



Engineered Resilient Systems (ERS)

A DoD Science and Technology Priority Area

Overview

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ERS Goals



ERS goals are to develop tools and procedures that enable DoD to:

- **Produce more complete and robust requirements pre-Milestone A**
 - Generate requirements that consider many more alternative scenarios
 - Make much more informed decisions early in the acquisition process
- **Make the engineering design process much more efficient and effective**
 - Consider many more design concepts in much less time
 - Increase productivity of work flow and collaboration
- **Consider the manufacturability of a proposed design explicitly**
 - Ensure the design is producible from both engineering and cost perspectives
 - Affect feedback between manufacturability and capability
- **Establish baseline resiliency of current capabilities**
 - Small perturbations of original requirements
 - Completely new missions and requirements
 - Support adaption to evolving Tactics, Techniques and Procedures (TTPs) of the threat



Capabilities Delivered by the ERS

FAR TERM (FY 18+)

- Explicitly consider evolving TTPs in design
- Living, adaptive repository of 100,000's of alternative designs, operational/mission contexts, value
- Semantic search and large-scale data mining
- Direct assessment of the producibility (manufacturability) of proposed alternatives
- Estimate lifecycle costs of design alternatives
- Fully incorporate training modules into collaborative tools

MID TERM (FY 16 - 18)

- Extend ERS to ground vehicles, weapons and software systems
- Embed ERS developers on Ships, Air Vehicle, and Sensor Acquisition Teams
- Integrate experimental and M&S data into design tools
- Quantify uncertainty of M&S and experimental outputs
- Field capability to evaluate and buy-down risk through acquisition process

NEAR TERM (FY 13 - 15)

- Capture and simulate essential components of the DoD acquisition and operational analysis processes
- Integrate M&S, collaborative tools, tradespace analysis, engineering design processes into single architecture
- Express lessons learned and create communities of interest through DoD social media exploitation
- Demonstrate ERS for Ships, Air Vehicles, and Sensors
- Provide technical basis for improvements to DoD policy

Revolutionary Capabilities That Result In

- 75% time savings via reduction of rework
- 100-fold increase in number of operational scenarios considered pre-Milestone A
- Quantification of risk for proposed systems
- Integration of Producibility and Lifecycle concepts formally across acquisition process
- Transformation of the acquisition process through risk mitigation, productivity enhancement, and knowledge management

Acquisition Challenges

- Increase speed and agility of system development
- Improve effectiveness and quality of fielded systems
- Minimize lifecycle costs, including cost of redesign

Secretary of Defense,
Dr. Robert Gates:

"... we need to have in mind the greatest possible flexibility and versatility for the broadest range of conflict ..."



ERS Architecture Overview

