

*Integration and Interoperability
through Operational Concepts
and Architectures*

CDR Mike Mara

Joint Staff, J8

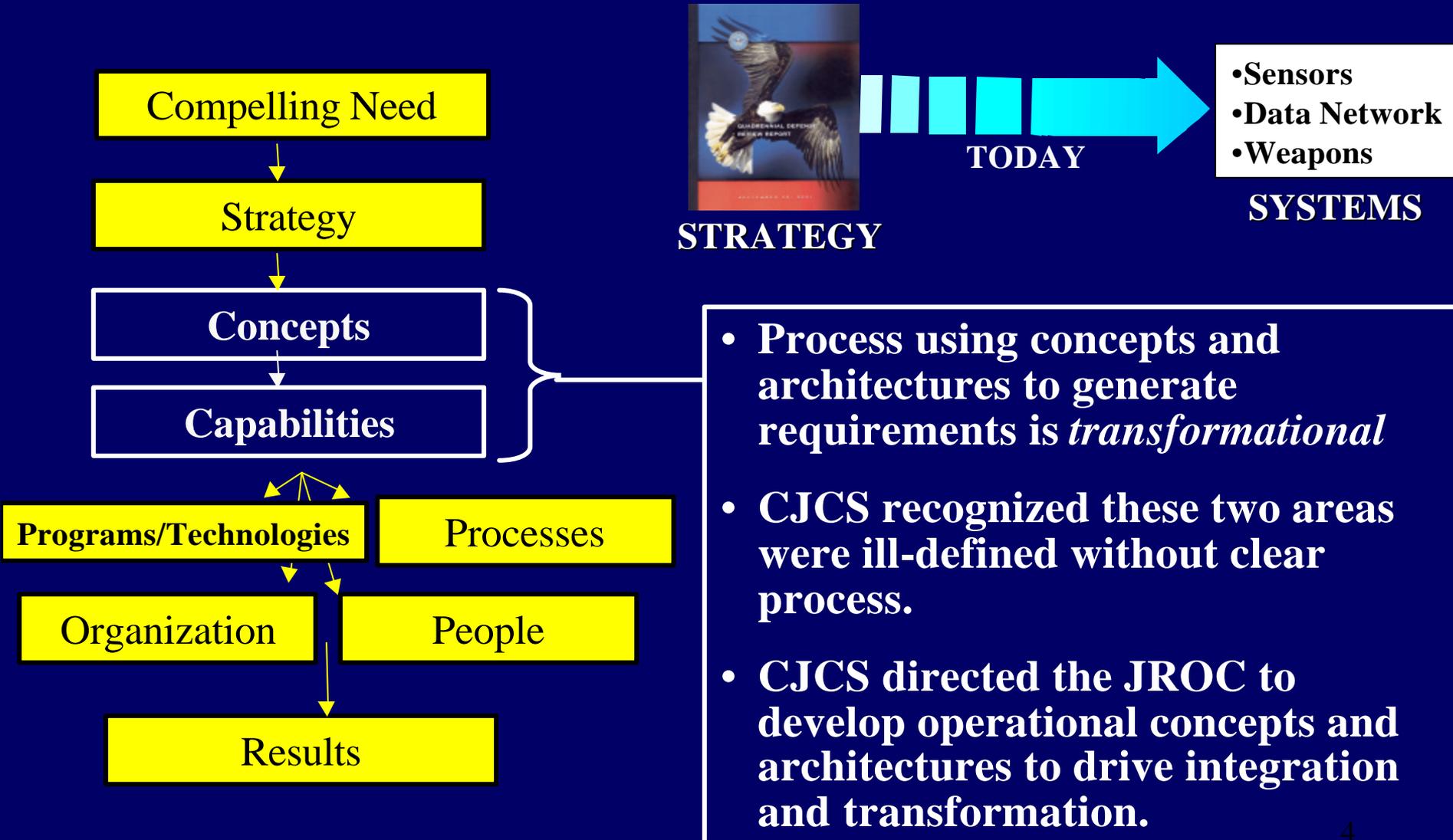
CJCS PRIORITIES

- Global war on terrorism
- Proponent for Joint warfighting
- *Proponent for transformation*
 - Spread transformation across DOTMLPF
(Doctrine, Organization, Training, Leadership, People, Facilities)
 - Synchronize and support Service modernization efforts
 - Guide and synchronize JFCOM experimentation efforts

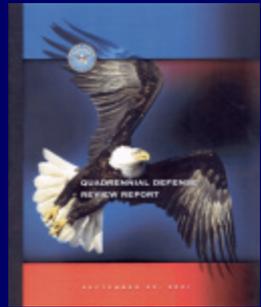
EVOLVING THE JROC

- **CJCS concept:**
 - “Drive the Fight” on integrating joint warfighting requirements and enabling architectures
 - Integrate US Joint Forces Command experimentation efforts into the JROC process
 - Put JROC proactively on the front-end of the requirements process
 - Adopt a strategic focus
- **CJCS wanted JROC to:**
 - Advance joint warfighting and interoperability
 - Get out in front of the requirements process
 - Strengthen the ability to use JROC process as a strategic management and integration tool

TRANSFORMATION REQUIRES A STRATEGY-TO-SYSTEMS PROCESS

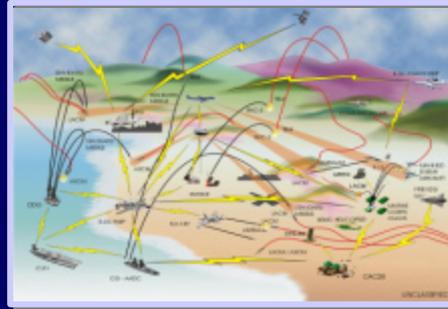


STRATEGY-TO-SYSTEMS USING CONCEPTS AND ARCHITECTURES

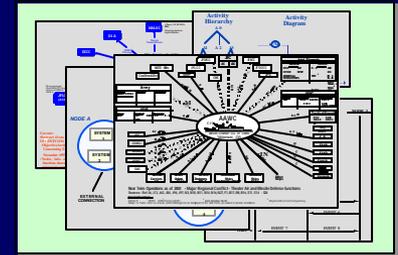


STRATEGY

① OPERATIONAL CONCEPTS



② OPERATIONAL ARCHITECTURES



③ REQUIREMENTS

Doctrine
Organization
Training
Materiel
Leadership
Personnel
Facilities

④ Refined by:

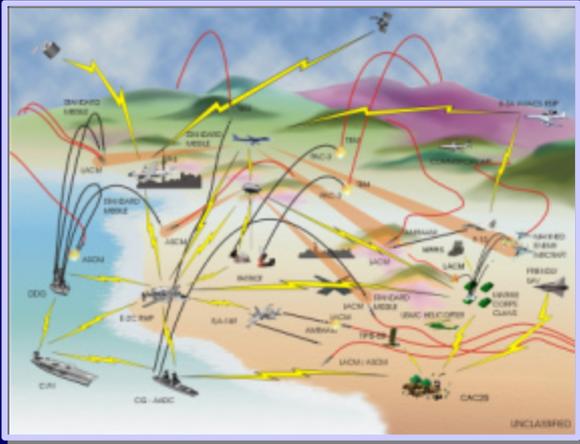
- Experimentation
- Technology
- Gap Analysis

⑤ CAPABILITIES

•Sensors
•Data Network
•Weapons

SYSTEMS

WHAT ARE OPERATIONAL CONCEPTS?



“End-to-end stream of activities that defines how force elements, systems, organizations and tactics combine to accomplish a military task”

JROC Jul 01

- **Usually in the form of a narrative description accompanied by a high level graphic depiction**
- **Based a simple idea of how a goal is to be met**
- **Modified based on**
 - Changes in strategic vision and mission
 - Advancement in technology
 - Exploration for solutions to problems unsolvable by current capabilities

OPERATIONAL CONCEPTS

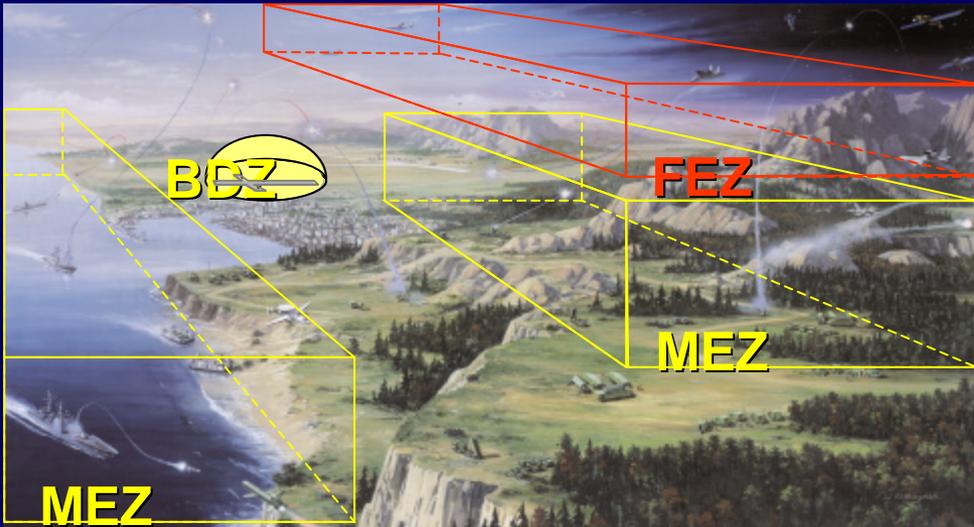
CHANGE THE WAY WE THINK

Current

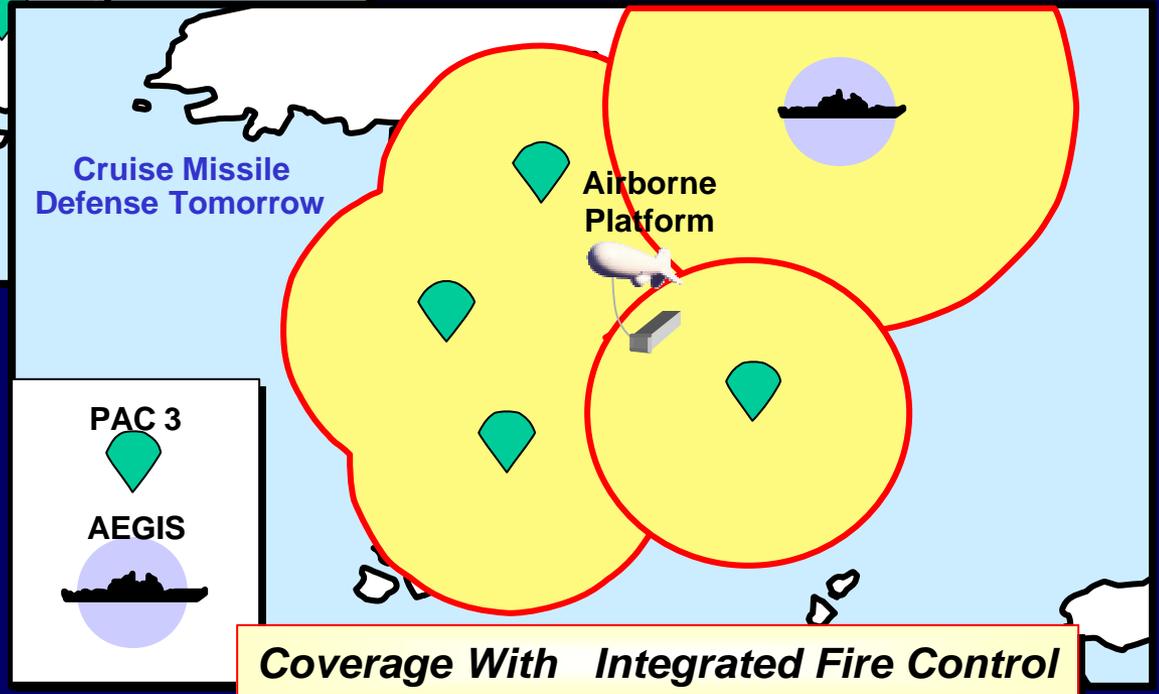
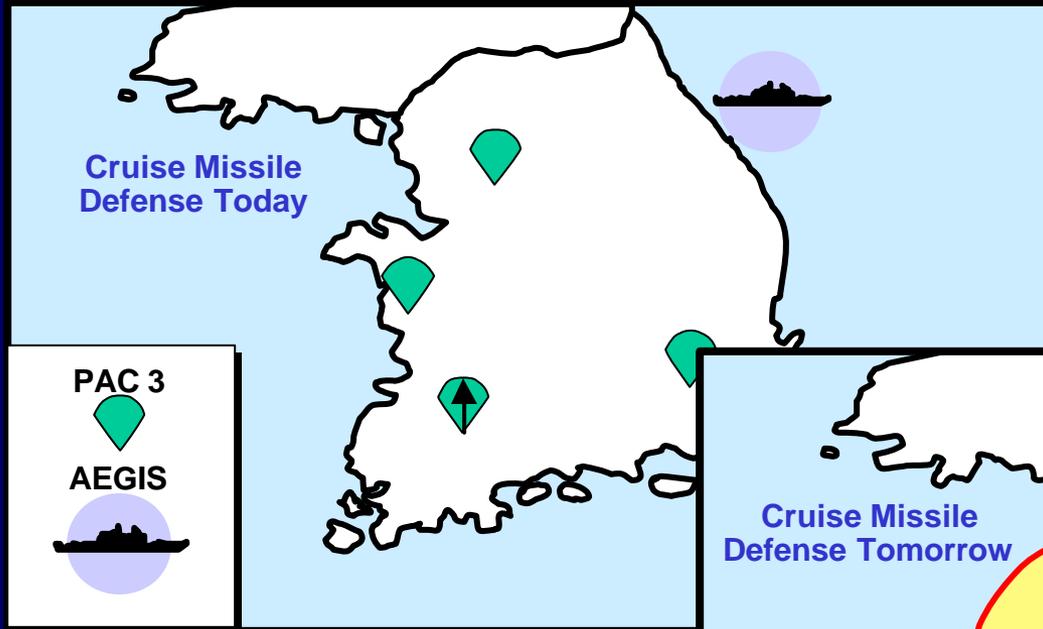
- Engagements constrained by
 - Procedural controls
 - Target ID
 - Sensor limitations
- Lack of interoperability among
 - Weapon Systems
 - Sensors
 - C4I

Future

- Single Integrated Air Picture
- Combat Identification
- Integrated Fire Control
- Automated Battle Management Aids
- Attack Operations
- Passive Defense
- Early Warning



TRANSFORMATIONAL CHANGE TO AIR DEFENSE



INTEGRATED ARCHITECTURES COMMUNICATE THE CONCEPT

Operational View

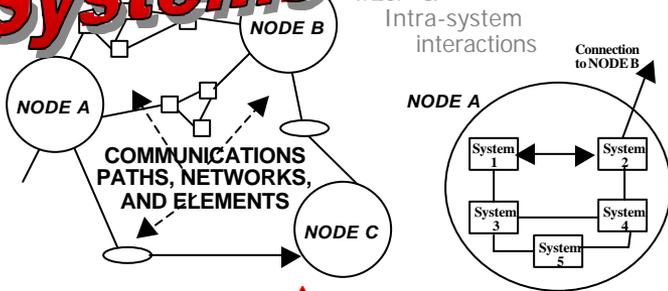


| IERS | INFORMATION DESCRIPTION | | | | INFORMATION SOURCE | | INFORMATION DESTINATION | INFORMATION EXCHANGE ATTRIBUTES | |
|------|---------------------------------|-------------|-------|------|--------------------|--------------------------------|--------------------------------|---------------------------------|----------|
| | OPERATIONAL INFORMATION ELEMENT | DESCRIPTION | MEDIA | SIZE | UNITS | OPERATIONAL ELEMENT & ACTIVITY | OPERATIONAL ELEMENT & ACTIVITY | FREQUENCY TIMELINESS THROUGHPUT | SECURITY |

Who has to exchange What with Whom?
 What manner (form, frequency, timeliness)?
 What processes / activities are supported?

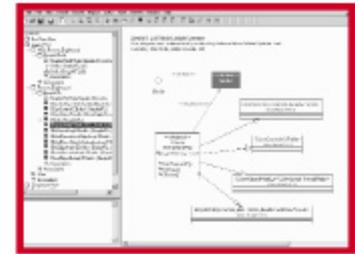
INTEROPERABILITY REQUIREMENTS

Systems View



Analyzes connectivity requirements, throughput needs, interface demands, performance drivers. Identifies optimal mechanisms (systems, configurations, flow paths) for achieving OA requirements

MATERIAL SOLUTIONS



Technical View

INTEROPERABILITY CONSTRAINTS

- Defines the rules governing implementation options
- Specifies message formats, file structures, data structures, protocol formats, etc.

- MESSAGE FORMAT**
- STANDARDS REFERENCE
 - MESSAGE TYPE(S)
 - MESSAGE FIELDS WITH REPRESENTATIONS
 - MAP FROM LDM TO MESSAGE FIELDS

- FILE STRUCTURE**
- STANDARDS REFERENCE
 - RECORD AND FILE DESCRIPTIONS
 - MAP FROM LDM TO RECORD FIELDS

ARCHITECTURES HIGHLIGHT INTEROPERABILITY REQUIREMENTS

E0: Execute Joint Theater Air Defense

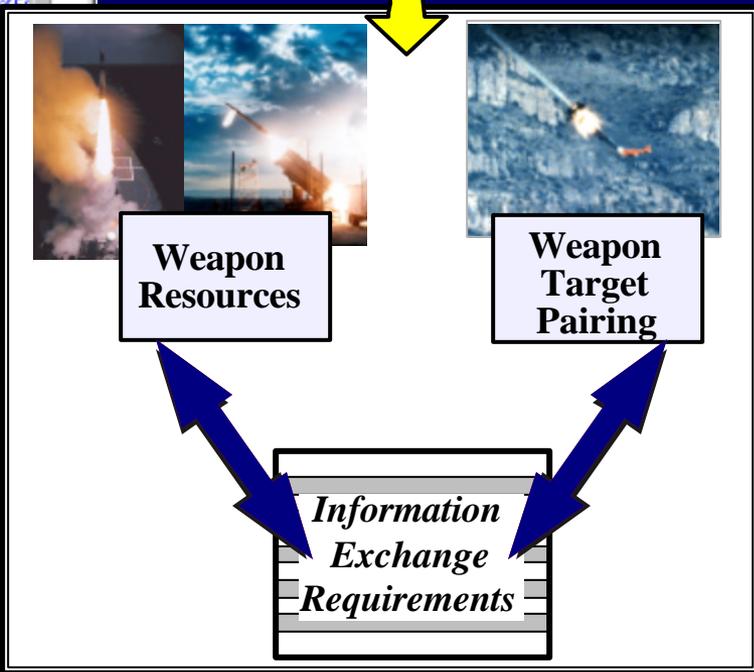
E2: Conduct Battle Operations

E2.7: Perform Integrated Fire Control

E2.7.3: Perform Weapon / Target Pairing

Joint Theater Air and Missile Defense
Operational Architecture

- CO (Command and Control Joint Theater Air and Missile Defense Operations)
 - E0 (Execute Joint Theater Air and Missile Defense)
 - E1 (Monitor the Battlespace Situation in the Joint Operations Area to Identify, Assess, and Determine the Method of Response to Threats)
 - E2 (Conduct Joint Theater Air and Missile Defense Battle Operations)
 - E2.1 (Provide Threat Alerts, Air Defense Warnings, Cueing, and Tracking)
 - E2.2 (Support Passive Air Defense of Defended Assets and JTE and MNE Resources)
 - E2.3 (Coordinate and Control DCA Active Air Defense Operations)
 - E2.4 (Coordinate and Control JTAMD-related OCA Attack Operations against Preplanned Targets and Immediate Threats)
 - E2.5 (Engage OCA Attack Operations Against OCA-relevant Air and Missile Threat-related Targets (CNL, CHA))
 - E2.6 (Monitor, Coordinate, and Control JTAMD-related BR/STTA Operations)
 - E2.7 (Perform Integrated Fire Control (ICL, CHAIN))
 - E2.7.1 (Perform Sensor/Target Pairing for the IFC Candidate Track, if Possible)
 - E2.7.2 (Perform Command and Control/Target Pairing for the IFC Candidate Tracks, if Possible)
 - E2.7.3 (Perform Weapon/Target Pairing for the IFC Candidate Track, if Possible)
 - E2.7.4 (Determine the Appropriate Integrated Fire Control Methodologies (or Methodologies) to Interdict the IFC Candidate)
 - E2.7.5 (Generate the Commands to Initiate and Maintain Integrated Fire Control Against the IFC Candidate)
 - E2.7.6 (Monitor the Integrated Fire Control Engagement)
 - E2.7.7 (Perform a Kill Assessment, if Possible)
 - E2.7.8 (Perform an Analysis of the Potential for IFC on Reengagement, if Possible)
 - E2.7.9 (Assess and Adjust, as Necessary, Integrated Fire Control Commands to Improve Engagement Performance)
 - E2.7.10 (Assess and Adjust, as Necessary, Integrated Fire Control Parameters to Improve Future Engagement)
 - E2.8 (Perform Siting Analysis for JTAMD-related Resource (CNL, CHAIN))
 - E2.9 (Coordinate Development and Dissemination of JTAMD-related Perspective of the Battlespace Situation)
 - E2.10 (Create and Maintain a Record of JTAMD Combat Activities)
 - E2.11 (Manage the Emissions Control Status of Resources (DPCON, TACON, and Direct Support for JTAMD))
 - E2.12 (Deconflict and Synchronize JTAMD-related DCA or OCA Engagements with other Activities in the Joint Operations Area)
 - E2.13 (Provide Weapons Control via Weapon Control Status, Change Direction and Recommendations, Track)



ARCHITECTURES LEAD TO CAPABILITY BASED REQUIREMENTS

Notional Resources

- Air-based 2D Air Radar
- Air-based 3D Air Radar
- Air-based Acoustic Intelligence Sensor
- Air-based Communications Intelligence Sensor
- Air-based Electromagnetic Intelligence Sensor
- Air-based Electronic Spectrum Measurement Intelligence Sensor
- Air-based Electronics Intelligence Sensor
- Air-based Electro-optical Intelligence Sensor
- Air-based Imagery Intelligence Sensor
- Air-based Infrared Sensor
- Air-based Measurement and Signature Intelligence Sensor
- Air-based Over the Horizon 3D Radar
- Air-based Seismic Intelligence Sensor
- Air-based Signals Intelligence Sensor
- Air-based Synthetic Aperture Radar
- Air-based Visual Intelligence Sensor
- Land-based 2D Air Radar
- Land-based 3D Air Radar
- Land-based Acoustic Intelligence Sensor
- Land-based Communications Intelligence Sensor
- Land-based Electromagnetic Intelligence Sensor
- Land-based Electronic Spectrum Measurement Intelligence Sensor
- Land-based Electronics Intelligence Sensor
- Land-based Electro-optical Intelligence Sensor
- Land-based Imagery Intelligence Sensor
- Land-based Infrared Sensor
- Land-based Measurement and Signature Intelligence Sensor
- Land-based Over the Horizon 3D Radar
- Land-based Seismic Intelligence Sensor
- Land-based Signals Intelligence Sensor
- Land-based Synthetic Aperture Radar
- Land-based Visual Intelligence Sensor
- Sensor Control
- Space-based 2D Air Radar
- Space-based 3D Air Radar
- Space-based Acoustic Intelligence Sensor
- Space-based Communications Intelligence Sensor
- Space-based Visual Intelligence Sensor
- Subsurface-based Acoustic Intelligence Sensor
- Subsurface-based Seismic Intelligence Sensor
- Surface-based 2D Air Radar
- Surface-based 3D Air Radar
- Surface-based Acoustic Intelligence Sensor
- Surface-based Communications Intelligence Sensor
- Surface-based Electromagnetic Intelligence Sensor
- Surface-based Electronic Spectrum Measurement Intelligence Sensor
- Surface-based Electronics Intelligence Sensor
- Surface-based Electro-optical Intelligence Sensor
- Surface-based Imagery Intelligence Sensor
- Surface-based Infrared Sensor
- Surface-based Measurement and Signature Intelligence Sensor
- Surface-based Over the Horizon 3D Radar
- Surface-based Seismic Intelligence Sensor
- Surface-based Signals Intelligence Sensor
- Surface-based Synthetic Aperture Radar
- Surface-based Visual Intelligence Sensor

Objective Systems



**Air Based
3D Air Search Radar**

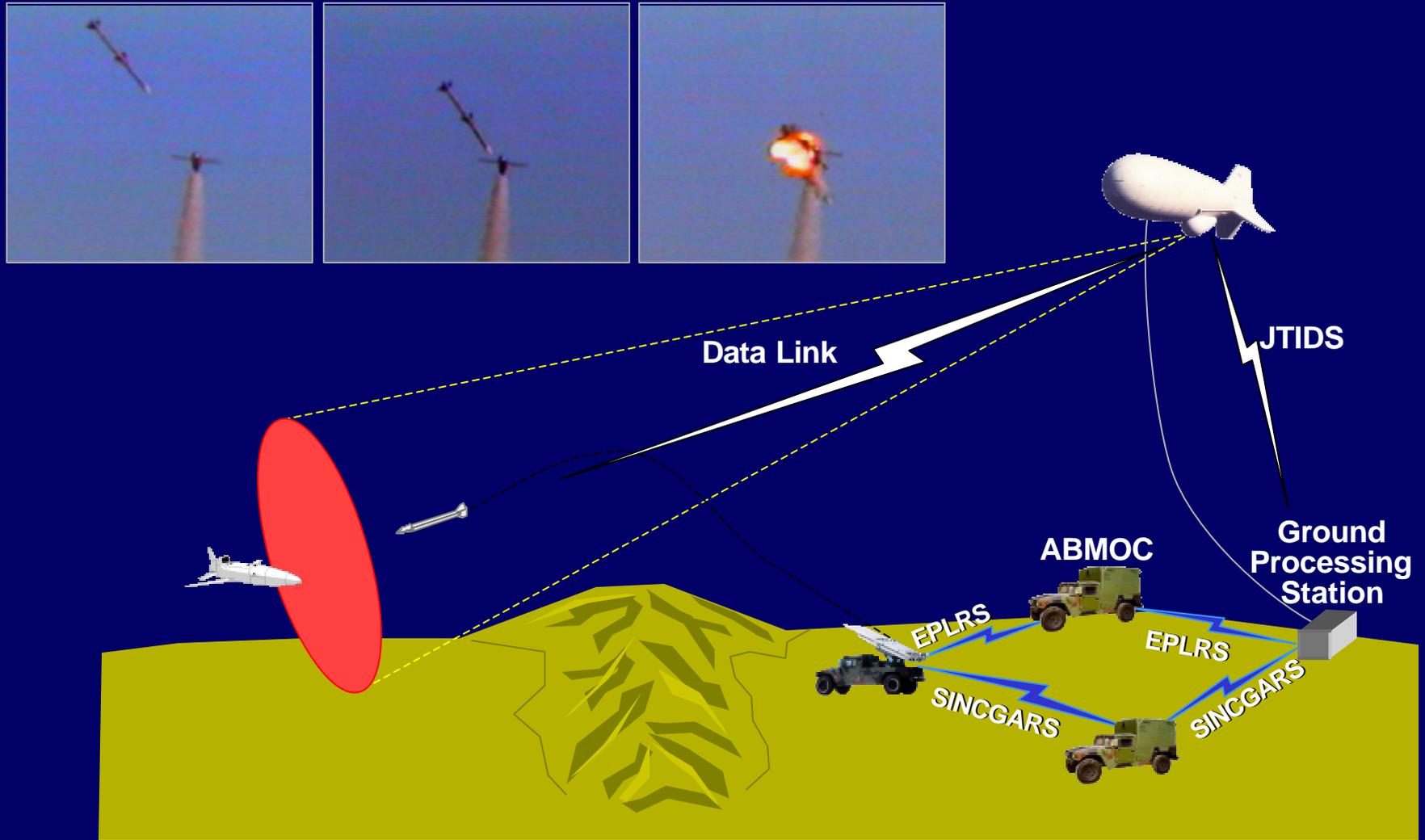
Aerostat

Persistent Surveillance

**Capability based requirements
that drive the acquisition process**

EXPERIMENTATION TESTS

CONCEPTS AND ARCHITECTURE



Beyond Line of Sight Engagement with Integrated Fire Control

SYNTHESIZING NEW CAPABILITIES

New Systems



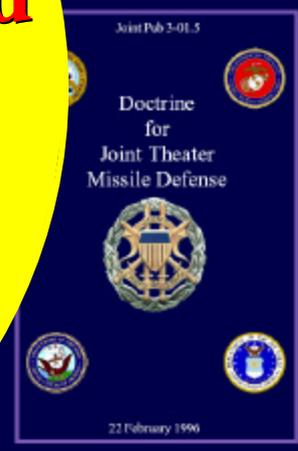
Legacy Systems

Material

Organization



Integrated Fire Control



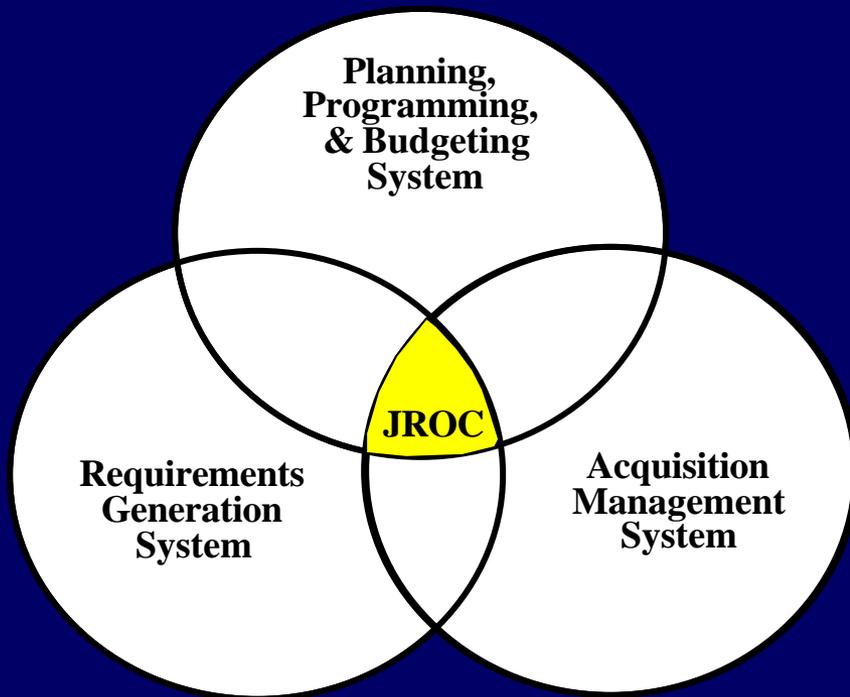
Doctrine



Training

Non-Material

ENGINE BEHIND INTEGRATION IS AN INFORMED JROC



Integration requires coordination of:

- *Requirements Generation*
- *Acquisition*
- *PPBS*

Operational concepts and architectures are the tools that enable JROC to drive capabilities based requirements.

WORK IN PROGRESS

2001

2002

2003

Jan Apr Jul Oct

Jan Apr Jul Oct

Jan Apr Jul Oct

Dominant Maneuver

Precision Engagement

JTF Command and Control

JTAMD

Combat ID

WARFIGHTING CONCEPTS AND ARCHITECTURE INTEGRATION DIVISION

- Ensure **integration**, **interoperability** and consistency of effort in all Joint concepts, architectures, requirements, and experimentation.
- Facilitate the seamless integration of Operational Concepts and Architectures.
- Identify the products and establish the processes to implement Joint Operational Concept(s) and Joint Operational Architecture(s) and Capabilities Based Requirements for **inclusion in the PPBS**.
- **Maintain the Joint Operational Architecture** and establish the methodology for periodic validation and update.

SUMMARY

- **Architectures drive integration:**
 - They identify which systems need to be interoperable and which don't
 - They ensure systems are born joint
- **Operational Concepts and Architectures are the key to attaining the Chairman's goals:**
 - They maintain a focus on joint warfighting
 - They enable transformation
 - They provide a roadmap for change synchronizing Service efforts

BACK UP

QDR OPERATIONAL GOALS TO FOCUS TRANSFORMATION EFFORT

- **Protect critical bases of operation and defeating CBRNE weapons**
- **Assure information systems in the face of attack and conducting effective information operations**
- **Projecting and sustaining U.S. forces in distant anti-access or area-denial environments**
- **Denying enemies sanctuary by providing persistent surveillance, tracking and rapid engagement with high volume precision strike**
- **Enhancing the capability and survivability of space systems**
- ***Leveraging information technology and innovative concepts to develop interoperable, joint C4ISR architecture and capability***

Action Plan

JROC-Directed OC/OA
Development Subjects

Dominant Maneuver

Precision Engagement

JTF C2

Focused Logistics

Combat ID

JTAMD

UNCLASSIFIED

DM ROAD AHEAD

Activities

Architecture
Spiral Development
Concept Development
Operational Descriptions
Functional Decomposition

Operational Views

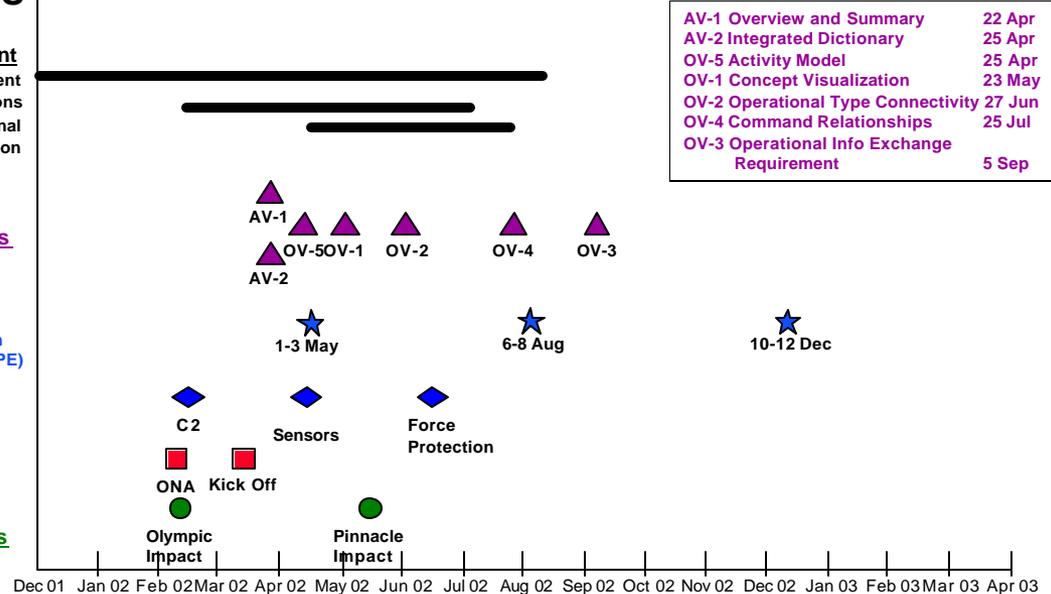
Wargaming

3 day Integration
Wargames (DM/PE)

OC Workshops

A2 Study

JFCOM Events



| | |
|--|--------|
| AV-1 Overview and Summary | 22 Apr |
| AV-2 Integrated Dictionary | 25 Apr |
| OV-5 Activity Model | 25 Apr |
| OV-1 Concept Visualization | 23 May |
| OV-2 Operational Type Connectivity | 27 Jun |
| OV-4 Command Relationships | 25 Jul |
| OV-3 Operational Info Exchange Requirement | 5 Sep |

Action Plan

JROC-Directed OC/OA
Development Subjects

Dominant Maneuver

Precision Engagement

JTF C2

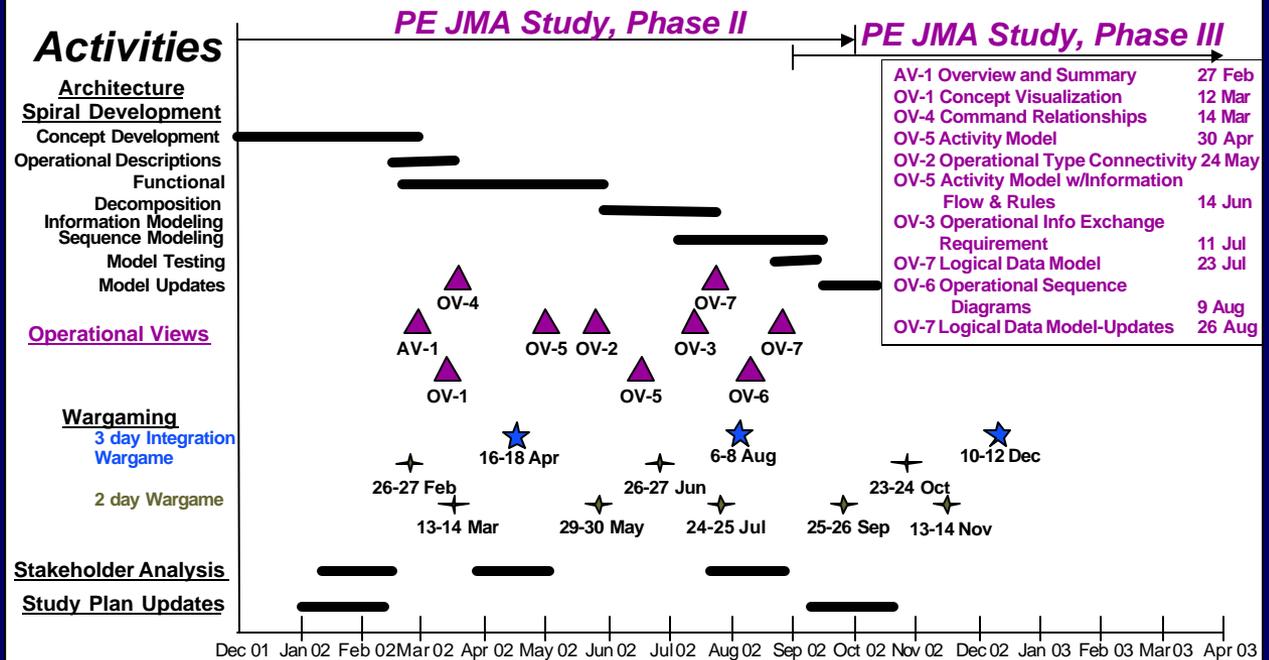
Focused Logistics

Combat ID

JTAMD

UNCLASSIFIED

PE ROAD AHEAD



Action Plan

JROC-Directed OC/OA
Development Subjects

Dominant Maneuver
Precision Engagement

JTF C2

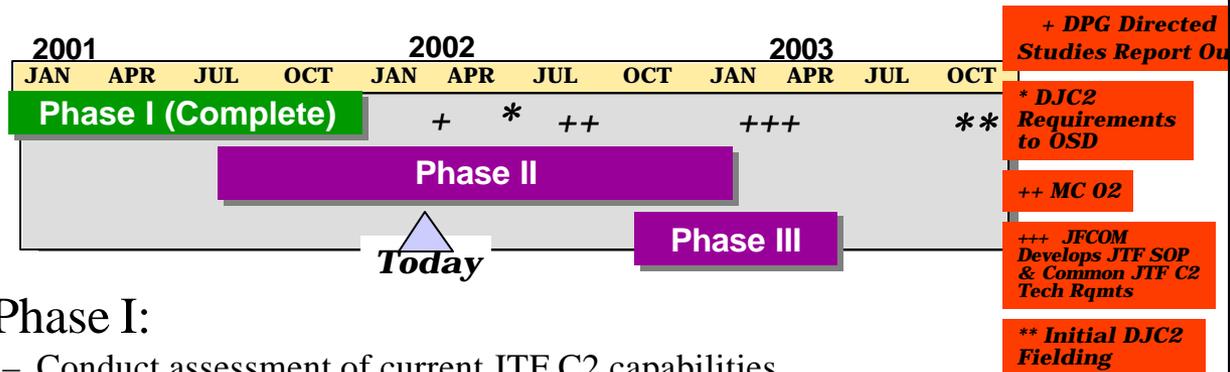
Focused Logistics

Combat ID

JTAMD

Draft

JTF C2 ROAD AHEAD



- Phase I:
 - Conduct assessment of current JTF C2 capabilities
 - Develop “As-Is” JTF C2 ops concept and architecture
- Phase II:
 - Develop “To Be” JTF C2 ops concept and architecture using DOTMLPF framework and JV2020 concepts of DM, PE, FDP, and FL
- Phase III:
 - Determine DOTMLPF shortfalls between current JTF C2 structures, processes, and system capabilities and JV2020 needs
 - Develop implementation plan required to achieve JV2020 JTF C2 vision

Action Plan

JROC-Directed OC/OA
Development Subjects

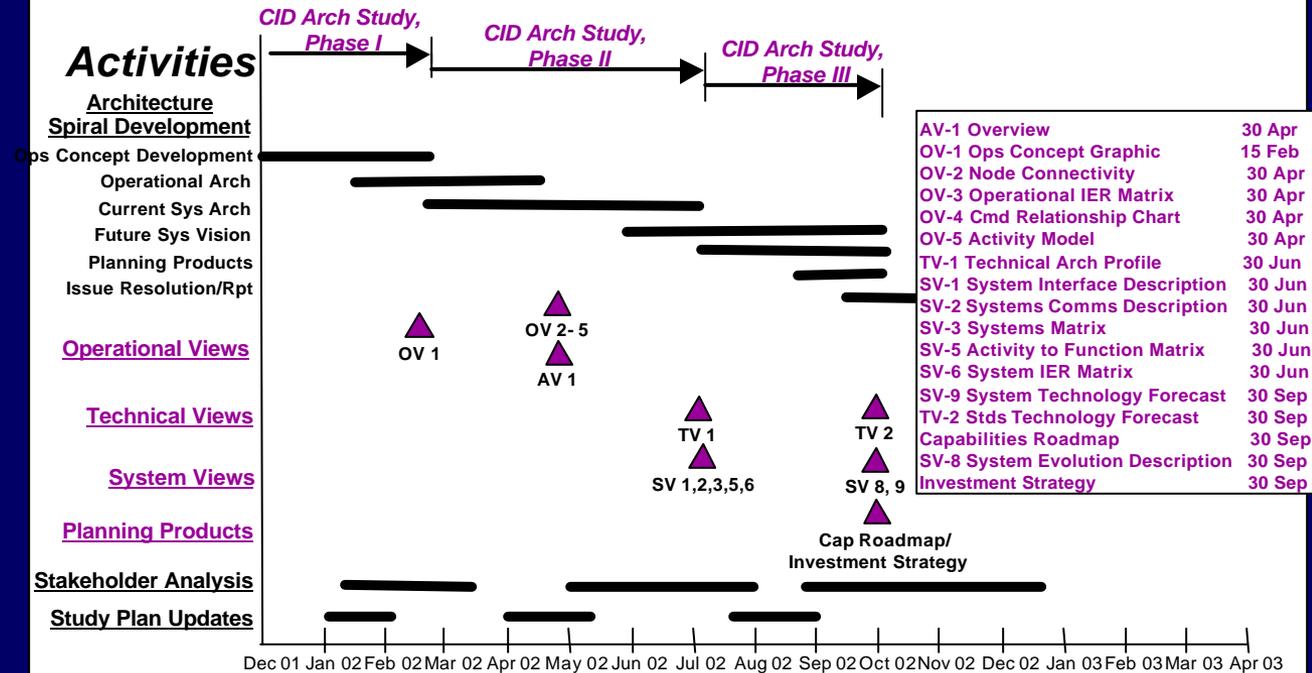
Dominant Maneuver
Precision Engagement
JTF C2
Focused Logistics

Combat ID

JTAMD

UNCLASSIFIED

CID ROAD AHEAD



10:40 11-Mar-02

UNCLASSIFIED

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Strategic Topic Sequencing

- **JROC chartered Strategic Topics correlate to Universal Joint Task List (UJTL) operational objectives :**

Strategic Topic

UJTL Objective

- | | |
|-------------------------------|---------------------------|
| – Joint Task Force C2 | Command the force |
| – Dominant Maneuver | Maneuver the force |
| – Precision Engagement | Engage the force |
| – Focused Logistics | Sustain the force |

- **Next set of Strategic Topics also aligned with UJTL operational objectives:**

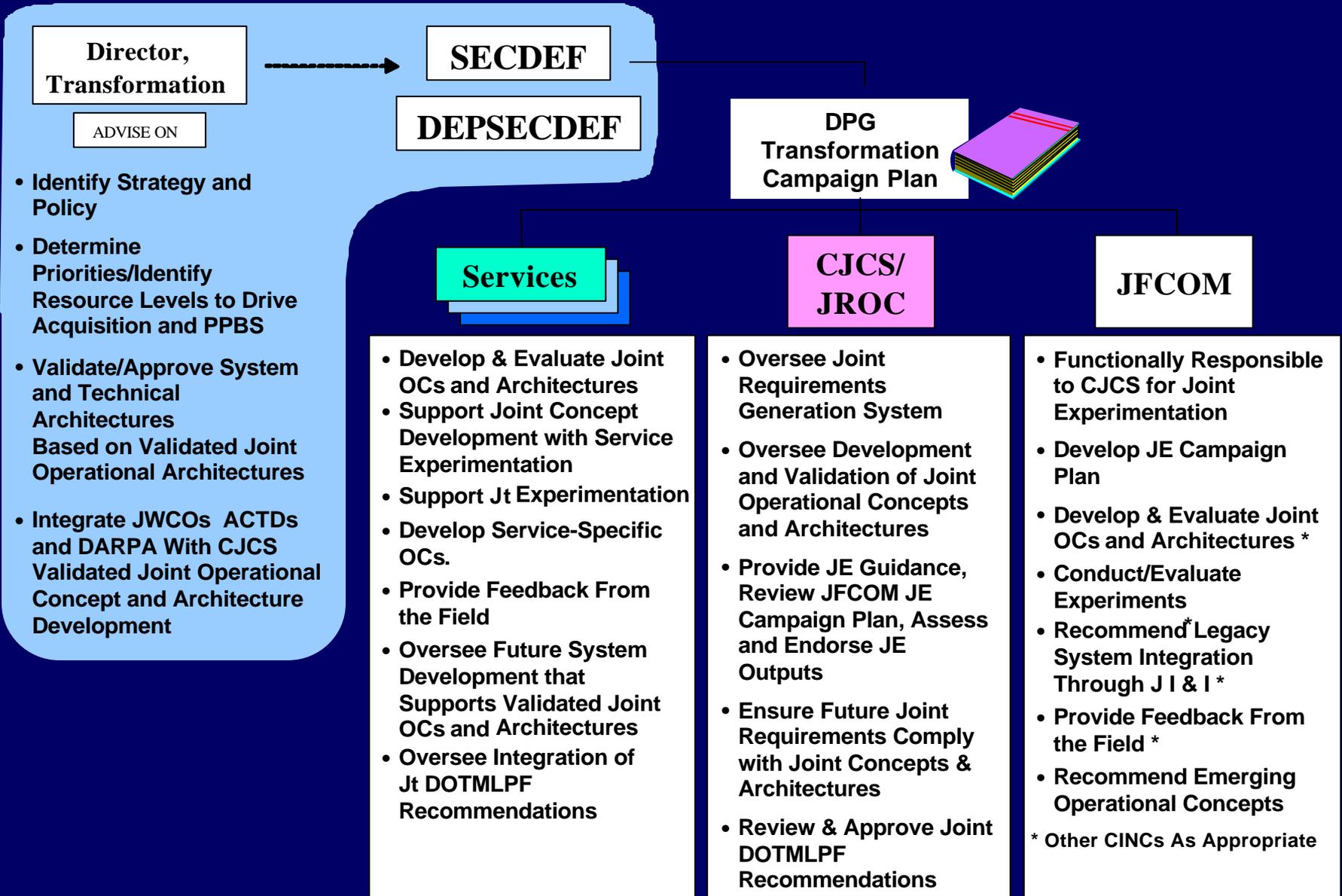
Strategic Topic

UJTL Objective

- | | |
|--------------------------------------|--------------------------|
| – Full Dimensional Protection | Protect the force |
| – Info Superiority | Inform the force |

TRANSFORMATION

ROLES & RESPONSIBILITIES



- TABLES
 - AV-1
 - OV1
 - Integrated Dictionary
 - IDEF3X
 - Functional Decomposition
 - Planning
 - Command and Control
 - Sustainment
 - Execution
 - Surrogate
 - Triggers
 - Output Connections
 - Outputs
 - Inputs
 - Controls
 - Mechanisms
 - ICOM Categorization
 - Calls
 - Branch From/Into Activity
 - Events
 - Conditions
 - State Descriptors
 - Activity Relevance
 - Notional Resources
 - Requirements Sources
 - Assumptions List
 - Universal Joint Tasks
 - Information Elements
 - Service Model List
 - Measure
 - Information Repository
 - Supporting Data

There are [4461] Records for all Activities Refresh Sort Export Find

- JTAMD_activities
 - [C0 \(Command and Control Joint Theater Air and Missile Defense Operations\)](#)
 - [E0 \(Execute Joint Theater Air and Missile Defense\)](#)
 - [P0 \(Plan JTAMD Operations\)](#)
 - [S0 \(Sustain Joint Theater Air and Missile Defense\)](#)
 - [z_END0001 \(End Activity - Normal\)](#)
 - Surrogate_Activities

An example showing detail and rigor of the process

Open the activity called "Execute Missile Defense"

Joint Theater Air and Missile Defense
Operational Architecture

TABLES

- AV-1
- OV1
- Integrated Dictionary
- IDEF3X
 - Functional Decomposition
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 - Triggers
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 - Control
 - Mechanization
 - ICOM
 - ICOM Organization
 - Calls
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 - Activity
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There are [4461] Records for all Activities Refresh Sort Export Find

JTAMD_activities

- C0 (Command and Control Joint Theater Air and Missile Defense Operations)
- E0 (Execute Joint Theater Air and Missile Defense)
 - E1 (Monitor the Battlespace Situation in the Joint Operations Area to Identify, Assess, and Determine the Method of Execution)
 - E2 (Conduct Joint Theater Air and Missile Defense Battle Operations)
 - E3 (Monitor JOA Airspace Control and Adjust JTAMD Operations-related Airspace Control, Relative for JTAMD Operations)
 - E4 (Monitor the Strategic, Operational, and Tactical Situation, and the Performance and Efficiency of TAMD Resources)
 - E5 (Assess the Performance of TAMD Relative to Other Recommendations and Tasking in the AADP in Execution)
 - E6 (Provide Air Defense Region and JTF/MNF Component Command Support for Joint Theater Air and Missile Defense)
 - E7 (Perform JTAMD Dynamic Planning)
- P0 (Plan JTAMD Operations)
- S0 (Sustain Joint Theater Air and Missile Defense)
- z_END0001 (End Activity - Normal)
- Surrogate_Activities

Notice other actions also available

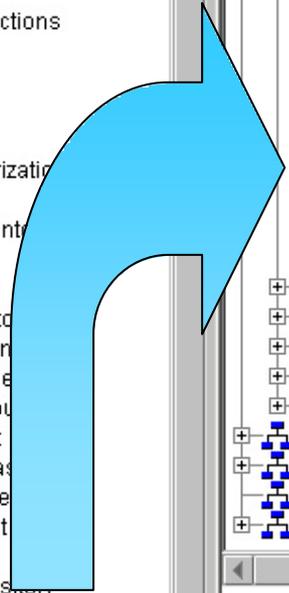
Next, open "Conduct Battle Operations"



Refresh Sort Export Find

Now open Perform Integrated Fire Control

- Sustainment
- Execution
- Surrogate
- Triggers
- Output Connections
- Outputs
- Inputs
- Controls
- Mechanisms
- ICOM Categorization
- Calls
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- Events
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- Assumptions List
- Universal Joint Tasking
- Information Elements
- Service Model List
- Measure
- Information Repository
- Supporting Data



- [Coordinate and Control Joint Theater Air and Missile Defense Operations](#)
- [Coordinate and Control Joint Theater Air and Missile Defense](#)
- [Identify, Assess, and Determine the Method of Execution for the Battlespace Situation in the Joint Operations Area to Identify, Assess, and Determine the Method of Execution for Joint Theater Air and Missile Defense Battle Operations](#)
- [E2.1 \(Provide Threat Alerts, Air Defense Warnings, Dewarnings, Cueing, and Tracking\)](#)
- [E2.2 \(Support Passive Air Defense of Defended Assets and JTF and MNF Resources\)](#)
- [E2.3 \(Coordinate and Control DCA Active Air Defense Operations\)](#)
- [E2.4 \(Coordinate, and Control TAMD-related OCA Attack Operations against Preplanned Targets and Immediate Threats\)](#)
- [E2.5 \(Engage OCA Attack Operations Against OCA-relevant Air and Missile Threat-related Targets \[CALL CHAIN\]\)](#)
- [E2.6 \(Monitor, Coordinate, and Control TAMD-related ISR/RSTA Operations\)](#)
- [E2.7 \(Perform Integrated Fire Control \[CALL CHAIN\]\)](#)
- [E2.8 \(Perform Siting Analysis for JTAMD-related Resource \[CALL CHAIN\]\)](#)
- [E2.9 \(Coordinate Development and Dissemination of JTAMD-related Perspective of the Battlespace Situation\)](#)
- [E2.10 \(Create and Maintain a Record of TAMD Combat Activities\)](#)
- [E2.11 \(Manage the Emissions Control Status of Resources OPCON, TACON, and Direct Support for JTAMD Operations\)](#)
- [E2.12 \(Deconflict and Synchronize JTAMD-related DCA or OCA Engagements with other Activities in the Joint Operations Area\)](#)
- [E2.13 \(Provide Weapons Control via Weapon Control Status Change Direction and Recommendations \(including\)\)](#)
- [E3 \(Monitor JOA Airspace Control and Adjust JTAMD Operations-related Airspace Control, Relative for JTAMD Operations\)](#)
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- [E7 \(Perform JTAMD Dynamic Planning\)](#)
- [P0 \(Plan JTAMD Operations\)](#)
- [S0 \(Sustain Joint Theater Air and Missile Defense\)](#)
- [z_END0001 \(End Activity - Normal\)](#)
- Surrogate_Activities

Again notice other actions available

Joint Theater Air and Missile Defense Operational Architecture

TABLES

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- IDEF3X
 - Functional Decomposition
 - Planning
 - Command and Control
 - Sustainment
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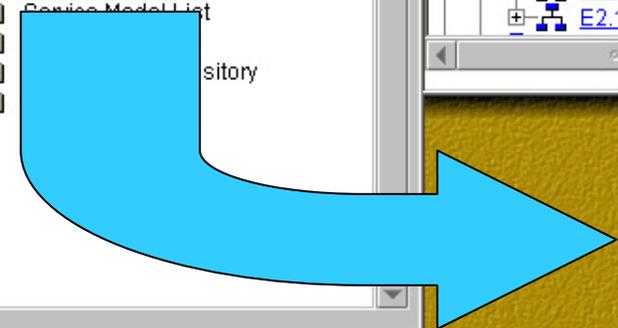
There are [4461] Records for all Activities Refresh Sort

- C0 (Command and Control Joint Theater Air and Missile Defense)
- E0 (Execute Joint Theater Air and Missile Defense)
 - E1 (Monitor the Battlespace Situation in the Theater)
 - E2 (Conduct Joint Theater Air and Missile Defense)
 - E2.1 (Provide Threat Alerts, Air Defense)
 - E2.2 (Support Passive Air Defense)
 - E2.3 (Coordinate and Control DCA)
 - E2.4 (Coordinate, and Control TAC)
 - E2.5 (Engage OCA Attack Operations)
 - E2.6 (Monitor, Coordinate, and Control)
 - E2.7 (Perform Integrated Fire Control)
 - E2.7.1 (Perform Sensor)
 - E2.7.2 (Perform Command)
 - E2.7.3 (Perform Weapon)
 - E2.7.4 (Determine the Appropriate Integrated Fire Control Methodology (or Methodologies) to Interdict the Canc)
 - E2.7.5 (Generate the Commands to Initiate and Maintain Integrated Fire Control Against the IFC Candidate)
 - E2.7.6 (Monitor the Integrated Fire Control)
 - E2.7.7 (Perform a Kill Assessment, if Poss)
 - E2.7.8 (Perform an Analysis of the Potentia)
 - E2.7.9 (Assess and Adjust, as Necessary)
 - E2.7.10 (Assess and Adjust, as Necessar)
 - E2.8 (Perform Siting Analysis for JTAMD-relate)
 - E2.9 (Coordinate Development and Dissemin)
 - E2.10 (Create and Maintain a Record of TAMD)
 - E2.11 (Manage the Emissions Control Status)
 - E2.12 (Deconflict and Synchronize JTAMD-rela)
 - E2.13 (Provide Weapons Control via Weapon Control States Change Direction and Recommendations including

This detail and rigor gives the VALUE of an ARCHITECTURE

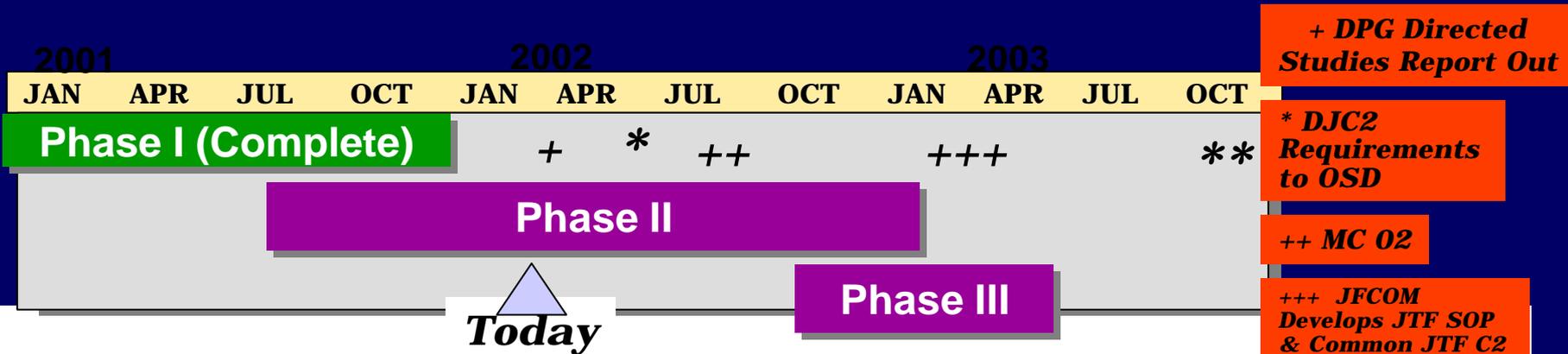
Analysis reveals REQUIREMENTS inherent to an Integrated Fire Control Engagement

The requirements then drive the Information Exchange Requirements



Joint Theater Air and Missile Defense Operational Architecture

JTF C2 ROAD AHEAD



•Phase I:

- Conduct assessment of current JTF C2 capabilities
- Develop "As-Is" JTF C2 ops concept and architecture

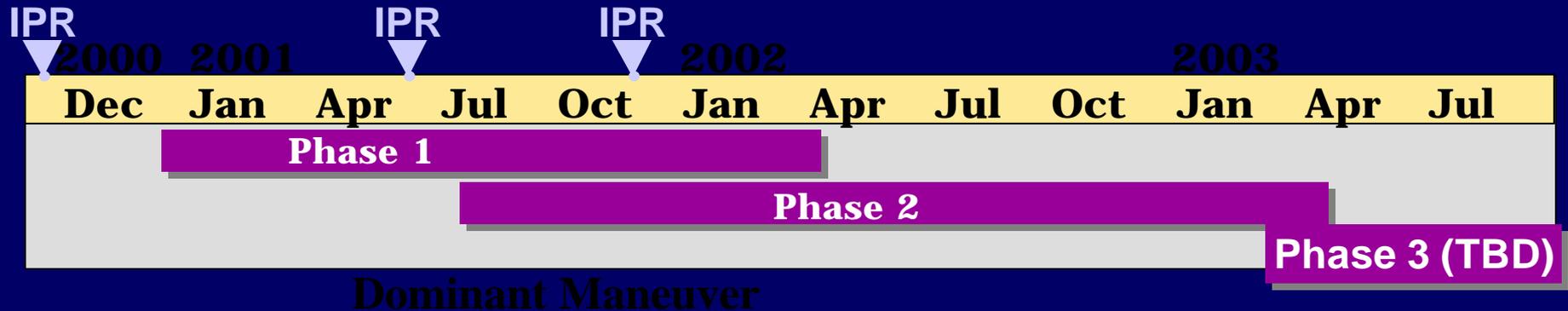
•Phase II:

- Develop "To Be" JTF C2 ops concept and architecture using DOTMLPF framework and JV2020 concepts of DM, PE, FDP, and FL

•Phase III:

- Determine DOTMLPF shortfalls between current JTF C2 structures, processes, and system capabilities and JV2020 needs
- Develop implementation plan required to achieve JV2020 JTF C2 vision

Strategic Topic Concepts & Architectures



Dominant Maneuver

- Current draft of the DM Operational Concept document released Dec 01
- Draft Operational Architecture Views (OV)
 - OV1: High-level Operational Concept Graphic
 - OV5: Activity Model
- Workshops
 - Move and Sustain Capability Workshop with J-4/Focused Logistics (FL) JWCA (18-20 Jul 01)
 - Command and Control (C2) Capability Workshop with J-6/JTF C2 Strategic Topic Task Force (20-21 Feb 02)
 - Sensors Workshop with ISR JWCA (9-11 Apr 02)
 - Protect the Force Capability Workshop with FDP JWCA (25-27 Jun 02)
- Wargames
 - Intra-DM Task Force wargames (Aug-Sep 01)
 - OSD/ONA Strategic Deployment and Logistics (Anti-Access) Wargame (6-7 & 12-13 Feb 02)
 - DM/PE Integration Games (1-3 May, 6-8 Aug, 10-12 Dec 02)

Input to USJFCOM Joint Experiments

- Olympic Challenge '04 Concept Development Workshops
- Olympic Impact '02 01 (28 Jan -1 Feb 02)
- Olympic Impact '02 02 (11-15 Feb 02)
- Pinnacle Impact (TBD)

Input to Chapter 10 (Dominant Maneuver) of the 2002 Joint Warfighting Science and Technology Plan