



# *Transitioning Science & Technology Programs*

**Technology Readiness Assessments  
and the Revised DoD Acquisition Series**

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Office of the Director, Defense Research and Engineering  
5 March 2003**

# Director, Defense Research & Engineering Priorities

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- Focus & Integrate DoD S&T on “Transformation”
- Enhance Technology Transition
- Address National Security S&E Workforce
- Expand Outreach to Combatant Commands and Intelligence Community
- Accelerate Support to the War on Terrorism

# DDR&E Priorities Expanded

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- **Enhance Technology Transition Efforts**
  - **Enhanced Primary Transition Efforts under DUSD (Advanced Systems and Concepts); Mrs. Sue Payton**
  - **Increase Investment in Technology Transition Efforts (Quick Reaction Special Projects and Advanced Concept Technology Demonstrations)**
  - **Expanded Use of Technology Readiness Assessments as Part of Defense Acquisition Board Major Program Reviews**

# Under Secretary AT&L Goals\*

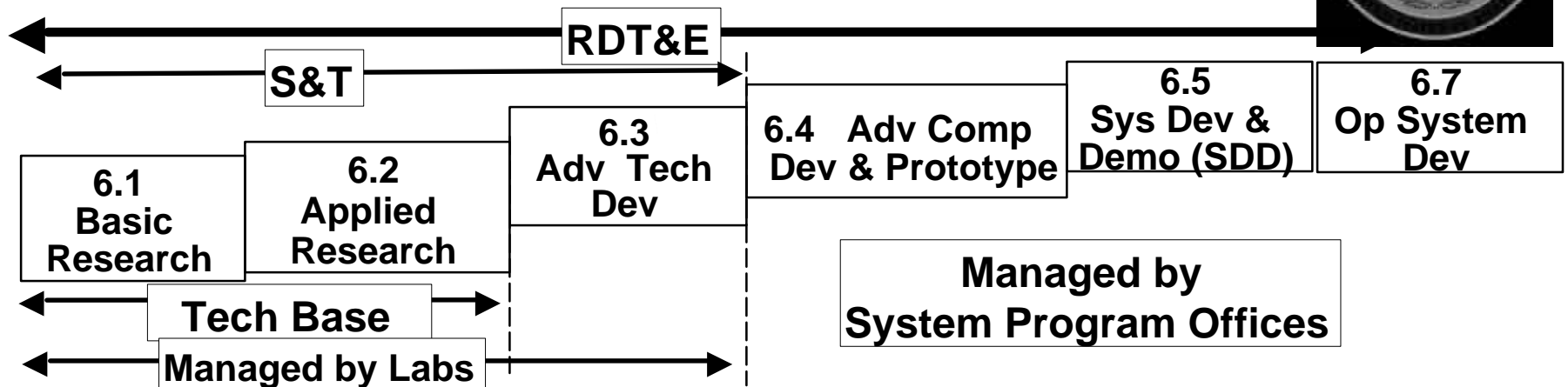
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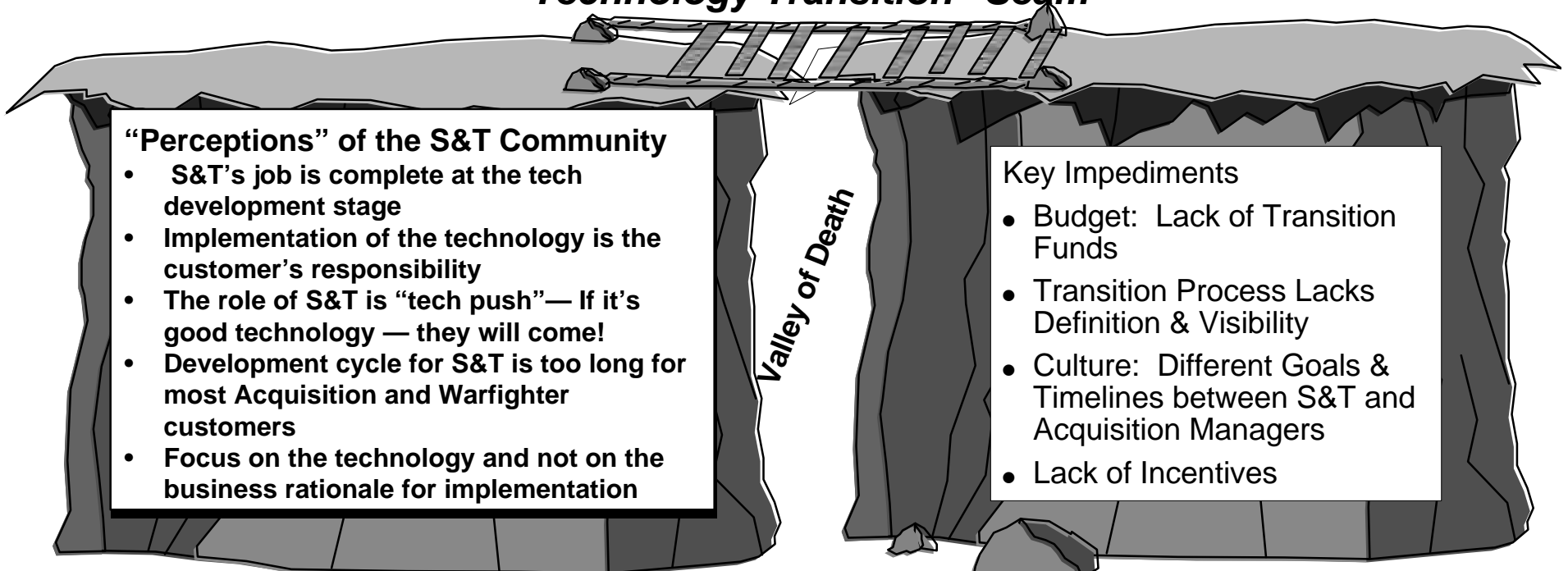
- **Theme: Accelerate Acquisition & Tech Transition Efforts**
  - **Revitalize Defense Acquisition Board at Senior Level**
  - **Mandate Evolutionary, Spiral Development**
  - **Implement Technology Readiness Assessments**
  - **Mandate the Goal of S&T at 3%**
  - **Exploite the Enormous Potential of ACTDs**
  - **Accelerate the Flow of Technology to the Warfighter**

\* From Nov 2002 Speech at PEO/SYSCOM Conference

# Speeding Technology Transition “The Challenge”



## Technology Transition “Seam”



### “Perceptions” of the S&T Community

- S&T’s job is complete at the tech development stage
- Implementation of the technology is the customer’s responsibility
- The role of S&T is “tech push”— If it’s good technology — they will come!
- Development cycle for S&T is too long for most Acquisition and Warfighter customers
- Focus on the technology and not on the business rationale for implementation

### Key Impediments

- Budget: Lack of Transition Funds
- Transition Process Lacks Definition & Visibility
- Culture: Different Goals & Timelines between S&T and Acquisition Managers
- Lack of Incentives

# Some Tech Transition Dimensions

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- Rate of Technology Change Increasing
- Capabilities-based Planning Changes Requirements/Needs Process
- Acquisition Excellence/Spiral Insertion
- Availability of Commercial Technology
- Demos (Try Before Buy)

***Multiple Dimensions Mean Multiple Solutions Needed***

# The Challenge: Pace of Technology



“Moore’s Law” → Computing doubles every 18 months

“Fiber Law” → Communication capacity doubles every 9 months

“Disk Law” → Storage doubles every 12 months

## Defense Acquisition Pace

F-22	Milestone I:	Oct 86	IOC:	Dec 05*
Commanche	Milestone I:	Jun 89	IOC:	Sep 09

\* Computers at IOC are 512 X faster, hold 65,000 X bits of information than they did at MS I

**Technology growth is non-linear...  
Acquisition path has been linear**

# Technology and Defense Acquisition

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## DoD 5000-Series: S&T Role in Evolutionary Acquisition As of April 2002

- **DoDD 5000.1, The Defense Acquisition System**
  - Rapid & Effective Transition From S&T to Products
  - Emphasis on Cost & Affordability in Program Development
- **DoDD 5000.2, Operation of the Defense Acq. System**
  - Identify S&T Solutions in Pre-Systems Acquisition
  - Reduce Technology Risks Before the Acquisition Process
  - Use Mechanisms with User & Acq. Customer to Ensure Transition
    - > ATDs, ACTDs, Service & Joint Experiments
- **DoD 5000.2-R, Procedures for Acquisition Programs**
  - Establish Technology Readiness Levels (TRLs) for Critical Technologies

Documents Available at <http://www.acq.osd.mil/ara/>



# Changes to Defense Acquisition Regulation



- DoDD 5000.1, The Defense Acquisition System
  - Rapid & Effective Transition From S&T to Products
  - Emphasis on Cost & Schedule Performance
- DoDD 5000.2
  - Identify S&T
  - Reduce Tech
  - Use Mechanism
    - > ATDs, AC
- DoD 5000.2-R, Procedures for Acquisition Programs
  - Establish Technology Readiness Levels (TRLs) for Critical Technologies

Cancelled By  
DepSecDef Oct  
2002

**Why? “To create an acquisition policy environment that fosters efficiency, flexibility, creativity, and innovation”**

# **Additional DepSecDef Guidance**

## **30 Oct 2002**

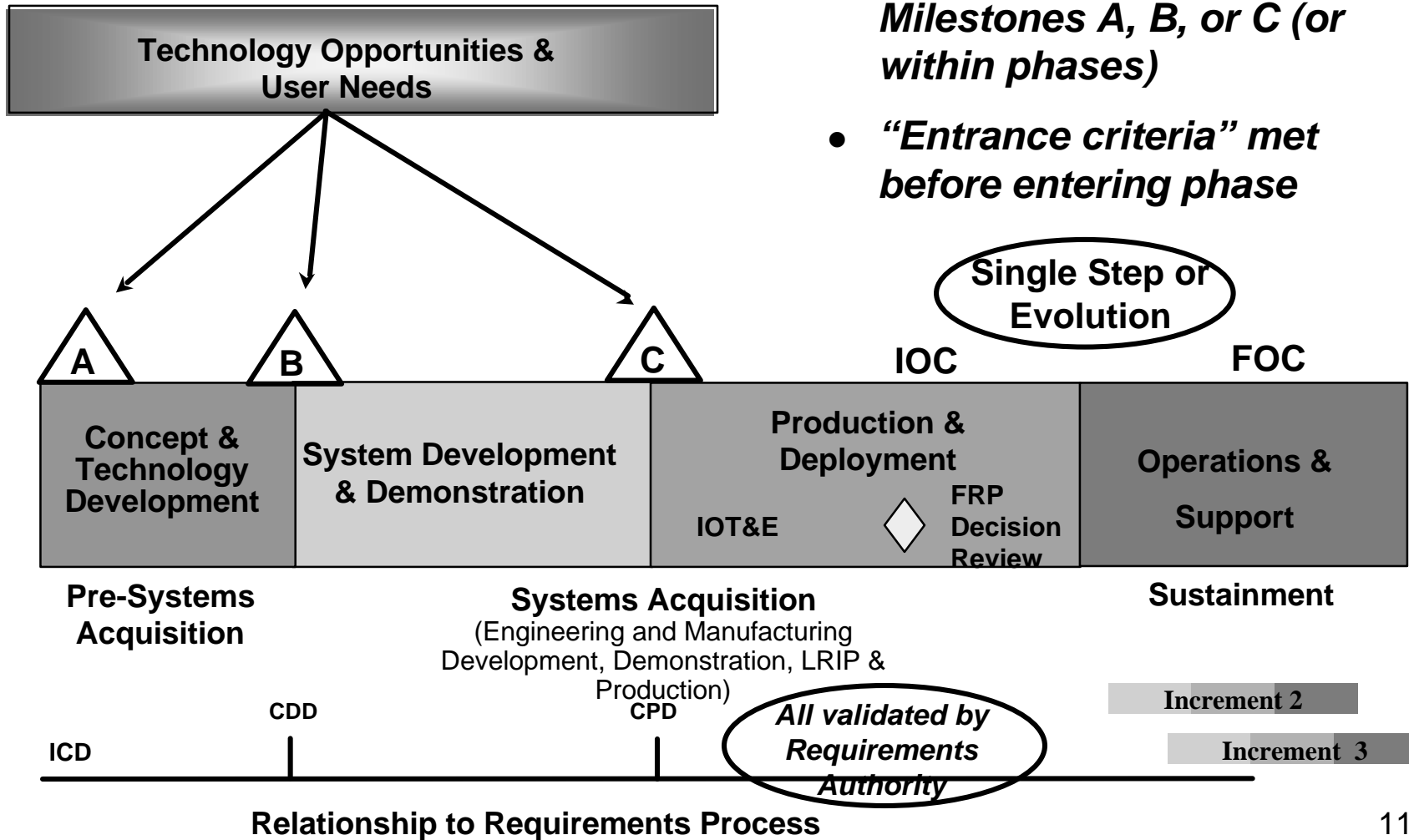
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- **DepSecDef Issued Interim Guidance (~40 Pages):**
  - **Reaffirmed the Importance of Technology Transition**
  - **Reaffirmed Evolutionary Acquisition**
  - **Reaffirmed Technology Development as a Continual Process**
  - **Directed Continuation of Technology Readiness Assessments and Independent Technology Assessments (Milestones B/C)**

**DEPSECDF Intent: Streamline Acquisition, with increased flexibility for technology insertion**

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- *Process entry at Milestones A, B, or C (or within phases)*
- *“Entrance criteria” met before entering phase*

# Changes to Requirements Process

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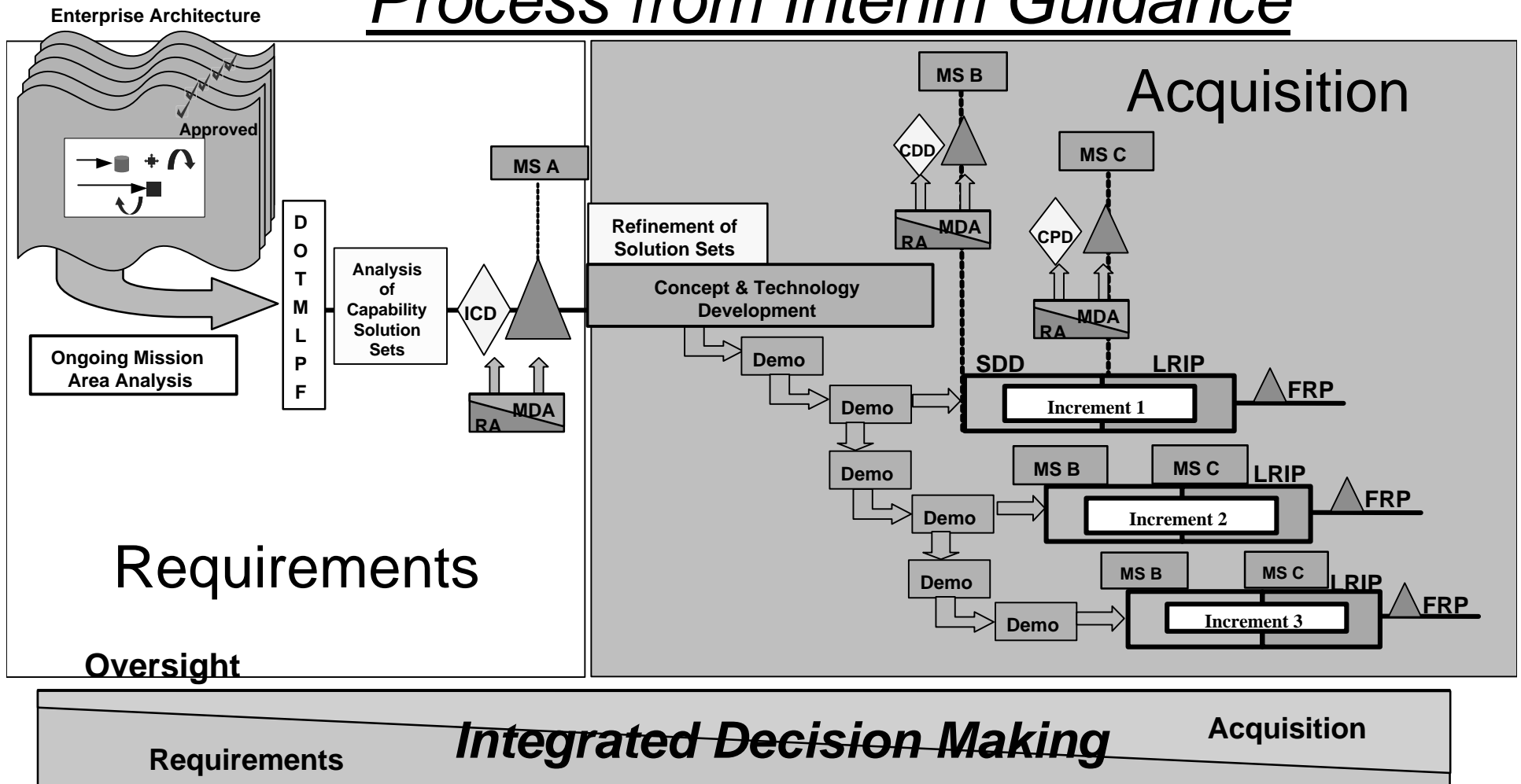


- **Warfighter “owns” the Requirements Process**
- **Moving to Top-Down “Joint Capabilities Integration”**
- **Key Documents:**
  - **Joint Integrating Architecture (JIA) (Pre MS-A)**
  - **Initial Capabilities Document (ICD) (Pre MS-A)**
  - **Capability Development Document (CDD) (MS-B)**
  - **Capability Production Document (CPD) (MS-C)**
  - **Capstone Requirement Document (CRD)**

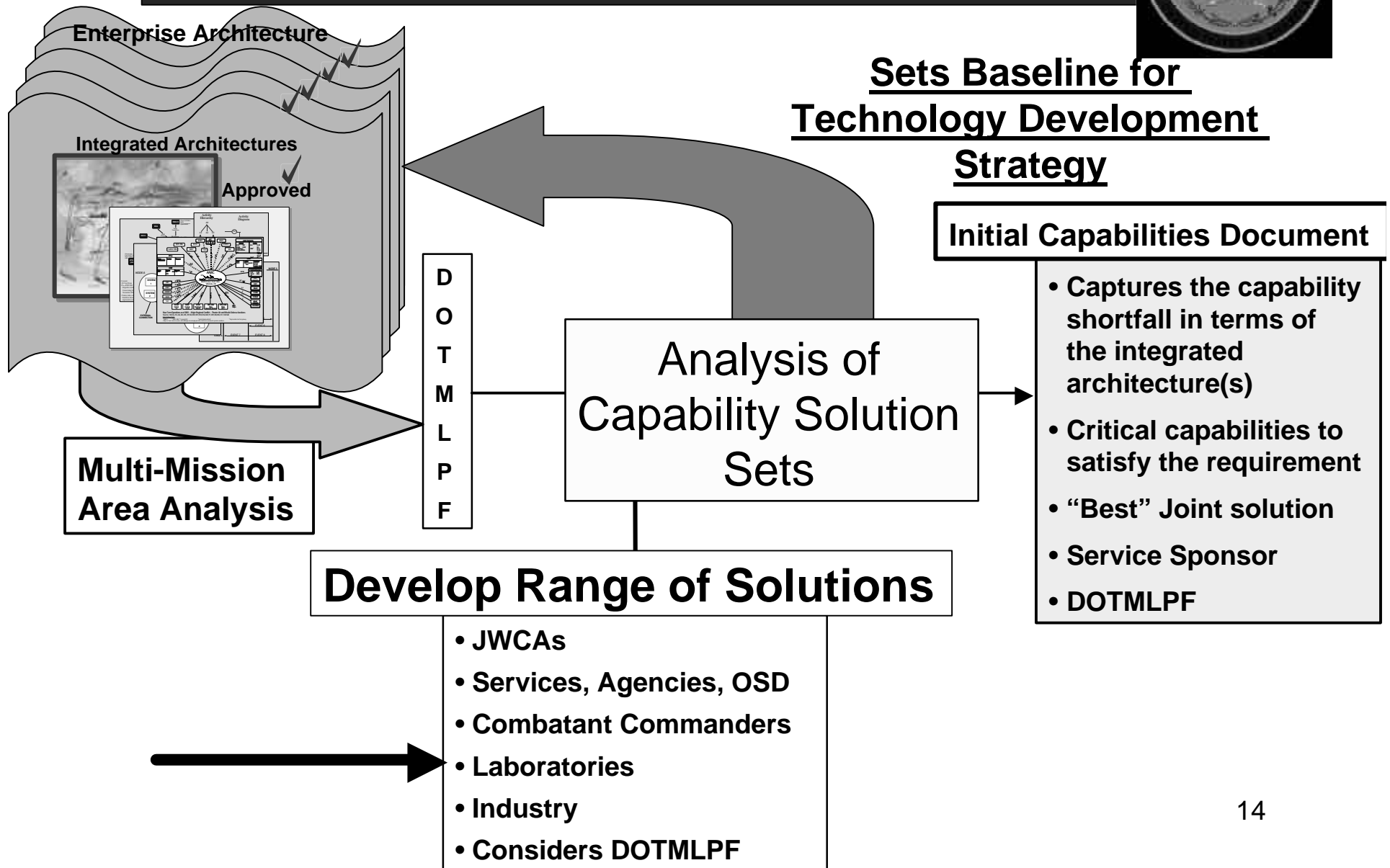
# Possible Future Requirements / Acquisition Process



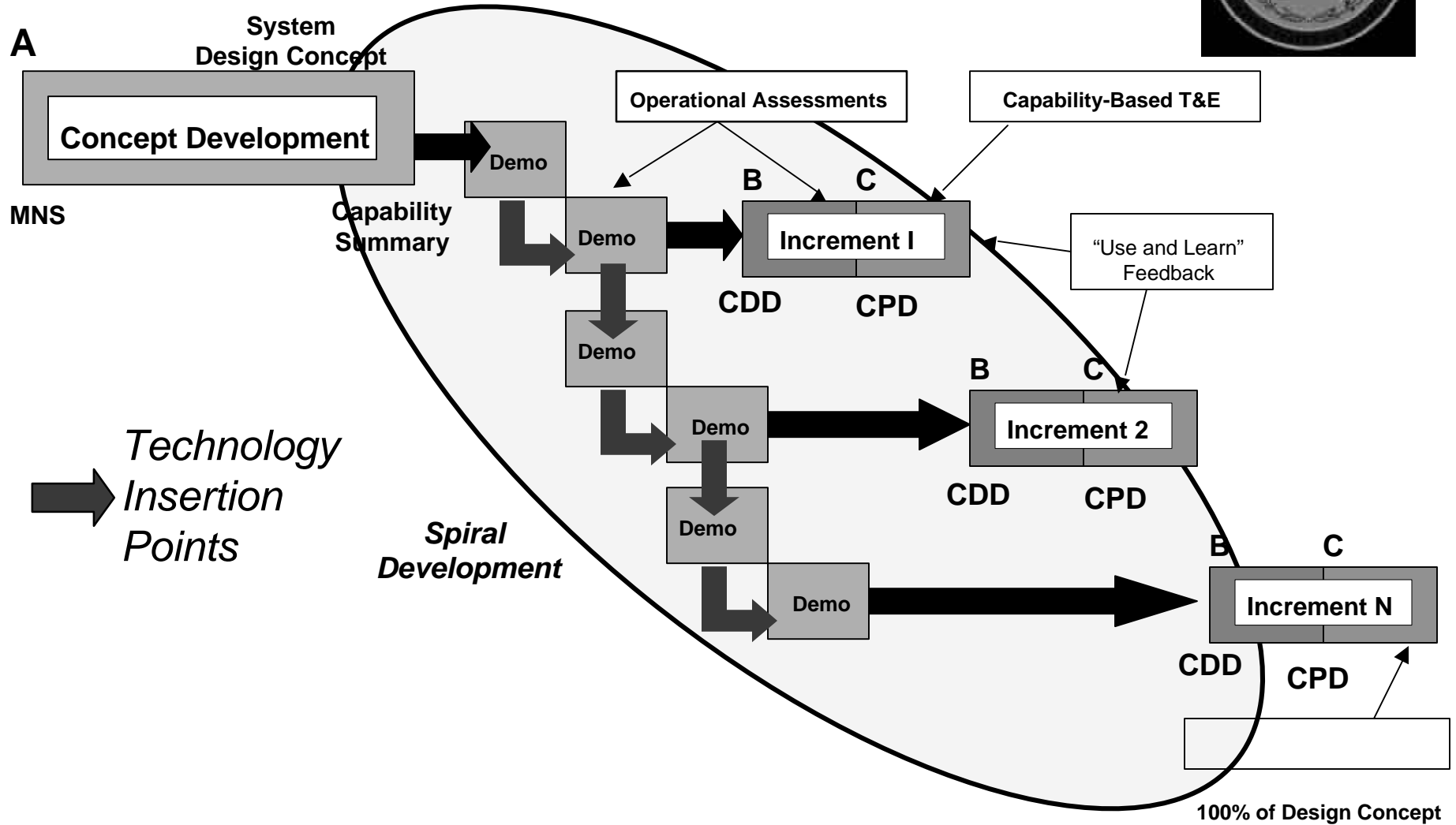
## Process from Interim Guidance



# Initial Requirements Process



# Evolutionary Acquisition and Spiral Development



Every Spiral Should Enhance Capability <sup>15</sup>

# Best Practices

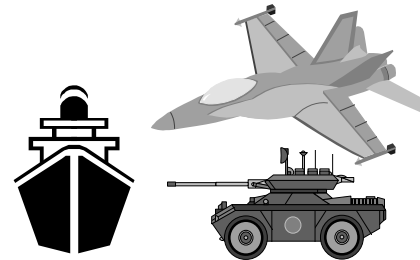


All Services are evolving their acquisition processes

FROM

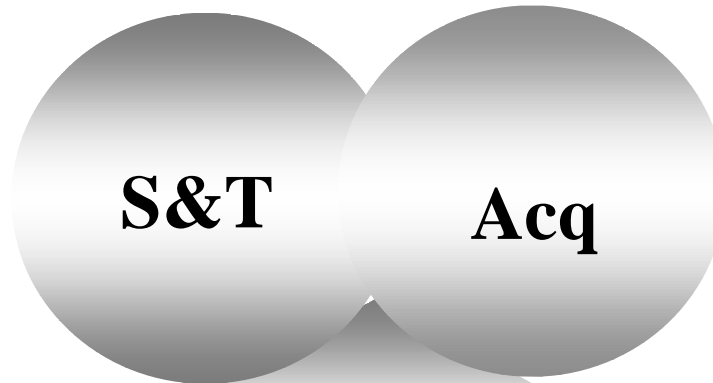


**S&T**



**Acq**

TO

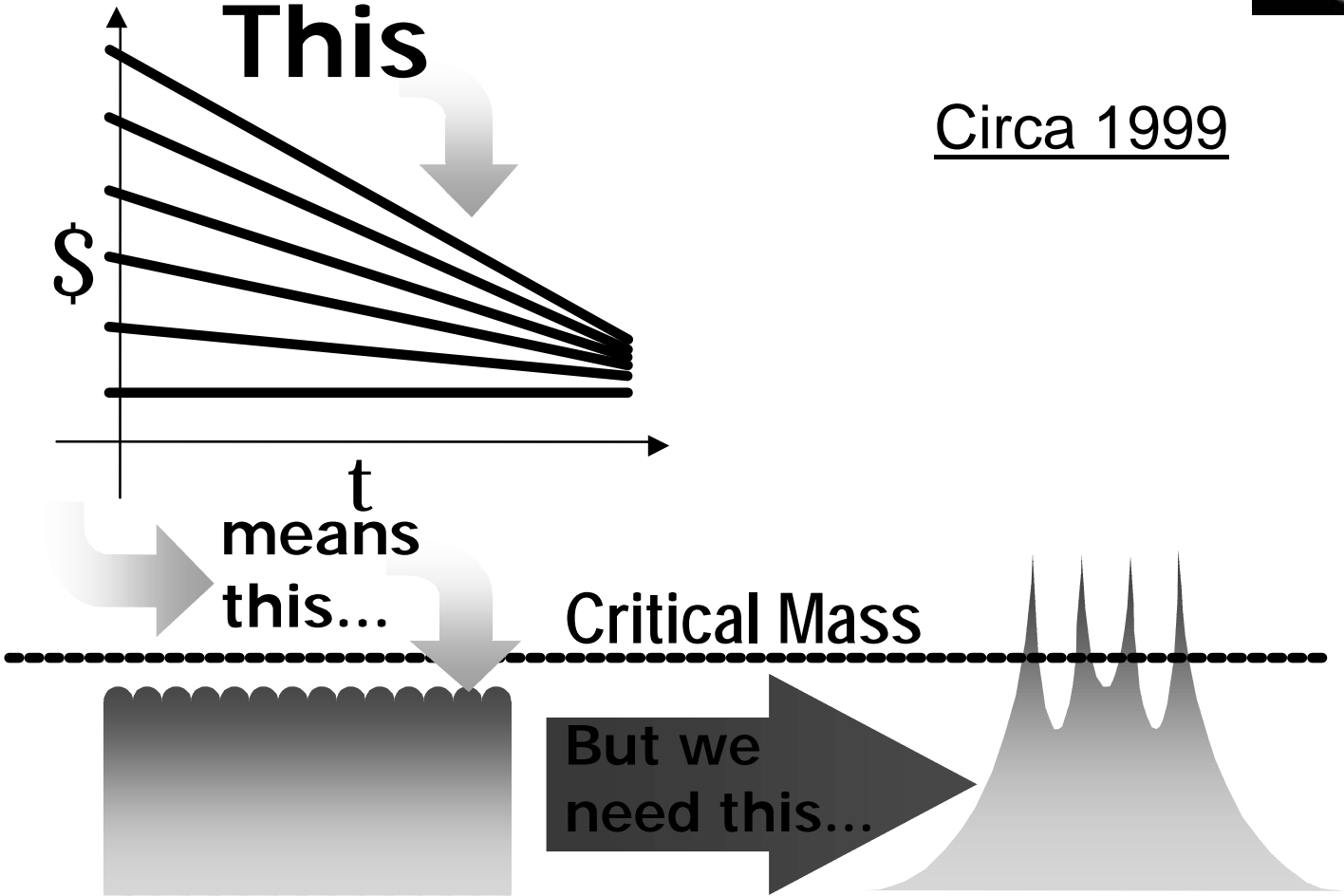


**Operational  
Requirements  
(Warfighter)**

*Enhanced  
Contact;  
Fewer  
Surprises*



# Navy Science & Technology (S&T) Problem / Solution



**Programs below critical mass were never ready for transition**

# Navy FNC IPT Approach

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- **Industry Board of Directors Model**
- **Principal Members:**
  - **Chair -- Requirements community -- Office of Chief of Naval Operations (OPNAV)/Marine Corp Combat Development Center (MCCDC)/Fleet/Force rep.**
  - **Transition Lead -- Acquisition community -- Systems Command (SYSCOM)/Program Executive Officer (PEO) rep.**
  - **Execution Manager/Technical Working Group Leader -- S&T community rep.**
  - **Executive Secretary -- S&T Resource Sponsor Rep.**

# **Air Force Applied Technology Council (ATC)**

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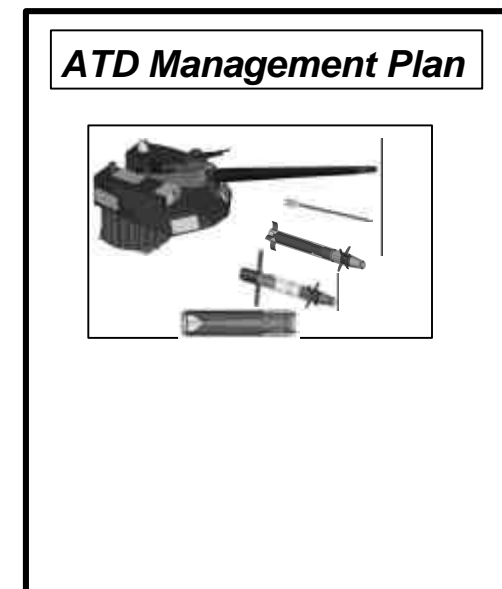


- **Tech transition process should be a 3-legged stool**
  - Air Force Research Lab, Product Centers, and Users
- **Recurring participation at senior levels**
  - MAJCOM/CVs, Product Center/CCs, and AFRL/CC
- **Funding commitments for both S&T and transition**
- **For Advanced Technology Demonstration (ATD) Programs**

# ***Army ATD Management Plans Accelerating Transition***



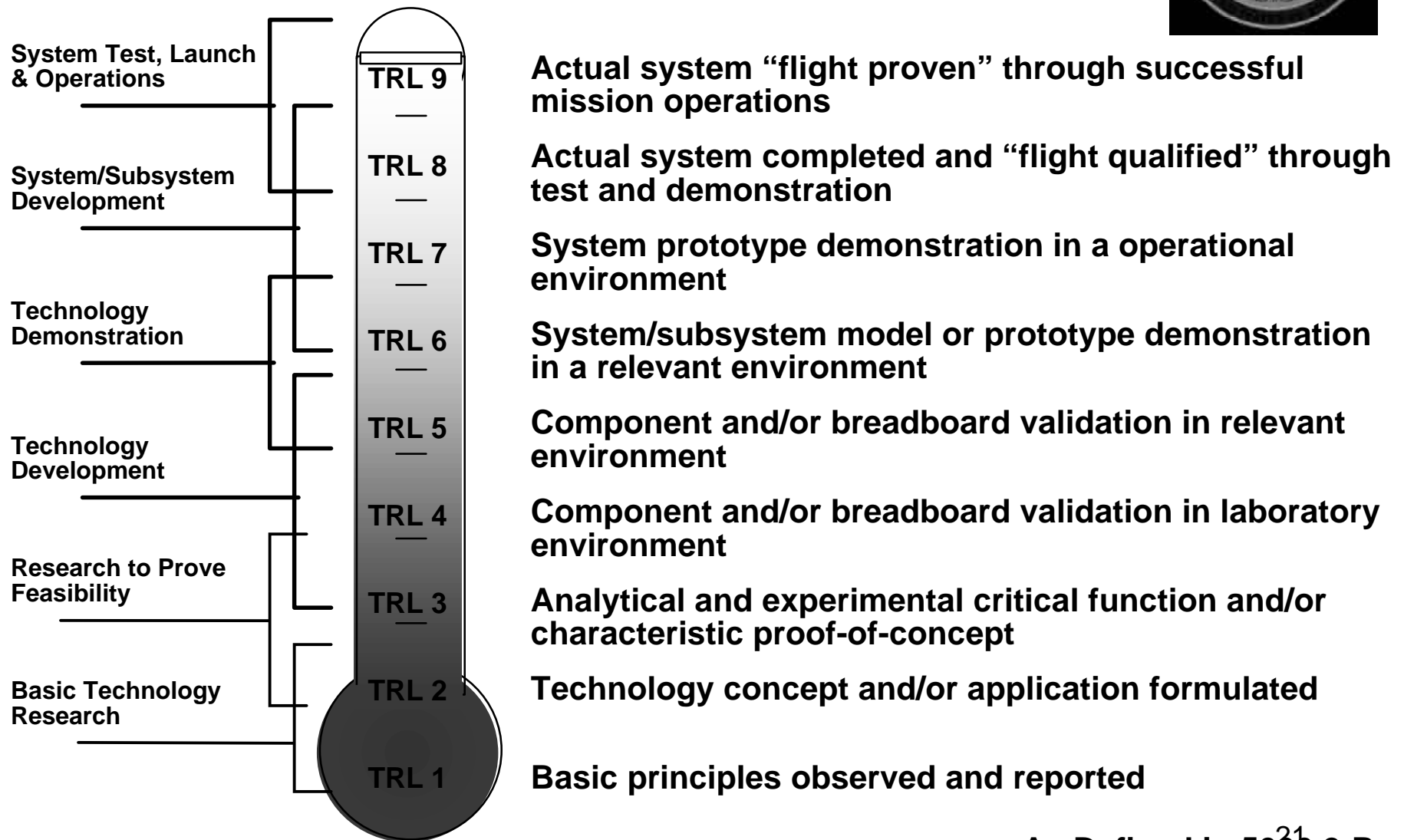
- ***Coordinated and Documented partnership between Warfighting Customer, Technology Developer and Acquisition Buyer***
- ***Proposed by Technologists and Tacticians***
- ***Approved by GO/SES***
  - ***HQ TRADOC Combat Developer***
  - ***HQDA Chief Scientist***
  - ***HQDA, G8 Force Development***
  - ***PEO/PM***



***Commitments to Transition needed Technology as Fast as Possible***

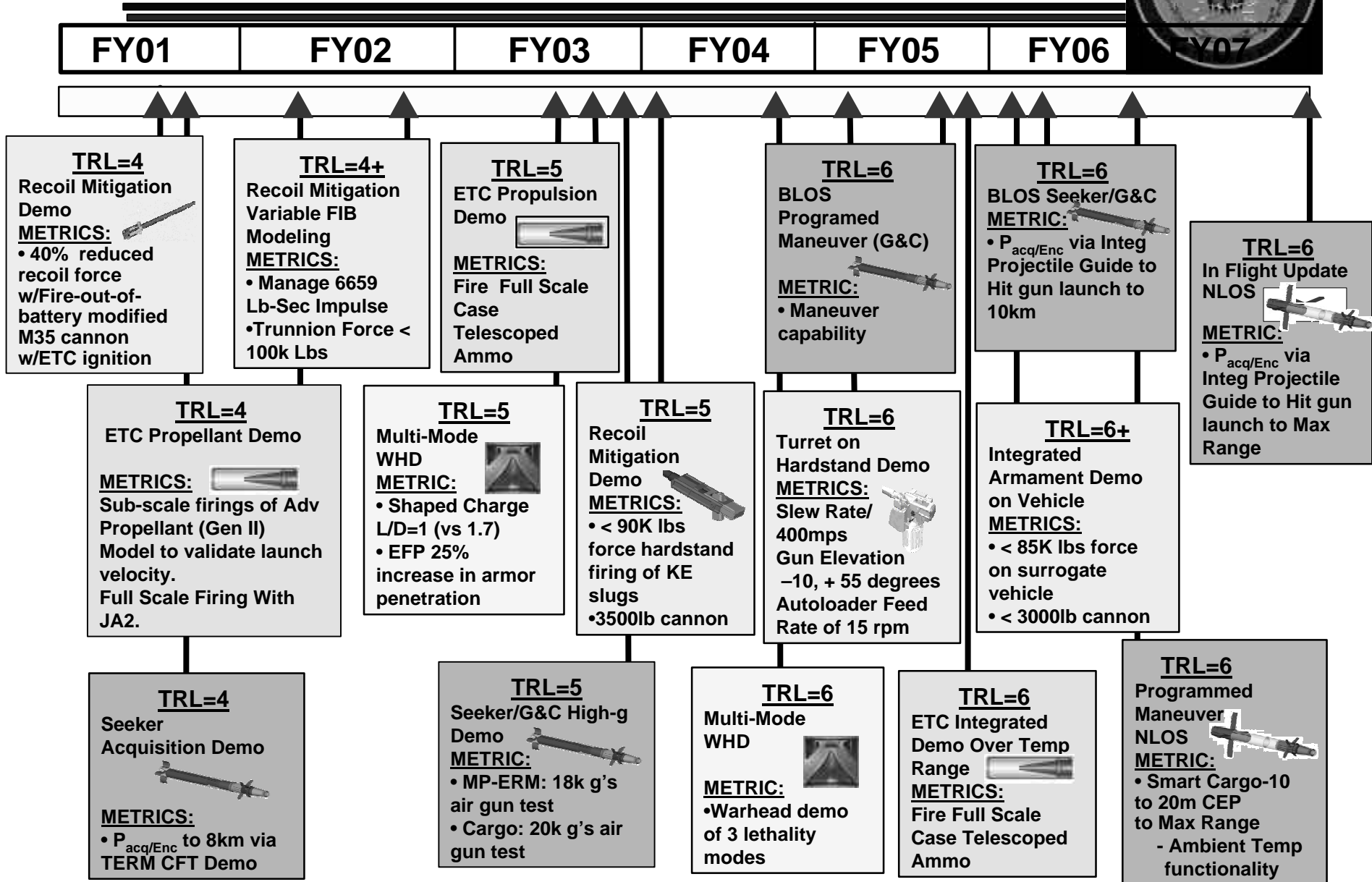
# Measuring Technology Maturity

## Technology Readiness Levels



# FCS Multi-Role Armament & Ammunition ATD

(III.WP.1999.01 )



# SPEED OF TECHNOLOGY CHANGE

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## In FY03 President's Budget Request New Program Quick Reaction Special Projects – 3 Projects

- **Defense Acquisition Challenge Program**

- Provides opportunities for inserting innovative and cost-saving technology into acquisition programs

- Funds used only for review and evaluation of proposals, not implementation

- **Quick Reaction Fund**

- Provides flexibility to respond to emergent DoD needs within budget cycle

- Takes advantage of technology breakthroughs in rapidly evolving technologies

- Completion of projects within a 6-12 month period

- **Technology Transition Initiative**

- Establishes a Technology Transition Council

- Jump starts selected components/subsystems into systems

# *Summary*

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- **Tech Transition is critical to maintaining capability edge**
- **Need Reaffirmed at Highest Levels**
- **DoD Implementing New Projects and Processes to Effect Transition**
- **Effective Tech Transition remains a Contact Sport**



# Continuum of Tech Transition

Complementary Approaches to Meet Warfighter Needs

