The OPNAV Perspective on Science, Technology, and Engineering: Opportunities and Obligations

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What Science and Technology Means to OPNAV: An Opportunity

Game Changing Technology
- Railgun, LDUUV, Directed Energy

Continuous Improvement For Current Product Lines
- FNCs, ManTech, TIPS
- prototypes and technology improvements
- informed options for acquisition: even “failed transitions” represent progress

A Reserve Capacity to “Surge” S&T in Response to Emergent Threats and Opportunities
- Speed to Fleet, Swamp Works, Tech Solutions

A Hedge Against An Uncertain Future
- A Broad Based Portfolio of Basic Science

Affordable Asymmetric Advantages
Not an oxymoron

**EM Railgun**
- Multi-use weapon at $25K per round ...

**LDUUV**
- ISR at a fraction of the cost of an SSN

**Solid State Laser**
- Less than $1 per “shot”
The Opportunity

Future Naval Capabilities Pillars

- **Sea Shield** - Missile defense, ASW, MCM and fleet/force protection technologies
- **Sea Strike** - Weapons, aircraft, and expeditionary warfare technologies
- **Sea Basing** - Logistics, shipping, and at-sea transfer technologies
- **FORCEnet** - C4ISR, networking, navigation, decision support and space technologies
- **Naval Expeditionary Maneuver Warfare** - Enhance the warfighting capabilities of naval ground forces with special emphasis on regular and irregular warfare
- **Capable Manpower** - Match Sailors and Marines to the right jobs, design intuitive systems, and train for mission essential competencies
- **Force Health Protection** - Protect Sailors and Marines by reducing morbidity and mortality when casualties occur
- **Enterprise and Platform Enablers** - Cross-cutting technologies to lower acquisition, operations, and maintenance costs
- **Power & Energy** - Energy security, efficient power and energy systems, high energy and pulse power

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Quick Reaction S&T

Off-the-shelf technology projects with a 12 to 24 month time horizon
• SwampWorks:
  – Newly invented/discovered technologies
  – Accelerated timeframe.
• TechSolutions:
  – Operational problems ID’d by Sailors and Marines
• Speed to Fleet (S2F):
  – high priority, near-term needs of warfighters
  – CNO funded, ONR/N84 managed

The Persistent Littoral Undersea Surveillance (PLUS) system was accelerated to operational use via S2F
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A Hedge Against An Uncertain Future
- A Broad Based Portfolio of Basic Science
- The Foundation for Advanced Technology
- Mitigating Against Tech Surprise
- Seed Corn for Imposing Our Own Surprises

Diagram:
- Discovery and Invention (Basic and Applied Science)
- Discovery & Invention (Basic and Applied Science) ≈ 45%
- Long Focus Time Frame
- Near Acquisition Enablers (Future Naval Capabilities) ≈ 30%
- Quick Reaction S&T ≈ 8%
- Leap Ahead Innovations (Innovative Naval Prototypes) ≈ 12%
- 1-2 years, 2-4 years, 4-8 years, 5-20 years
The Flip Side of Opportunity......

OPNAV Operates at the Intersection of Fiscal Stress and Strategic Uncertainty
Under These Conditions, “Opportunity” Can Feel More Like.......

.......A Bill......
The Flip Side of Opportunity......

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.....or A Treasure Chest to Be Raided
The Flip Side of Opportunity......

OPNAV Operates at the Intersection of Fiscal Stress and Strategic Uncertainty
Under These Conditions, “Opportunity” Can Feel More Like....... or.....A Treasure Chest to Be Raided....

....“if only I had that next marginal dollar...then I’d be whole....”

ONR, just 1.26% of Navy’s budget ...

Source: DoN FY13 Presidential Budget, figures do not include OCO

ONR S&T, $1.97B

* includes USMC S&T

FY13 DON Budget ($155.9B)

RDT&E Budget ($16.9B)

PROCUREMENT, $42.5

O&M, $49.9

MILCON, $2.4

MILPERS, $44.2

RDT&E, $16.9

6.6, $0.85

6.7, $3.98

6.5, $5.75

6.2

6.4, $4.34

6.1

Source: DoN FY13 Presidential Budget, figures do not include OCO
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.......or A Disruption....
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....there’s a reason it’s called Disruptive Innovation........
The Flip Side of Opportunity......

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“.... our POM is in ruins......”
The Flip Side of Opportunity Is Obligation

- What Science and Technology Means to OPNAV: An Obligation
- An Opportunity Without A Matching Obligation is Meaningless
- An Opportunity Without A Matching Obligation Distorts the Opportunity
- Our First Obligation: Embrace Disruption....Engage In The Process
  .....while our POM build may never go from this to this.........
The Flip Side of Opportunity Is Obligation

- An Opportunity Without A Matching Obligation is Meaningless
- An Opportunity Without A Matching Obligation Distorts the Opportunity
- **Our First Obligation: Embrace Disruption….Engage In The (Messy) Process**
  
  .....we can at least aspire to this........
The Flip Side of Opportunity Is Obligation

- **Our Next Obligation: Examine Our Own Technology Development Practices**
  - CNO is Pressing On Many Fronts: Improve Our Innovation OODA Loop
  - Until Now The Primary Focus Has Been On the S&T Side of that Equation
  - While S&T Can Always Continue To Be Improved........
  - The Next Great Opportunity for Improvement Lies With Us.......
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Where We Are Today: To Improve Innovation
Focusing On S&T Is Necessary But Insufficient

On The Opportunity Side: We Manage
S&T Strategically at the 3/4-Star Level

On The Obligation Side: We Manage
R&D Tactically At the Program Level
True or False? The Valley Of Death Is Caused by a Lack of BA-4 Funding

is this a Valley of Death?
or a Darwinian Sea?

is the Valley of Death a fait accompli?
or an artifact of how we manage R&D?
Where We’re Headed/Signs of Progress

Initially Focus on Transition
BA-3 to BA-4

RDT&E Corp Board:
A Strategic Approach
BA-1 thru BA-7
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- An Opportunity Without A Matching Obligation Distorts the Opportunity
- **Our Final Obligation: Make Peace With the Non-Linear Nature of S&T**
  - While each of these are now hailed as a success, their individual journeys in real time were full of twists, turns, and unexpected obstacles and opportunities along the way

*Every new leap in the Navy’s warfighting capabilities started with Navy research:*
- GPS
- E2-D radar
- Towed array
- Aegis
- Quiet propulsion
- Directed energy ...
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**Historical Perspective Materials Genome Initiative 1988-2011**

- 1988 DOE: Advanced Strategic Computing Initiative
- 1989 NRC: Materials Science & Engineering for the 1990s
- 1995 AFOSR-MEANS
- 2001 ONR-D3D
- 2004 DARPA-AIM
- 2008 NRC-ICME
- 2010 DOE-CMS&C
- 2011 Challenges for Materials Insertion

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Questions?

Comments?