Enterprise ISEA of the Future
a Technology Vision for Fleet Support

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Our Naval Opportunities

Six tenets to achieve and maintain U.S. naval power:

- **Bigger**
- **Better**
- **Networked**
- **More Talented**
- **More Agile**
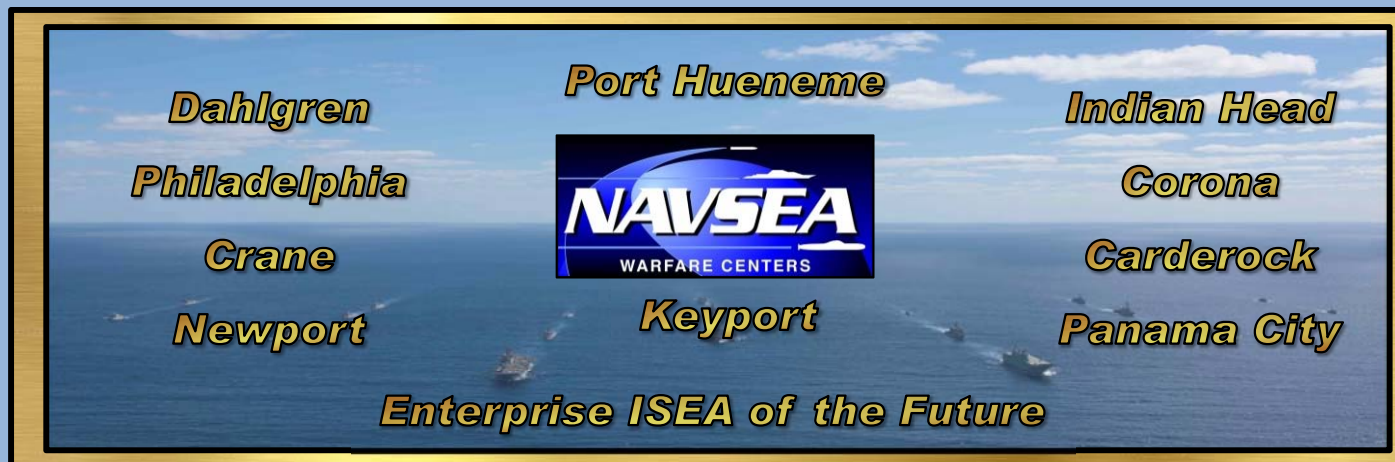- **More Ready**

…Navy

Expand the Advantage

ISEA Traditional Role

The In-Service Engineering Agent (ISEA) is responsible for overall engineering, test, maintenance and logistics requirements in support of specific operational equipment.

Functions include:

- Design
- Safety
- Test Support
- Technical Documentation
- Data Analysis

- Maintenance Engineering
- Computer Programs
- Installation
- Fleet Support
- Training and Manning
- Integrated Logistics

- Data Management
- Configuration Management
- Test Equipment
- Supply Support
- Repair Facilities

Dahlgren
Philadelphia
Crane
Newport

Port Hueneme

Keyport

Indian Head
Corona
Carderock
Panama City

Enterprise ISEA of the Future

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ISEA of the Future Vision

Research, development and application of advanced technology enabling the ISEA of the future to optimize the lifecycle sustainment and iterative improvement of the ship, combat and weapons systems deployed to the Fleet.

- Predictive Analysis
- Augmented Reality
- Automation
- Data Analytics

- Deep Learning
- Artificial Intelligence
- Machine Learning
- Neural Networks

- Autonomy
- Unmanned Systems
- Data-Driven Decision Support

Artificial Intelligence

Artificial Intelligence brings a promise of true human-to-machine interaction. When machines become intelligent, they can understand requests, connect data points and draw conclusions. Machines can reason, observe and plan in order to present optimized solutions to human decision makers.

Image by Vikas Patel Haluwa

Image by ACM SIGARCH

Software and hardware configuration will be tracked down to the level of individual chips and files, rather than servers and applications. Due to the improved data quality, the ISEA will have visibility of configuration at the system, platform, strike group, and fleet level.

Artificial Intelligence and highly sophisticated modeling and simulation will allow the ISEA to identify all potential issues related to ship modernization months and even years before a ship restricted availability.

Immersive Technologies

Immersive technologies like Augmented Reality and Virtual Reality will change how we create and experience content in the following ways:

1. Transitions the move from observation to immersion
2. Reduction of cost via virtual prototyping and remote technical support
3. Lowers the barrier to innovation and allows iterative experimentation
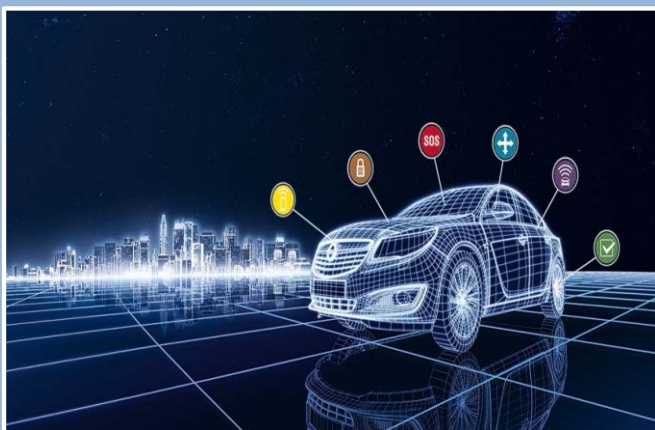4. Provides a layer of authenticity of experience

Image by OpelOnStar

In the future, the "iterative improvement" of platforms will take place in a fully immersive photo realistic "holo-deck like" environment where the ISEA will literally "walk the ship" to understand with rigorous detail all facets impacting the ship modernization process.

Automation and Autonomy

Autonomous systems and advances in robotics will allow machines to play a greater role in the sustainment and modernization of our ships. The biggest game changer will be intelligence and the ability of machines to learn from experience.

In the future, humans and robots will work collaboratively together to solve a variety of ISEA assignments, including:

- Inspections

- Repairs

- Technical assists

- Maintenance

- Hardware installations

- Test events
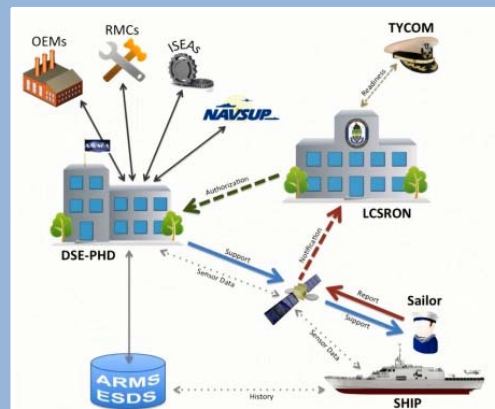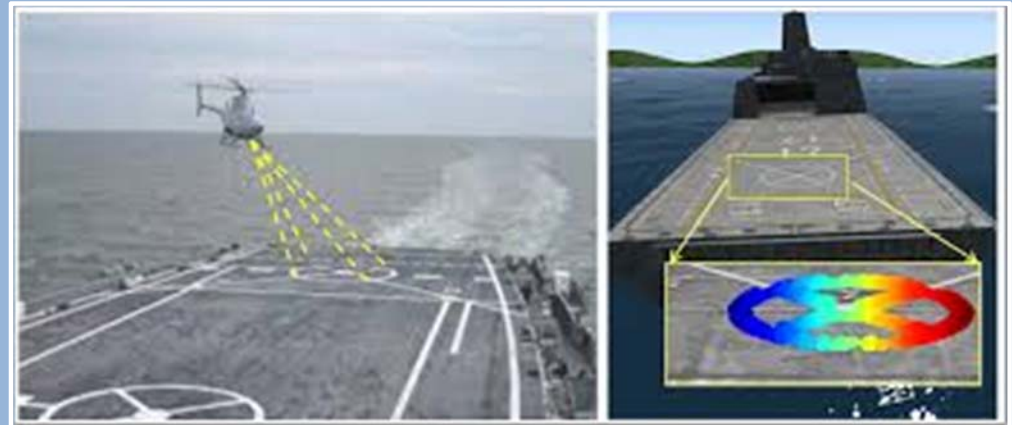
Way Forward

- **Build a coalition of Government, Industry and Academic strategic partners with specific expertise in technology development and application**

- **Identify and build technology roadmaps and development plans for experimentation and prototyping**

- **Align and exploit internal research and development efforts to technology focus areas supporting ISEA**
  - **e.g. Advanced Naval Technology Experiment, 23 May 2018**

> *Expand the Advantage and Culture of Affordability Precepts.*
> *Invite Dramatic Change.*
> *The Future is Now!*