
Military Roles in Response to the Terrorism Threat

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Traditional Military Roles

- q **Provide for the Defense of the Country**
- q **Protect National Interests Abroad**
- q **Support Civilian Agencies During National Emergencies**
- q **Posse Comitatus Act**
 - **Limitation on Use of the Military as a “Civilian Police Force”**

Military Response to Sept 11 Attacks

- q **Immediate Deployment of Aircraft and Ships**
 - **Air Patrols over New York, Washington**
 - **Surface Combatant Ships Deployed Along East Coast of US**
- q **Interactions with FAA to Coordinate Air Picture**
- q **Coordination with Local Civilian Agencies**

Military Response Subsequent to Sept 11

- q **Operation “Enduring Freedom”**
- q **Northern Command Created to Centralize Military’s Role in Defense of U.S.**
 - **“Defend the American People Where They Live and Work---Functioning in a Supporting Role to Civil Authorities” (Secretary of Defense Donald Rumsfeld, April 17, 2002)**

Needs in Aligning Military and Civilian Capabilities

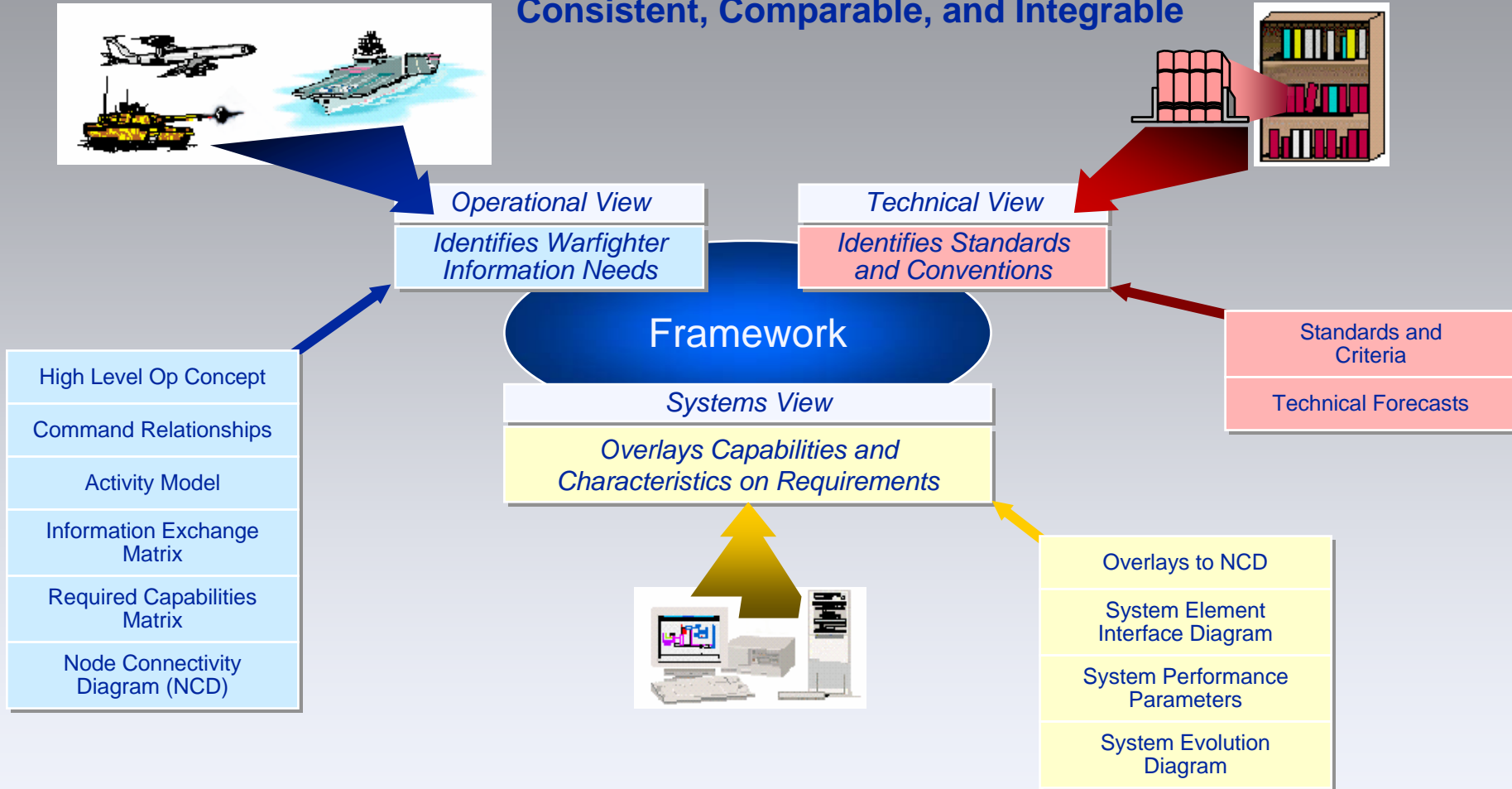
- q Streamlined, Efficient Organizational Structure**
- q Coordination and Sharing of Intelligence Information**
- q Coordination and Sharing of Sensors**
- q Appropriate, Effective Allocation of Resources**

Key Issue in Aligning Military and Civilian Resources

- q **Definition of an Overarching SE Process that Provides**
 - **Means to Protect Sensitive Military Information While Sharing Significant Information on Activities of Terrorist Organizations**
 - **Integration of Multi-Source Intelligence and Sensor Data to Provide a “Coherent Operational Picture”**
 - **An Integrated Data Base Approach to Support Military and Civilian Activities**
 - **Alignment of Multiple Levels of Command and Control**
 - **Effective Allocation of Resources**

DOD C4ISR Architecture Framework

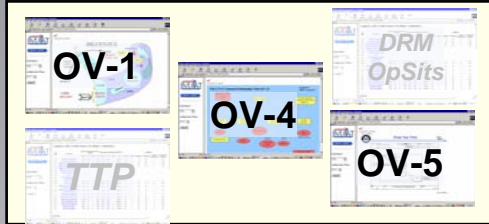
Guidelines and Process for Developing Architectures That Are Consistent, Comparable, and Integrable



Can the U.S. DOD C4ISR Architecture Framework Version 2.0 be Used as the Basis for an Overarching SE Process?

Using Architectures in Systems Engineering

Operational Concept

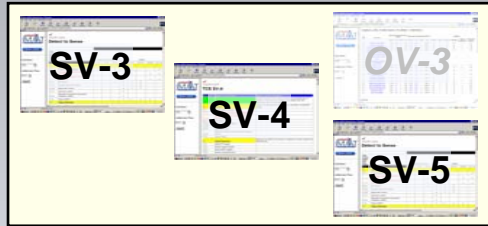


Lesser

The Role of Engineering and Technology

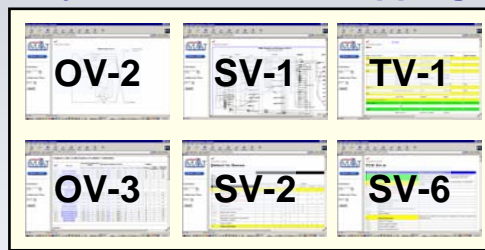
Greater

System Functional Mapping



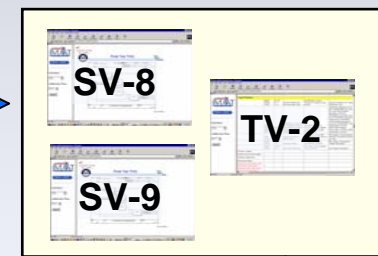
1st Order Analysis:
Functionality--

System Interface Mapping

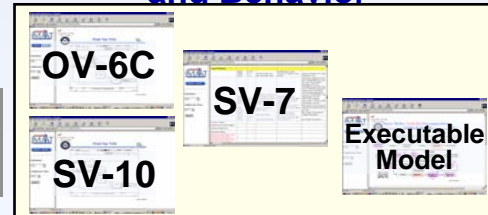


2nd Order Analysis:
Static Interoperability

SoS Evolution



Architecture Performance and Behavior



3rd Order Analysis:
Dynamic Interoperability

- OV-1 High-level Operational Concept Graphic
- OV-2 Operational Node Connectivity Description
- OV-3 Operational Information Exchange Matrix
- OV-4 Command Relationships Chart
- OV-5 Activity Model
- OV-6C Operational Event/Trace Description
- SV-1 System Interface Description
- SV-2 Systems Communication Description
- SV-3 Systems Matrix
- SV-4 System Functionality Description
- SV-5 Operational Activity to System Function Traceability Matrix
- SV-6 System Information Exchange Matrix
- SV-7 System Performance Parameters Matrix
- SV-8 System Evolution Description
- SV-9 System Technology Forecast
- SV-10 System Activity Sequence & Timing
- TV-1 Technical Architecture Profile
- TV-2 Standards Technology Forecast

DRM: Design Reference Mission
OpSit: Operational Situation
TTP: Tactics, Techniques, Procedures
FoS: Family of Systems
SoS: System of Systems

Note: There are dependencies between the Architecture products that are not shown in the System Engineering flow. Many of the products are developed concurrently.

Architectures Provide the Framework for SoS Systems Engineering & Acquisition

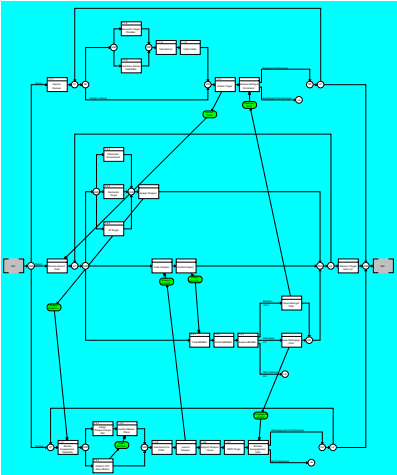
Model Definition(s) for Use in SOS Engineering

SOS
Capstone
Requirements
Document

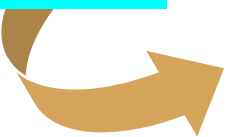


Allocation

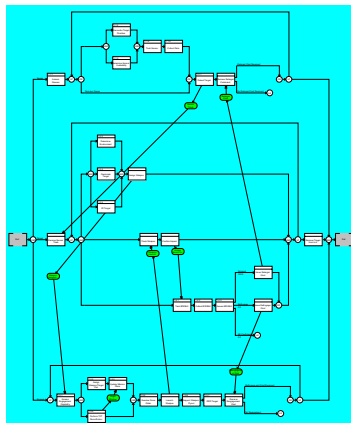
Functional Model



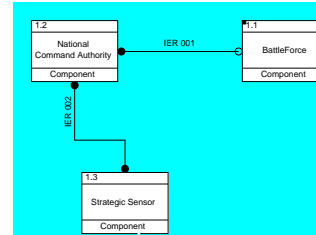
- Nodes (Org. Elements)
- Activities
- IERs (Comm.Req)
- Engagement Logic
- Resources
- Timing



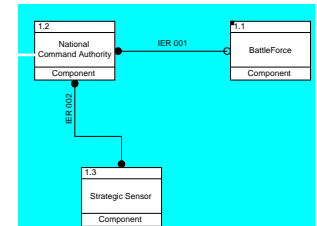
- Functions
- System Execution Logic
- Data Flow
- Resources



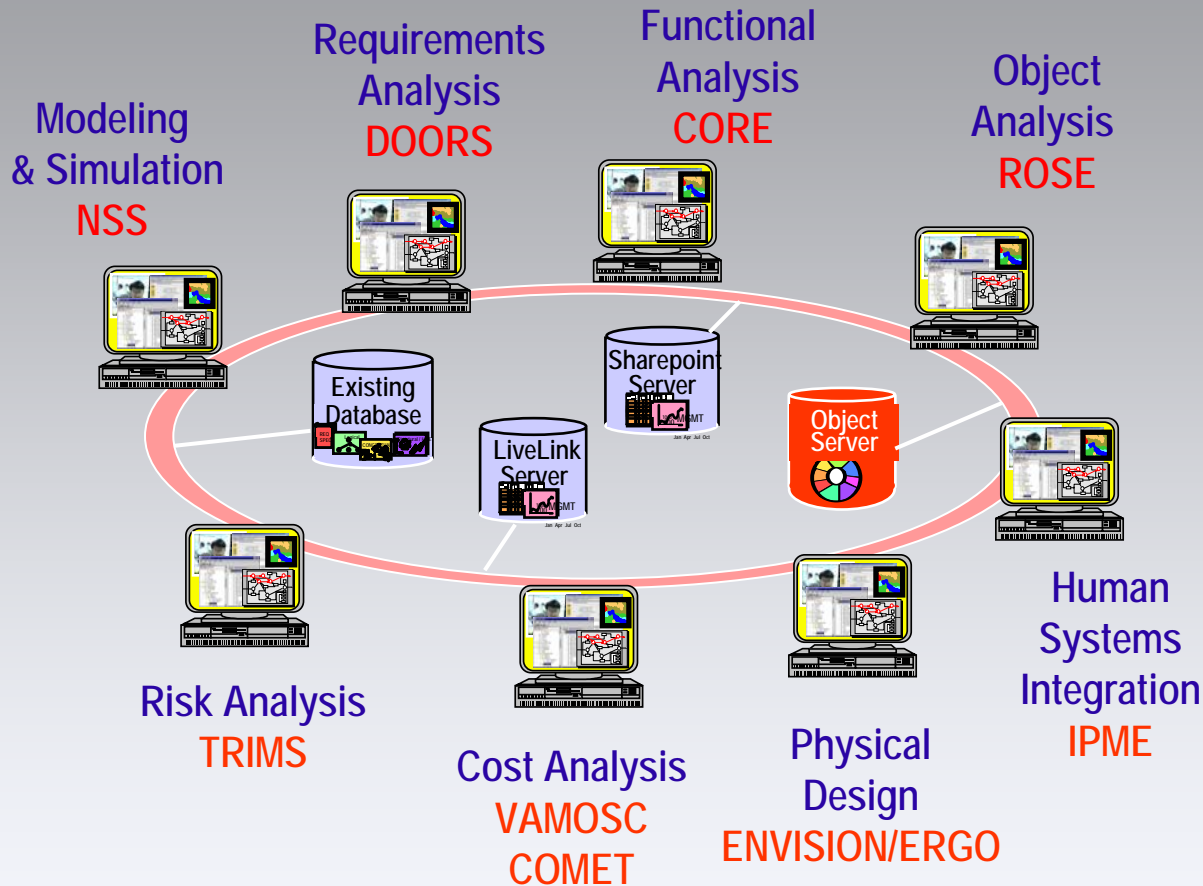
Physical Model



- Platforms/Facilities
- Nodes
- Systems
- Operators
- Interfaces



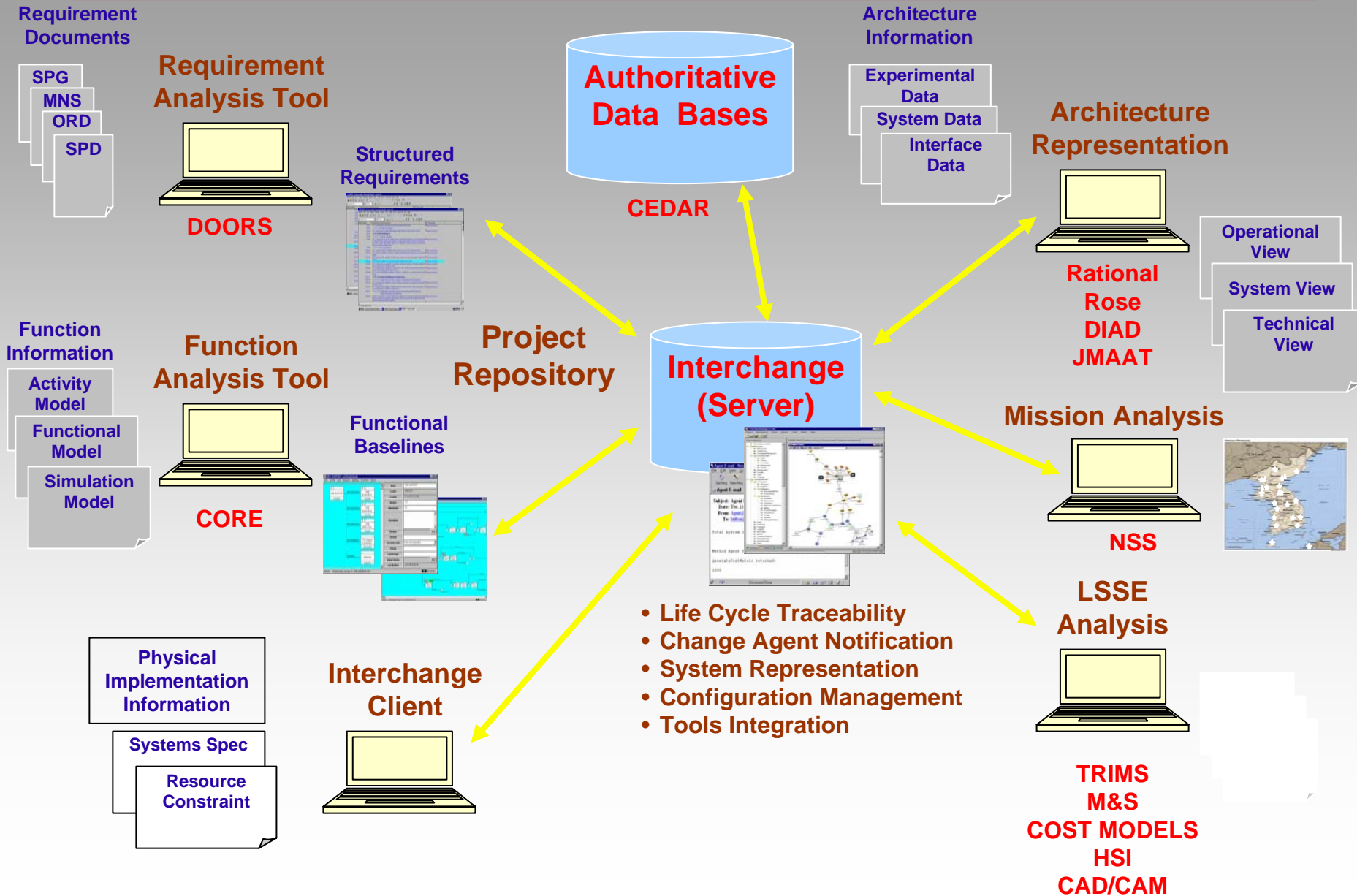
An Integrated Environment for SOS Engineering*



Provides for a Seamless Flow of Information Between Tools

*Implemented in the Naval Collaborative Engineering Environment

Integrated Engineering Environment SE Process & Products



SE Data and Products

Information Requirements

SOS Oper. Objectives

SOS Characteristics

SOS Perf. Profile

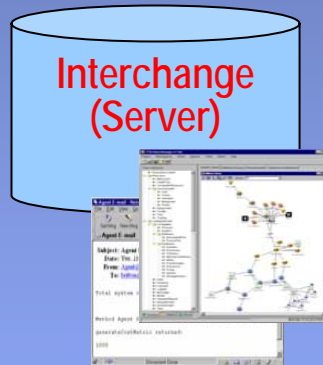
Platform/System O&M
Cost
Profile

Platform/System
Manning
Profile

Platform/System
C4ISR Info.
Views

Naval CEE Function

Capture SOS Information in
Data Base Management System



- Life Cycle Traceability
- Change Agent Notification
- System Representation
- Configuration Management
- Tools Integration

Outputs/ Integrated Database

Integrated SOS
Requirements

CRD

SOS C4ISR Arch.
Framework Views

CRD/SPD

Integrated SOS Perf.
Specifications

SPD

SOS Oper. Functions

SPD

Platform/System
Interfaces/ICDs

SPD

Platform/System
Manning & Task
Profiles

SPD

Platform/System
Ownership Costs

PPBS

FOS Effectiveness &
MOEs/MOPs

TEMP

Summary

- q **Military Assets Play a Vital Role in Responding to the Terrorist Threat**
 - **Need to be Appropriately Aligned and Coordinated with Civilian Agencies**

- q **An Overarching SE Process is Needed to Provide the Basis for Coordination/ Integration of Multiple Agency Assets**
 - **The DoD C4ISR Architecture Framework has been Successfully Applied by the Navy to Similar Requirements**

 - **An Integrated Engineering Environment has Also Been Successfully Deployed to Support the Navy Process**