

# ACQ 405

# Analysis of Alternatives



Foundational Learning



Workflow Learning



Performance Learning

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# Lesson Objectives

- Explain how the Analysis of Alternatives (AoA) supports DoD's three decision support systems
  - Explain statute and policy
  - Recognize the perspective what an ideal AoA provides
  - Recognize some Best Practices
  - Describe an AoA Study Team



# Statutes and Policies

- Sections 2366a and 2366b of Title 10, USC
  - NDAA 2006 ([updated with NDAA 2016](#))
- Weapons Systems Acquisition Reform Act of 2009
  - Public Law 111-23                      May 22, 2009                      NDAA FY09
- Director of Cost Assessment and Program Evaluation
  - DoDD 5105.84                      May 11, 2012                      DA&M
- Operation of the Defense Acquisition System
  - DoDI 5000.02                      January 7, 2015                      USD(AT&L)
- Joint Capabilities Integration and Development System
  - CJCSI 3170.011                      January 23, 2015                      CJCS



# 2366a and 2366b Certification

- § 2366a. Major defense acquisition programs: determination required before Milestone A approval
  - (b) Written Determination Required.—A major defense acquisition program or subprogram may not receive Milestone A approval or otherwise be initiated prior to Milestone B approval until the milestone decision authority determines in writing...
    - (6) that an **analysis of alternatives** has been performed consistent with study guidance developed by the Director of Cost Assessment and Program Evaluation; ...
- § 2366b. Major defense acquisition programs: certification required before Milestone B
  - (a) Certifications and Determination Required.—A major defense acquisition program may not receive Milestone B approval until the milestone decision authority— ...
    - (3) determines in writing that— ...
      - (F) the Department of Defense has **completed an analysis of alternatives** with respect to the program;

**A major defense acquisition program must have an AoA\***



# Example documents for 2366b Business Case Analysis

- ARA memo
- **AoA**
- ORD
- CDD
- ASR
- SCP
- ICE
- MNS
- PB
- TRA report and memo
- PDR report
- CDD JROCM
- Class Justification & Approval
- Service Full Funding Memos

ARA: Acquisition Resources & Analysis  
ORD: Operational Requirements Document  
ASR: Acquisition Strategy Report  
ICE: Independent Cost Estimate

SCP: Service Cost Position  
PB: President's Budget  
TRA: Technology Readiness Assessment  
MNS: Mission Need Statement



## “Responsibilities.—

- The Director of Cost Assessment and Program Evaluation shall serve as the principal official within the senior management of the Department of Defense for the following: ...
  - (4) **Formulation of study guidance** for analyses of alternatives for major defense acquisition programs **and performance of such analyses**, as directed by the Secretary of Defense”<sup>1</sup>

## “Study Guidance for Analysis of Alternatives.—

- The Director of Cost Assessment and Program Evaluation shall **take the lead** in the development of study guidance for an analysis of alternatives for each joint military requirement for which the Chairman of the Joint Requirements Oversight Council is the validation authority.
- In developing the guidance, the Director shall **solicit the advice** of appropriate officials within the Department of Defense and ensure that the guidance requires, at a minimum—
  - (1) **full consideration of possible trade-offs** among cost, schedule, and performance objectives for each alternative considered; and
  - (2) an **assessment of whether or not the joint military requirement** can be met in a manner that is consistent **with the cost and schedule objectives** recommended by the Joint Requirements Oversight Council.”<sup>2</sup>

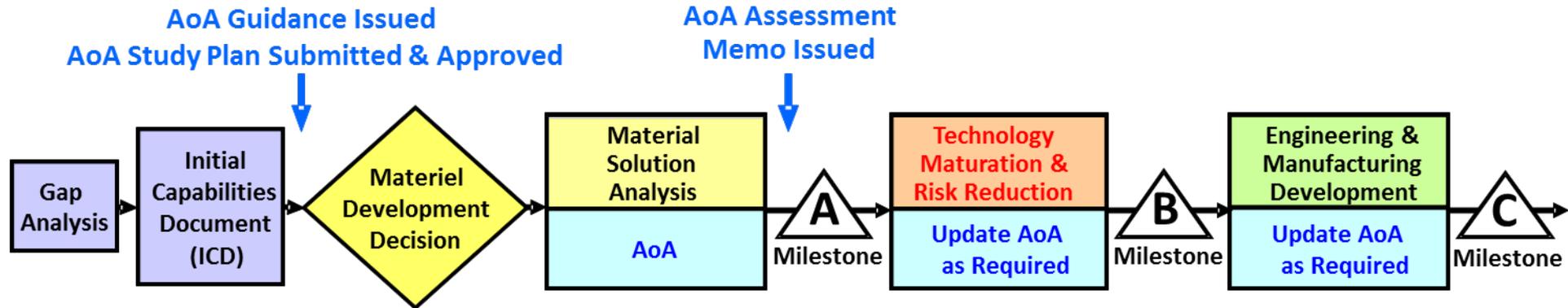


# DoDD 5105.84 Policy Requirements

- DCAPE is the principal authority **to guide and assess** AoAs
- DCAPE ensures that AoAs **consider trade-offs** among effectiveness, suitability, and life-cycle costs (or total ownership costs, if applicable) **of alternatives** that satisfy established capability needs among a comprehensive set of **potential** material solutions
- DCAPE shall:
  - a) **Develop** AoA Study **guidance** for MDAPs and MAIS programs.
  - b) **Approve** AoA Study **plans** for each MDAP and MAIS program.
  - c) **Evaluate the adequacy** of each AoA. Upon completion of an AoA, the DCAPE shall provide the Head of the DoD Component or PSA and to the Milestone Decision Authority an assessment of the AoA, to include a determination on whether the analysis is consistent with the AoA guidance.



# DoDI 5000.02 Policy Requirements

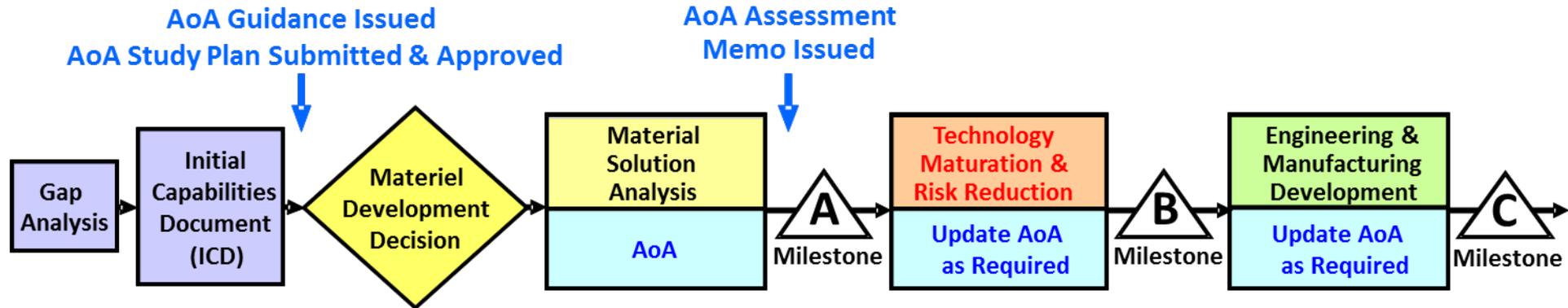


- The **validated** ICD and the AoA Study Plan will guide the AoA and Materiel Solution Analysis Phase activity
- The AoA will inform and be informed by affordability analysis, cost analysis, sustainment considerations, early systems engineering analysis, threat projections, and market research
- In developing the guidance, the DCAPE solicits the advice of other DoD officials and ensures that the guidance requires, at a minimum:
  - 1) Full consideration of possible tradeoffs among life-cycle cost, schedule, and performance objectives (**including mandatory key performance parameters**) for each alternative considered
  - 2) An assessment of whether the joint military requirement can be met in a manner consistent with the cost and schedule objectives recommended by the JROC or other requirements validation authority
  - 3) Consideration of **affordability** analysis results and affordability goals if established by the MDA

Note: The text above is a list of direct extracts from DoDI 5000.02 dated January 7, 2015. Greater detail is provided in Enclosure 9 of that document.



# DoDI 5000.02 Policy Requirements (CONT)



- The study plan will be coordinated with the MDA and approved by the DCAPE **prior** to the Materiel Development Decision.
- The final AoA will be provided to the DCAPE **not later than 60 calendar** days prior to the Milestone A review (or the next decision point or milestone as designated by the MDA)
- **Not later than 15 business** days prior to the Milestone A review, DCAPE evaluates the AoA and provides a memorandum to the MDA, with copies to the head of the DoD Component or other organization or principal staff assistant assessing whether the analysis was completed consistent with DCAPE study guidance and the DCAPE-approved study plan.
- The final AoA will also be provided to and reviewed by **the requirements validation authority** prior to the Milestone A decisions or release of the request for proposals of the Technology Maturation and Risk Reduction Phase activities.

Note: The text above is a list of direct extracts from DoDI 5000.02 dated January 7, 2015. Greater detail is provided in Enclosure 9 of that document.



# What Does an Ideal AoA Provide?

- An ideal AoA provides essential information on the decision space available to make executive decisions
  - Prioritized, quantified, contextualized capability gaps
  - Feasible alternatives that are affordable and mitigate the capability gaps
  - The trades within and across alternatives among cost, schedule, and performance
  - Transparent analysis of recognized quality
  - Sensitivity analysis—how robust are the solutions?

**AoA provides well-described and understood  
“options” for the decision-maker**



# AoA Best Practices

## Stand-up a Service Executive Steering Body

Good Practice: Service Executive Steering Body is formed and includes key stakeholders (e.g. requirements, acquisition, resources)

Result:

- Ensures balanced approach needed for success
- Stakeholder integration throughout process mitigates risk of “stovepiped” analysis and solutions
- Provides a link to the CAPE-led “Study Advisory Group” which monitors execution of the AoA

Poor Practice: Service Executive Steering Body not formed

Result:

- Service more likely to proceed down path unaware of issues that may delay or kill effort



## Cost and affordability considered upfront

Good Practice: Cost and affordability boundaries established early in the analysis

Result:

- Facilitates exploration of viable trade space
- Analytical resources not expended on infeasible solutions
- Includes O&S
- Includes impact on schedule—how long to build within cost limits

Poor Practice: Cost and affordability not considered or not addressed until end of AoA

Result:

- Exploration of viable trade space may be minimized or not accomplished
- Key aspects of viable trade space may be missed because analytical resources are applied toward exploring infeasible solutions

**Screen out infeasible candidates early in the effort**



# AoA Best Practices (CONT)

## Transparent Analysis

Good Practice: Site visits to centers of analysis and open analyst interaction

Result:

- Facilitates understanding of analysis enabling leadership to focus on the implication of results
- Fosters sound analysis which “co-opts” CAPE and AT&L
- Service can address OSD concerns before study time and effort invested

Poor Practice: No or limited analyst interaction

Result:

- Understanding of analysis impeded
- Confidence in analysis diminished
- Leadership time diverted to analyst reviews
- Re-work more likely

**Recent site visits to Army Materiel Systems Analysis Activity proved useful in understanding methodology of on-going AoAs**



## Obtaining information from contractors / allies

Good Practice: Use request for information  
(RFI)

Result:

- Facilitates discussion of trade space to inform AoA
- Faster access to information
- May provide data as input to modeling and simulation

Poor Practice: Use request for proposal (RFP)

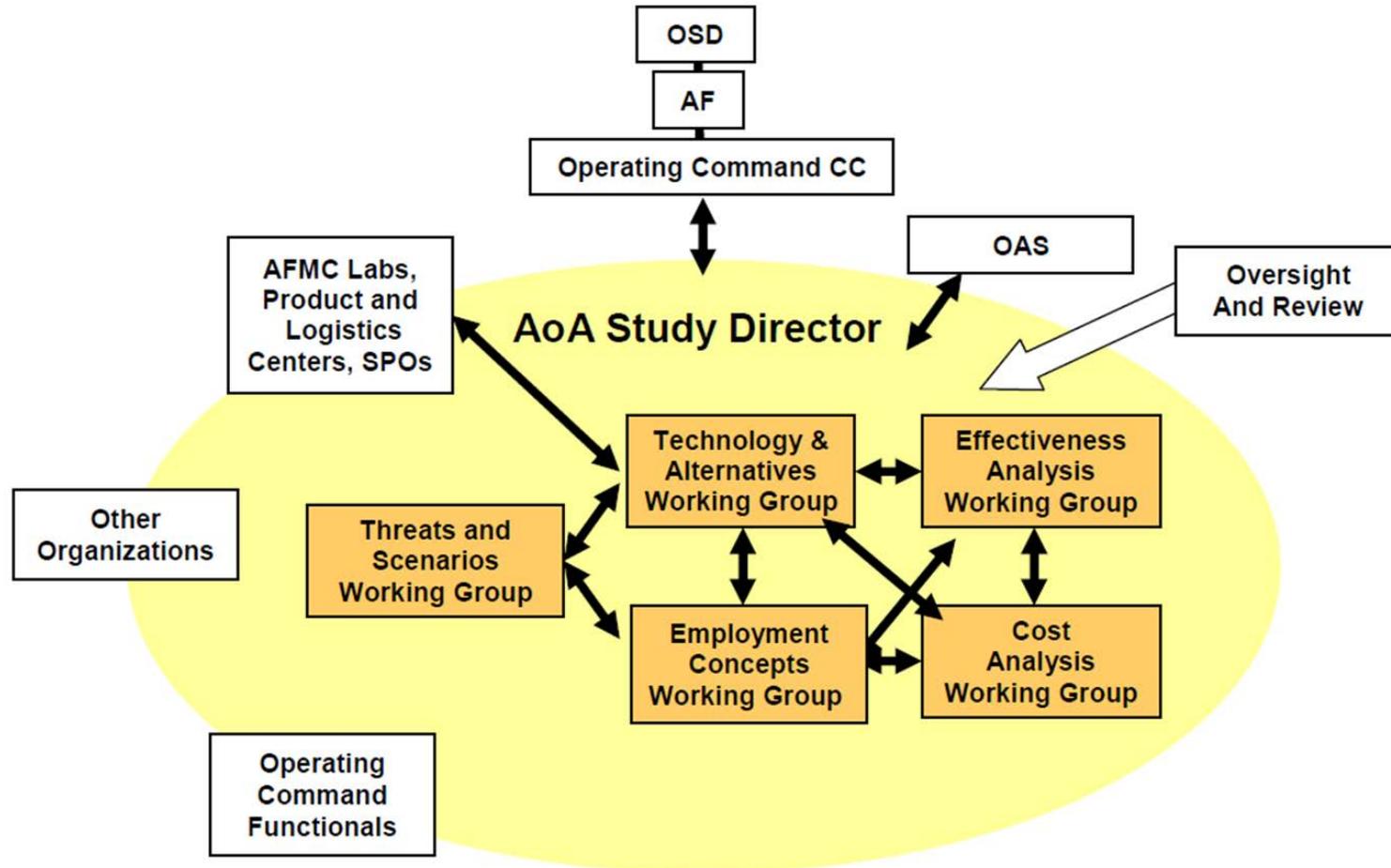
Result:

- May prejudge AoA
- Encumbers process with open competition constraints

**Use of contractor information is legal and desirable but must be well-protected to avoid compromise that puts SESB at risk**

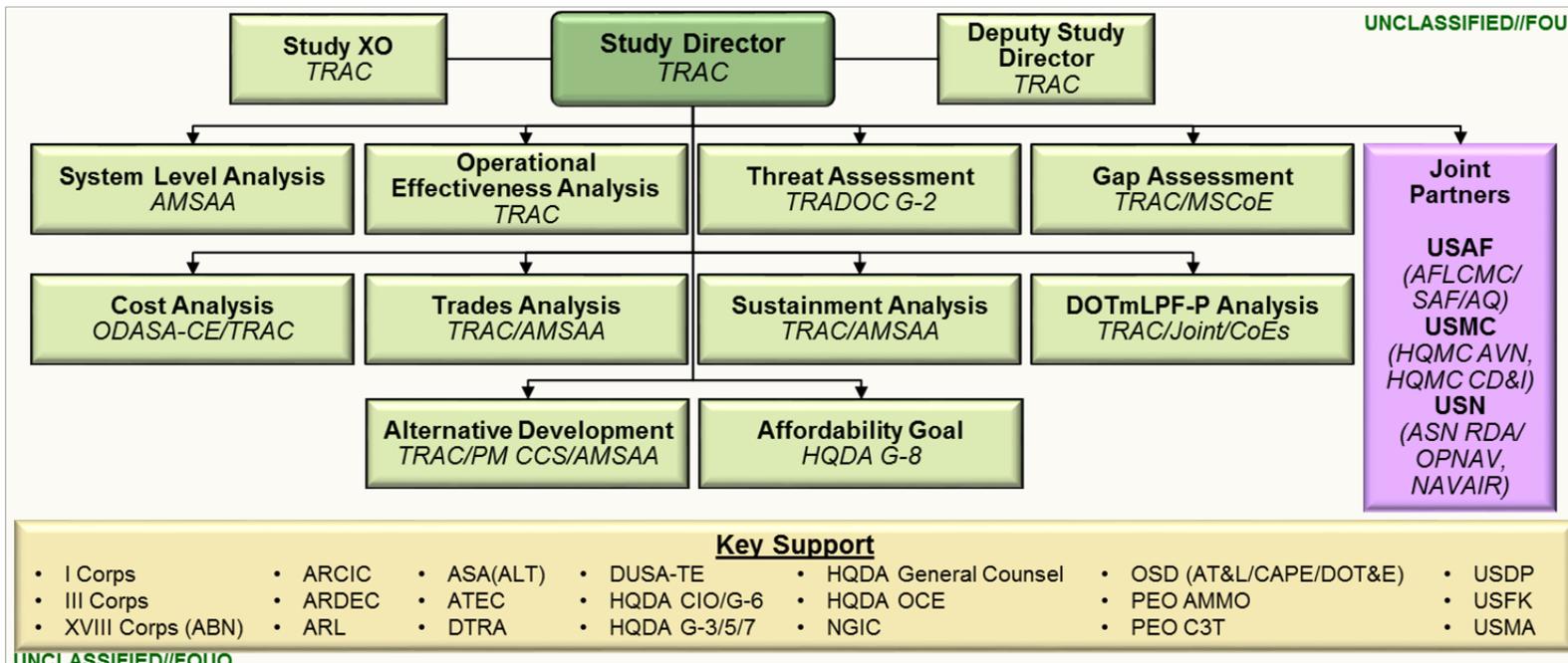


# AoA Study Team Structure (example)





# (U) Study Team Organization



**UNCLASSIFIED//FOUO**

(U) AMSAA – Army Materiel Systems Analysis Activity  
 (U) ARDEC – Armament Research, Development, and Engineering Center  
 (U) ARL – Army Research Laboratory  
 (U) ASA(ALT) – Assistant Secretary of the Army for Acquisition, Logistics, and Technology  
 (U) ATEC – Army Test and Evaluation Command  
 (U) DTRA – Defense Threat Reduction Agency  
 (U) DUSA-TE – Department of the Undersecretary of the Army, Test and Evaluation  
 (U) HQDA CIO/G-6 – Headquarters, Department of the Army, Chief Information Officer  
 (U) HQDA G-3/5/7 – Headquarters, Department of the Army, Operations and Plans  
 (U) HQDA G-8 – Headquarters, Department of the Army, Office of the Deputy Chief of Staff for Programs  
 (U) HQDA General Counsel – Headquarters, Department of the Army General Counsel

(U) HQDA OCE – Headquarters, Department of the Army, Office of the Chief of Engineers  
 (U) MSCoE – Maneuver Support Center of Excellence  
 (U) NGIC – National Ground Intelligence Center  
 (U) ODASA-CE – Office of the Deputy Assistant Secretary of the Army for Cost and Economics  
 (U) OSD AT&L – Office of the Secretary of Defense for Acquisition, Technology, and Logistics  
 (U) OSD DOT&E – Office of the Secretary of Defense, Director Operational Test and Evaluation  
 (U) PEO AMMO – Program Executive Office, Ammunition  
 (U) PEO C3T – Program Executive Office, Command, Control, Communications-Tactical  
 (U) PM CCS – Program Manager, Close Combat Systems.  
 (U) TRADOC G-2 – Training and Doctrine Command, Intelligence Support Agency  
 (U) USAF, AFLCMC – United States Air Force, Air Force Life Cycle Management Center  
 (U) USAF SAF/AQ – United States Air Force, Secretary of the Air Force (Acquisitions).  
 (U) USDP – Under Secretary of Defense, Policy (U//FOUO)  
 (U) USFK – United States Forces Korea  
 (U) USMA – United States Military Academy  
 (U) USMC HQMC AVN – United States Marine Corps, Headquarters Marine, Aviation  
 (U) USMC HQMC CD&I – United States Marine Corps, Headquarters Marine, Corps Combat Development and Integration  
 (U) USN (ASN RDA) – United States Navy, Assistant Secretary of the Navy, Research, Development, and Acquisition  
 (U) USN (NAVAIR) – United States Navy, Naval Air Systems Command  
 (U) USN (OPNAV) – United States Navy, Office of the Chief of Naval Operations



# References

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