Acquisition Milestones and Phases

TOPIC LEARNING OBJECTIVES

Upon successful completion of this topic, the student will be able to:

1. Recognize the terms acquisition strategy, key performance parameter and acquisition program baseline.
2. Recognize the user's (Warfighter's) role and tools in identifying deficiencies through the JCIDS process.
3. Recognize the activities and work content of the Materiel Solution Analysis & Technology Maturation & Risk Reduction (Pre-Systems Acquisition) portion of the acquisition life-cycle.
4. Identify uses of the Analysis of Alternatives.
5. Recognize the activities and work content of the Engineering and Manufacturing Development & Production and Deployment (Systems Acquisition) portion of the acquisition life cycle.
6. Recognize the activities and work content of the Operations and Support (Sustainment & Disposal) portion of the acquisition life-cycle.
7. Identify how DoD International Acquisition and Exportability (IA&E) activities support the U.S. National Security and National Defense Strategies.
8. Identify the information required for a milestone review.
9. Recognize the policy regarding Configuration Steering Boards.
10. Recognize the Navy's 2-pass/7-gate review process.
11. Recognize the differences for a typical shipbuilding program in the execution of the acquisition framework.
12. Identify the evolutionary acquisition strategy approach.

STUDENT PREPARATION

Student Support Materiel

1. None

Primary References

1. DoD and SECNAV 5000 Series
2. ASN(RDA) website -- http://www.secnav.navy.mil/rda
3. Acquisition Guidebooks: https://aaf.dau.edu/guidebooks/
4. DAU ACQ 1010, 2020, 2030, PMT 2570 Course Materiel
5. Acquisition life cycle Chart: https://www.dau.edu/tools/interactive-defense-acquisition-life-cycle-wall-chart-major-capability-lane
6. Adaptive Acquisition Framework Document Identification (AAFID): https://www.dau.edu/aafdid

Additional References

1. None

TOPIC LEARNING OBJECTIVES

Upon successful completion of this topic, the student will be able to:

13. Recognize the relationship between risk management and exit criteria.
14. Given an acquisition program scenario with information on technology maturity, funding and JCIDS documentation, identify the correct starting point for the program in the acquisition life cycle.
15. Identify what constitutes a program deviation.
16. Identify the actions that should be taken by the acquisition manager when program deviations occur.

STUDENT PREPARATION

Student Support Materiel

1. None

Primary References

1. DoD and SECNAV 5000 Series
2. ASN(RDA) website -- http://www.secnav.navy.mil/rda
3. Acquisition Guidebooks: https://aaf.dau.edu/guidebooks/
4. DAU ACQ 1010, 2020, 2030, PMT 2570 Course Materiel
5. Acquisition Life cycle Chart: https://www.dau.edu/tools/interactive-defense-acquisition-life-cycle-wall-chart-major-capability-lane
6. Adaptive Acquisition Framework Document Identification (AAFID): https://www.dau.edu/aafdid

Additional References

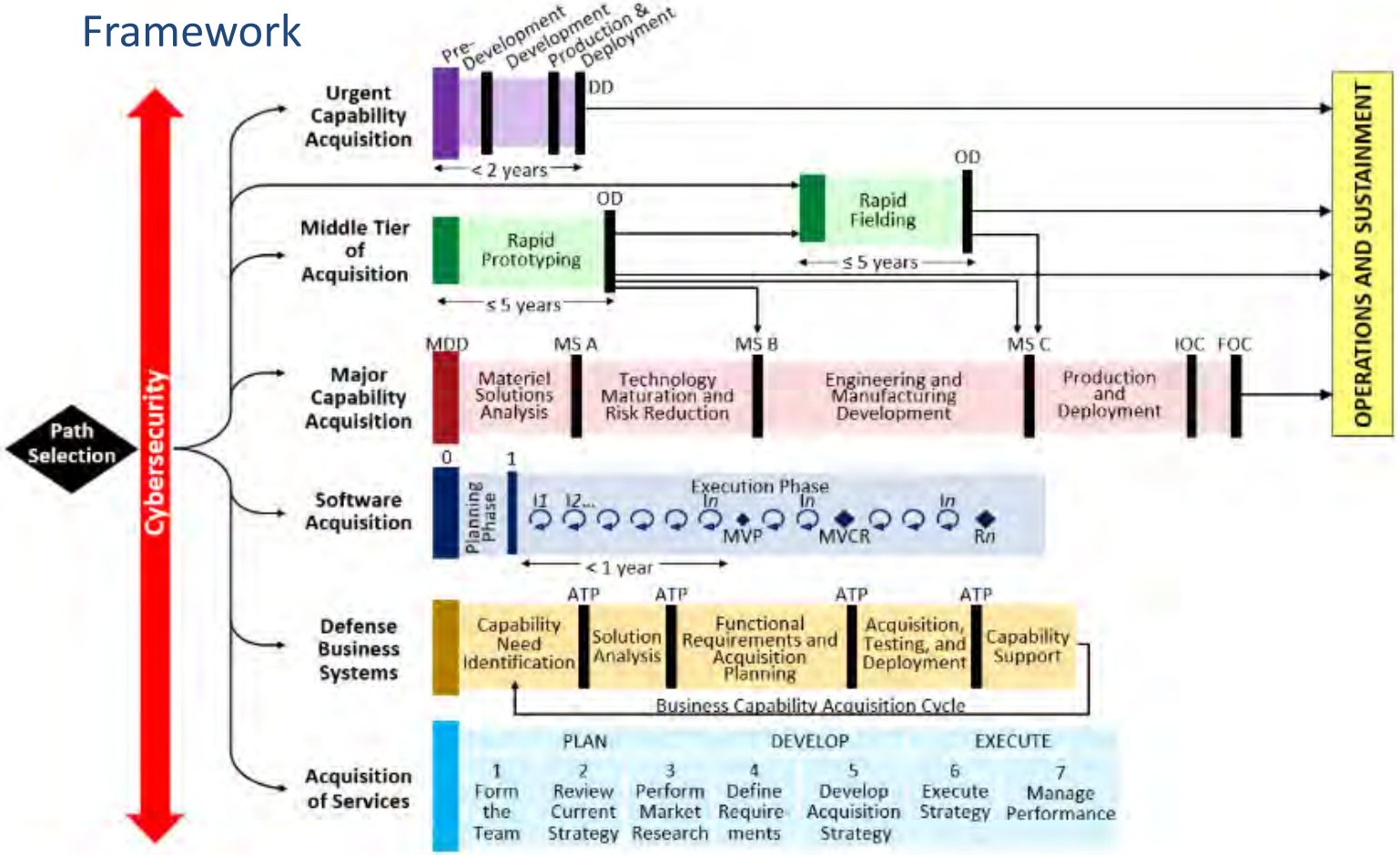
1. None

Overview

- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Operations and Support
- Ships are different
- Navy Specific Review Policy

Introduction

- Defense Acquisition System (DAS) supports the National Defense Strategy through the development of lethal and effective force
  - To achieve that objective the DoD will employ the Adaptive Acquisition Framework



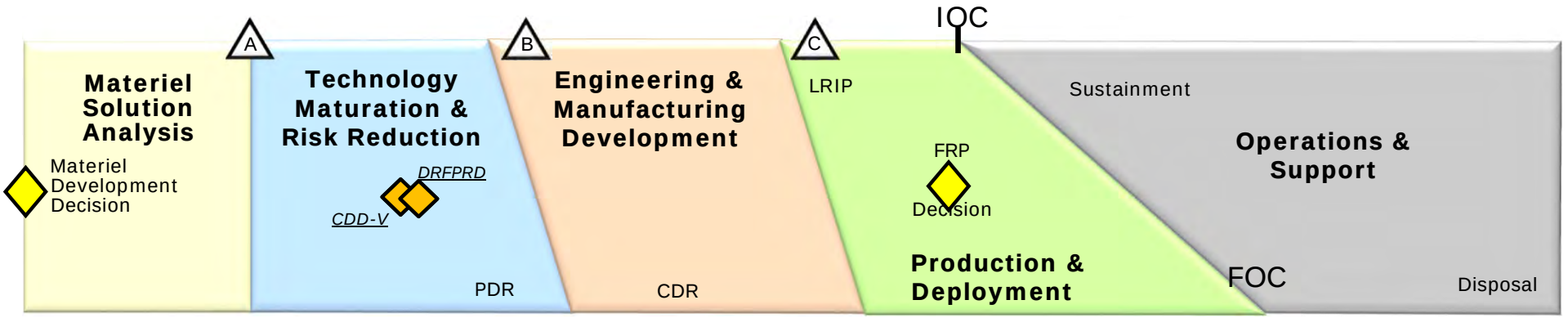
3.3.2 Acquisition Milestones & Phases

Introduction

- JUONS
  - Urgent Operational Need (UON) — Capability requirements identified as impacting an ongoing or anticipated contingency operation. If left unfulfilled, UONs result in capability gaps potentially resulting in loss of life or critical mission failure. When validated by a single DoD component, these are known as DoD component UONs. DoD components, in their own terminology, may use a different name for a UON.
  - Joint Emergent Operational Need (JEON) — UONs that are identified by a CCMD, CJCS, or VCJCS as inherently joint and impacting an anticipated contingency operation.
  - Joint Urgent Operational Need (JUON) — UONs that are identified by a CCMD, CJCS, or VCJCS as inherently joint and impacting an ongoing contingency operation

DAS Structure

- The model below depicts the "classic" DAS model which is the starting point for most military weapons systems and is used on hardware intensive development programs (Major Capability Acquisition)
  - DoDI 5000.02 includes other models for software intensive programs, hybrid programs, and accelerated acquisition programs
- The structure of a DoD acquisition program and the procedures used should be tailored as much as possible to the characteristics of the product being acquired, and to the totality of circumstances associated with the program, including operational urgency and risk factors



PDR: Preliminary Design Review
CDD-V: CDD Validation

DRFPRD: Development Request for Proposal Release Decision
CDR: Critical Design Review
LRIP: Low Rate Initial Production
FRP: Full Rate Production

IOC: Initial Operational Capability
FOC: Full Operational Capability

DAS Structure, cont.

- DAS uses milestones to oversee and manage acquisition programs
  - Milestone A (M/S A): Initiates technology maturation and risk reduction
  - Milestone B (M/S B): Initiates engineering and manufacturing development
  - Milestone C (M/S C): Initiates production and deployment
- Divided into five phases
  - Materiel Solution Analysis Phase (MSA)
  - Technology Maturation and Risk Reduction Phase (TMRR)
  - Engineering and Manufacturing Demonstration Phase (EMD)
  - Production and Deployment Phase (P&D)
  - Operations and Support Phase (O&S)
- Consists of four decision points
  - Materiel Development Decision (MDD)
  - Capabilities Development Document-Validation (CDD-V)
  - Development Request for Proposal Release Decision (DRFPRD)
  - Full Rate Production (FRP)

Milestone Review Information Requirements

- Information required to support decision reviews should be:
  - Tailored by the Milestone Decision Authority (MDA)
  - Consistent with (and not to exceed) the requirements specified in DoDI 5000.85 (Major Capability Acquisition)

- The information required must provide insight into:
  - Program progress and risk
  - Affordability
  - Program trade-offs
  - Acquisition Strategy updates
  - Development of exit criteria for the next phase or effort

- Requirements are captured in DoDI 5000.85, Appendix 3B.1

Entrance Criteria

- Required for all programs, described in general terms
  - Minimum accomplishments required of every program prior to entry into the next phase or effort
  - Contained in DoDI 5000.85, Major Capability Acquisition

Milestone and Phase Information Requirements »

INFORMATION REQUIREMENT	PROGRAM TYPE1			LIFE-CYCLE EVENT1,2,3								SOURCE	TYPE	APPROVAL AUTHORITY
	MDAP	ACAT II	ACAT ≤ III	MDD	MS A	CDD Val	Dev RFP Rel	MS B5	MS C	FRP Dec	OTHER			
2366a WRITTEN DETERMINATION	•				•							10 U.S.C. 2366a; DoDI 5000.85	Statutory	MDA
2366b CERTIFICATION AND DETERMINATION	•							•	•			10 U.S.C. 2366b; 10 U.S.C. 2446b; DoDI 5000.85	Regulatory, Statutory	MDA
ACQUISITION APPROACH (Part of Acquisition Strategy)	•	•	•		•		•	✓	✓	✓		10 U.S.C. 2431a; 15 U.S.C. 631, et seq.	Statutory	MDA
Acquisition Decision Memorandum (ADM)	•	•	•	•	•		•	•	•	•	•	DoDI 5000.85	Regulatory	MDA
ACQUISITION PROGRAM BASELINE (APB)	•	•	•				•	✓	✓	✓	✓	10 U.S.C. 2435; 10 U.S.C. 2433a	Regulatory, Statutory	MDA
ACQUISITION STRATEGY	•	•	•		•		•	✓	✓	✓		10 U.S.C. 2431a; DoDI 5000.85	Regulatory, Statutory	MDA
Affordability Analysis	•	•	•	•	✓		✓	✓	✓	✓		DoDI 5000.85	Regulatory	MDA
ANALYSIS OF ALTERNATIVES (AoA)	•	•	•		•		✓		✓		✓	40 U.S.C. 11312; §811, P.L. 106-398; 10 U.S.C. 2366a; 10 U.S.C. 2366b; DoDD 5105.84	Statutory	MDA (DCAPE evaluates and assesses AoAs for all ACAT I programs)

A program must meet exit criteria of current phase & entrance criteria of next phase prior to transition

https://www.dau.edu/aafdid/Pages/Milestone-and-Phase-Information-Requirements.aspx

Exit Criteria

- Program specific technical, schedule or management risk areas
  - Proposed by PM and approved by MDA for the next phase
  - Exit criteria should be the major showstoppers that the PM, PEO, and/or MDA agree require intensive management during that particular phase to ensure the program is ready to proceed to the following phase
- Documented at a Milestone Review in the Acquisition Decision Memorandum (ADM). Exit criteria must be specific and demonstrable
- Examples are:
  - Demonstrated performance (engine thrust)
  - Accomplishment of some process (manufacturing yield)
  - Accomplishment of some event (first flight)

MDA uses exit criteria to determine risk has been sufficiently reduced for the program to enter the next phase

Acquisition Program Baseline (APB)

- APB documents program goals in terms of:
  - Cost, schedule, performance
    - Thresholds – minimum requirement
    - Objectives – desired/maximum requirement

- Everyone in program chain of command commits to cost, schedule, and performance thresholds and objectives documented in the APB

- Programs garner extra attention when they do not meet the goals defined in the APB
  - Sometimes explainable and recoverable
  - Sometimes can lead to program cancellation
  - Sometimes can lead to rebaseline

Program goals documented in the APB define the trade space for a program

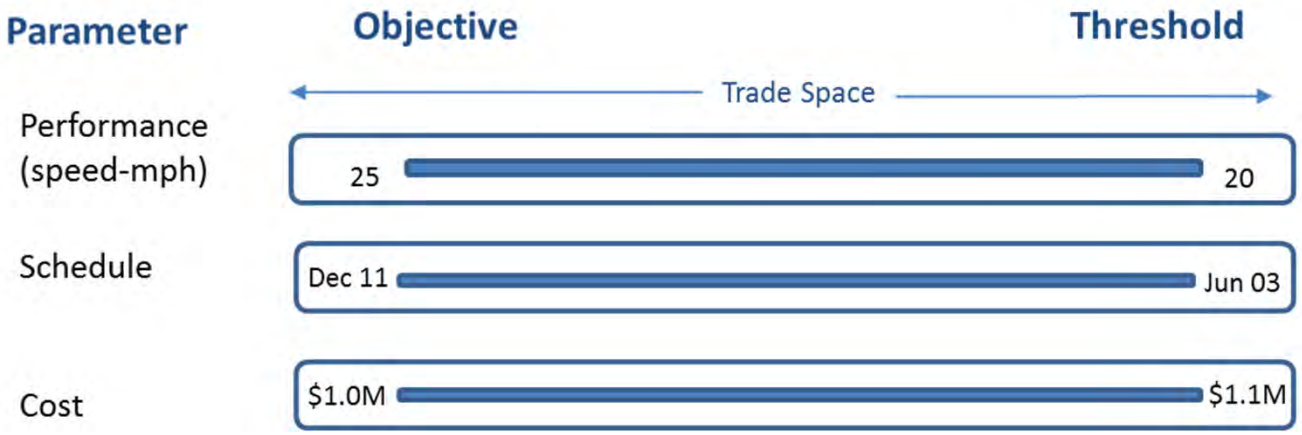
Thresholds and Objectives

- Threshold
  - ***Minimum acceptable*** values that, in the user's judgement, are necessary to satisfy the need. The threshold values establish the trade space and these may not be exceeded unless approved by the MDA
  - Threshold values represent deviation limits for the schedule, performance, and cost parameters
  - Default threshold values (unless otherwise specified)
    - Performance: Threshold = Objective
    - Cost: Threshold = Objective value plus 10%
    - Schedule: Threshold = Objective value + 6 months

- Objective
  - A value better than or equal to the threshold which results in an ***operationally meaningful, time critical, and cost-effective*** increment above the schedule, performance and cost thresholds for each program parameter

Trade Space

- Trade Space
  - The set of potential solutions or alternatives that can be explored to meet a specific need or requirement, considering various factors like cost, schedule, and performance
  - Area between objective & threshold
  - Defines region of PM control while managing the program
  - MDA approval required to achieve ***above*** objective or ***below*** threshold program performance



  - Can a PM trade schedule for increased performance if:
    - Schedule remains within threshold?
    - Performance exceeds objective?

Program Deviations

- Program Deviation
  - Occurs when the current estimate of the program exceeds threshold for cost schedule, or performance
  - Early deviation indicators are defined by MDA
    - e.g., 10% schedule slip from APB
  - Nunn-McCurdy Unit Cost Breach
    - Nunn-McCurdy Act requires DoD to report to Congress whenever a Major Defense Acquisition Program (MDAP) experiences cost overruns that exceed certain thresholds
    - Types:
      - Significant Nunn-McCurdy: MDAP experiences cost growth of 15% from their current baseline or 30% from their original baseline; sponsors must notify Congress within 45 days after the Program Deviation Report
      - Critical Nunn-McCurdy: MDAP experiences cost growth of 25% from their current baseline or 50% from their original baseline; subject to detailer review for potential terminations

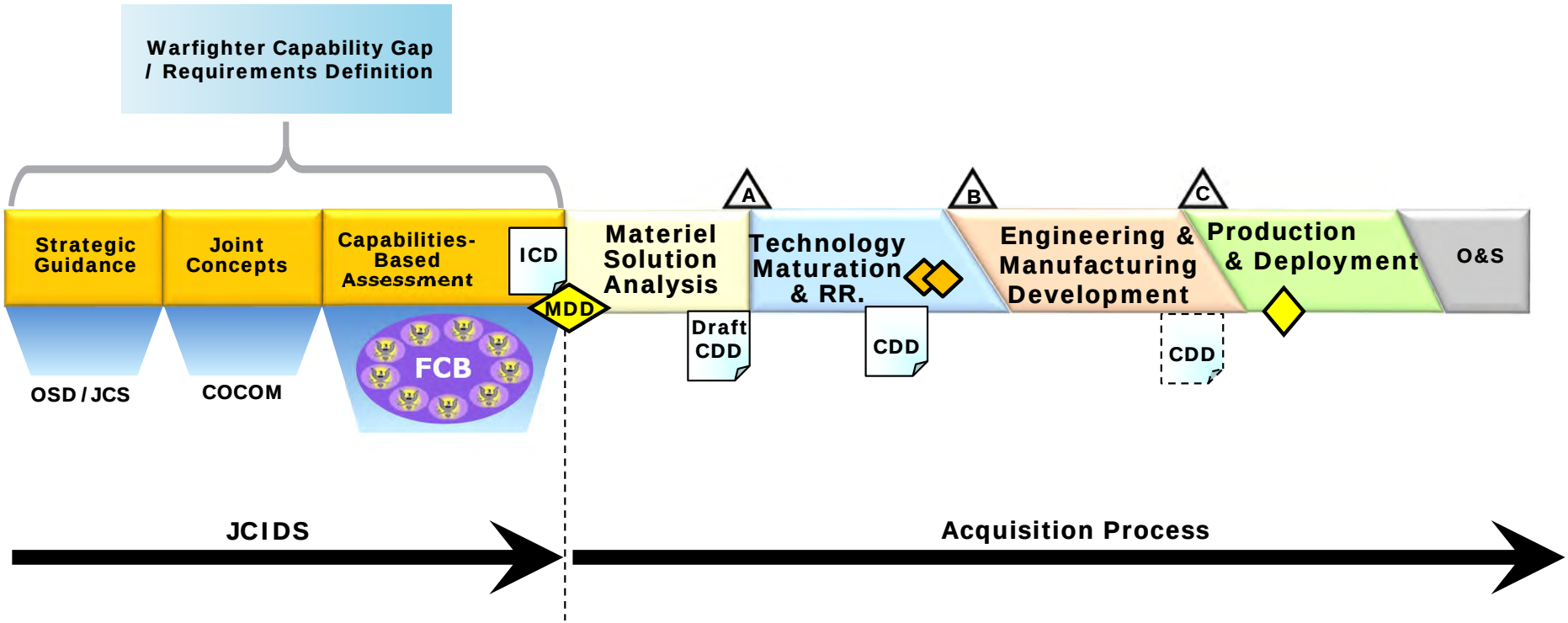
Program Deviations Actions

- Program Deviation actions:
  - ***Immediately notify the Milestone Decision Authority*** through appropriate management channels
  - ***Within 30 days*** the program manager will submit a Program Deviation Report to notify MDA of:
    - Reason for the program deviation
    - Actions required to bring the program within baseline
  - ***Within 90 days*** one of the following should have occurred:
    - Program is back within APB parameters, or
    - PM will submit information to the Overarching IPT to inform a recommendation to the MDA on whether a revision to the APB is needed

Overview

- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Operations and Support
- Ships are different
- Navy Specific Review Policy

JCIDS Relationship to DAS



(JCIDS) Joint Capabilities Integration and Development System is often referred to as the requirements generation process;

the DoD defines and validates requirements through the JCIDS

JCIDS Relationship to DAS (cont.)

- The primary objective of JCIDS is to ensure the capabilities required by the Joint Warfighter are identified with their associated operational performance criteria to successfully execute the missions assigned
  - Policy leads to the development of Joint Concepts and Concept of Operations (CONOPS)
  - Capability Based Assessment (CBA) process produces a validated Initial Capabilities Document (ICD) which:
    - Summarizes the results of the identification of warfighting capability gaps
    - Potential solutions to mitigate or resolve those gaps

Warfighter requirements are implemented into the acquisition framework via the Capability Documents

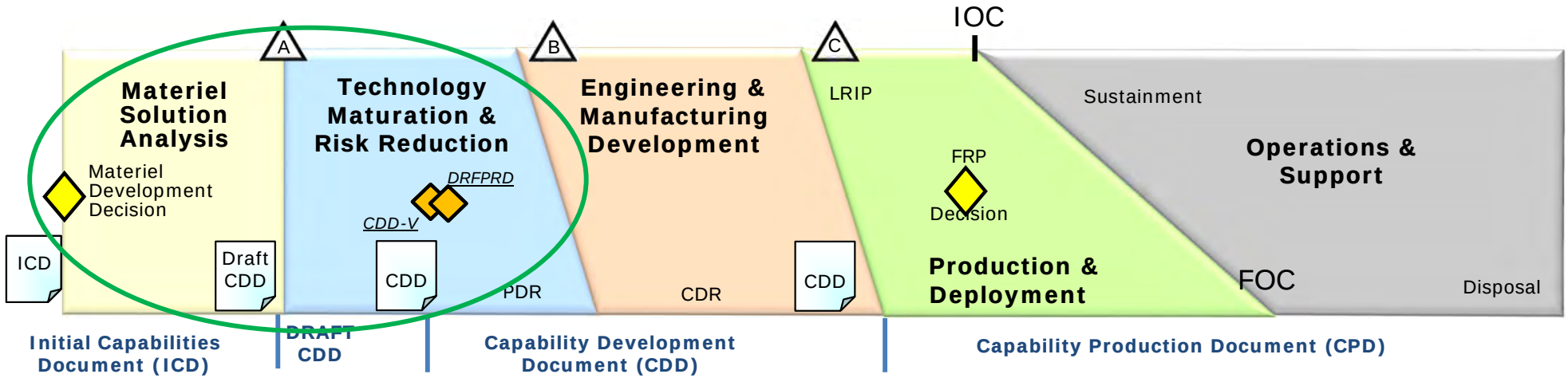
Overview

- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Operations and Support
- Ships are different
- Additional Acquisition Policy

Pre-Systems Acquisition

Warfighter Requirements

- Refining user requirements
- Analyzing candidate materiel solutions
- Developing candidate technologies
- Preparing documents that support program start (Acq Strategy, APB, etc.)



PDR: Preliminary Design Review
CDD-V: CDD Validation

DRFPRD: Development Request for Proposal Release Decision
CDR: Critical Design Review
LRIP: Low Rate Initial Production
FRP: Full Rate Production

IOC: Initial Operational Capability
FOC: Full Operational Capability

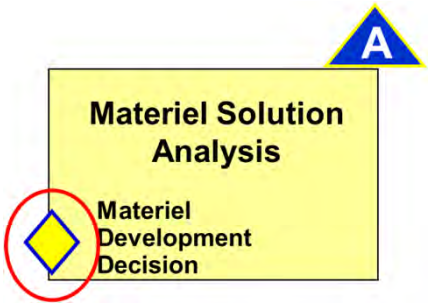
Getting to a Materiel Development Decision (MDD)

- ICDs that recommend a materiel approach to resolving capability gaps support a Materiel Development Decision (MDD) by the MDA
- MDD is the decision that a new product is needed
  - Triggers the Analysis of Alternatives (AoA)
- To pass the MDD, the MDA must:
  - Determine that a materiel solution is necessary
  - Designate the DoD Component that will lead the program
  - Determine the acquisition phase of entry
  - Information required for the MDA:
    - Initial Capabilities Document (ICD)
    - Evidence of strong technical foundation
    - AoA Study Guidance and AoA Study Plan
    - Capstone Threat Assessment (CTA)

Following the MDD, the MDA may authorize entry into the acquisition framework at any point consistent with phase-specific entrance criteria and statutory requirements

Materiel Solution Analysis

- Purpose: Assess potential materiel solutions
- Guided by: Validated ICD, AoA Study Guidance & Study Plan
- Major activities:
  - ***Establish PM & PMO***
  - Conduct AoA
  - Develop initial:
    - Acquisition Strategy, Test & Evaluation Master Plan (TEMP), Systems Engineering Plan (SEP), Life-Cycle Sustainment Plan (LCSP), and Cyber Security Strategy
  - User writes draft CDD
    - Translate user gaps into requirements
- Minimum funding:
  - For all Phase activities and to support M/S A decision
- Phase complete when:
  - ***MDA approves materiel solution and Acquisition Strategy***



Analysis of Alternatives (AoA)

- AoA focuses on:
  - Material solution needed to close the capability gap
  - Mission effectiveness
  - Key trades between cost and capability
  - Schedule
  - Concepts of operations
  - Overall risk
  - Producibility of workforce and industrial base
  - Total life-cycle cost (including facilities, sustainment, and disposal)
- Places emphasis on innovation and competition to achieve the best possible system solution
  - Existing Commercial-Off-The-Shelf (COTS) functionality and solutions drawn from a diversified range of large and small businesses shall be considered
- AoA energizes Industry to advertise potential technology solutions to everyone: AoA team, OPNAV Resource Sponsor, and favorite Congressmen

Results of the AoA provide the basis for the Acquisition Strategy

Hierarchy of Materiel Alternatives

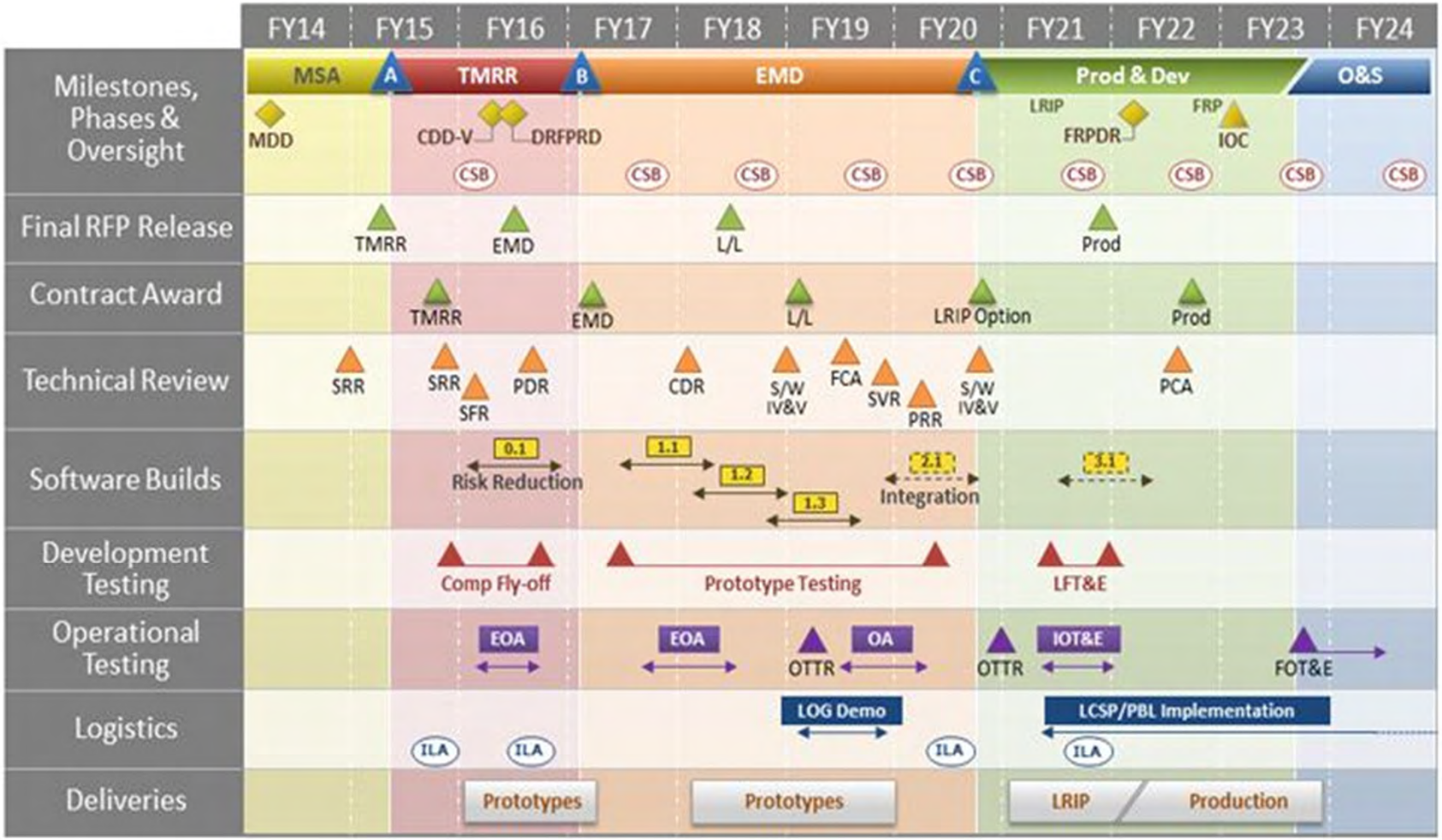
- AoA approved by Cost Assessment and Program Evaluation (CAPE)
- AoA considers Hierarchy of Materiel Alternatives
  1. Procurement/modification of commercially available products, services, and technologies
  2. The additional production/modification of previously-developed U.S. and/or Allied military systems or equipment
  3. An international cooperative development program with one or more Allied nations
  4. A new Joint Component or Government Agency development program
  5. A new DoD Component-unique development program

Acquisition Strategy

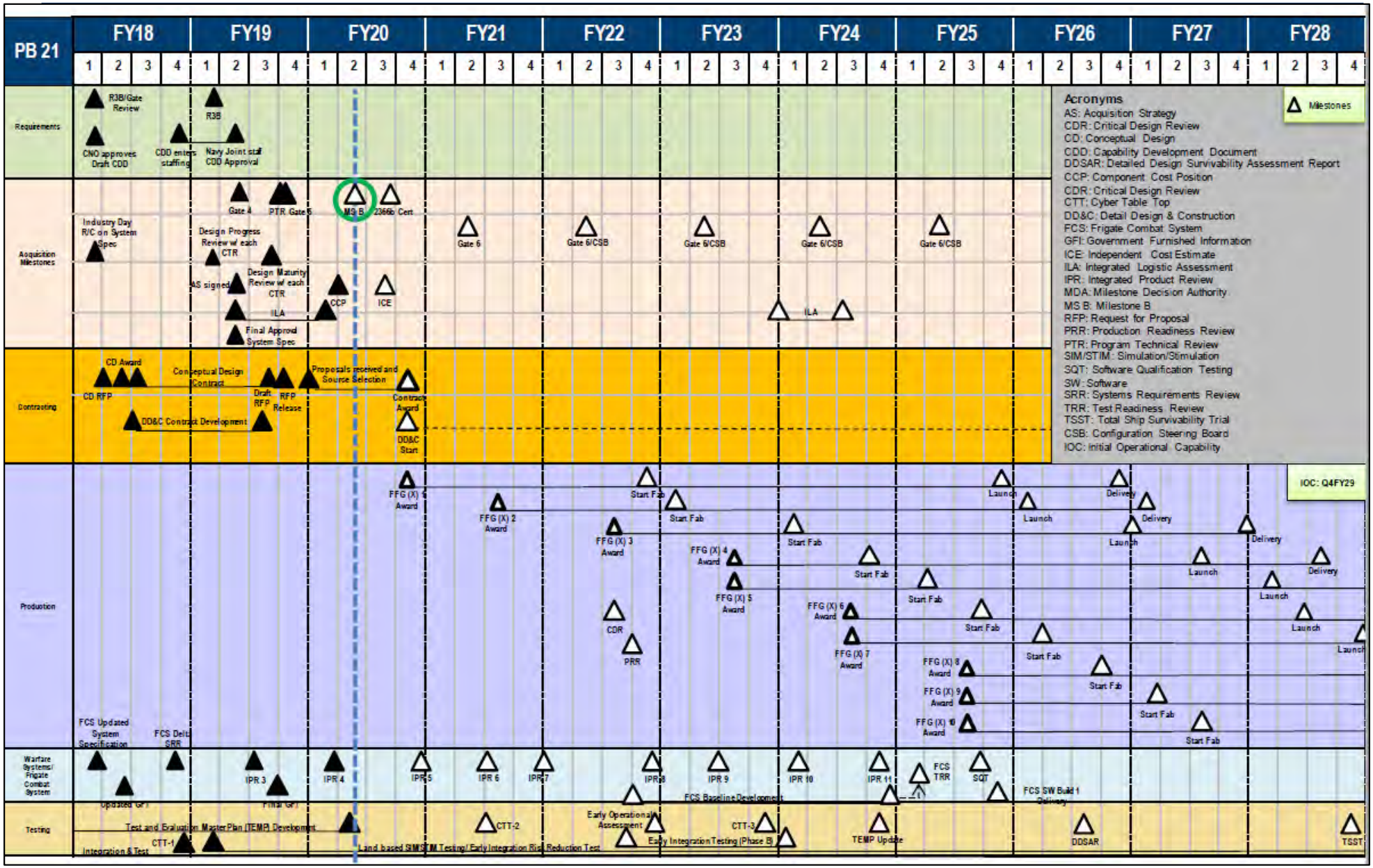
- Acquisition Strategy (AcqStrat)
  - PM must prepare and the MDA must approve an Acquisition Strategy at M/S A
  - Strategy ***guides program execution*** from initiation through re-procurement of systems, subsystems, components, spares and services beyond the initial production contract award, and during post-production support
  - ***Tailors acquisition framework*** for the specific program
  - Evolves through an iterative process – becomes increasingly more definitive
  - ***Provides a master schedule*** **-** prescribes accomplishments for each acquisition phase and identifies the critical events that govern program management
  - ***Provides basis*** for other program plans and strategies
    - For example: Test and Evaluation Master Plan (TEMP), contract awards and deliveries, competition strategy, Systems Engineering Plan (SEP), etc.

Acquisition Strategy maximizes affordability from initiation through post-production

Program Schedule Example



FFG(X) Schedule Example



International Considerations

- The global defense acquisition environment requires proactive engagement by the DoD acquisition community to achieve strategic goals:
  - U.S. Government National Security Strategy and SECDEF/USD (A&S) priorities encourage international defense acquisition activities
  - DoDI 5000.02 requires consideration of international cooperation, sales and exportability in acquisition strategies
  - DoD's rapid acquisition efforts should include evaluation of global defense technology and products
  - U.S. industry is aggressively pursuing international sales in an increasingly competitive global defense market
- International Acquisition and Exportability (IA&E) activities included throughout the life-cycle

PMs need to include IA&E in development of Acquisition Strategy

DoD IA&E Objectives

- Five key DoD IA&E Objectives that should be considered:
  - Operational: To increase military effectiveness through interoperability and partnership with allies and partners
  - Economic: To reduce weapons acquisition by sharing costs and economies of scale, or avoiding supplication of development efforts with our friends and allies
  - Technical: To access the best technology worldwide, and help minimize the capabilities gap with allies and coalition partners
  - Political: To strengthen alliances and relationship with other friendly countries
  - Industrial: To bolster domestic and allied defense industrial bases
- Items to take into account when considering IA&E efforts:
  - Increased bureaucracy, security risk, and dependency on foreign sources

Forms of International Acquisition

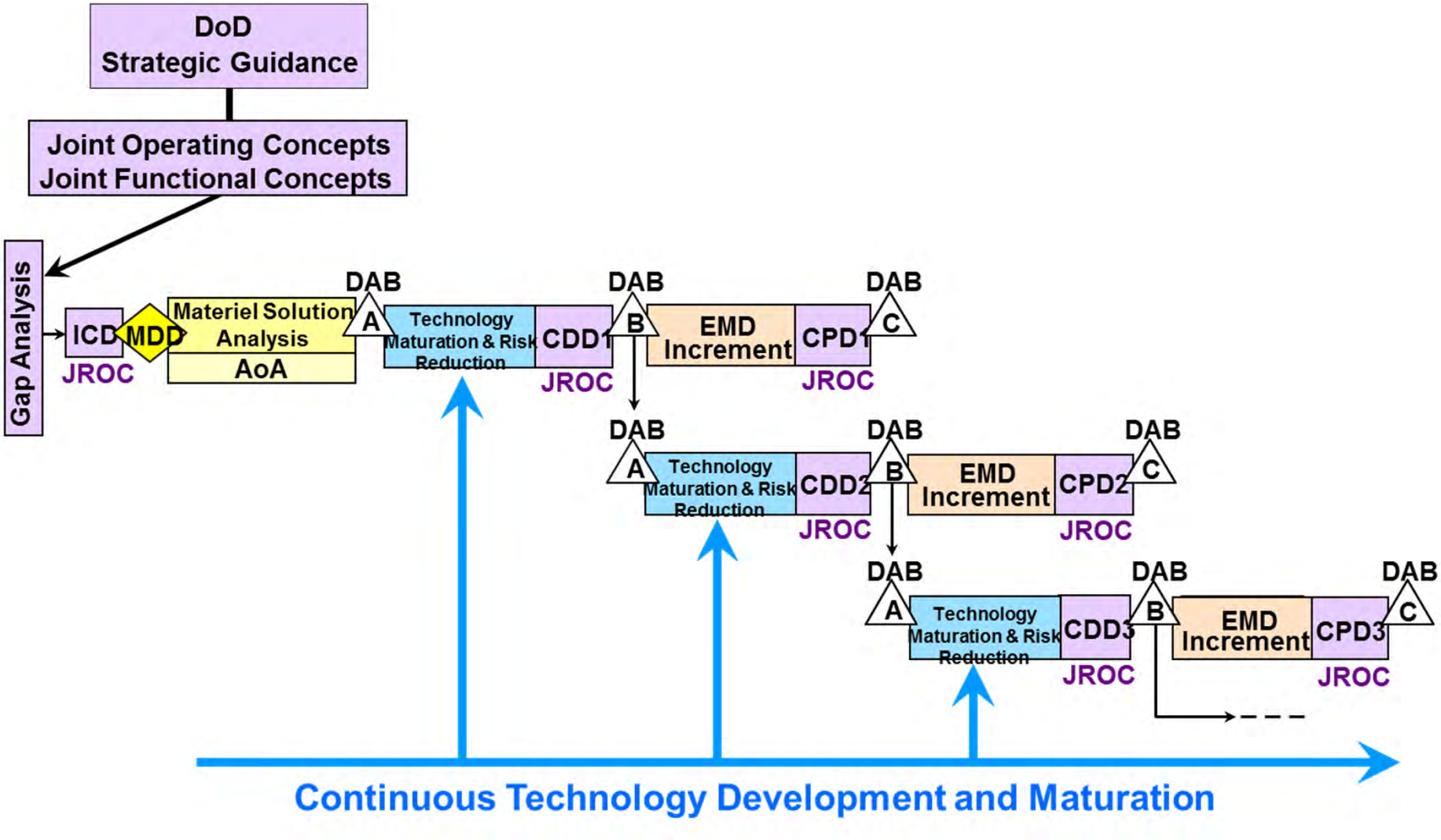
	International Cooperative Programs (ICP)	Foreign Military Sales (FMS)	Building Partner Capacity (BCP)	Direct Commercial Sales (DCS)
Requirement	Manually Determined	Foreign Customer	DoD Determined	Foreign Customer
Relationship	Partner	Buyer-Seller	Provider-Receiver	Buyer-Seller
Form of agreement	International Agreements	FMS Letter of Offer and Acceptance (LOA)	Psuedo LOA	Export License and Industry Contract(s)
Funding	Equitable Shared	Foreign Customer	DoD	Foreign Customer
Program Management	Joint	DoD Implementing Agency (IA)	DoD IA	Foreign Customer
Contract Privity	Partner Nations and Industry	DoD IA and Industry	DoD IA and Industry	Foreign Purchaser and U.S. Industry

Acquisition Strategy Summary Description

- AcqStrat also provides a summary description of the capability need and will identify whether an evolutionary or single step approach will be taken
- Evolutionary – For time-phased incremental implementation to meet user requirements or needs, the strategy:
  - Defines the increment about to be undertaken, as well as subsequent evolutions
  - Defines how the evolutionary approach will satisfy the full-capability needs
- Single step – In a single step to full-capability approach, the full system capability is developed and demonstrated prior to Milestone C
  - Any modification that is of sufficient cost and complexity that it could itself qualify as a Major Defense Acquisition Program (MDAP) or Major Automated Information System (MAIS) is considered for management purposes as a separate acquisition effort

Evolutionary acquisition is the preferred strategy for rapid acquisition of mature technology

Evolutionary Approach



DDG-51 FLT IIA

- Production started in 1988, commission 1991. 39 ships built. Decom planned 2021, extended 2031

DDG-51 FLT III Upgrades

- Production started in 2019, commission 2023. ships planned 10. Decom planned 2053, extension to ????

Acquisition Program Baseline (APB)

- DoDI 5000.85 states all acquisition programs or increments must ***establish threshold and objective goals for the minimum number of cost, schedule, and performance parameters*** that describe the program over its life-cycle
- APB is established at program initiation
  - Agreement between MDA and the PM and his/her acquisition chain of command that will be used for tracking and reporting for life of the program or increment
  - Includes affordability caps for unit production and sustainment costs
  - Includes sufficient parameters to describe cost estimate, schedule, performance, supportability, and other relevant factors over the program's life-cycle
  - DoD does not obligate funds for ACAT I or ACAT IA programs beyond M/S B until MDA approves APB
  - Revised after milestone reviews, program restructuring, or unrecoverable program deviations
  - Draft APB is due at the Development Request for Proposal Release Decision (DRFPRD)

Acquisition Program Baseline (APB) (cont.)

- APB contains only those parameters that, if thresholds are not met, will require MDA to reevaluate the program and consider alternative concepts or design approaches
- Threshold:
  - If threshold values are not achieved, program performance may be seriously degraded, program may be too costly, or program may no longer be timely
- Objective:
  - Values that are desired by the user and which the PM is attempting to obtain
  - Objective values represent operationally meaningful, time critical, and cost-effective increments above the performance threshold for each program parameter
- Examples of Parameters:

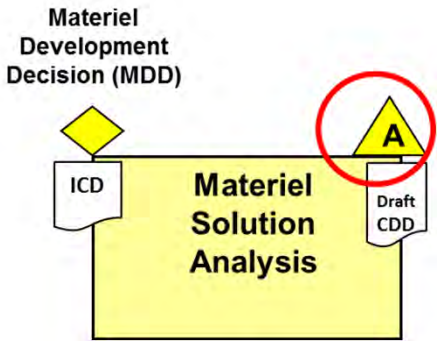
COST	SCHEDULE	PERFORMANCE
Total RDT&E $ (Then Year)	Milestones	Hit/Kill Probability
Total Procurement	Technical Tests	Speed
Average Unit Procurement Cost	IOT&E	Availability
Total Quantities	IOC	Range

Key Performance Parameters

- Key Performance Parameters (KPPs) are:
  - Attributes of a system that are ***critical or essential*** to the development of an effective military capability
  - Attributes that make a significant contribution to the governing Joint Operations Concept
- Where are they found?
  - Capability Development Document (CDD)
  - Acquisition Program Baseline (APB)
- Who validates KPPs?
  - For Major Defense Programs, the Joint Requirements Oversight Council (JROC)
  - For other programs, either the Joint Capability Board (part of the Joint Staff) or the DoD Component (depending on Joint impact of the system)
- Mandatory KPPs
  - Force Protection, System Survivability, Sustainment and Energy
    - Net-Ready still required but can be addressed as a KPP or Performance Attribute

Milestone A (M/S A)

- M/S A, a.k.a. Risk Reduction Decision, is an investment decision to pursue a specific product and commit resources
- PM presents:
  - Proposed materiel solution (based on AoA)
  - AcqStrat
  - SEP/ TEMP
  - CDD/CONOPS
  - LCSP/ Independent Cost Estimate (ICE)
  - Risk assessment (and mitigation activities)
  - Appropriate “should cost” targets



- Component:
  - Presents affordability analysis and affordability goals (included in ADM)
  - Submits their cost estimate for the preferred solution
  - Demonstrates that the program will be fully funded in the Future Years Defense Program (FYDP)
- MDA:
  - Makes a determination on the materiel solution, release of TMRR RFP, and exit criteria for the TMRR Phase which is documented in the Acquisition Decision Memorandum (ADM)

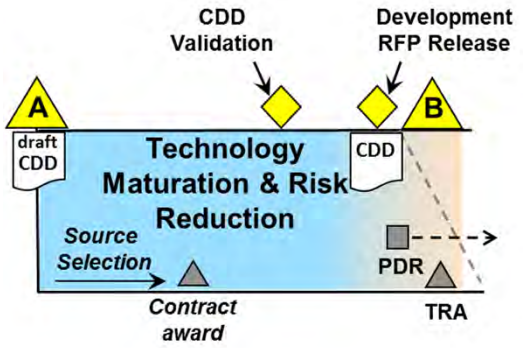
A successful M/S A decision leads to entry into the TMRR phase

M/S A (cont.)

- MDA approves:
  - Milestone A Certification (10 USC 2366a) (statutory requirement); certifies that
    - System fulfills an approved ICD
    - Materiel solution validated by the AoA
    - System is necessary even if it duplicates an existing system capability
    - Cost estimate is submitted (w/ OSD CAPE concurrence) and is consistent with JROC priority level
    - Defense Intelligence Agency (DIA) validates Validated Online Life-cycle Threat (VOLT) Report
  - Affordability Analysis
    - Affordability goals for unit procurement and sustainment costs
  - Acquisition Strategy (AcqStrat)
    - Primary guide for the overall program
  - Acquisition Decision Memorandum (ADM)
    - Approves entry to TMRR phase
    - Exit criteria for TMRR phase

Technology Maturation & Risk Reduction

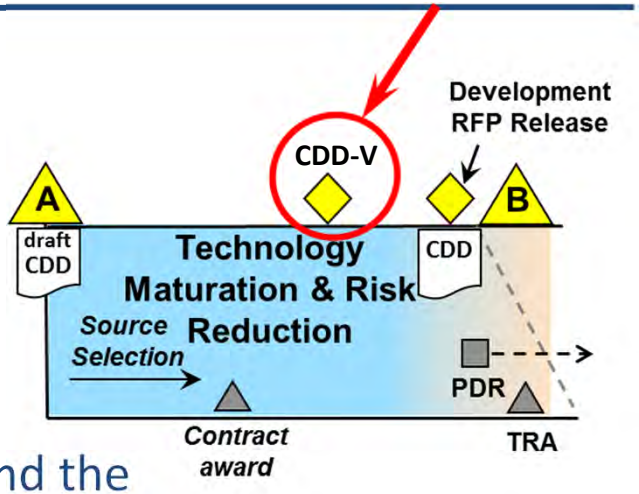
- Purpose: ***Reduce technology, engineering, integration, and life-cycle cost risks;*** demonstrate critical technologies on prototypes; complete preliminary design
- Guided by: ICD, AcqStrat, Draft CDD, and SEP
- Basis for entry: MDA approved materiel solution and AcqStrat
- Major activities:
  - Competitive prototyping
  - ***Preliminary Design Review (PDR)***
  - ***CDD Validation***
  - Plan for sustainment
  - ***Development RFP Release Decision (DRFPRD)***
  - Technology Readiness Assessment (TRA)
  - Reliability, Availability, and Maintainability Cost Rationale (RAM-C) report



- Phase complete when: Affordable increment of military-useful capability identified; technology demonstrated in relevant environment (TRL 6); PDR conducted prior to M/S B (unless waived by the MDA); validated capability requirements; full funding in the FYDP; compliance with affordability goals for production and sustainment

Completion of the TMRR phase leads into M/S B

Capability Development Document (CDD) Validation



- The requirements validation authority (JROC for MDAPs) validates the CDD
- Major cost-performance trades complete
- Risk reduction sufficient to support preliminary design activities
- MDA and/or Component Acquisition Executive (CAE) and the requirements leadership

ensure that:

  - The validated requirements continue to address the priorities of the users in a cost effective & affordable way
  - ***Requirements are achievable, affordable, and testable***
  - Requirements trades are fully informed by the systems engineering trade-off analyses completed by the PM or the DoD Component

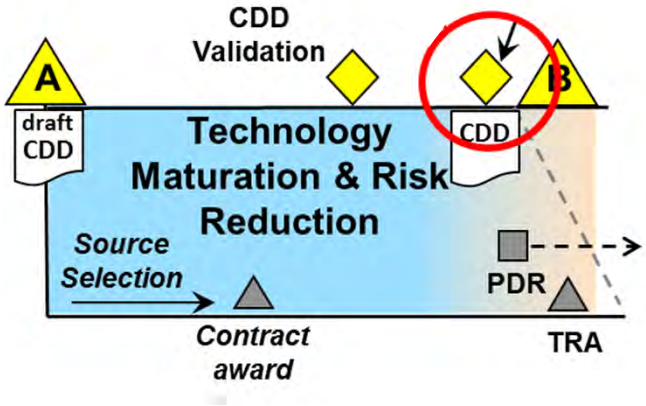
KPPs and KSAs in the CDD guide efforts leading to PDR and inform the Development RFP Release Decision

Configuration Steering Boards (CSB)

- IAW Public Law and DoDI 5000.02:
  - Chaired by the CAE with membership from the USD(A&S) and Joint Staff
  - Formed after CDD Validation
  - CSB responsibilities:
    - Periodically review capability requirements for ACAT I & IA programs and identify opportunities for adjustment
    - Propose to the validation authority those changes that may be necessary to achieve affordability constraints on production & sustainment costs, or that will result in a more effective product
    - Review technical configuration changes for potential cost/schedule impact
    - Evaluate cost & schedule impacts of changes
    - Changes shall not be approved unless funds are identified and schedule impacts mitigated
  - Meets at least annually, or as required, to support de-scoping decisions
    - CSB recommends de-scope options to the MDA for final approval
    - Must coordinate with the Joint Staff and Service requirements officials

Development Request for Proposal (RFP) Release Decision

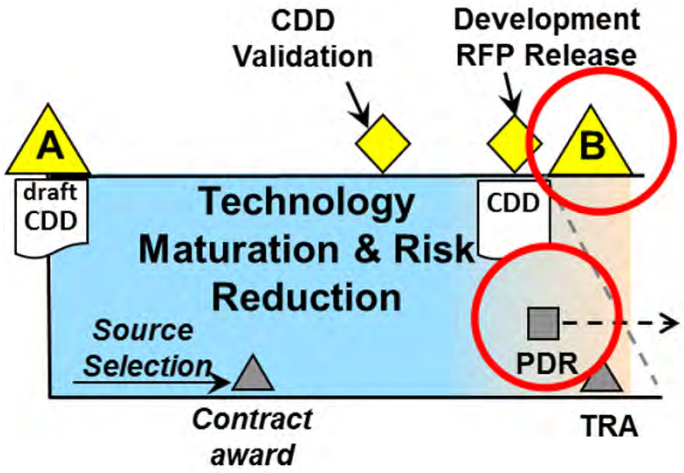
- Authorizes release of the RFP(s) for EMD (and often for LRIP options)
- Purpose: To ensure that an executable and affordable program has been planned
- The program will either succeed or fail based on the:
  - Definition of the capability requirements
  - Affordability of the program
  - Executability of the Acquisition Strategy
- ***MDA determines preliminary LRIP quantities***



The last point at which significant changes can be made without a major disruption

M/S B

- M/S B, a.k.a. the Development Decision, is an investment decision to pursue specific product and commit resources
  - Authorizes entry into, and contract award for, EMD
  - ***Formal initiation of the program***
- MDA approves
  - Entry into EMD
  - AcqStrat, APB
  - ***Low Rate Initial Production (LRIP) quantities***
    - Production-representative articles to be used for Initial Operational Test & Evaluation
  - Exit criteria
  - Contract type
  - ***Requires demonstration that all sources of risk have been adequately mitigated***
  - Issues the M/S B Certification and Determination and ADM
  - Triggers the SCN funding at Milestone B for ship building

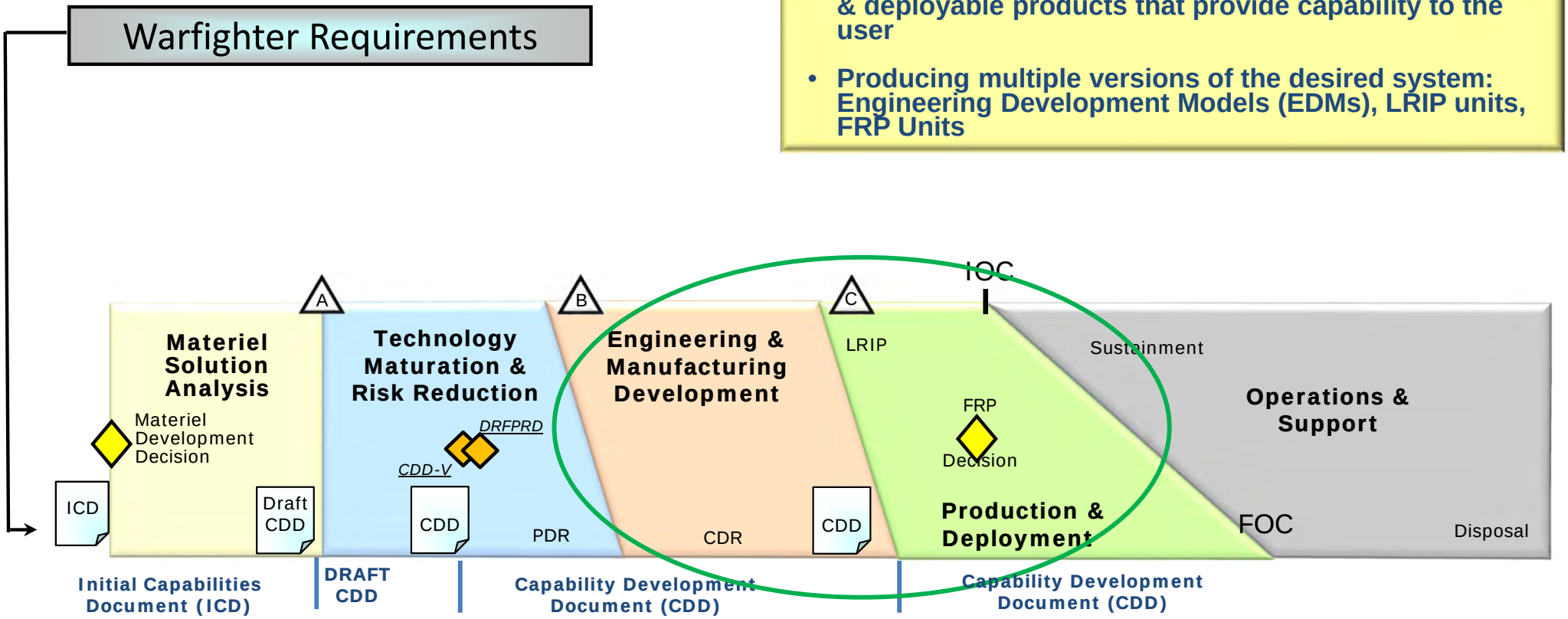


Overview

- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Operations and Support
- Ships are different
- Navy Specific Review Policy

Systems Acquisition

- **Developing concepts and technologies into producible & deployable products that provide capability to the user**
- **Producing multiple versions of the desired system: Engineering Development Models (EDMs), LRIP units, FRP Units**



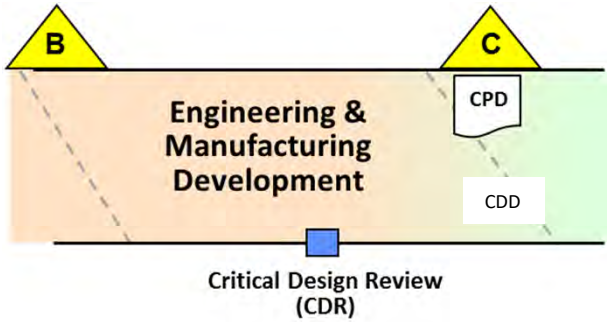
PDR: Preliminary Design Review
CDD-V: CDD Validation

DRFPRD: Development Request for Proposal Release Decision
CDR: Critical Design Review
LRIP: Low Rate Initial Production
FRP: Full Rate Production

IOC: Initial Operational Capability
FOC: Full Operational Capability

Engineering & Manufacturing Development

- Purpose: Develop, build, and test a product to verify all operational and derived requirements have been met and to support production or deployment decisions
- Guided by: AcqStrat, CDD, TEMP, and SEP
- Basis for entry: mature technology, approved requirements, full funding in FYDP
- Major activities:
  - Complete HW and SW design
  - Systematically retire any open risks
  - Build/test prototypes or first articles to verify compliance with requirements (KPPs and KSAs) via DT&E activities
  - Prepare for production, deployment & sustainment
  - Establish initial product baseline for all Configuration Items (CI)
  - ***Critical Design Review (CDR)*** – opportunity to assess design maturity
  - ***Operational Assessments (OAs) conducted by OTA***
- Phase complete when:
  - Design is stable
  - Systems meets requirements (demonstrated through DT and early OT);
  - System meets or exceeds all EMD Phase exit criteria and M/S C entrance criteria



M/S C

- M/S C is the point at which the program is reviewed for entrance into the Production and Deployment phase

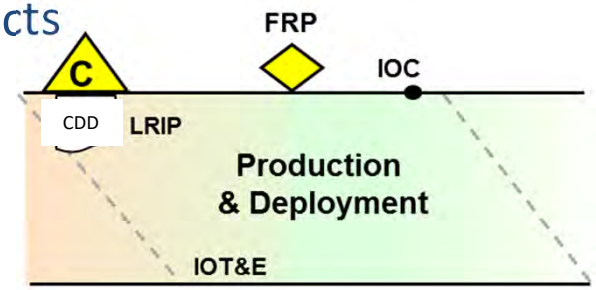
- MDA considers:
  - Cost Estimates
  - Validated Online Life-cycle Threat (VOLT)
  - Environmental issues
  - Demonstration that design is stable & meets requirements based on performance in DT
  - Operational Assessment (OA)
  - Mature SW capability
  - No significant manufacturing risks
  - Validated CDD
  - Demonstrated supportability, interoperability, and affordability
  - Properly phased production ramp-up and/or fielding support

- MDA decision (via ADM) commits DoD to the production of a system

Authorizes entry into Production and Deployment

Production & Deployment

- Purpose: Produce and deliver requirements compliant products
- Guided by: AcqStrat, TEMP, CDD, SEP, and LCSP
- Basis for entry: Acceptable performance in DT & OA
- Major activities:
  - Low-Rate Initial Production (LRIP): Establishes initial production base, provides Operational Test and Evaluation (OT&E) test articles, efficient ramp-up to full-rate production, and maintains production continuity pending OT&E completion
  - OT&E: OT in a realistic threat environment to determine operational ***effectiveness and suitability***
  - Beyond LRIP (BLRIP) Report - A statutory report ***generated for Congress before a Full-Rate Production (FRP) Decision Review***
  - FRP Decision Review: MDA approval requires control of manufacturing processes, acceptable performance and reliability, and establishment of adequate sustainment and support systems
  - Initial Operational Capability (IOC): Declared by operational authority when the defined organizations have been equipped, trained, and are capable of conducting mission operations
  - Full Operational Capability (FOC): Operational authority declares FOC when the defined organizations are fully equipped, trained, fully mission-capable
- Phase complete when: IOC achieved, deployment in full swing

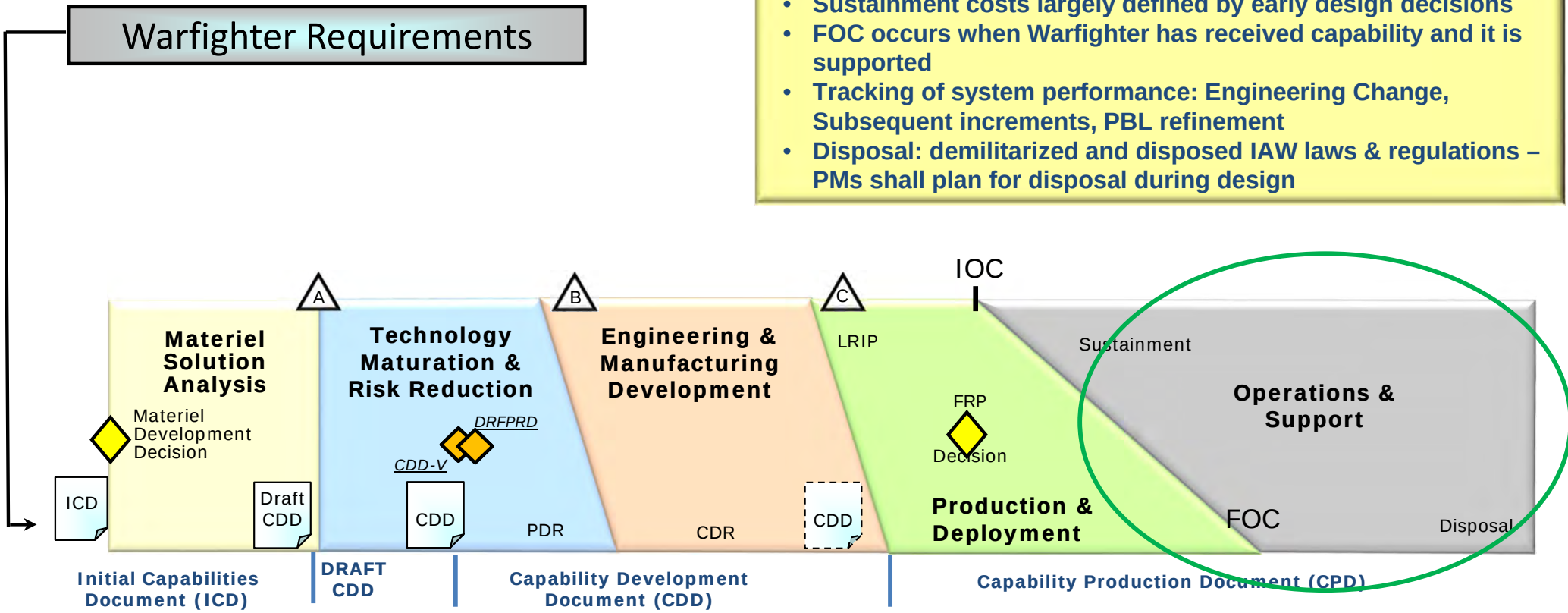


Overview

- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Operations and Support
- Ships are different
- Navy Specific Review Policy

Operations and Support

- Typically the ***most*** expensive phase of a program's life
- Sustainment costs largely defined by early design decisions
- FOC occurs when Warfighter has received capability and it is supported
- Tracking of system performance: Engineering Change, Subsequent increments, PBL refinement
- Disposal: demilitarized and disposed IAW laws & regulations – PMs shall plan for disposal during design



PDR: Preliminary Design Review
CDD-V: CDD Validation

DRFPRD: Development Request for Proposal Release Decision
CDR: Critical Design Review
LRIP: Low Rate Initial Production
FRP: Full Rate Production

IOC: Initial Operational Capability
FOC: Full Operational Capability

Operations & Support

- Purpose: Execute the support strategy, satisfy materiel readiness and support performance requirements, and sustain the system over its life-cycle (including disposal)
- Guided by: Product Support Strategy (PSS), PESHE
- Basis for entry: Successful FRP Decision
- Major activities:
  - Life-cycle Sustainment: PM deploys the support package IAW the PSS. PM assures that resources are programmed and necessary IP deliverable, data, tools, equipment, and facilities are acquired to support each maintenance level. Organic depot capability established IAW the PSS and the LCSP
  - Disposal: At the end of service life. Systems demilitarized and disposed of IAW all legal and regulatory requirements and policies relating to safety, security, and the environment
- Phase is complete when: No assets remain in service

LCSP: Life Cycle Sustainment Plan
PESHE: Program Environmental Safety and Occupational Heath

Review

- An Initial Capabilities Document, Analysis of Alternatives (AoA) study guidance and an AoA plan are necessary for this entry point into the Acquisition Framework

- The point at which the MDA gives permission to enter the Production and Deployment phase

- All sources of program risk must be adequately mitigated prior to this milestone

Review

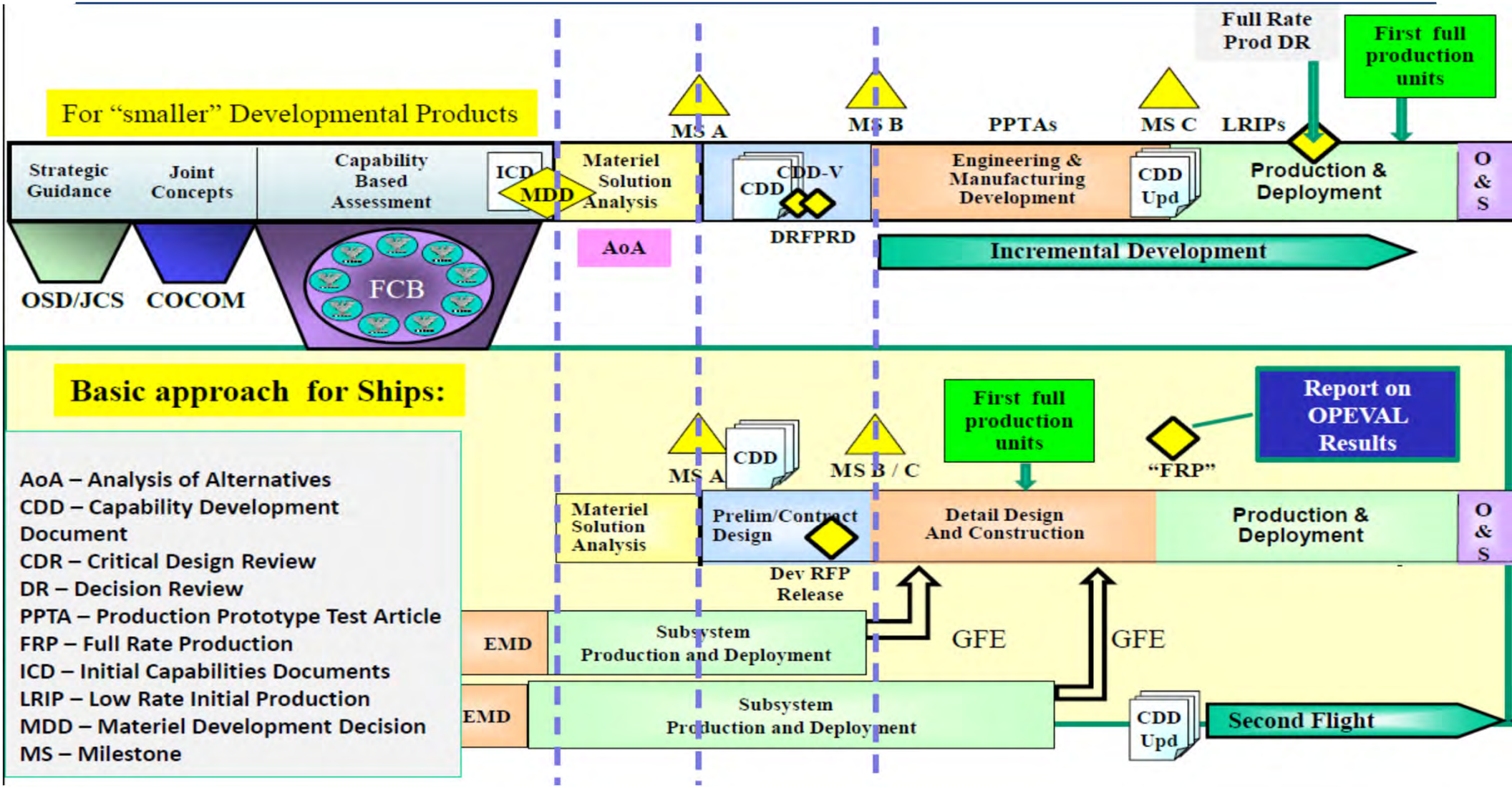
- System disposal usually occurs in the latter part of this phase

- In the Materiel Solution Analysis Phase, the Acquisition Strategy and the _____ are approved

Overview

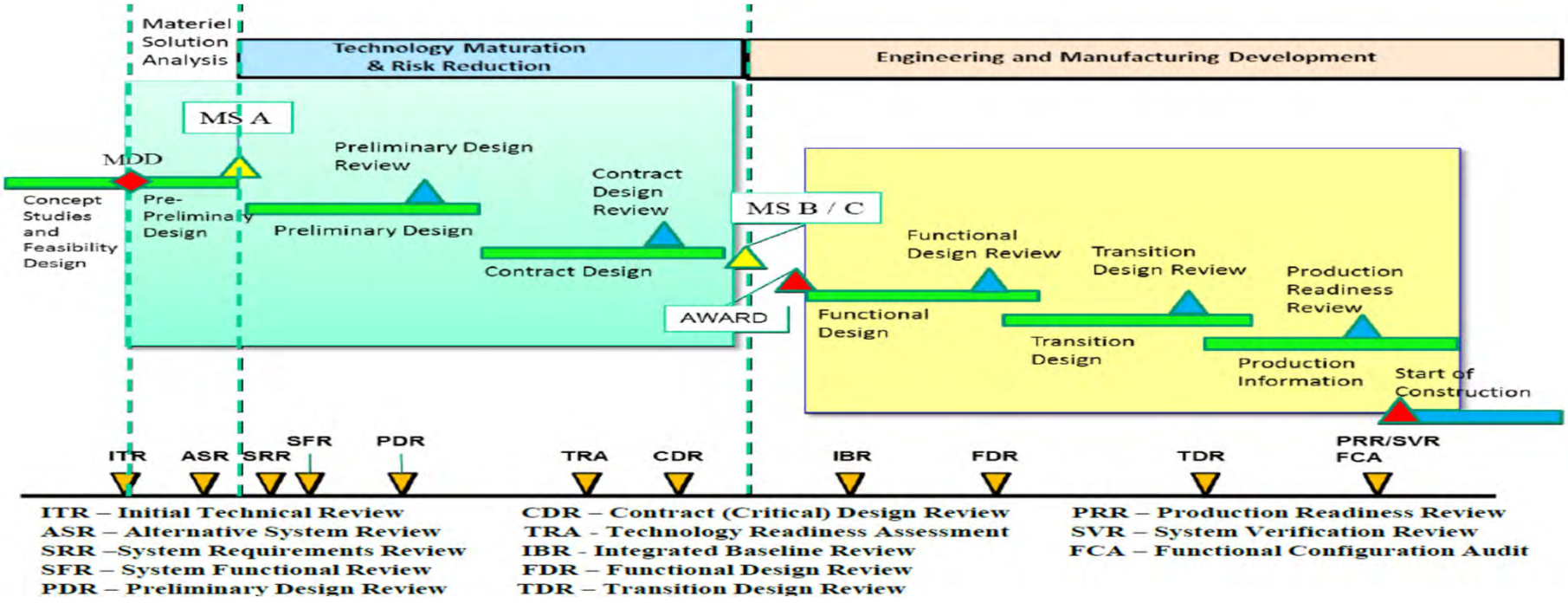
- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Sustainment
  - Operations and Support
- Ships are different
- Navy Specific Review Process

Ships are different



Ships are different (cont.)

- PM is designated as soon as possible – before the MDD
- Initial AcqStrat and TEMP are critical documents which:
  - Set the stage for future understanding by Leadership
  - Gain initial buy-in to the process
- Between M/S A and M/S B/C
  - RFP and specification development is for the ship, not an EDM



Overview

- Introduction
- Warfighter Requirements
- Pre-Systems Acquisition
  - Materiel Solution Analysis
  - Technology Maturation & Risk Reduction
- Systems Acquisition
  - Engineering and Manufacturing Development
  - Production and Deployment
- Sustainment
  - Operations and Support
- Ships are different
- Navy Specific Review Process

Navy's 2-pass/7-gate Review Process

- Purpose: to improve governance and insight into the development and execution of acquisition programs

Gates 1, 2, 3, 4

- Requirements Gates
- Led by CNO or CMC
- Starts prior to Materiel Development Decision (approved by ASN RDA)
- Leads to:
  - Approving the ICD
  - Approving AOA guidance
  - Selecting an AOA optimal alternative
  - Approving a CDD
  - Developing a CONOPS
  - Approving System Design Specification (SDS) Development Plan

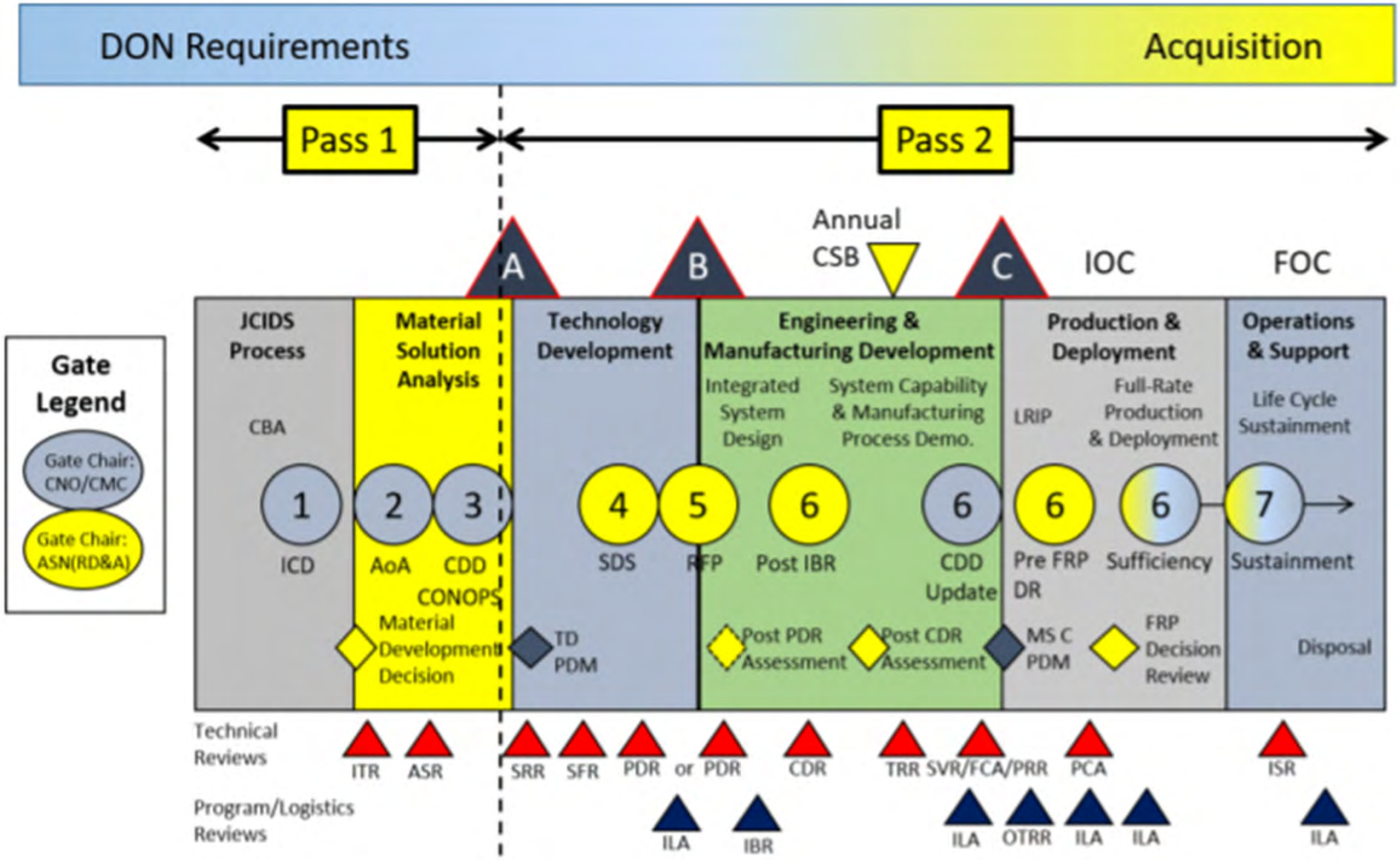
Gates 5, 6, 7

- Acquisition/Sustainment Gates
- Led by ASN(RDA)
- Starts after Gate 4, ends after Milestone B (initial EMD phase)
- Leads to:
  - Approving the SDS
  - Approving release of the RFP
  - Assessing readiness for production
  - Assessing sufficiency of EVMS
  - Assessing the IBR
  - Follow-on Gate 6's pre- and post-Milestone C and FRP DR

From SECNAVNOTE 5000, Department of the Navy (DON) Requirements and Acquisition Process improvements

Navy 2-Pass 7-Gate Process

Program Initiation at M/S A



How Ready Is The Technology?

Situation #1

1. An ***Initial Capabilities Document (ICD) was validated and approved*** for a joint war fighting capability to intercept and attack ballistic missile reentry vehicles in mid-course, prior to reentering the earth's atmosphere. The ICD identified ***several possible materiel approaches*** to provide the required capability including an air launched missile interceptor. Market research determined that the ***technology is feasible, but the various possibilities need to be analyzed*** to determine the best missile and launch platforms before the appropriate technology can be demonstrated. The MDA also wants to ***designate a lead DoD Component*** for this joint war fighting system, needs a strategy for rapid fielding using evolutionary acquisition, and wants to encourage maximum innovation and competition for the best system(s) from private industry. CAPE has issued ***AoA study guidance*** and approved an ***AoA study plan***

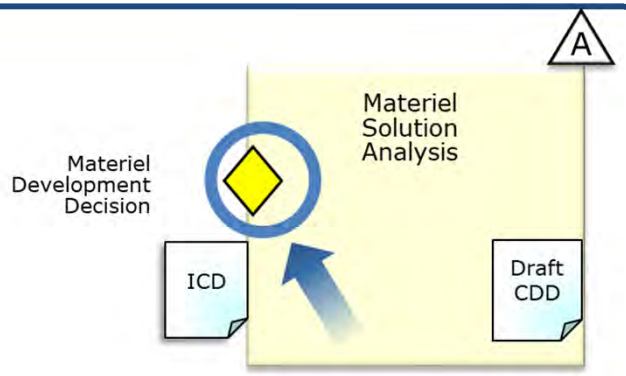
Question

- The best entry point for situation #1 is:

1. MDD into Materiel Solution Analysis (MSA)
2. M/S A
3. DRFPRD – M/S B
4. M/S C

Materiel Solution Analysis

PURPOSE: to conduct the analysis and other activities needed to choose the concept for the product that will be acquired



Enter: Approved ICD, study guidance for conducting the AoA and an approved AoA plan. AoA study guidance for MDAPs and AoA plan approval will be provided by CAPE.

Activities:

- Establish PM & PMO, Conduct AoA, user writes draft CDD, develop initial:
- Acquisition Strategy
- Test & Evaluation Master Plan (TEMP)
- Systems Engineering Plan (SEP)
- Life Cycle Sustainment Plan (LCSP)
- Cyber Security Strategy
- Translate capability gaps into system specific requirements

Guided by: Validated ICD, AoA Study Guidance & Study Plan

Exit: MDA approves materiel solution and AS

Situation #2

- Senior leaders in the U.S. Army are anticipating protracted times of constrained budgets and limited opportunities to train. Army leaders are looking for technology solutions that will greatly improve accuracy when firing side arms with limited training. ***There is a recently updated CDD*** leveraging an already existing ICD for Soldier small-arms capability needs. The CDD requires a new Soldier side-arm solution that includes an integrated targeting LASER with significantly improved first shot accuracy. Multiple commercial vendors offer pistols with integrated targeting LASERs; ***three vendors in particular have existing contracts and running productions lines supplying the U.S. Marine Corps and U.S. Special Operations Forces***. Field evaluations from the Marines and SOF combat units indicate effectiveness and suitability of the firearms, particularly accuracy, which meets the CDD thresholds. ***The program has full procurement funding***

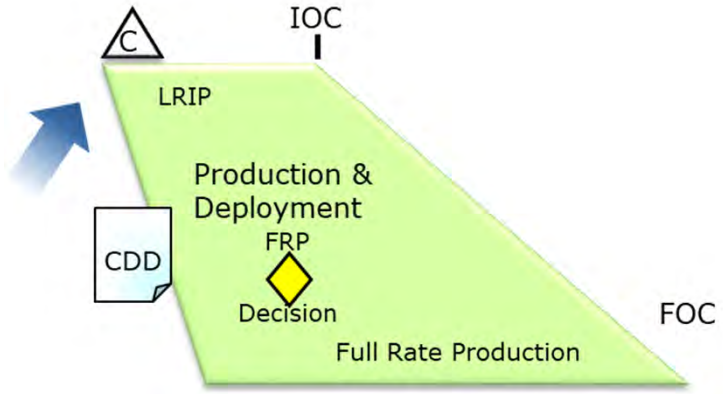
Question

- The best entry point for situation #2 is

1. MDD into Materiel Solution Analysis (MSA)
2. M/S A
3. DRFPRD – M/S B
4. M/S C

Production & Deployment

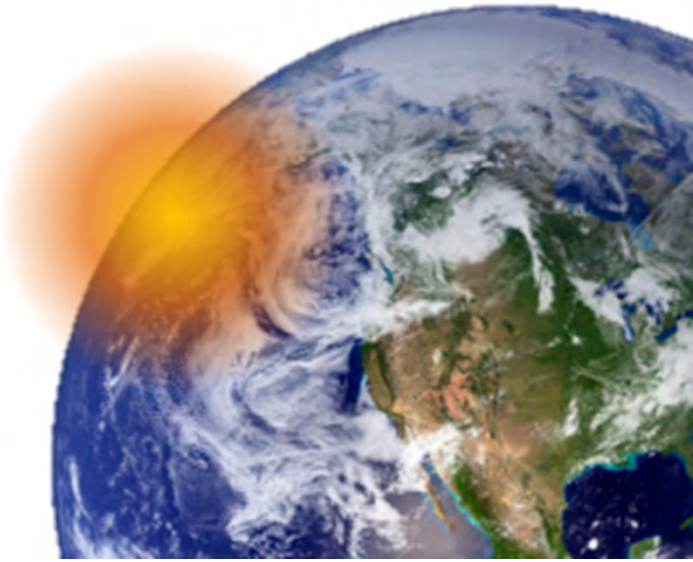
PURPOSE: to produce and deliver requirements-compliant products to receiving military organizations



- **ENTER:** Acceptable performance in DT & OA; mature software; no significant manufacturing risks; approved CPD; acceptable interoperability and operational supportability; demonstration of affordability; fully funded
- **ACTIVITIES:** Low Rate Initial Production, OT&E, LFT&E (If Required) and interoperability testing of production-representative articles; Full-Rate Production Decision Review; fielding and support of fielded systems; Initial Operational Capability
- **GUIDED BY:** AS, CPD, TEMP, SEP, LCSP
- **EXIT:** Initial operational capability; deployment in full swing

Situation #3

- ***An ICD has been validated and approved*** for a capability to intercept and attack ballistic missile reentry vehicles in mid-course, prior to reentering the earth's atmosphere. Air Force will be lead service to develop this capability. ***An analysis of alternatives and an acquisition strategy have been completed*** and the Air Force has selected as the best system a laboratory proposal for a laser mounted on an existing airplane. ***Funding for the effort was included in the latest update to the FYDP***. The concept is promising, however, ***the technology has not been matured and there are significant performance risks***. The user has provided a draft CDD based on the ICD



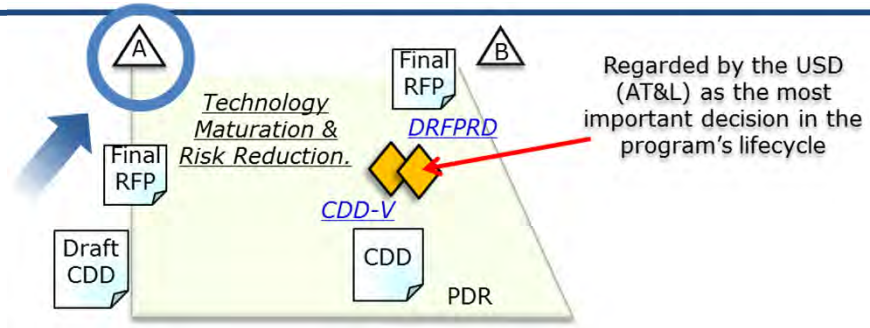
Question

- The best entry point for situation #3 is

1. MDD into Materiel Solution Analysis (MSA)
2. M/S A
3. DRFPRD – M/S B
4. M/S C

Technology Maturation and Risk Reduction

PURPOSE: to reduce Technology, Engineering, Integration, and Life-Cycle Cost Risks; Demonstrate Critical Technologies on Prototypes; Complete Preliminary Design



- **ENTER:** MDA approved materiel solution and Acquisition Strategy
- **ACTIVITIES:**
  - Competitive prototyping of critical subsystems
  - SE Trade-off analysis
  - Develop contracting strategy
  - Conduct CDD Validation and Preliminary Design Review (PDR)
  - Conduct Development RFP Release Decision
  - Begin source selection for EMD
- **GUIDED BY:** Acquisition Strategy & Draft CDD/Approved CDD
- **EXIT:**
  - Affordable increment of military-useful capability identified
  - Technology demonstrated in relevant environment;
  - PDR conducted prior to MS B (unless waived by the MDA)
  - Validated capability requirements
  - Full funding in the FYDP
  - Compliance with affordability goals for production and sustainment

Situation #4

- A Navy Lab has developed a protective eye shield/mask that will guard the wearer's eyes against the full spectrum of current lasers directed from any angle. The Navy Lab has coordinated with the users, who ***have produced an ICD and CDD that have both been validated and approved*** by the Chief of Naval Operations. The Navy Acquisition Executive agreed to ***fully support this initiative in the upcoming budget review***, and has identified specific offsets in other programs to provide the funding. The ***technology appears to be mature and technical risks are assessed as low***. However, the system has yet to be tested outside of the lab. It also ***has not been integrated with other components of a helmet system***

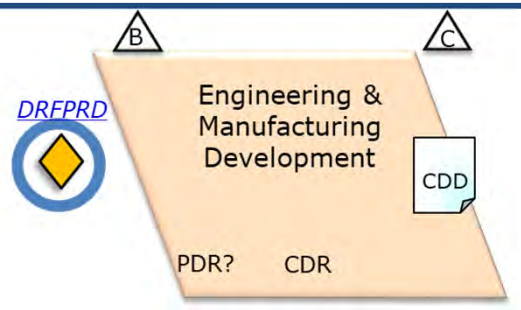
Question

- The best entry point for situation #4 is

1. MDD into Materiel Solution Analysis (MSA)
2. M/S A
3. DRFPRD - M/S B
4. M/S C

Engineering and Manufacturing Development

PURPOSE:
to develop, build, and test a product to verify that all operational and derived requirements have been met and to support production or deployment decisions



- **ENTER:** Adequate Risk Reduction; Approved Requirements; Full Funding in FYDP
- **ACTIVITIES:** Complete detailed design, system-level CDR, integrated testing, establish product baseline, demonstrate manufacturing processes and supportability
- **GUIDED BY:** CDD, AS, SEP, & TEMP
- **EXIT:**
  - The design is stable;
  - The system meets validated capability requirements demonstrated by developmental and
  - Initial operational testing as required in the TEMP
  - Manufacturing processes have been effectively demonstrated and are under control;
  - Industrial production capabilities are reasonably available; and
  - The system has met or exceeds all directed EMD Phase exit criteria and Milestone C entrance criteria

Summary

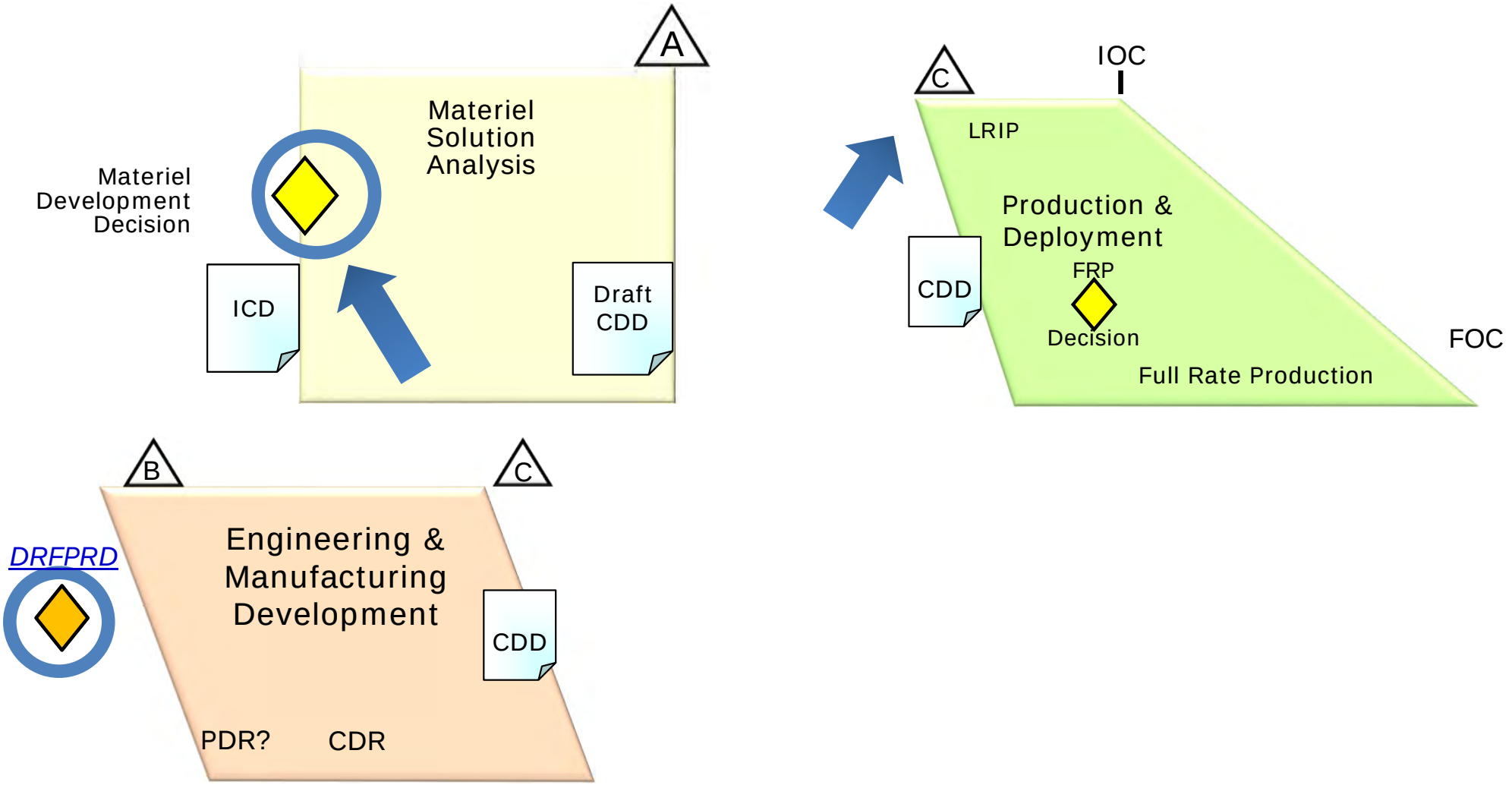
- Recognize the terms acquisition strategy, key performance parameter, and acquisition program baseline.
- Describe the activities and work content of the Warfighter requirements portion of the acquisition life-cycle.
- What two phases of the acquisition life-cycle make up Pre-Systems Acquisition and what happens during those phases?
- Identify uses of the Analysis of Alternatives.

Summary

- What two phases of the acquisition life-cycle make up systems Acquisition and what happens during those phases?
- What happens during the Operations and Support phase?
- Identify the advantages and disadvantages of international armaments cooperative development in an acquisition strategy.
- What information is required for a milestone review?

Summary

- Recognize the policy regarding Preliminary Design Reviews and a Post Preliminary Design Review Assessment.
- What is the purpose of Configuration Steering Boards?
- What additional acquisition policy has been instituted by the Navy?
- Recognize the differences for a typical shipbuilding program in the execution of the acquisition framework.


A
Materiel
Solution
Analysis
Materiel
Development
Decision
ICD
Draft
CDD
C
IOC
LRIP
Production &
Deployment
FRP
CDD
Decision
FOC
Full Rate Production
B
C
DRFPRD
Engineering &
Manufacturing
Development
CDD
PDR?
CDR