a Glance

What is it?

- The Shore Working Group is one of seven working groups within Navy Task Force Energy that support the development of a Department of the Navy Energy Strategy.
- The Shore Working Group is chaired by OPNAV N46 and Commander, Navy Installations Command

What does it do?

- The Shore Working Group is coordinating efforts with other agencies in support of Task Force Energy strategic development.
- We are facilitating the creation and sustainment of a culture that values energy as both a strategic resource and a tactical advantage for the Navy Shore Community.

What will it accomplish?

- The Shore Working Group will focus its efforts on a long-range strategy to:
  - Reduce energy consumption
  - Reduce water consumption
  - Reduce fossil fuel consumption
  - Increase alternative energy production
  - Ensure reliable energy for critical infrastructure
- The Shore Working Group will:
  - Develop energy-related governance, policies, doctrines, programs, communication plans, and project execution plans
  - Establish departmental energy conservation program goals and develop procedures to measure energy conservation accomplishments
  - Share ideas and practices that can help other working groups

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The Shore Working Group's mission is to lay the groundwork for the shore enterprise to meet the objectives of the emerging Department of the Navy Energy Strategy. The working group provides the technical expertise and leadership necessary to identify energy initiatives and promote the necessary culture changes.

Current energy initiatives within the shore community include:

- Ocean Thermal Energy Conversion (OTEC) – Explores large-scale application
- Co-generation Plants – Produces 80MW of electricity on Navy land
- Wind Power – Utilizes wind resources at several installations
- Geothermal Power – Operates a world-class plant at China Lake and expanding to other viable locations
- Energy Conservation Investment Program (ECIP) – Invests $20M annually in renewable projects
- LEED Silver Certification Requirements – Enhances sustainability of new military construction projects
- Culture Change – Leads sailors, marines and civilians to manage energy in their daily lives
- Research and Development – Supports advances in energy technology and research to meet the Navy's energy goals

Challenges and opportunities include:

- Identifying and fast-tracking potentially game-changing technologies
- Communicating best practices and opportunities within the shore community and industry
- Providing secure energy to the shore community

Naval Energy Forum

Task Force Energy
Fuels Working Group

Energy Security * Energy Efficiency * Environmental Stewardship

When: 14-15 October 2009

At a Glance

What is it?

- The Fuels Working Group is one of seven working groups within Navy Task Force Energy that support the development of a Department of the Navy Energy Strategy.

What does it do?

- The Fuels Working Group will:
  - Develop critical path test requirements necessary to approve alternative fuels.
  - Apply science and technology to improve understanding of the impacts of alternative fuels on naval systems.
  - Collaborate with energy partners across military Services, Allied nations, federal agencies, academia and industry to identify, evaluate and approve renewable fuel sources with potential benefit for all.

What will it accomplish?

- The Fuels Working Group will provide a path toward reducing the Navy's dependence on petroleum through the approval and use of more environmentally conscious alternative fuel sources.

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The Fuels Working Group has primary responsibility for the approval and implementation of fuels derived from non-petroleum sources for use in Navy aircraft, ships, ground vehicles and equipment.

In conjunction with other working groups, the Fuels Working Group establishes the technical and operational requirements necessary to develop, test and procure alternative and renewable fuel sources for use in Navy systems.

Current initiatives within the fuels community include:

- Test and Certification Requirements – Develops testing protocols for alternative fuels
- Aircraft and Ship Demonstrations – Tests fuels produced from renewable sources
  - F-18 "Green Hornet" initiative (camelina plant derived)
  - "Green Ship" initiative (algae derived)
- Non-Tactical Alternative Fuel Vehicles – Increases utilization of non-petroleum fuel for base vehicles and support equipment
- Alternative Fuel Testing – Enhances characterization and test simulation to determine fuel chemistry differences and evaluate potential operational impacts

Challenges and opportunities include:

- Developing modeling and simulation technologies/systems to streamline the testing and certification of alternative fuel sources
- Identifying and fast-tracking potentially game-changing technologies
- Expanding the Navy's ability to share best practices and leverage technology development and investment across the public and private sectors