

EDO Board Prep Study Guide



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1 Organization

1.1 Command Chains and Governance

- Refs:
- [1] “2.1.1. Command Structures” Mar. 11, 2025.
 - [2] *SECNAVINST 5400.15D*, Jan. 19, 2021.
 - [3] *SECNAVINST 5000.2G*, Apr. 8, 2022.
 - [4] “2.1.5. Technical Authority and Engineering Agents” Apr. 11, 2025.

1.1.1 Operations Chain (Title 10)

Chain flow. President → Secretary of Defense (SECDEF) → Combatant Commander (CCDR) . The Chairman of the Joint Chiefs of Staff (CJCS) is the principal military adviser; service chiefs are *not* in the operational chain of Title 10.

Board cue. Boards love the contrast with acquisition authority; avoid conflating operational and acquisition chains.

Echelons. Counted from the Chief of Naval Operations (CNO) (e.g., CNO is Echelon I, Systems Commands (SYSCOMs) are Echelon II, etc.).

Figure 1.1 shows the Title 10 chain of command. Figure 1.2 shows the Chain of Command from the President to Echelon III commands.

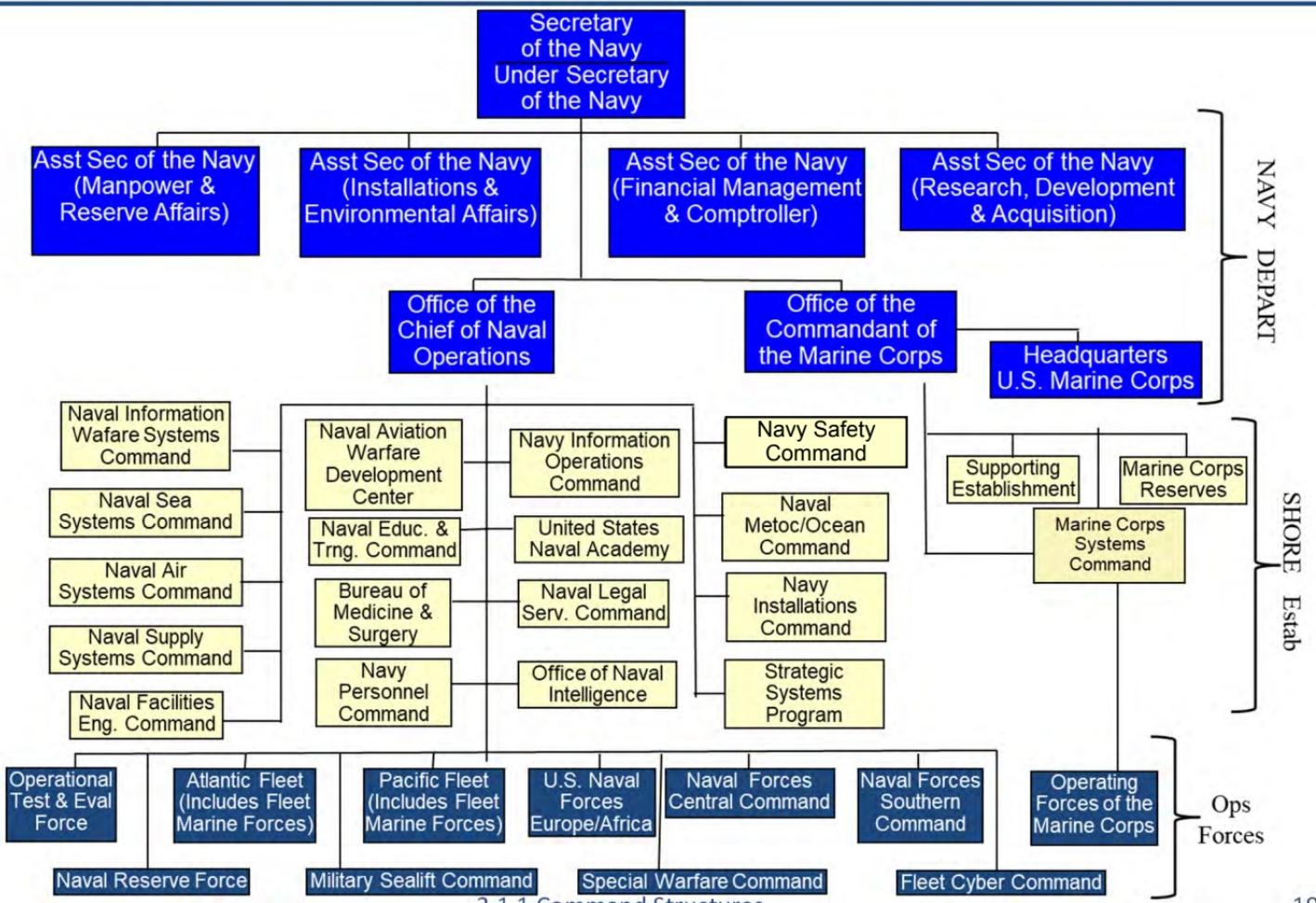


Figure 1.1. Title 10 Chain of Command. Source: 2.1.1. Command Structures, 2025 [1].

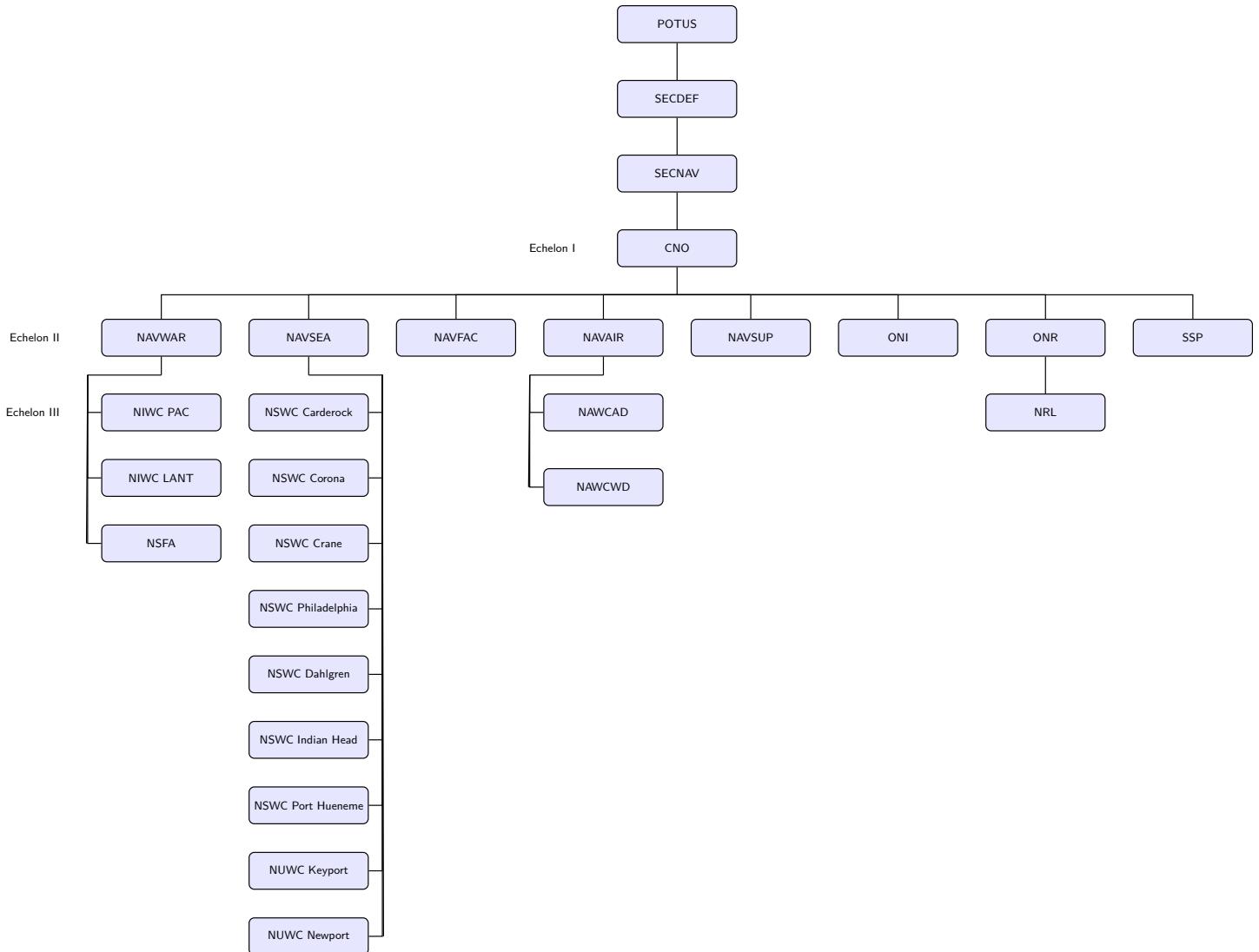


Figure 1.2. Organization Command Structure

1.1.2 Acquisition Governance (Department of the Navy)

Policy authority. Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RD&A)) is the Service Acquisition Executive (SAE) for the Department of the Navy (DON) and sets policy for Program Executive Offices (PEOs) and Direct Reporting Program Managers (DRPMs) [2, 3].

Matrix execution. PEOs hold program authority; SYSCOMs (Naval Sea Systems Command (NAVSEA), Naval Information Warfare Systems Command (NAVMAR), Naval Air Systems Command (NAVAIR)) provide the Technical Authority (TA) warrants and workforce; Naval Warfare Centers (NWCs) deliver research, development, test, and engineering support [2].

Figure 1.3 shows the Navy acquisition governance chain of command.

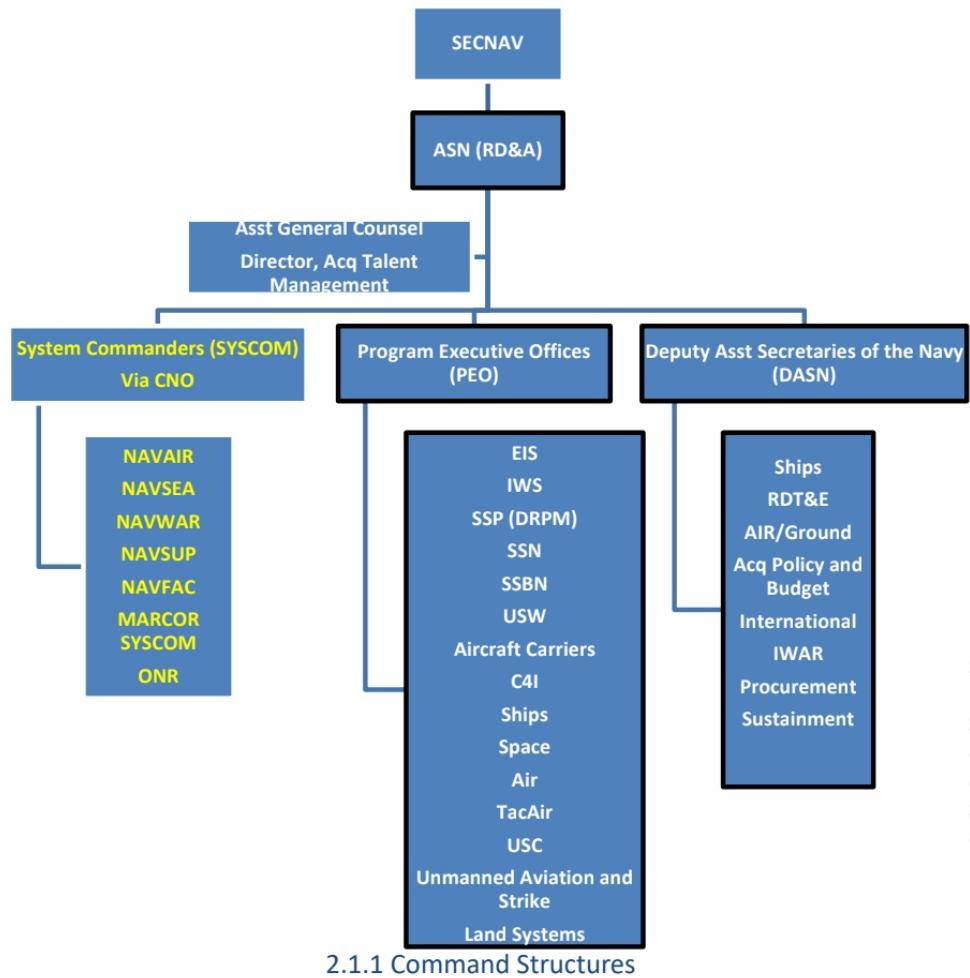
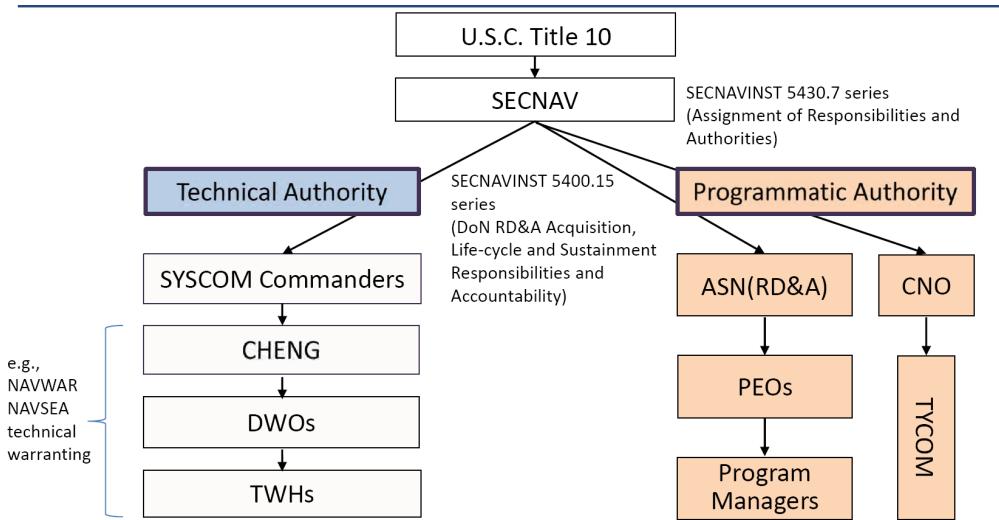


Figure 1.3. Acquisition Governance Chain of Command. Source: 2.1.1. Command Structures, 2025 [1].

1.1.3 Approving Authorities



SECNAVINST 5400.15 series: SYSCOMs provide in-service support to Program Executive Offices (PEOs) and Direct Reporting Program Managers (DRPMs); serve as technical authority, operational safety, certification authorities for assigned areas. PEOs and DRPM shall act for and exercise the programmatic authority of the Naval Acquisition Executive to directly supervise the management of assigned programs. ASN(RD&A) is responsible for overall supervision of sustainment including maintenance. CNO is responsible for manning, training, and equipping their forces, including the resourcing of sustainment.

2.1.5 Technical Authority and Engineering Agents

Figure 1.4. Technical Authority v.s. Program Authority alignment. Source: 2.1.5. Technical Authority and Engineering Agents, 2025 [4]

Figure 1.4 contrasts the roles of TA and Program Authority (PA) in Navy acquisition.

1.2 Technical Authority and Engineering Agents

Refs: [2] SECNAVINST 5400.15D, Jan. 19, 2021.

[4] “2.1.5. Technical Authority and Engineering Agents” Apr. 11, 2025.

[5] “2.1.4. Naval Warfare Centers” Dec. 18, 2024.

1.2.1 What Technical Authority Is

TA. Independent engineering authority to set, maintain, and certify conformance to technical standards and baselines across the lifecycle [2].

Ultimate Technical Authority (UTA). Executed at the SYSCOM level (e.g., NAVSEA); resides with the Commander and flows through the Chief Engineer via a formal warranting system [4].

Delegated TA. Technical Warrant Holders (TWHs) (*Lead/Local/Warranted TA*) receive domain-specific authority across hull, mechanical, and electrical systems, combat systems, cybersecurity, and airworthiness or seaworthiness [4].

Core TA duties. Must-know responsibilities:

1. Establish and approve technical requirements, standards, and certification criteria;
2. Control the authoritative technical baseline (drawings, specs, interface control);
3. Adjudicate departures and waivers from specification and safety-critical changes; and
4. Certify readiness, readiness for service, and technical acceptability.

Independence. TA remains separate from cost, schedule, and programmatic authority to protect warfighter safety and mission assurance [2].

1.2.2 What EAs Do (and Do Not Do)

Engineering Agents (EAs) perform lifecycle engineering under TA governance. They are *not* TA unless they hold a TA warrant [4]. Common EA roles include:

In-Service Engineering Agent (ISEA). Lifecycle systems engineering for *fielded* systems (e.g., fleet introduction, distance support, troubleshooting/Casualty Report (CASREP) support, maintenance planning, obsolescence, technical manuals/data, configuration of the in-service baseline).

Design Agent (DA). Develops detailed design and configuration documentation for a system or platform (e.g., ship detail design, Initial Capabilities Documents (ICDs), drawings, Technical Data Packages (TDPs)) to TA-approved standards.

Alteration Engineering Agent (AEA). Produces alteration packages (e.g., installation drawings, test procedures, logistics updates) and supports fleet introduction for ship or system changes.

Systems Integration Agent (SIA). Orchestrates system-of-systems integration (e.g., interfaces, interoperability, cybersecurity in the integration space) across combat system elements and platforms.

Technical Direction Agent (TDA). Issues and maintains technical work direction for installations and maintenance (e.g., Technical Work Document (TWD), local instructions) consistent with the TA-approved baseline.

1.2.3 Where Engineering Agent Authority Comes From

Statutory basis. [2] assigns DON acquisition responsibilities, directing SYSCOMs to execute TA and to designate Warfare Centers as EAs that support PEOs and Program Managers (PMs).

Delegations from TA. NAVSEA, NAVAIR, and NAVWAR Chief Engineers issue written warrants or designation letters (Lead-/Lab/Local TA) that flow requirements to specific Warfare Center codes; EA charters reference those warrants [4].

Execution orders. PEOs and PMs provide technical direction letters, project orders, and statements of work that scope the EA's tasks while preserving independence for specification compliance and certification [5].

Accountability. EAs report to the SYSCOM Chief Engineer for technical rigor and to the sponsoring PM for cost and schedule; loss of a warrant or charter terminates their authority to issue technical documentation [4].

1.2.4 Waterfront Triage: What Engages Whom

Spec/drawing nonconformance (build or repair). Generate a departure or waiver request for the proper TA warrant holder; minor deviations may be approved by Local or Lead TA, while major or safety-critical issues go to the Chief Engineer/UTA.

In-service failure (CASREP/technical assist). ISEA opens a support case, provides immediate workarounds and troubleshooting, coordinates root-cause analysis, updates technical data, and recommends permanent fixes (engineering change or alteration).

Change to configuration. If a permanent change is needed, the AEA develops the alteration package; SIA validates interfaces; DA updates drawings and TDPs; TA approves and certifies.

Principle to remember. EAs execute engineering; TA sets the rules and certifies compliance.

1.3 NAVSEA Organization and Warfare Centers

Refs: [5] “2.1.4. Naval Warfare Centers” Dec. 18, 2024.

[6] “Warefare Centers” 2025.

1.3.1 HQ Codes (must-know one-liners)

SEA 01 – Comptroller. Budget Submitting Office (BSO) ; leads NAVSEA financial governance.

SEA 02 – Contracts. Contracting authority and policy.

SEA 03 – Cyber Engineering and Digital. Enterprise cyber engineering and digital transformation.

SEA 04 – Industrial Operations. Shipyards, logistics, and quality-assurance oversight.

SEA 05 – Chief Engineer (TA). Sets engineering standards and certifies designs.

SEA 06 – Sustainment. Life-cycle product support.

SEA 07 – Undersea Warfare. Dual-hatted as Program Executive Office, Undersea Warfare Systems (PEO UWS) ; provides life-cycle support for in-service submarine and undersea forces.

SEA 08 – Nuclear Propulsion. Manages all technical matters pertaining to naval reactors. Triple-hat duties:

SEA 08 Deputy Commander. Leads nuclear propulsion activities within NAVSEA.

Director, Naval Nuclear Propulsion (Office of the Chief of Naval Operations (OPNAV) OON). Serves as the Navy’s principal nuclear propulsion authority.

Deputy Administrator for Naval Reactors. Interfaces with the National Nuclear Security Administration and the Department of Energy.

SEA 09 – Safety and Regulatory Compliance. Strengthens and aligns safety oversight and reporting.

SEA 10 – Total Force and Corporate Operations. Manages the workforce, corporate services, and governance.

SEA 21 – In-Service Ships (dual-hat Commander, Navy Regional Maintenance Center (CNRMC)). Oversees fleet surface-ship sustainment and modernization. Program Management Offices (PMOs) under SEA 21:

PMS 321. Unmanned small combatants and amphibious ships.

PMS 326. International fleet support.

PMS 339. Surface training systems.

PMS 421. Large surface combatant modernization and sustainment.

PMS 443. Bridge integration and HM&E sustainment.

PMS 451. Destroyer Modernization 2.0 portfolio.

SEA 21I. Inactive Ships Directorate.

Surface Maintenance Engineering Planning Program (SURFMEPP) Activity. Surface Maintenance Engineering Planning Program.

1.3.2 Warfare Centers (alphabetical)

Table 1.1 lists NAVSEA Warfare Centers with locations and descriptions.

TABLE 1.1: NAVSEA WARFARE CENTERS WITH LOCATIONS AND DESCRIPTIONS.

CENTER	LOCATION	DESCRIPTION
NSWC Carderock	West Bethesda, MD	Ship design and engineering.
NSWC Corona	Corona, CA	Analytics and data driven performance assessments.
NSWC Crane	Crane, IN	Electronic/expeditionary warfare; strategic system components.
NSWC Dahlgren	Dahlgren, VA	Surface ship weapons system development and integration .
NSWC Dam Neck	Virginia Beach, VA	Combat-system software, training/testing.
NSWC Indian Head	Indian Head, MD	Energetics, explosive-ordnance-disposal technologies.
NSWC Panama City	Panama City, FL	Mine warfare and littoral warfare systems.
NSWC Philadelphia	Philadelphia, PA	Surface and undersea machinery, power, controls, and auxiliary ship systems.

Continued on next page

TABLE 1.1: NAVSEA WARFARE CENTERS WITH LOCATIONS AND DESCRIPTIONS. (Continued)

CENTER	LOCATION	DESCRIPTION
NSWC Port Hueneme	Port Hueneme, CA	Integrated logistics and test and evaluation for surface warfare combat systems.
NUWC Keyport	Keyport, WA	Sustaining undersea warfare systems and vehicles.
NUWC Newport	Newport, RI	Undersea, subsea, and seabed warfare weapons systems development and integration.

Source: 2.1.4. Naval Warfare Centers, 2024 [5] Warfare Centers, 2025 [6]

Hint: Remember that for Naval Surface Warfare Centers (NSWCs) there are 3-C's, 2-D's, and 3-P's plus 1-I. There are only two "Ports" for Naval Undersea Warfare Centers (NUWCs).

1.3.3 NWC Locations

Figure 1.5 shows the geographic locations of NWCs. For the Engineering Duty Officer (EDO) board, most recommend drawing the US to show where the NWCs are located. The other option is to list them out, but a map is more visual.



Figure 1.5. Geographic locations of Navy Warfare Centers. Source: 2.1.4. Naval Warfare Centers, 2024 [5].

1.4 NAVWAR Enterprise and Warfare Centers

Refs: [7] “2.1.3. NAVWAR Enterprise” Dec. 17, 2024.

1.4.1 HQ Directorates and FRD

Table 1.2 lists NAVWAR HQ directorates and Fleet Readiness Directorates (FRDs) with one-line roles.

TABLE 1.2: NAVWARHQ DIRECTORATES AND FIELD READINESS DIRECTORATES – ONE-LINE ROLES.

CODE	OFFICE	ONE-LINER
1.0	Comptroller	Budget formulation/execution; BSO duties; funds control and financial reporting.
2.0	Contracts	Contracting policy/oversight; acquisition strategy; award/administration of instruments.
3.0	Counsel	Legal counsel for acquisition/ethics; protests, claims, agreements, and compliance.
4.0	Logistics & Fleet Support	Life-cycle logistics; sustainment planning; supply/tech data; fleet support integration.
5.0	Chief Engineer / TA (Cyber)	Technical standards/architecture; interoperability; cyber TA; certification/air-gapping where required.
6.0	Program Management	Program governance; milestone readiness; portfolio integration; interface with PEOs.
7.0	Science & Technology	S&T portfolio; experimentation/prototyping; tech transition to programs of record.
8.0	Corporate Operations	Workforce, security, facilities, enterprise information-technology/chief-information-officer services, PAO, and other corporate enablers.
FRD-100	Fleet Support	Sustainment services and distance support; field engineering and readiness assistance.
FRD-200	Installations	C4I installation planning/execution; shore/afloat integration and cutover support.

Source: 2.1.3. NAVWAR Enterprise, 2024 [7]

1.4.2 Warfare Centers (alphabetical)

Table 1.3 lists NAVWAR Warfare Centers with locations and descriptions.

TABLE 1.3: NAVWAR WARFARE CENTERS WITH LOCATIONS AND DESCRIPTIONS.

CENTER	LOCATION	DESCRIPTION
NIWC LANT	Charleston, SC	Enterprise information-technology solutions; cradle-to-grave C4ISR.
NIWC PAC	San Diego, CA	C4ISR RDT&E; Navy/Joint/Allied support.
NSFA	Chantilly, VA	Navy link to the NRO; space research and development coordination.

Source: 2.1.3. NAVWAR Enterprise, 2024 [7]

NIWC LANT detachments

- HQ: Charleston, SC.
- New Orleans, LA.
- Norfolk, VA.
- Naples, Italy.
- Manama, Bahrain.

NIWC PAC detachments

- HQ: San Diego, CA.
- Everett, WA.
- Pearl City, HI.
- Santa Rita, Guam.
- Yokosuka, Japan.

1.5 NAVAIR Warfare Centers

Refs: [5] “2.1.4. Naval Warfare Centers” Dec. 18, 2024.

Table 1.4 lists NAVAIR Warfare Centers with locations and descriptions. This is an optional item to know for the EDO board, not as critical as NAVSEA/NAVWAR.

TABLE 1.4: NAVAIR WARFARE CENTERS WITH LOCATIONS AND DESCRIPTIONS.

CENTER	LOCATION	DESCRIPTION
NAWCAD	Patuxent River, MD	Aircraft/engines/avionics RDT&E; Test Pilot School.
NAWCWD	China Lake / Point Mugu, CA	Weapons systems, ranges, guided-missle integration.

Source: 2.1.4. Naval Warfare Centers, 2024 [5]

1.6 Navy PEOs (Program Executive Offices)

- Refs: [2] SECNAVINST 5400.15D, Jan. 19, 2021.
[5] “2.1.4. Naval Warfare Centers” Dec. 18, 2024.
[8] “3.1.5. Field Activity Financial Management” Mar. 26, 2025.

Program Executive Office, Aircraft Carriers (PEO CVN). Designs, builds, delivers, and sustains nuclear-powered aircraft carriers.

PMS 312. In-service aircraft carrier program management.

PMS 378. Nuclear-Powered Aircraft Carrier (CVN) -78 class program management.

PMS 379. CVN-79/80 program management.

Program Executive Office, Integrated Warfare Systems (PEO IWS). Develops and sustains ship and submarine combat systems.

IWS 1.0. Aegis combat system lead.

IWS 1.0F. Aegis fleet readiness.

IWS 2.0. Above-water sensors portfolio.

IWS 3.0. Surface ship weapons integration.

IWS 4.0. International and foreign military sales.

IWS 5.0. Undersea systems.

IWS 6.0. Command-and-control systems.

IWS 9.0. DDG-1000, littoral combat ship, and patrol craft combat systems.

IWS 11.0. Terminal defense systems.

IWS 12.0. NATO Seaspark programs.

IWS 80.0. Atalanta combat systems.

IWS X. Integrated combat-system document center.

Program Executive Office, Ships (PEO Ships). Oversees surface combatant and amphibious ship construction and modernization.

Program Executive Office, Unmanned and Small Combatants (PEO USC). Manages littoral combat ships, frigates, expeditionary platforms, and unmanned surface/undersea portfolios.

Team Submarines. Integrates strategic and attack submarine acquisition and sustainment.

Program Executive Office, Attack Submarines (PEO SSN). Attack submarine programs.

PMS 351. New attack submarine acquisition.

PMS 390. Undersea special mission systems.

PMS 391. In-service submarine sustainment.

PMS 394. Advanced undersea systems development.

PMS 450. Virginia class program management.

Program Executive Office, SSBN (PEO SSBN). Strategic deterrent submarine portfolio.

PMS 396. In-service Ballistic Missile Submarine, Nuclear (SSBN) sustainment.

PMS 397. Columbia class program management.

Submarine Maintenance Engineering Planning Program (SUBMEPP). Surface maintenance engineering planning program support to ballistic submarine availabilities.

PEO UWS. Submarine combat, cyber, and sensor systems.

PMS 401. Submarine acoustic systems.

PMS 404. Undersea weapons.

PMS 415. Undersea defensive warfare systems.

PMS 425. Combat and weapon control systems.

PMS 435. Electromagnetic systems.

PMS 485. Maritime surveillance systems.

Program Executive Office, Command, Control, Communications, Computers, and Intelligence (PEO C4I). Delivers fleet Command, Control, Communications, Computers, and Intelligence (C4I) capabilities.

PMW 120. Battlespace awareness and information operations.

PMW 130. Information Assurance (IA) and cybersecurity programs.

PMW 150. Navy command-and-control systems.

PMW 160. Tactical networks.

PMW 170. Communications and Global Positioning System (GPS) navigation.

PMW 740. International C4I integration.

PMW 750. Carrier strike and air integration.

PMW 760. Ship integration.

PMW 770. Undersea integration.

PMW 790. Shore and expeditionary integration.

PMW series focus. Two PMW series within PEO C4I have distinct roles:

PMW 1XX. Major capability development portfolios (new platforms and end-to-end networks) where PEO C4I owns the baseline capabilities document, acquisition strategy, and milestone execution; Warfare Centers supply lead systems integration, test ranges, and engineering agents via tailored project orders [2, 5].

PMW 7XX. Fleet integration portfolios synchronizing new capabilities into existing hulls, aircraft, and shore nodes; emphasizes installation planning, logistics, and interoperability packages coordinated through regional Warfare Centers and type commanders [2, 8].

Program Executive Office, Digital and Enterprise Services (PEO Digital). Provides enterprise digital services (e.g., Flank Speed collaboration environment).

Program Executive Office, Manpower, Logistics and Business IT (PEO MLB). Modernizes manpower, logistics, and business information-technology systems.

1.6.1 PEO/Warfare Center Interaction Model

Role Designation. PEOs charter Warfare Centers as EAs (ISEA, DA, SIA) via technical direction letters aligned with [2]; the Warfare Center executes under Navy Working Capital Fund (NWCF) funding while reporting performance to the PM [5].

Requirements Translation. PM Integrated Product Teams (IPTs) decompose Capabilities Development Documents (CDDs) into technical requirements that Warfare Center TA holders validate and flow down through alteration packages, interface control documents, and test plans [5].

Funding Mechanisms. PEO PMOs issue project orders or Economy Act orders using their appropriations; Warfare Centers accept into NWCF, schedule Work Breakdown Structures (WBSes), and recover rates through Stabilized Labor Rates (SLRs) while keeping the PM apprised of burn rates and Net Operating Result (NOR) impacts [8].

Governance Rhythm. Monthly technical reviews focus on requirements churn, test results, and configuration control; quarterly business reviews reconcile execution to SLR assumptions and assess workforce mix, drawing on Warfare Center cost visibility [2, 8].

Acquisition Decision Events. Warfare Centers provide independent readiness assessments (test status, technical risk) for PEO milestone decisions, often serving as certifying authorities for safety releases or flight clearances prior to fielding [2, 5].

2 PPBE

2.1 PPBE (Planning, Programming, Budgeting, and Execution)

- Refs:
- [9] “3.1.1. PPBE (Planning, Programming, Budgeting, and Execution)” Mar. 26, 2025.
 - [10] “3.1.2. Congressional Enactment” Mar. 26, 2025.
 - [11] “DoD Financial Management Regulation 7000.14—R, Volume 3” Jul. 1, 2025.
 - [12] “3.1.3. Program Funding” Sep. 8, 2025.
 - [13] “G-Invoicing Program Guide and Resources” 2025.
 - [14] *41 U.S.C. § 6307: Project Order statute*, 2011.
 - [15] *31 U.S.C. § 1535: Economy Act*, 2018.
 - [16] *31 U.S.C. § 1301(a): Application — Purpose Statute*, 2018.
 - [17] *31 U.S.C. § 1502(a): Bona Fide Needs Rule*, 2018.
 - [18] *31 U.S.C. § 1341; § 1517: Anti-Deficiency Act*, 2018.

2.1.1 What PPBE does

Aligns strategy to resources across the Future Years Defense Program (FYDP) . *Planning* (strategy → guidance), *Programming* (balanced force/program → Program Objective Memorandum (POM)), *Budgeting* (validated request → President's Budget (PB)), *Execution* (obligations/outlays → performance feedback) [9].

2.1.2 Timeline (annual rhythm)

Figure 2.1 shows the Planning, Programming, Budgeting and Execution (PPBE) timeline across multiple fiscal years with key milestones during each calendar year.

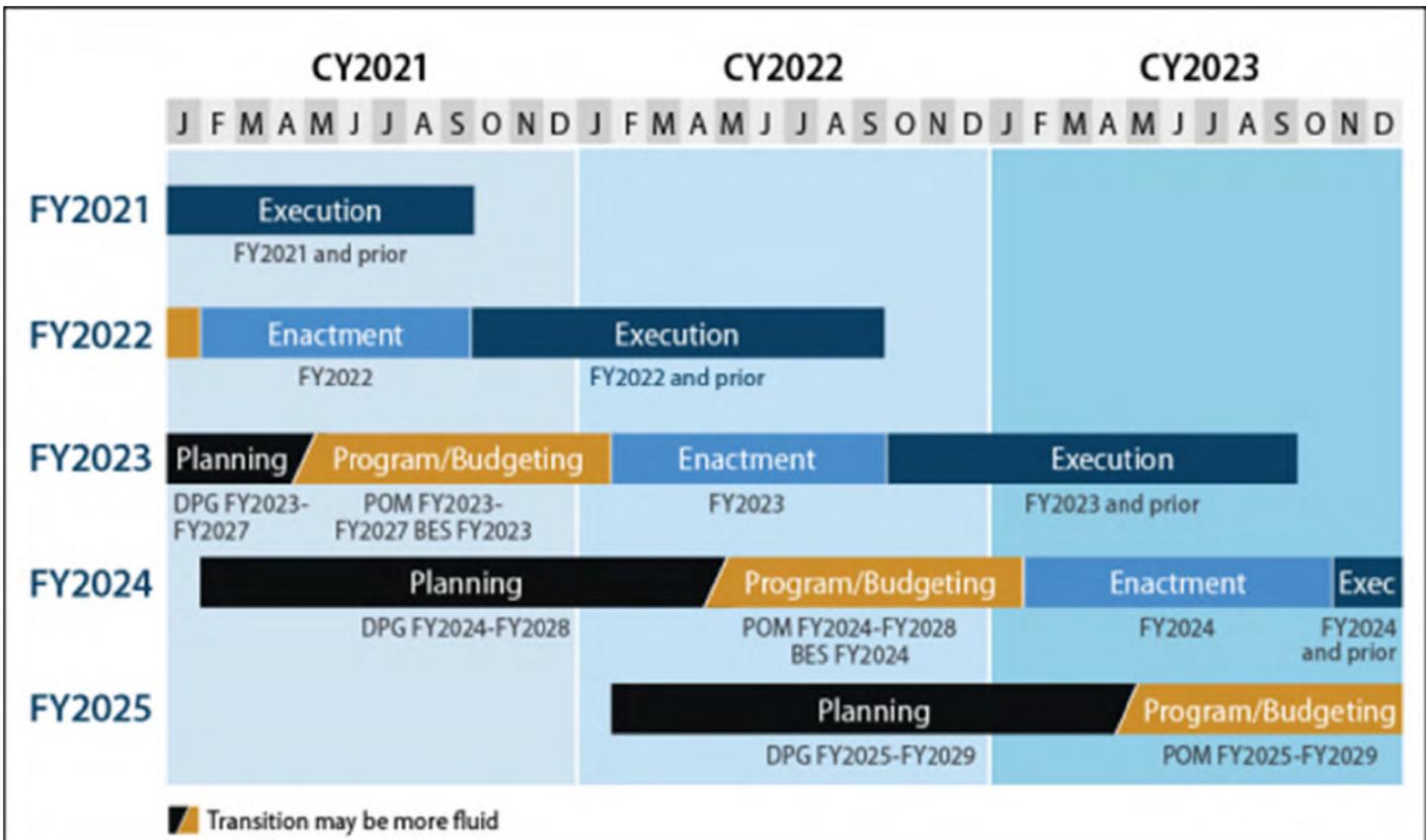


Figure 2.1. PPBE Timeline for multiple fiscal years. Source: 3.1.1. PPBE (Planning, Programming, Budgeting, and Execution), 2025 [9].

2.1.3 Congressional Enactment (Regular Order)

Figure 2.2 highlights how Congress moves from the PB submission through authorization and appropriations when operating on-time without a Continuing Resolution (CR) . Being able to walk this chart helps bridge PPBE milestones with Hill activity.

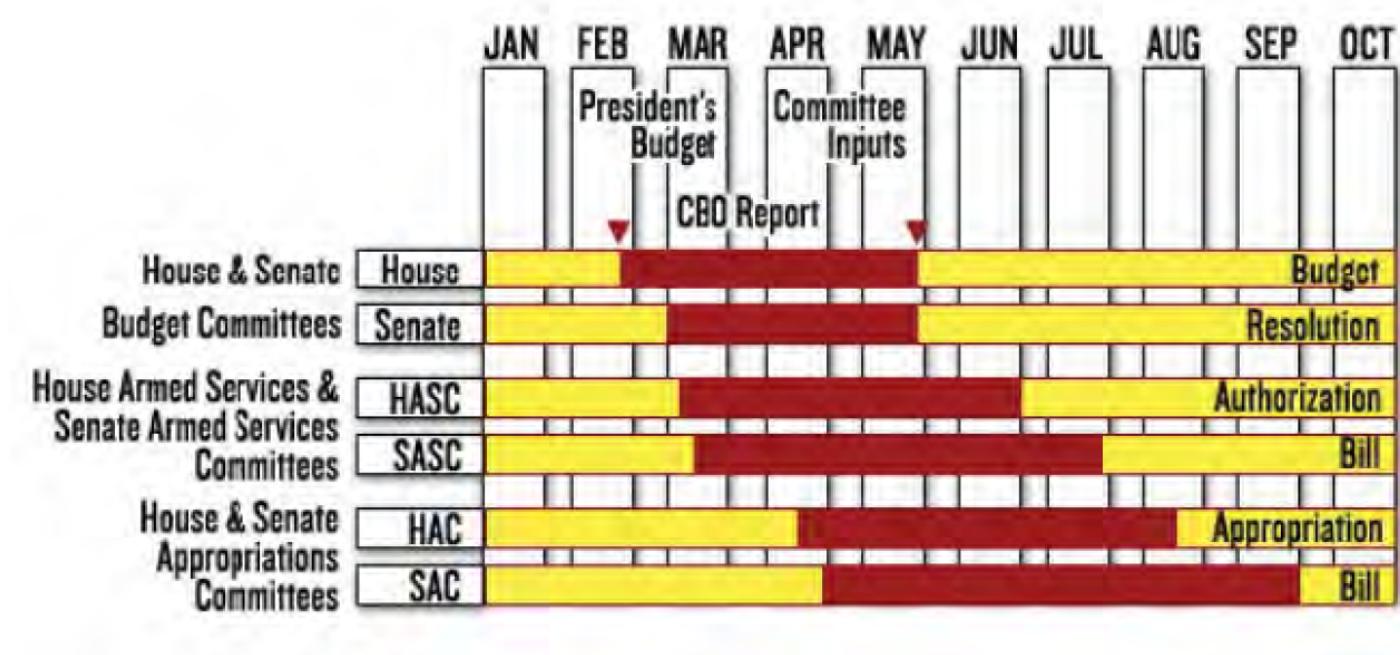


Figure 2.2. Congressional Enactment Timeline. Source: 3.1.2. Congressional Enactment, 2025 [10].

2.1.4 Key Terms and Definitions

Table 2.1 lists key terms and definitions.

TABLE 2.1: KEY TERMS IN PPBE

TERM	ONE-LINER
PY	Last completed FY: execution look-back and CR baselines.
CY	Ongoing FY: execution and mid-year reviews.
BY	Next FY in submission.
POM	Service's balanced force/program across the FYDP.
FYDP	5-year program structure and resources.

Source: DoD Financial Management Regulation 7000.14-R, Volume 3, 2025 [11]

Other terms and definitions from [9]:

Cost Assessment and Program Evaluation (CAPE). Provides independent cost assessment and program evaluation.

Program Decision Memorandum (PDM). Records SECDEF program decisions at the end of Program Review.

OPNAV Integration of Capabilities and Resources (N8). Builds the Navy POM; trades across portfolios with cost/risk realism.

OPNAV Warfare Systems (N9). Validates/advocates warfare requirements; integrates by mission area.

Warfare Integration Directorate (N91). Manages cross-domain mission integration and architecture; orchestrates POM issue papers and mission engineering. *Office designators can shift; verify current subcodes week-of.*

2.1.5 Programming v.s. Budgeting

Table 2.2 compares key differences between Programming and Budgeting. One way to think about this: (1) Budgeting is for the money for this year and (2) Programming is for the 5-year FYDP.

TABLE 2.2: PROGRAMMING V.S. BUDGETING

PROGRAMMING	BUDGETING
Purpose	Build a balanced force across FYDP
Lead	N8 with supporting codes/PEOs/SYSCOMs
Key products	POM, PDM
	Price/validate an executable BY request
	FMB/OSD (Comptroller)/OMB
	Budget estimate, reclama, President's Budget

Source: 3.1.1. PPBE (Planning, Programming, Budgeting, and Execution), 2025 [9]

2.1.6 PPBE Programming

3-Star v.s. 4-Star Reviews: During Office of the Secretary of Defense (OSD)'s Program Review, issues raised on the Services' POMs move first to a 3-Star Programmers Panel (staff-level, chaired by Director, CAPE (DCAPE)) that vets issue papers, builds options (with offsets), and forwards recommendations. Unresolved or strategy-level trades go to the 4-Star forum, the Deputy's Management Action Group (DMAG) co-led by the Deputy SECDEF (with the Vice-Chairman of the Joint Chiefs of Staff (VCJCS)), for senior adjudication. Decisions at this stage are documented as a PDM or (in recent cycles) a programmatic Resource Management Decision (RMD), which updates the FYDP and hands off to the Comptroller's Budget Review that culminates in budgetary RMDs.

2.1.7 Appropriations Life-cycle (Colors of Money)

Figure 2.3 visualizes when each major appropriation category is Current, Expired, or Cancelled. Pair this with the obligation windows discussion so you can sketch the chart quickly at the board.

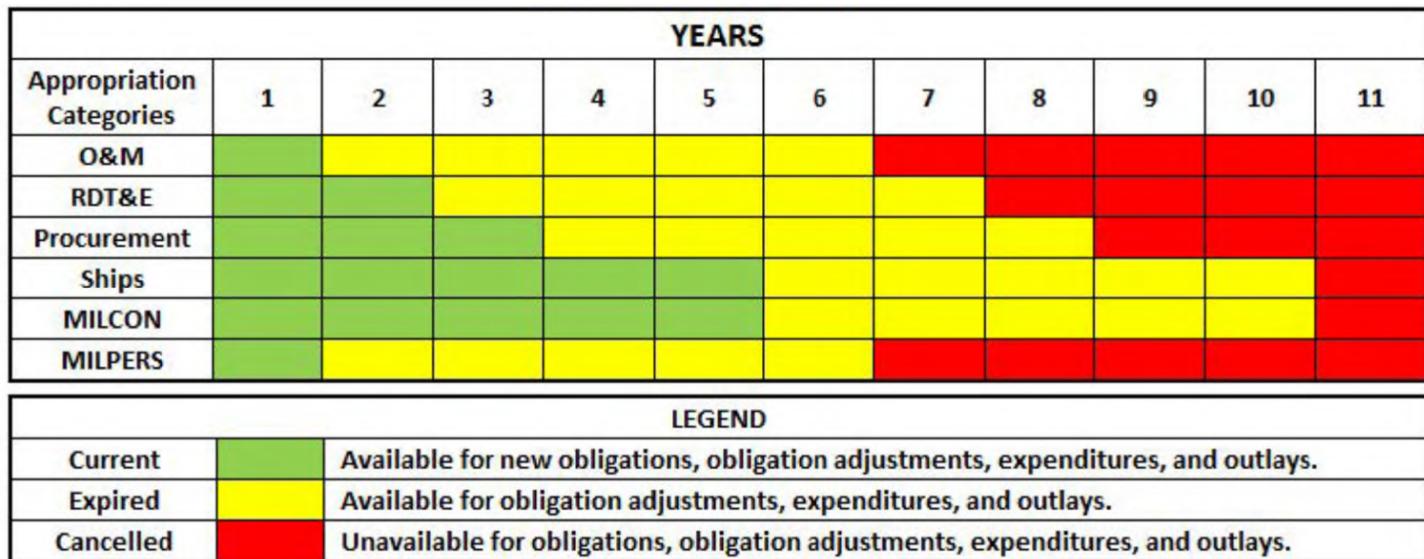


Figure 2.3. Colors of Money Timeline. Source: 3.1.3. Program Funding, 2025 [12].

2.1.8 IGT (Intragovernmental Transactions)

Definition. Orders and collections between federal entities using Treasury's G-Invoicing: 7600A (order), 7600B (agreement/performance), Intra-Governmental Payment and Collection (IPAC) for collections [13].

Why it matters. Intragovernmental Transaction (IGT) acceptance is an obligation on the customer side and the revenue recognition driver for the performing Working Capital Fund (WCF) activity.

2.1.9 Common Ordering Instruments

Work Order. Internal directive used within a command to control scope/cost/schedule.

Project Order. Statutory order for a definite, specific, and entire project; obligational on acceptance; performs like a contract between Department of Defense (DoD) activities. (41 U.S.C. § 6307) [14]

Military Interdepartmental Purchase Request (MIPR) /IPR (DD Form 448). Economy Act order between federal entities; obligational when accepted; performed by the servicing agency. (31 U.S.C. § 1535) [13, 15]

2.1.10 Fiscal Law (Know These Cold)

Purpose Statute ("Misappropriation"). Funds must be used only for their appropriated purpose (31 U.S.C. § 1301(a)) [16].

Bona Fide Needs Rule. Use current-year appropriations only for legitimate needs of that fiscal year (31 U.S.C. § 1502(a)) [17].

Anti-Deficiency Act. Do not obligate/expend in excess of available amounts or before funds are available (31 U.S.C. § 1341, § 1517) [18].

2.1.11 Reprogramming: Moving Resources After Enactment

Four mechanisms (high level).

1. **Congressional Prior Approval Reprogramming (PA Reprog)** : Actions above statutory/committee thresholds or affecting congressional special-interest items or new starts. Requires approval from all four defense committees; timing driven by committee cycles [11].
2. **Internal Reprogramming (IR)** : Realignments within an appropriation that do not cross thresholds or trigger congressional interest; used for proper purpose alignment without changing totals. Notice sent to committees [11].
3. **Below-Threshold Reprogramming (BTR)** : Component-level authority to move funds below set dollar/percent limits within the same appropriation/fiscal year; limits reset annually by appropriations acts/committee guidance [11].
4. **Letter Transfer (LT)** : Treasury non-expenditure transfer moving budgetary resources between appropriations/treasury symbols when authorized (e.g., statute or enacted language) [11].

Hint

General rules of thumb—cannot change color-of-money or extend time; must complete before funds' obligation period ends; expired-year accounts limited to valid upward/downward adjustments only [11].

2.1.12 From Enactment to Field Authority

1. Treasury *warrants* the appropriation; Office of Management and Budget (OMB) *apportions* on Standard Form 132.
2. OSD (Comptroller) issues allocations to components such as the DON.
3. OPNAV (Financial Management Budget (OPNAV) (FMB) / OPNAV Programming Division (N82)) allocates to SYSCOM BSOs (Echelon II), which suballocate to Warfare Centers (Echelon III), followed by *allowances/allotments* to the Enterprise Resource Planning (ERP) system [11].
4. Commands record commitments, obligations, and expenses, and request outlays via Defense Finance and Accounting Service (DFAS) .

2.2 NWCF Essentials: Rates, Results, and Execution

- Refs:**
- [11] “DoD Financial Management Regulation 7000.14—R, Volume 3” Jul. 1, 2025.
 - [13] “G-Invoicing Program Guide and Resources” 2025.
 - [19] *10 U.S.C. § 2208: Working-capital funds*, 2023.
 - [20] “DoD FMR 7000.14-R, Volume 3, Chapter 19: Defense Working Capital Funds” Jul. 1, 2025.
 - [21] “Continuing Resolutions: Overview of Components and Recent Practices” Mar. 27, 2025.

2.2.1 Key Definitions (Execution)

Commitment. Administrative reservation of funds in anticipation of an obligation; reduces available authority but is not yet a legal liability [11] (e.g., National Reconnaissance Office (NRO)’s Request for Contract Action (RCA) process).

Obligation. Legal liability incurred that encumbers funds [11] (e.g., award of a contract, acceptance of an IGT order).

Expenditure/Expense. Recording of cost when goods/services are received/accepted (accrual basis) [11] (e.g., sending check to pay an invoice).

Outlay/Disbursement. Treasury cash payment to a vendor or performing activity [11] (e.g., payment check is cashed in).

2.2.2 Flow: PMO Purchase Request to Treasury Payment

1. PMO *commits* funds (approved in the ERP system).
2. Contract award or IGT order acceptance creates the *obligation* [11, 13].
3. Performance/acceptance posts *expense* (accrual).
4. DFAS schedules the invoice for payment; Treasury disburses (*outlay*) via IPAC (for IGT) or commercial EFT [13].

2.2.3 NWCF Metrics and Equations

NOR (annual profit/loss).

$$\text{NOR} = \text{Revenue} - \text{Total Expenses}$$

Target performance remains near break-even over time (small NOR) [11].

Accumulated Operating Result (AOR) (retained earnings/equity over time).

$$\text{AOR}_t = \text{AOR}_{t-1} + \text{NOR}_t \pm \text{Other Adjustments}$$

Represents the *corpus* (net position) of the fund [11].

2.2.4 NWCF Corpus v.s. Appropriations

Corpus (AOR/Working Capital). Revolving cash and retained earnings authorized under 10 U.S.C. § 2208 [19]; remains available without fiscal year limitation to finance operations until recovered through stabilized rates [20].

Customer Appropriations. Mission-funded (e.g., Operation and Maintenance, Navy (OMN) , Research, Development, Test, and Evaluation (RDT&E) , Shipbuilding and Conversion, Navy (SCN)) dollars obligated by the customer when a project order or inter/intra-governmental order is accepted; purpose, time, and amount statutes still apply to the customer [11].

Capital Investment Program (CIP). Financed by NWCF corpus but budgeted in the capital budget exhibit; used for plant/equipment modernization and amortized back through rates, not through a separate appropriation [20].

No Augmentation. NWCF activities cannot augment customer appropriations; corpus only bridges cash timing between expense recognition and reimbursement [20].

2.2.5 Stabilized Rates and SLR

Stabilized Rates. Customer prices set in the budget build to recover expected full costs (labor, material, overhead, depreciation/C CIP) with a near-zero NOR goal [11].

SLR. Published labor \$/hr for a shop/code; recovers direct labor + fringe + overhead + G&A + capital depreciation recovery [11]:

$$\text{SLR} = \frac{\text{Direct Labor} + \text{Fringe} + \text{OH} + \text{G\&A} + \text{Depreciation Recovery}}{\text{Direct Labor Hours}}$$

Adjustment Battle Rhythm. Rates are established two years ahead during the PPBE budget build and held constant throughout budget year execution; mid-year changes require OUSD(C) approval when earned rates diverge materially from planned costs, and Navy BSOs typically review SLR accuracy monthly/quarterly to recommend any out-of-cycle adjustments [20].

2.2.6 NWCF v.s. Mission-Funded (Appropriation) Commands

Which billets at NWCF are mission-funded. Military administration and leadership billets (CO/XO/Admin) are funded by **Military Personnel (MILPERS)** and treated as mission-funded within NWCF; certain command/HQ oversight billets may also be OMN funded by policy, so verify locally. These costs are not recovered in stabilized rates. Others that are assigned to NWCF will bill hours towards work and the NWCF will reimburse MILPERS [11].

2.2.7 Standing Up or Modifying a NWCF Business Area

1. **Business Case Development:** Sponsor (e.g., ASN(RD&A) or SYSCOM) prepares analytical justification showing workload, demand signal, and ability to operate on a revolving basis without violating purpose/time/amount [20].
2. **acdon Approval Chain:** Secretary of the Navy (SECNAV) (delegated to ASN (FM&C)) endorses the concept and forwards to OUSD(C) while coordinating with Navy Comptroller to align PPBE exhibits [20].

3. **OUSD(C)/OMB Review:** DoD Chief Financial Officer (CFO) validates cash requirements, rate methodology, and capital plan, then seeks OMB alignment for the PB [20].
4. **Congressional Notification:** Congress must be notified (and, when required, explicitly authorize in appropriations or authorizations) before execution; 10 U.S.C. § 2208 [19] restricts creation of new WCFs without legislative awareness [20].
5. **Implementation:** Once approved, the new business area is issued an NWCF business unit code, begins PPBE rate build two years out, and transitions legacy appropriated accounts via opening balance adjustments [20].

2.2.8 NWCF Cycle of Operations (Order to Cash)

1. **Customer order.** IGT 7600A or project order is received and *accepted*, creating the customer's obligation.
2. **Work in process.** Labor and material are applied; costs accumulate; billing events are scheduled per percent complete or delivery.
3. **Revenue recognition and billing.** The NWCF recognizes revenue and bills via IPAC (IGT) or a commercial invoice if authorized.
4. **Collection (cash).** Treasury IPAC/electronic funds transfer posts; NWCF cash increases; NOR/AOR update through the period close [11, 13].

2.2.9 Operating During a Continuing Resolution

Customer Funding Limits. Appropriated customers remain bound by prior-year obligation rates and anti-deficiency constraints; NWCF orders cannot exceed apportioned CR amounts until an appropriations act is passed [21].

Cash Cushion. Existing NWCF corpus allows Warfare Centers to keep executing accepted orders (labor continues, suppliers paid) even if reimbursements lag, provided cash balances stay within the FMR's upper/lower operating limits [20].

No New Starts. CR guidance prohibits new start projects, major capital investments, or rate changes absent explicit exception; NWCF managers defer new workloads that would obligate customer funds beyond CR allowances [21].

Rate Discipline. Stabilized rates remain frozen; only emergency OUSD(C)-approved rate adjustments may occur, so BSOs focus on expense control to avoid large NOR swings during the CR period [20].

2.2.10 Why Use a Warfare Center (Organic)

Things PMOs/industry can't do. Inherently governmental TA warrants, certification authority, certain safety releases; highly classified or nuclear workspaces.

Things they shouldn't do. Independent test/assessment, spec adjudication, tech baseline control, blue-&-gold separation to avoid Organizational Conflict of Interest (OCI) .

Things they won't do. Sustainment engineering at scale, depot-level organic repair, fleet distance support.

2.3 Congressional Enactment

Refs: [10] “3.1.2. Congressional Enactment” Mar. 26, 2025.

[21] “Continuing Resolutions: Overview of Components and Recent Practices” Mar. 27, 2025.

2.3.1 Foundations and core definitions

Power of the purse. U.S. Constitution, Article I.

Section 8.

“The Congress shall have power to... provide for the Common Defense... and general welfare...”

Section 9.

“No money shall be drawn from Treasury, but in consequence of Appropriations made by law...”

Key terms. Budget Authority (BA) (legal authority to incur obligations), Total Obligational Authority (TOA) , obligations, outlays, Legislative Proposal (LEGPROP) .

Authorization v.s. Appropriation. National Defense Authorization Act (NDAA) authorizes programs/policy; appropriations provide BA.

2.3.2 Who drafts what

Authorization. House Armed Services Committee (HASC) /Senate Armed Services Committee (SASC) .

Appropriations. House Appropriations Committee (HAC) /Senate Appropriations Committee (SAC) .

Budget Resolution. House Budget Committee (HBC) /Senate Budget Committee (SBC) (sets topline aggregates and 302 allocations; not a law).

Independent analysis/oversight. Congressional Budget Office (CBO) (scoring), Congressional Research Service (CRS) (research), Government Accountability Office (GAO) (audits/oversight).

2.3.3 Regular-order timeline

Figure 2.4 shows the timeline from the PB → Appropriation Bill with approximate timelines assuming no CR.

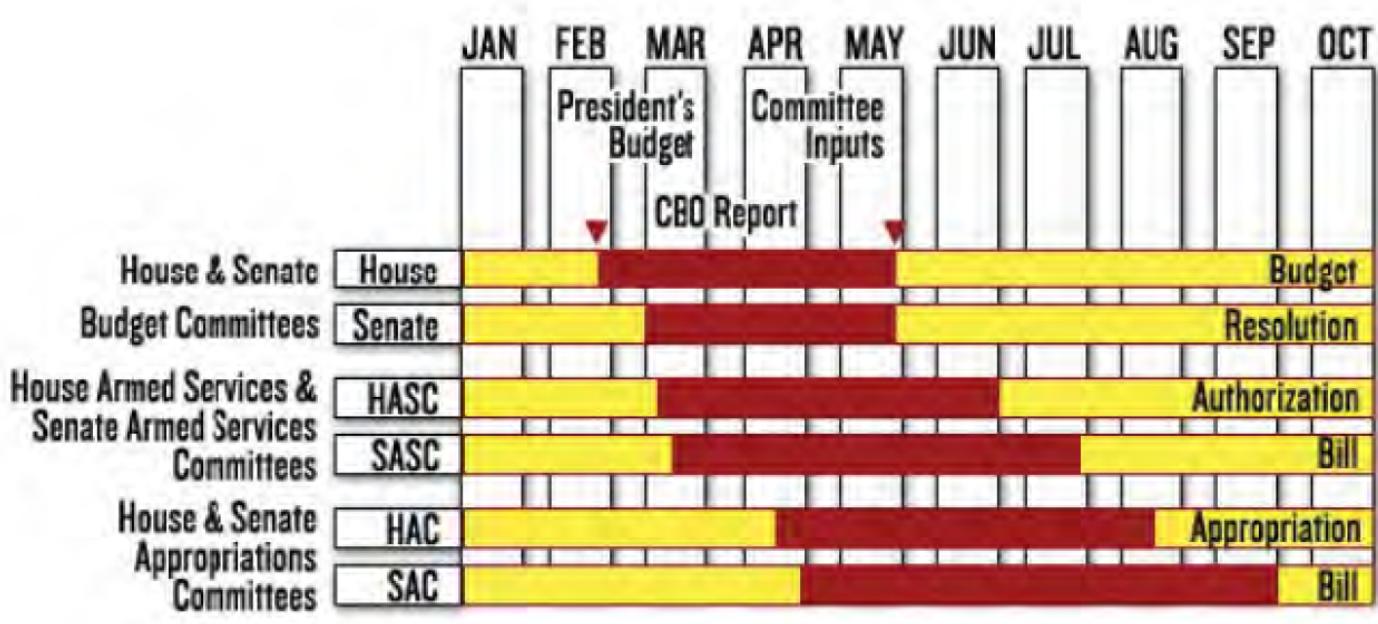


Figure 2.4. Congressional Enactment Timeline. Source: 3.1.2. Congressional Enactment, 2025 [10].

2.3.4 The 12 regular appropriations bills

Defense. Department of Defense appropriations.

Military Construction and Veterans Affairs. Military construction, housing, and Department of Veterans Affairs programs.

Energy and Water. Department of Energy, Army Corps of Engineers, and related infrastructure programs.

Homeland Security. Department of Homeland Security operations and components.

Interior and Environment. Department of the Interior and Environmental Protection Agency activities.

Labor, Health and Human Services, Education. Departments of Labor, Health and Human Services, and Education, plus related agencies.

Legislative Branch. U.S. Congress and supporting legislative branch agencies.

Financial Services and General Government. Treasury, judiciary, Small Business Administration, and other independent agencies.

Transportation and Housing and Urban Development. Departments of Transportation and Housing and Urban Development.

Commerce, Justice, Science. Departments of Commerce and Justice plus science agencies such as NASA and the National Science Foundation.

State and Foreign Operations. Department of State, U.S. Agency for International Development, and foreign assistance programs.

Agriculture and Food and Drug Administration (FDA). Department of Agriculture and Food and Drug Administration activities.

Note

The bills that EDO's care about the most are Defense, Military Construction (MILCON) & Department of Veterans Affairs (VA) and Energy & Water. This because those bills directly affect funding for our acquisitions.

Hint

These bills are sometimes packaged into minibuses or a single omnibus appropriations act.

2.3.5 Continuing Resolution

CR rules (board one-liner). *No new starts; rate/quantity changes generally constrained unless specified; execution limited by OMB apportionment and any anomalies in law [21].*

2.3.6 Sequestration

Automatic, across-the-board reductions if statutory caps/triggers are breached; applied by account unless modified by law.

2.4 Program Funding and Execution

Refs: [11] “DoD Financial Management Regulation 7000.14—R, Volume 3” Jul. 1, 2025.

- [13] “G-Invoicing Program Guide and Resources” 2025.
- [22] 10 U.S.C. § 3501: Multiyear Procurement, 2023.
- [23] “DFARS 217.172: Multiyear Contracts” 2025.

2.4.1 BA, commitment, obligation, expenditure, outlay

1. *BA* available (legal authority).
2. *Commitment* (administrative reservation).
3. *Obligation* (legal liability via contract/order).
4. *Expenditure* (payment recorded).
5. *Outlay* (cash disbursed/Treasury).

Source references [11, 13].

2.4.2 Appropriation categories, scope, obligation windows

Table 2.3 shows the Colors of Money with their spending categories and obligation windows. Figure 2.3 from § 2.1.7 visually shows when each category is Current, Expired, or Cancelled.

TABLE 2.3: APPROPRIATION CATEGORIES, SCOPE, OBLIGATION WINDOWS

CATEGORY	TYPICAL SCOPE	OBLIGATION WINDOW
RDT&E	Science & technology; development; test & evaluation	2 years
OPN ^a	End items/modernization and spares	3 years
OMN	Operations, maintenance, training, minor mods	1 year
MILCON	Facilities construction and real property	5 years
MILPERS	Personnel pay	1 year

^a SCN is a specific procurement with a 5-year obligation window.

Source: DoD Financial Management Regulation 7000.14-R, Volume 3, 2025 [11]

2.4.3 Funding policies

Annual. (OMN/MILPERS). Fund only bona fide needs of the fiscal year.

Incremental. (RDT&E). Fund work as it occurs by fiscal year.

Full-funding. (Procurement/MILCON). Fund the total usable end-item at award.¹

Common techniques/exceptions: Advance Procurement (long-lead items), Multiyear Procurement, Economic Order Quantity, Cost-to-Complete when provided in law.

Exceptions to the Full Funding Policy

Below is the list of the key exceptions to the Full Funding Policy, what they allow, and the must-know rules/approvals (Table 2.4 shows full details).

¹Exceptions to Full funding are select SCN programs (CVNs, SSBNs, and LHD/LHAs) with Congressional approval.

TABLE 2.4: KEY EXCEPTIONS TO THE FULL FUNDING POLICY: WHAT THEY ALLOW AND WHAT TO REMEMBER

EXCEPTION	TYPICAL APPROPRIATION	WHAT IT ALLOWS	MUST-KNOW RULES / APPROVALS
MYP	APN, OPN, SCN	Single contract covering multiple fiscal years of buys to achieve predictable demand and unit-cost savings; may include EOQ purchases common across years.	Requires specific congressional authorization; stable requirements/design; credible savings; low technical risk; term generally up to 5 years; plan/budget any cancellation liability.
Advance Procurement (incl. LLTM/EOQ)	APN, OPN, SCN	Limited <i>early</i> funding (often 1–2 years before the main “buy” year) for long-lead components or EOQ lots to protect schedule or achieve price breaks.	Narrow and part-specific; must be justified in budget docs; EOQ commonly tied to MYP (or explicit block authority); does <i>not</i> equal full funding of the end item.
BB	Primarily SCN	A single contract buying multiple ships (or end items) across fiscal years to gain tooling/learning-curve efficiencies.	Requires explicit congressional authorization; funds still obligated year-by-year; not under the MYP statute, so oversight mechanics differ.
CTC	SCN	Additional funds in a later FY to finish an item (e.g., ship) when matured estimates exceed prior appropriations.	Completes original approved scope (not added capability); appears as a distinct request/justification; common in long-duration shipbuilding.
RCOH for CVN	SCN (with prior Advance Procurement)	Mid-life refueling and major overhaul funded incrementally over multiple years; early procurement of nuclear fuel/critical components.	Recognized exception due to size/complexity; incremental SCN with advance procurement years ahead of the principal execution.

Note:

- (i) Economic Order Quantity (EOQ) purchases are commonly approved within Multiyear Procurement (MYP) or other explicit multi-year constructs;
- (ii) Block Buy resembles MYP in intent (savings) but uses program-specific authorization;
- (iii) Plan for cancellation liability under MYP when required.

Source: DoD Financial Management Regulation 7000.14-R, Volume 3, 10 U.S.C. § 3501, DFARS 217.172: Multiyear Contracts, 2025, 2023, 2025 [11, 22, 23]

2.4.4 Navy Sustainment Funding: TYCOM v.s. Fleet (O&S)

Who holds O&M,N. Type Commanders (TYCOMs; e.g., COMNAVSURFOR, COMNAVAIRFOR, COMSUBFOR) are the primary executors of OMN for unit readiness: flying hours, steaming days, intermediate-level maintenance, training, and afloat/ashore support.

Fleet Commanders. PACFLT and USFF set operational priorities and readiness goals, adjudicate contingencies, and may centrally manage certain Fleet-wide initiatives; they influence TYCOM allocations but most execution occurs at the TYCOM.

Program Office (SYSCOM/PEO). Funds in-service engineering, tech data, Diminishing Manufacturing Sources, and modernization using Other Procurement, Navy (OPN) /Aircraft Procurement, Navy (APN) (end items/kits) and RDT&E/OMN

(installation, trials) as appropriate; manages sustainment Indefinite-Delivery, Indefinite-Quantitys (IDIQs) /PBL with color-of-money compliance.

Who pays what. OPN/APN: hardware/software upgrade kits, initial spares; OMN: installs, fleet introduction/training, minor mods, repair parts consumption; RDT&E: development/test of engineering changes. NAVSUP/NWCF activities recover costs via rates for supply/repair.

Board cue. In O&S, TYCOMs execute most OMN; Program Managers fund modernization and in-service support from OPN/APN/RDT&E. Align funding lines with the WBS and the Colors-of-Money rules to avoid Anti-Deficiency Act risk.

Quick information regarding exceptions to the full funding policy:

MYP. Up to 5 years; stable design; verifiable savings; cancellation liability planned.

Advance Procurement (Long-Lead Time Material (LLTM) /EOQ). Focused early buys for schedule/savings; not full funding.

Block Buy (BB). Congressionally authorized multi-ship buys; obligate by Fiscal Year (FY) ; not the MYP statute.

Cost-to-Complete (CTC). Complete original scope when estimates mature upward; separate SCN request.

Refueling and Complex Overhaul (RCOH). Planned mid-life overhaul; incremental SCN with advance procurement of cores/- critical material.

2.4.5 Which money when (by acquisition phase)

Table 2.5 shows the nominal types of appropriation used for Materiel Solution Analysis (MSA) , Technology Maturation and Risk Reduction (TMRR) , Engineering and Manufacturing Development (EMD) , Production and Deployment Phase (P&D) , and Operations and Support Phase (O&S)

TABLE 2.5: APPROPRIATION TYPES PER PHASE

PHASE	TYPICAL APPROPRIATION(S)
MSA	RDT&E (analyses, prototyping); small OMN for studies
TMRR	RDT&E (risk reduction, development, test)
EMD	RDT&E (develop/build/test/qualify); selected long-lead/AP/EOQ in Procurement when authorized
PD	Procurement (e.g., OPN); limited RDT&E for fixes
OS	OMN sustainment; spares via Procurement as applicable

2.4.6 MILCON v.s. O&M sustainment v.s. OPN modernization

Rule of thumb: Real property construction ⇒ MILCON; keeping systems running (repair/overhaul, services) ⇒ OMN; new capability/end-item upgrades ⇒ Procurement (e.g., OPN).

2.4.7 Field Activity Financial Management (NWCF quick hits)

Goal. NWCF activities price to *break even over time*; in-year result is **NOR**, cumulative is **AOR**.

Rates (SLR). Recover direct labor + overhead + G&A; shocks flow to NOR/AOR and are managed over time.

Carryover. Unfilled orders at FY end; subject to limits/management.

IGT via G-Invoicing. Treasury-mandated platform for intra-gov orders/settlement; apportionment/availability rules still govern customer funds.

2.5 Cost Elements, Estimates, and Learning Curves

Refs: [3] SECNAVINST 5000.2G, Apr. 8, 2022.

- [11] “DoD Financial Management Regulation 7000.14—R, Volume 3” Jul. 1, 2025.
- [24] “Federal Acquisition Regulation (FAR)” 2025.
- [25] DoDI 5000.85, Aug. 6, 2020.
- [26] “3.1.6. Cost Estimating” Dec. 18, 2024.
- [27] “Adaptive Acquisition Framework” 2025.

2.5.1 Direct v.s. Indirect Costs

Direct. Traceable to a final cost objective (e.g., technician hours, end-item material).

Indirect. Pooled and allocated (overhead, G&A, facilities, depreciation). See the Federal Acquisition Regulation (FAR) cost principles [24].

2.5.2 Program Cost Terms (Know the Stack)

Flyaway Cost. Recurring production cost of an aircraft/weapon delivered (excludes non-recurring tooling, spares, support).

Weapon System Cost. Flyaway plus support equipment, training, data, and initial spares.

Procurement Cost. Weapon system cost plus peculiar support and MILCON as applicable.

Life-Cycle Cost (LCC). All costs from concept through disposal (RDT&E, procurement, O&S, disposal).

Total Ownership Cost (TOC). LCC plus broader infrastructure/indirect enterprise costs.

Note

Use DON/DoD cost handbook definitions; be consistent across documents. [3, 25].

Figure 2.5 shows the LCC from above and how they relate to one another. Note how each cost builds to the next as different types of expenditures are added.

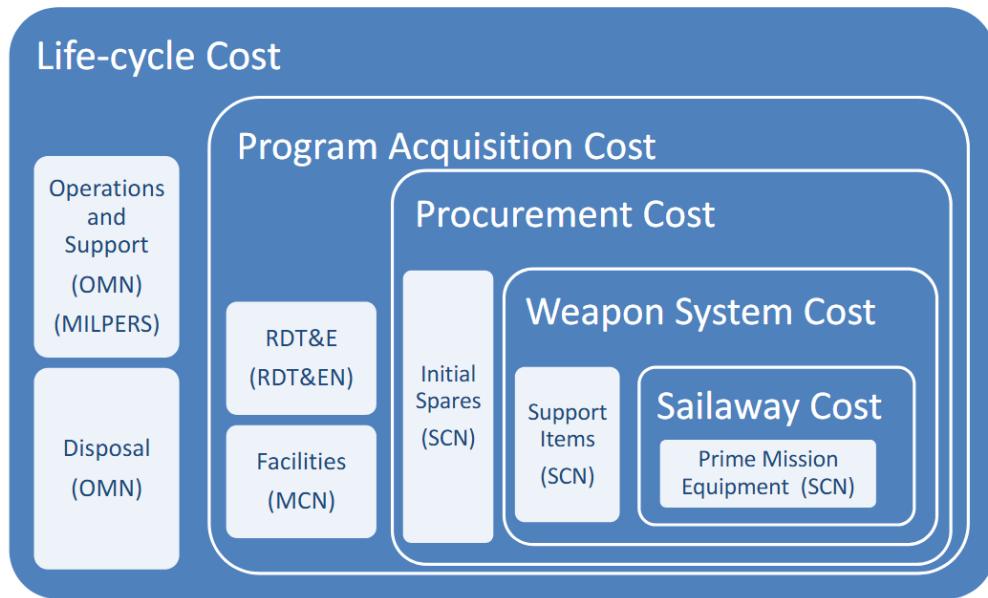


Figure 2.5. Composition of Life Cycle Costs. Source: 3.1.6. Cost Estimating, 2024 [26].

2.5.3 Why the LCCE Matters

Establishes the affordability baseline, informs Acquisition Program Baseline (APB), drives color-of-money phasing, and underpins “will-cost / should-cost” targets [25]. Figure 2.6 shows the different types of funding that will be used in different phases of the MCA. Most of the LCC will be from the O&S phase.

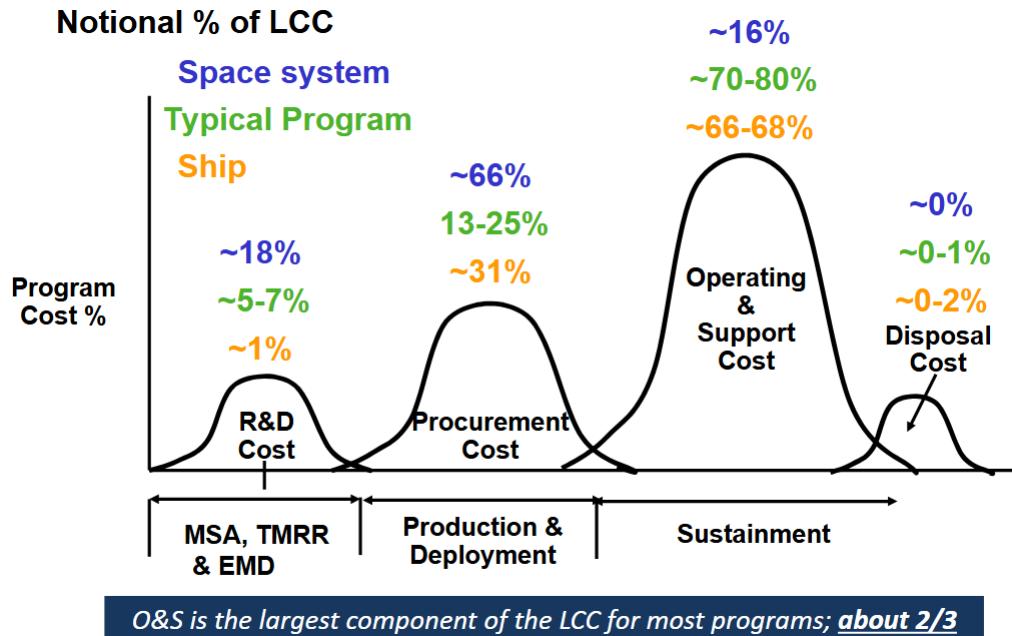


Figure 2.6. LCC over time. The colors of money used are shown for each phase including percent of total costs. Source: 3.1.6. Cost Estimating, 2024 [26]

2.5.4 Estimating Methods (Types, When, and Why)

Analogy (top-down). *When:* Earliest stages (ICD/Materiel Development Decision (MDD), pre- Analysis of Alternatives (AoA)) when design is immature and only analogous programs or components exist. *Why:* Fast, defensible scoping by scaling from a close comparator using adjustment factors (size, weight, speed, complexity). Good for bounding affordability and informing trades before detailed data exists.

Parametric (CER-based). *When:* AoA through TMRR when historical data supports Cost Estimating Relationships (CERs) (e.g., weight, Source Lines of Codes (SLOCs), thrust, kW). *Why:* Enables rapid sensitivity analysis and trade-space exploration with statistical confidence intervals; supports independent cross-checks and early budget phasing.

Engineering (bottom-up). *When:* EMD and production planning when Bill of Materials (BoMs), routing, labor standards, and quotes are available. *Why:* Most traceable and auditable; ties to technical baseline and schedule networks; supports Integrated Baseline Reviews (IBRs) and negotiation objectives.

Actuals / Extrapolation. *When:* From late TMRR into production when pilots/LRIP actuals exist and learning effects are visible. *Why:* Highest fidelity; captures learning curves and process improvements; anchors estimates to realized performance and Cost and Software Data (CSDR) actuals [27].

TABLE 2.6:

TYPE	DESCRIPTION	WHEN USED	WHY USED
Analogy	Uses cost of a similar past system, adjusted for differences	Early concept/refinement (Pre-Milestone A/B)	Quick estimate when data limited
Parametric	Uses statistical cost estimating relationships (CERs) like cost vs. weight or power	Milestone B/C; early design	Captures cost drivers using quantifiable parameters
Engineering (Bottom-Up)	Builds from detailed WBS—materials, labor, overhead	Post-CDR, LRIP	High accuracy for mature designs
Actual Cost / Extrapolation	Uses historical/production actuals (learning curves)	FRP / O&S	Most accurate; supports should-cost and sustainment budgeting

2.5.5 Products and Players

Cost Analysis Requirements Description (CARD). Technical/schedule baseline for independent estimates.

Independent Cost Estimate (ICE). Component Acquisition Executive (CAE) or OSD CAPE for Acquisition Category (ACAT) I; Program Office Estimate (POE) .

CSDR. Contractor cost & software data reporting for actuals/CERs.

APB/Selected Acquisition Report (SAR) /Defense Acquisition Executive Summary (DAES). Baselines and reporting [25].

2.5.6 Learning Curve (Production Efficiency)

If unit time/cost follows an $s\%$ slope, doubling quantity reduces unit cost by $s\%$. Typical aerospace slopes: 85–90% early, flattening as processes mature. Plan lots and spares buys accordingly [27].

2.5.7 Cost Escalation (Inflation Indices)

Escalate base-year costs to then-year using approved DoD inflation indices; separate real growth from price growth; align phasing to obligation windows [11].

2.5.8 Will-Cost / Should-Cost

Will-Cost. Conservative reference estimate used for budgeting and margin planning.

Should-Cost. Management targets that drive efficiencies (e.g., lean events, value engineering, rate negotiations) [25].

3 Contracting and Solicitation

3.1 Intro to Contracting Fundamentals

- Refs:
- [24] “Federal Acquisition Regulation (FAR)” 2025.
 - [28] “Defense Federal Acquisition Regulation Supplement (DFARS)” 2025.
 - [29] “Navy Marine Corps Acquisition Regulation Supplement (NMCARS)” 2025.
 - [30] *SUPSHIP Operations Manual, Chapter 3: Contract Management*, Sep. 1, 2023.
 - [31] *NAVSEA Source Selection Guide*, Aug. 1, 2022.
 - [32] *NAVSEA Contracts Handbook*, May 1, 2023.
 - [33] *10 U.S.C. § 3201: Competition requirements*, 2023.

3.1.1 Why the Navy Uses Contracts

- Contracts create a legally enforceable relationship between the Government and industry partners, defining rights and responsibilities for each party.
- Written terms provide structure for changes via agreed conditions, protecting both the Navy and the Contractor throughout acquisition actions.
- Binding agreements ensure accountability for cost, schedule, and performance outcomes that cannot be achieved through informal arrangements.

3.1.2 Essential Elements of a Binding Contract

Mutual Assent. Requires an offer and acceptance with a meeting of the minds on all material terms such as scope, price, quantity, and delivery.

Consideration. Both sides exchange value (e.g., payment, performance, schedule relief) that courts will evaluate for adequacy in Government contracting.

Capacity. Parties must be legally competent to enter the agreement; lack of capacity (e.g., incapacity, lack of authority) undermines enforceability.

Lawful Purpose. The contract must pursue a legal objective; agreements for unlawful acts are void.

3.1.3 Government Relationship to Contractors

Transactional. Each party enters with distinct incentives (contractor profit versus government outcomes); avoid unauthorized commitments.

Professional. Both teams must understand the contract and collaborate to meet requirements.

Collaborative. Contractors bring technical expertise while programmatic decision-making remains inherently governmental.

Constrained. Interactions are bound by ethics rules, conflicts-of-interest standards, and contract clauses.

3.1.4 FAR System and NAVSEA Overlays

FAR. Government-wide acquisition regulation establishing policy, procedures, and contract clauses [24].

Defense Federal Acquisition Regulation Supplement (DFARS). DoD-level supplement tailoring FAR provisions for defense-unique requirements, including competition, source selection, and industrial base policy [28].

Navy Marine Corps Acquisition Regulation Supplement (NMCARS). DON supplement that adds Navy-specific directives such as approval thresholds, peer reviews, and templates [29].

SUPSHIP Operation Manual (SOM) Chapter 3. NAVSEA guidance for Supervisor of Shipbuilding (SUPSHIP) on contract formation, modification, and surveillance [30].

NAVSEA Source Selection Guide. Standardizes competitive source selection procedures, roles, and documentation for SYSCOM procurements [31].

NAVSEA Contracts Handbook. Practical desk reference covering policy interpretations, clause usage, and best practices for NAVSEA contracting professionals [32].

3.1.5 Types of Contracting Officers (Know All Three)

Procuring Contracting Officer (PCO). Leads acquisition planning through award; signs contracts and bilateral modifications on behalf of the Government.

Administrative Contracting Officer (ACO). Oversees post-award administration, surveillance, and contractor performance; typically assigned via Defense Contract Management Agency (DCMA) or NAVSEA field offices.

Termination Contracting Officer (TCO). Manages partial or complete contract terminations, settlement proposals, and equitable adjustments.

All contracting officers must hold a warrant that delineates dollar and authority limits; only a warranted Contracting Officer (KO) can obligate the United States [24].

3.1.6 PM and KO Partnership

PM. Accountable to the Milestone Decision Authority (MDA) for cost, schedule, and performance; integrates technical authority, requirements, and budget execution across the lifecycle.

KO. Provides acquisition strategy execution expertise, ensures compliance with statute/regulation, and is responsible for contract integrity and enforceability.

Board Cue. PMs lead program outcomes; KOs safeguard the contracting instrument. Neither can assume the other's authorities, so coordination before solicitations, negotiations, or modifications is mandatory.

3.1.7 Competition in Contracting Act Requirements

Full and Open Competition. Default posture: all responsible sources may compete [24, 33].

Full and Open After Exclusion of Sources. Permits set-asides (e.g., small business, 8(a)) or alternate-source strategies when justified [24].

Approval for Other than Full and Open. Requires documented justification and senior approval per Subpart 6.3 [24, Subpart 6.3].

Seven Exceptions to Full and Open Competition (Memorize)

1. Only one responsible source will satisfy agency requirements (see [24, § 6.302-1]).
2. Unusual and compelling urgency (see [24, § 6.302-2]).
3. Industrial mobilization; engineering, developmental, or research capability (see [24, § 6.302-3]).
4. International agreement (see [24, § 6.302-4]).
5. Authorized or required by statute (see [24, § 6.302-5]).
6. National security (see [24, § 6.302-6]).
7. Public interest (see [24, § 6.302-7]).

Hint

Be ready to cite an example scenario for each exception and the approval level required.

3.1.8 Responsiveness, Responsibility, and Key Determinations

Responsiveness (sealed bidding). Bid must conform to all material terms of the Invitation for Bids; nonconforming bids are rejected without discussion [24].

Responsibility. Prospective contractor must possess adequate resources, schedule compliance, performance record, integrity, and necessary systems to receive award ([24, § 9.104]).

3.1.9 J&A v.s. D&F

J&A. Documents the rationale for other-than-full-and-open competition, identifies the chosen statutory exception, and records approval by the appropriate official. Must be posted to <https://sam.gov> after award with required redactions [24].

D&F. Formal determination that specific conditions are satisfied before taking an action (e.g., use of special contract types, multiyear contracting); states the findings that support the determination [24].

Note

At the NRO, documents and rational are post on the low and high-side Acquisition Research Center (ARC) . We are required to post other-full-and-Open compeition for five days on the ARC to allow opportuniy for other contractors to bid.

3.1.10 Who Signs D&Fs (and When)

General Rule. [24, § 1.704] requires the contracting officer to sign Determinations and Findings (D&Fs) when the action is within their delegated authority, unless a higher approval level is specified elsewhere in the regulation or delegation memo.

Head Contracting Activity (HCA). [24, §§ 16.603-3, 16.504(c)(1)(ii)(D)] reserve approval for actions such as issuing a letter contract or awarding a single-award task/delivery IDIQ expected to exceed \$100M; DON HCAs may redelegate no lower than a flag/Senior Executive [29, § 5201.707].

SAE. Multiyear contracting, extraordinary contractual relief, or other actions identified in [24, § 17.105-1] and [28, § 217.172] require a D&F signed by the Service SAE (ASN(RD&A) for the Navy, who is also the DON Senior Procurement Executive) or a specifically delegated official.

Document Content. Every D&F must cite the specific statutory/regulatory authority, describe supporting facts, and state the determination in clear language; expiration dates and any required follow-on reviews must also be included per [24, § 1.707] and [29, § 5201.707] guidance.

3.2 Solicitation Preparation

- Refs:** [24] “Federal Acquisition Regulation (FAR)” 2025.
[25] *DoDI 5000.85*, Aug. 6, 2020.
[28] “Defense Federal Acquisition Regulation Supplement (DFARS)” 2025.
[29] “Navy Marine Corps Acquisition Regulation Supplement (NMCARS)” 2025.
[31] *NAVSEA Source Selection Guide*, Aug. 1, 2022.
[32] *NAVSEA Contracts Handbook*, May 1, 2023.
[34] “3.2.2. Solicitation Preparation” Mar. 25, 2025.
[35] *10 U.S.C. § 4021: Prototype projects: other transaction authority*, 2023.
[36] *10 U.S.C. § 4022: Follow-on production contracts or transactions*, 2023.
[37] *15 U.S.C. § 638: Small Business Innovation Research program*, 2023.

3.2.1 Summary

Uniform Contract Format (UCF) scaffolding. Tailor the UCF (Sections A through M) so Section C defines the requirement, Section L tells offerors how to respond, and Section M mirrors evaluation factors and the stated basis of award [24, 34].

Release readiness. Do not release the Request for Proposal (RFP) until the acquisition plan/strategy is approved, funds are certified, legal review is complete, synopsis rules are satisfied, and the source-selection teams are chartered [24, 29, 34].

Communication discipline. Request for Informations (RFIs), draft RFPs, industry days, and Q&A all flow through the KO; once released, clarifications must be shared with all offerors through written amendments or controlled exchanges [24, 34].

3.2.2 Practitioner Steps

1. Finalize the requirement package (spec /Statement of Work (SOW), Contract Data Requirements Lists (CDRLs), Independent Government Cost Estimate (IGCE), market research report) with IPT concurrence and Small Business coordination documentation [24, 34].
2. Structure Section L instructions: volumes, page limits, submission medium, proposal due date, classification controls, and [24, § 5.203] synopsis timing.
3. Align Section M evaluation factors, subfactors, and relative importance statements with the basis of award (Lowest Price Technically Acceptable (LPTA) v.s. trade-off) and rating methodology approved by the Source Selection Authority (SSA), KO, legal, and cost/price community [24, 31].
4. Verify pre-release approvals and postings: acquisition plan or strategy, Determination of Acquisition Strategy (as applicable), certified funds, and <https://www.SAM.gov> synopsis [29, 34].

5. Manage amendments and records after release: capture bidder Q&A, issue conformed RFPs, adjust milestones when requirements shift, and file every action in the official contract record [24, 32].

3.2.3 Checklist

- Acquisition plan/strategy signed; conformed requirements package appended [29].
- Funding document (Purchase Request (PR) , project order, or MIPR) signed and funds certified for the planned obligation [24].
- Market research report and Small Business Coordination Record approved [24].
- Source Selection Plan endorsed by SSA, legal, and cost/price; nondisclosure/OCI statements executed for SSA, Source Selection Advisory Council (SSAC) , Source Selection Evaluation Board (SSEB) , and advisors [31].
- Section L instructions mirror Section M factors, include proposal structure, late proposal policy, and submission portal guidance [24].
- <https://www.SAM.gov> synopsis posted (15 days before closing for most supplies/services; 30 days for R&D unless justified) [24].
- Amendment template/change log prepared; routing matrix established for expedited approvals [32].

3.2.4 Navy Overlays and Tailoring

NMCARS overlays. Follow [29, § 5205.303/5205.301] for synopsis exceptions and NAVSEA contracting notices for Contract Requirement Package checklists and release approvals [29, 32].

Technical data. Coordinate with TA on [28, § 252.227] clauses, distribution statements, and CDRL tailoring to protect Navy equities.

Shipbuilding tailoring. For availabilities, modernization, or planning efforts, ensure Section C and the WBS matches the avail sequence and integrates warfare-center technical direction and installation responsibilities [34].

3.2.5 Industry Engagement & Communications

Pre-release. RFIs, sources-sought notices, draft RFPs, and industry days are vetted through the KO; responses shared with all potential offerors to avoid unequal access [24].

Post-release. Clarifications and Q&A must be issued as amendments for all offerors; exchanges stay within [24, § 15.201] boundaries until competitive range is established [32].

Small business focus. Coordinate with the Small Business Professional and Competition Advocate on set-aside decisions, subcontracting plan reviews, and mitigation of potential limitations on subcontracting [24].

3.2.6 Documentation & Approvals to Capture

- Signed Source Selection Plan and SSA/SSAC/SSEB appointment letters with confidentiality and OCI certifications [31].
- Competition Advocate memoranda where narrowed sources or synopsis deviations are requested [24, 29].
- Legal sufficiency memorandum for the conformed solicitation (Sections C, H, L, and M) retained in the contract file [32].
- KO release memorandum noting solicitation number, issue date, amendment log, and proposal due date/time [34].

3.2.7 Competitive Method Selection: Sealed Bidding v.s. Negotiated Procurement

Sealed bidding (FAR Part 14). Preferred when requirements are well-defined, award will be based on price alone, discussions are not needed, and the Government expects to receive more than one responsive bid. It uses public opening, responsiveness determinations, and fixed-price awards [24, Part 14].

Negotiated procurement (FAR Part 15). Used when the Government needs to evaluate technical approach or past performance, intends to conduct discussions, or when requirements or pricing demand flexibility. Negotiated acquisitions support best-value trade-offs and cost-reimbursement vehicles [24, Part 15].

When to choose. If the team can describe performance in terms of precise specifications with minimal risk and expects no need for exchanges, sealed bidding streamlines award. When innovation, risk, or integration complexity requires subjective evaluation, or when schedule/budget changes are likely, negotiated procurement is mandatory [24, 31].

3.2.8 Contract Type Landscape and Risk Allocation

Fixed-price family. Contractor accepts the cost risk; Government locks price once requirements are stable. Includes:

- **Firm-Fixed-Price (FFP)** : Used for mature, low-risk requirements, often in Production and Deployment [24, 25].
- **Fixed-Price Incentive (Firm Target) (FPIF)** : Shares cost variance through a negotiated share ratio; encourages cost control while keeping final price bounded by a ceiling. Used during Engineering & Manufacturing Development (EMD) or Low-Rate Initial Production (LRIP) when cost risk remains but production discipline is needed [24, 25].
- **Fixed-Price with Economic Price Adjustment (FPEPA)** : Adds indexed adjustments for volatile commodities or long-lead items [24].
- **Fixed-Price Redetermination (FPR)** : Re-prices after defined milestones when initial uncertainty is expected to retire [24].

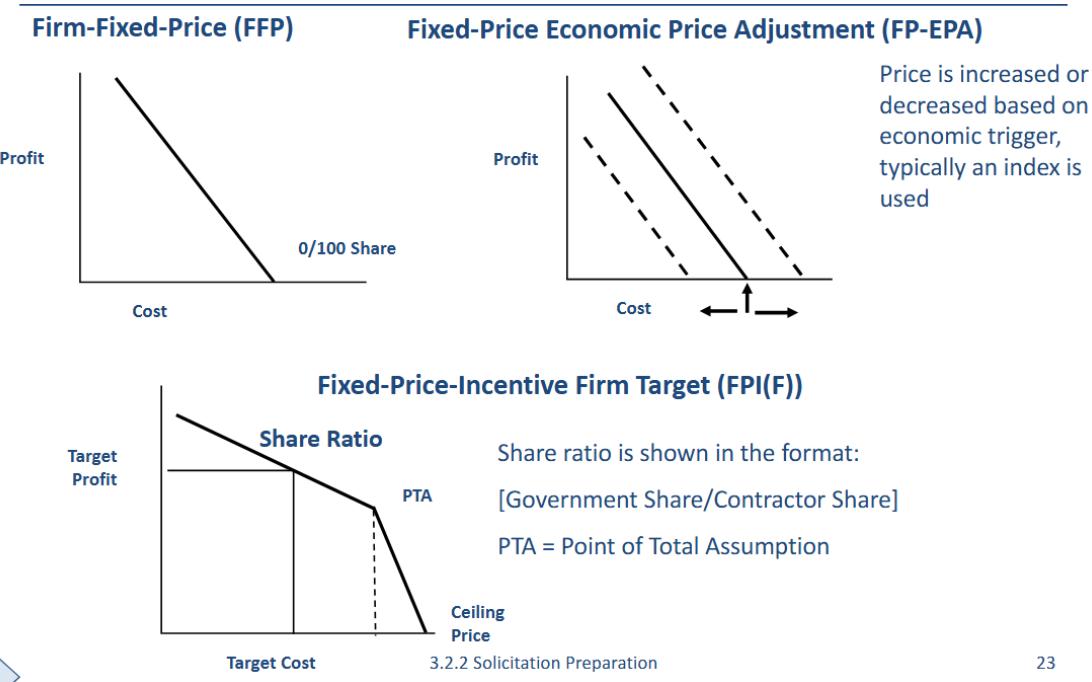
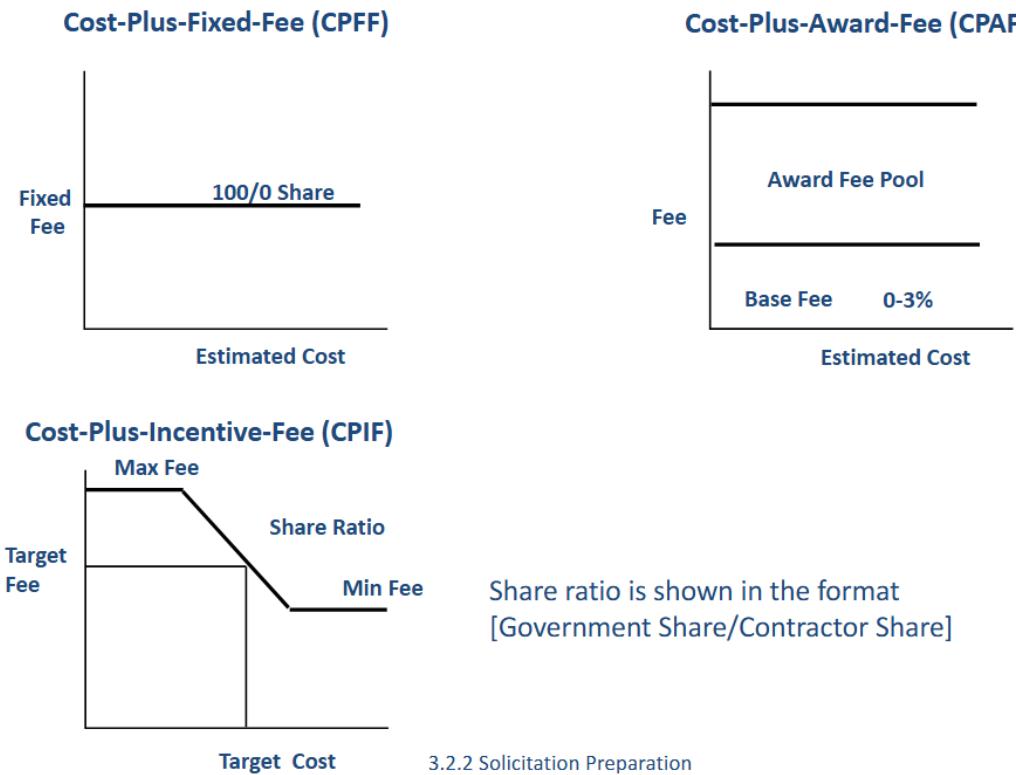


Figure 3.1. Fixed-price incentive geometry (cost, profit, Point of Total Assumption (PTA)).

Cost-reimbursement family. Government carries more cost risk; contractor must deliver best effort. Includes:

- **Cost-Plus-Fixed-Fee (CPFF)** : Used in early R&D or prototyping (MSA/TMRR) when effort is exploratory [24, 25].
- **Cost-Plus-Incentive-Fee (CPIF)** : Shares cost variance similar to FPIF but without a price ceiling; encourages efficiency while acknowledging uncertain cost baseline [24].
- **Cost-Plus-Award-Fee (CPAF)** : Adds subjective award-fee evaluation for mission effectiveness or management performance that cannot be captured in objective metrics [24].



3.2.2 Solicitation Preparation

Figure 3.2. Cost-reimbursement contract risk/fee characteristics. Source: 3.2.2. Solicitation Preparation, 2025 [34].

Award v.s. incentive fees. Incentive fees (cost or performance) are calculated from predetermined formulas tied to measurable outcomes (cost, schedule, technical). Award fees are earned through periodic board evaluations against tailored factors and may be unearned if performance is merely satisfactory [24, 32].

Award-fee governance. The Award Fee Determining Official (often the PM or SSA designee) chairs an Award Fee Board, uses the approved plan, and issues a determination memo. Fees are paid after each period and must be commensurate with value delivered; scores below the threshold earn zero dollars for that segment [24, 31].

MCA phase alignment. MSA and TMRR generally use CPFF or CPAF because of design uncertainty; EMD can transition to CPIF or FPIF as risk retires; Production and Deployment favors FFP/FPIF; Operations and Support relies on FFP or FFP Level of Effort (LOE) and can incorporate sustainment IDIQs for depot work [25].

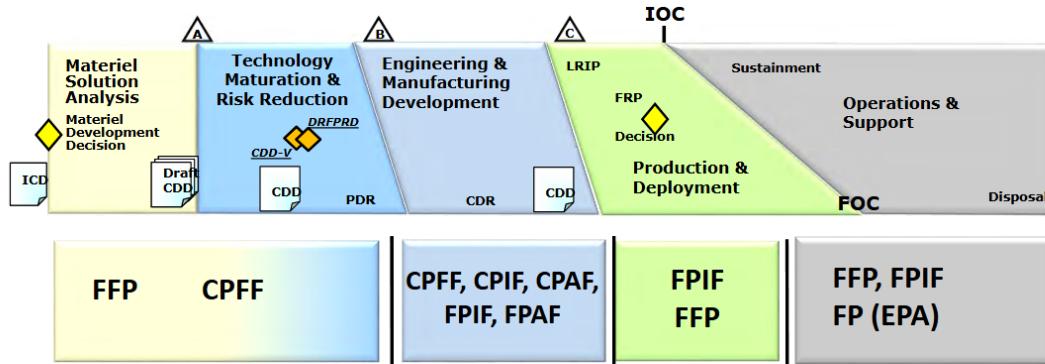
MSA. Analytical trades and early prototypes benefit from CPFF flexibility as requirement scope evolves.

TMRR. CPIF/CPAF maintain incentives while the Government still absorbs major technical risk during competitive prototyping.

EMD. FPIF or CPIF balance contractor motivation and cost control once the design stabilizes, with ceilings to protect the Government.

PD. FFP/FPIF dominate because production baselines and learning curves are known; contractor should own execution risk.

OS. Sustainment leverages FFP, FFP LOE, or IDIQs task orders to manage repeatable workloads and retain competition for modernization.



CPFF= Cost-Plus-Fixed-Fee CPIF= Cost-Plus-Incentive-Fee FFP = Firm-Fixed-Price
 CPAF= Cost-Plus-Award-Fee FPIF= Fixed-Price-Incentive-Firm FP (EPA) = Fixed-Price Economic Price Adjustment

Figure 3.3. Contract-type emphasis across MCA phases.

3.2.9 Fixed-Price Incentive (Firm Target) Mechanics

Share ratio. Defines how cost overruns or underruns are split between Government and contractor (e.g., 70/30 means Government absorbs 70%

Point of total assumption (PTA). The cost point beyond which every additional dollar of overrun is borne entirely by the contractor:

$$PTA = \frac{\text{Ceiling Price} - \text{Target Cost}}{\text{Government Share Ratio}} + \text{Target Cost.}$$

Example. Target cost \$100M, target profit \$10M (target price \$110M), ceiling price \$120M, share ratio 70/30. If actual cost is \$112M:

$$\text{Contract price} = \$110M + 0.3 \times (\$100M - \$112M) = \$106.4M.$$

The PTA occurs at \$113.3M; beyond that, profit erodes dollar-for-dollar until exhausted [24, 32].

3.2.10 Indefinite & Flexible Contract Forms

IDIQ. Indefinite-Delivery, Indefinite-Quantity contracts provide flexibility in quantity and timing with task/delivery orders; suited for recurring installations, sustainment, or services [24].

Time-and-Materials (T&M) / Labor-Hour (LH). Hybrid vehicles when it is not possible to estimate effort precisely; require ceiling price, surveillance, and justification because Government assumes cost risk on labor hours [24].

Undefinitized contract actions (Undefinitized Contract Actions (UCAs)). Letter contracts or other actions authorized before all terms are settled (e.g., urgent ship repair). Must be definitized within the regulatory timeline, with strict management for obligation limits and profit [24, 28, 29].

3.2.11 Debriefings and Protests (Forums and Timelines)

Debriefings. Post-award (and certain pre-award) debriefings are conducted per [24, § 15.506]. For DoD enhanced debriefings, the question period extends the debrief conclusion for protest timeliness purposes; verify current Class Deviation guidance.

Protest forums. (i) Agency-level to the contracting activity (KO/Head of Contracting Activity) [24, § 33.103]; (ii) GAO bid protests [24, § 33.104]; (iii) U.S. Court of Federal Claims (COFC) under 28 U.S.C. § 1491(b).

Who handles them. Agency: procuring activity and counsel; GAO: GAO decides, agency produces the record and implements any stay; COFC: Department of Justice litigates, COFC judge adjudicates and may grant injunctive relief.

Timelines (common rules). Pre-award challenges to solicitation terms must be filed before the proposal due date. For post-award protests at GAO: file within 10 calendar days of when the basis is known, or within 5 business days after debriefing conclusion to obtain an automatic stay of performance under CICA. Agency-level protest timeliness follows similar 10-day knowledge rules in [24, § 33.103]. COFC has no fixed day-limit but relief is equitable; prompt filing is expected.

3.2.12 Why Cost-Plus After LRIP? (PD and O&S Exceptions)

High residual technical risk. Post-LRIP, major engineering change proposals, tech refresh, or obsolescence-driven redesign can reintroduce uncertainty better handled under CPIF/CPAF than FFP.

Unstable scope or emergent defects. Corrective actions discovered during Initial Operational Test and Evaluation (IOT&E) /early fielding may require iterative investigation and rework where a best-effort *cost-reimbursable* vehicle protects schedule and access to talent.

Sustainment stand-up. Initial depot activation, organic transition, or complex Performance-Based Logistics (PBL) standing up new measurements and data flows can warrant short-duration CPFF/CPAF with incentives while processes stabilize.

Data rights/technical baseline gaps. Where the Government lacks detailed technical data to price FFP confidently, a temporary cost-plus arrangement with aggressive CDRL deliverables can bridge to FFP.

Governance. Treat as exceptions with a plan to transition to FFP/FPIF once uncertainty retires; document rationale in the Acquisition Strategy and obtain approvals consistent with [24, 28].

3.2.13 Simplified Acquisition and Small Business Programs

Simplified Acquisition Threshold (Simplified Acquisition Threshold (SAT)). Generally \$250,000 (higher in contingency or overseas circumstances). Benefits include streamlined competition, quotation-based awards, and mandatory small-business reservations above the micro-purchase threshold [24].

Small Business Administration (Small Business Administration (SBA)) programs. FAR Part 19 [24, Part 19] implements 8(a), Historically Underutilized Business Zone (HUBZone) , Service-Disabled Veteran-Owned Small Business (SDVOSB) , and Women-Owned Small Business (WOSB) programs. The contracting officer must consider set-asides, sole-source thresholds, and subcontracting plans to meet DON goals.

3.2.14 Alternative Acquisition Authorities

Other Transaction (Other Transaction (OT)) agreements. Authorized by 10 U.S.C. § 4021 (prototype) and § 4022 (follow-on production) to rapidly engage nontraditional performers, provided cost share or significant participation criteria are met [35, 36].

Small Business Innovation Research (Small Business Innovation Research (SBIR)). 15 U.S.C. § 638 establishes Phase I (feasibility), Phase II (prototype), and Phase III (commercialization/production). SBIR awards leverage R&D funds to deliver Navy-unique technology with data rights protections for five years [37].

3.2.15 Technical Data Rights Overview

Unlimited rights. Government may use, disclose, and authorize others without restriction (typically for data developed exclusively at Government expense) [28].

Government purpose rights. Government may use or authorize contractors for Government purposes for five years, after which rights convert to unlimited. Applies to mixed-funding developments [28].

Limited/Restricted rights. Contractor retains control; Government use is constrained to internal purposes (limited for noncommercial technical data, restricted for commercial computer software). Negotiated licenses or specifically negotiated licenses can expand access [28].

3.2.16 Uniform Contract Format Essentials

Sections A through H (contract). Cover Standard Form 33, supplies/services, packaging, inspection, delivery, special contract requirements, clauses, and attachments [24].

Sections I through K (legal/representations). Incorporate FAR/DFARS clauses, representations, certifications, and instructions for completion [24, 28].

Sections L and M (solicitation/Evaluation). Instructions to offerors, proposal structure, page limits, and evaluation criteria that must remain synchronized to any change to factors or relative order requires an amendment [24, 31].

3.3 Cost and Price Evaluation

- Refs: [24] “Federal Acquisition Regulation (FAR)” 2025.
[28] “Defense Federal Acquisition Regulation Supplement (DFARS)” 2025.
[38] “3.2.4. Cost and Price Evaluation” Dec. 18, 2024.

3.3.1 Summary

KO accountability. The KO must determine that every negotiated price is fair and reasonable, integrating price, cost, technical, field-pricing, and risk analysis inputs before award per FAR 15.404-1(a)(1)–(5) [24, § 15.404-1(a)].

Cost v.s. price lens. Use price analysis when certified cost or pricing data are not required, and escalate to cost analysis when element-by-element scrutiny is needed to support the prenegotiation objective [24, §§ 15.404-1(b), 15.404-1(c)].

Rate discipline. Forward pricing rates and structured profit analysis keep the Government prenegotiation objective current; the objective is always proposed cost plus profit or fee per FAR policy [24, §§ 15.401, 15.404–4, 15.407–3].

Financial health cue. Profitability ratios (Return on Sales (ROS), Return on Assets (ROA)) and cash-flow checks expose responsibility risk and focus Defense Contract Audit Agency (DCAA)/ DCMA field-pricing support requested by the KO [24, § 9.104-1] [38].

3.3.2 Practitioner Steps

1. Baseline the offeror’s proposal: confirm certified cost or pricing data requirements, request data other than certified cost or pricing data when warranted, and map contractual requirement traces [24, §§ 15.403-1, 15.404-1(a)].
2. Execute price analysis first—compare competition results, historical buys, catalog/commercial data, and independent estimates; pivot to cost analysis when price analysis alone cannot demonstrate reasonableness [24, §§ 15.404-1(b), 15.404-1(c)].
3. Decompose direct labor, material, and Other Direct Costs (ODCs); verify indirect pools and allocation bases; and apply the five allowability tests before accepting proposed cost elements [24, §§ 31.201-2, 31.202, 31.203].
4. Establish the profit/fee objective using the agency’s structured approach and update forward pricing rates or agreements as necessary to avoid stale factors in negotiations [24, §§ 15.404-4, 15.407–3].
5. Pull in field-pricing support early: blend DCAA audit results, DCMA production assessments, and program team technical evaluations into the prenegotiation briefing and contract file [24, § 15.404-1(a)(5)] [24, § 42.101(b)] [28, § 242.302(a)(13)(A)].

3.3.3 Proposed Price, Cost, Profit, and Fee

Proposed price. The offeror’s total price equals estimated cost plus any profit or fee applicable to the contract type [24, § 15.401].

Cost. Sum of allowable direct and indirect costs required to deliver the contract—all subject to reasonableness, allocability, and cost-principle limits [24, §§ 31.201-2, 31.202, 31.203].

Profit. Negotiated incentive element above allowable cost for fixed-price or incentive contracts, set through structured analysis [24, § 15.404-4(a)].

Fee. Fixed remuneration on cost-reimbursement vehicles that does not vary with actual cost (e.g., CPFF fee) [24, § 16.306(a)].

3.3.4 Direct and Indirect Cost Structure

Direct cost pools. Direct labor, materials, and ODCs traceable to a single final cost objective; charged through project-specific accounts backed by bills of material, timecards, travel authorizations, or subcontract quotes [24, § 31.202] [38].

Indirect cost pools. Overhead (manufacturing, engineering) and General and Administrative (G&A) accrued across multiple objectives, then allocated using consistent bases that reflect benefits received [24, § 31.203].

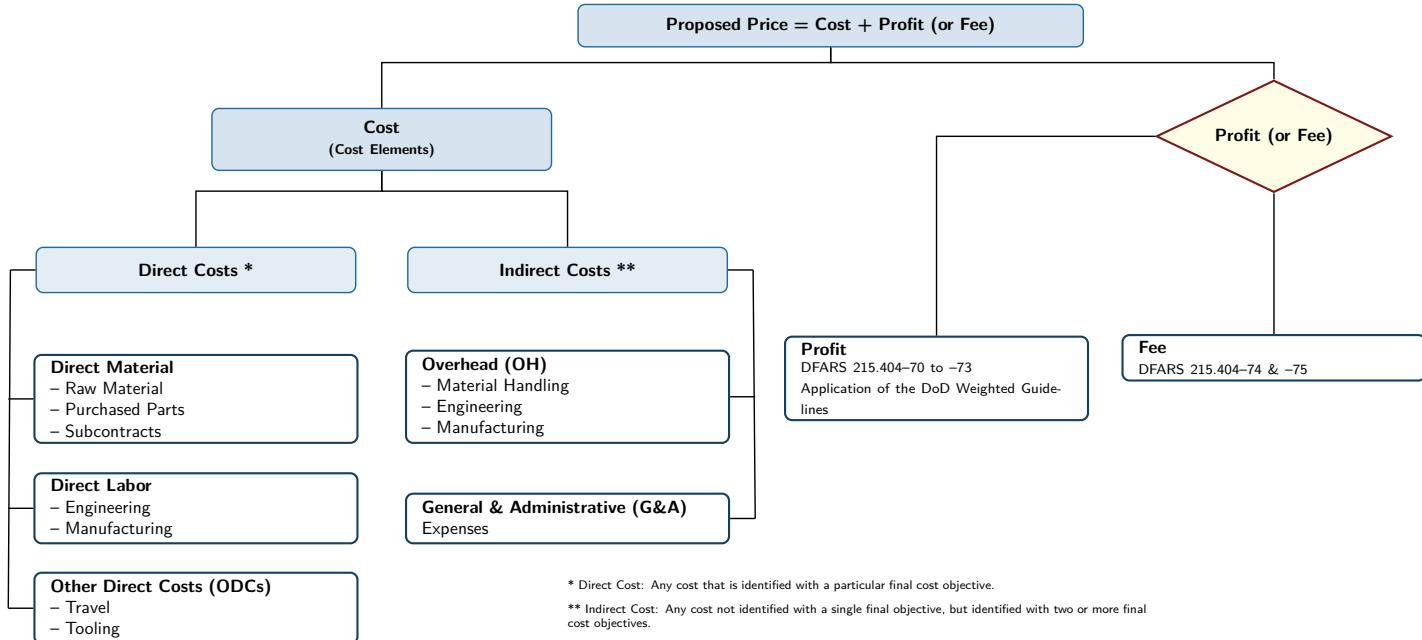


Figure 3.4. Mapping direct v.s. indirect contractor cost elements. Source: 3.2.4. Cost and Price Evaluation, 2024 [38]

3.3.5 Other Direct Costs and Cost Allowability

Other direct costs (ODCs). Travel, subcontract services, specialized tooling, and similar charges that can be singled out for the contract even though they are not labor or bulk material categories [24, § 31.202] [38].

Cost allowability. A cost is billable only if it is reasonable, allocable, consistent with applicable Cost Accounting Standards (CAS) / Generally Accepted Accounting Principles (GAAP) , compliant with contract terms, and within any Subpart 31.2 limitations [24, § 31.201-2].

Note

Slides may refer to “cash allowability”; FAR terminology is *cost* allowability.

3.3.6 Cost and Price Analysis

Price analysis. Examination of the total proposed price without breaking out cost elements using competition, historical buys, or market indicators [24, § 15.404-1(b)].

Cost analysis. Evaluation of individual cost elements (direct, indirect, and profit) when price analysis alone cannot demonstrate reasonableness [24, § 15.404-1(c)].

Integrated view. Technical analysis, field-pricing support, and risk assessments feed both techniques to substantiate the final fair and reasonable determination [24, § 15.404-1(a)(5)].

3.3.7 Forward Pricing Rates and Fully Burdened Labor

Forward Pricing Rate Proposal (FPRP). Contractor-submitted forward pricing rate proposal that lays out projected indirect rates and factors for the pricing period [24, § 15.407-3(a)].

Forward Pricing Rate Agreement (FPRA). Negotiated agreement-often executed by DCMA-that locks indirect rates for one to three years, reducing repetitive audits and speeding negotiations [24, § 15.407-3(c)] [38].

Fully burdened rate. Applies direct labor, indirect burdens, and any negotiated profit/fee to a common labor-hour baseline so skill mixes can be compared on an apples-to-apples basis [38].

3.3.8 Indirect Rate Math and Profitability Checks

Apply the standard relationships from the cost principles and the coursebook when validating proposals; they are board favorites for quick-turn computations covering indirect pools, Total Cost Input (TCI) , G&A, and profitability metrics such as ROS and ROA [24, §§ 31.201-2, 31.202, 31.203] [38].

$$\text{Indirect Cost Rate} = \frac{\text{Indirect Cost Pool}}{\text{Allocation Base}} \quad (3.1)$$

$$\text{TCI} = \text{Direct Cost} + \text{Overhead Cost} \quad (3.2)$$

$$\text{G\&A Cost} = \text{G\&A Rate} \times \text{TCI} \quad (3.3)$$

$$\text{Fully Burdened Labor Rate} = \frac{\text{Direct Labor Cost} + \text{Indirect Costs} + \text{Profit/Fee}}{\text{Direct Labor Hours}} \quad (3.4)$$

$$\text{ROS} = \frac{\text{Operating Profit}}{\text{Net Sales}} \quad (3.5)$$

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \quad (3.6)$$

Track ROS and ROA against industry benchmarks, cash-on-hand, and debt loads to detect responsibility concerns or unsustainable buy-ins before negotiations [38].

3.3.9 Oversight and Field Pricing Support

DCMA production insight. Delegated contract administration offices deliver manufacturing surveillance, schedule risk analysis, and forward-pricing coordination; DFARS highlights that payment authority stays with the buying command even when DCMA supports rates [28, § 242.302(a)(13)(A)] [38].

DCAA audit coverage. DCAA is the responsible Government audit agency for most contractors, providing proposal adequacy reviews, incurred cost audits, and financial capability analyses [24, § 42.101(b)].

Integrated negotiation record. Document how DCMA, DCAA, technical, and program inputs influenced the prenegotiation objective and the final price reasonableness determination [24, § 15.404-1(a)(5)] [38].

3.3.10 Checklist

- File both price and cost analysis results (including technical inputs) showing how the fair-and-reasonable price was determined [24, § 15.404-1].
- Verify each significant cost element passes the five allowability tests and that allocation bases match current practice [24, §§ 31.201-2, 31.203].
- Confirm the current FPRA/FPRP is in the file or document why legacy rates remain valid [24, § 15.407-3].
- Capture DCAA audit opinions, DCMA rate guidance, and profitability ratio trends in the prenegotiation briefing to evidence responsibility diligence [24, §§ 9.104-1, 42.101(b)] [38].

3.4 Earned Value Management (EVM)

Refs: [25] DoDI 5000.85, Aug. 6, 2020.

[28] “Defense Federal Acquisition Regulation Supplement (DFARS)” 2025.

[39] “3.6.1. Introduction to EVM” Mar. 26, 2025.

[40] “3.6.2. EVM Data Analysis” Mar. 26, 2025.

3.4.1 What EVM is

Earned Value Management (EVM) is a project management technique that integrates scope, schedule, and cost to assess project performance and progress. It provides a quantitative measure of project performance by comparing the planned work with the actual work completed and the associated costs. EVM is widely used in government and defense projects to ensure that projects are delivered on time and within budget.

3.4.2 Key Components of EVM

Core cost and schedule metrics establish the earned value performance baseline [39, 40].

Planned Value (PV) / Budgeted Cost of Work Scheduled (BCWS): The budgeted cost for the work scheduled to be completed by a specific date.

Earned Value (EV) / Budgeted Cost of Work Performed (BCWP): The budgeted cost for the work actually completed by a specific date.

Actual Cost (AC) / Actual Cost of Work Performed (ACWP): The actual cost incurred for the work completed by a specific date.

Budget at Completion (BAC): The total budget allocated for the project.

Estimate at Completion (EAC): The forecasted total cost of the project based on current performance.

Cost Performance Index (CPI): A measure of cost efficiency, calculated as $CPI = EV/AC$. A CPI less than 1 indicates a cost overrun.

Schedule Performance Index (SPI): A measure of schedule efficiency, calculated as $SPI = EV/PV$. An SPI less than 1 indicates a schedule delay.

Schedule Variance (SV): The difference between the earned value and the planned value, calculated as $SV = EV - PV$. A negative SV indicates a schedule delay.

Cost Variance (CV): The difference between the earned value and the actual cost, calculated as $CV = EV - AC$. A negative CV indicates a cost overrun.

Info

The first three are equivalent terms and should know both. This guide will use the first set (PV, EV, AC)

3.4.3 When to Use EVM

EVM is mandated on cost or incentive contracts (and applicable subcontracts) when the program meets the policy thresholds and the effort is discretely measurable [28, 39]. Key decision points for the PM include:

\$100 million and above: Implement the full ANSI/EIA-748 standard and ensure the contractor's system is formally validated by DCMA.

\$20 million to \$99.9 million: Implement ANSI/EIA-748 guidelines, with validation required when performance indicates risk.

Additional policy considerations [25, 39]:

- Applicability determinations must confirm the work scope can be discretely measured before mandating EVM.
- The Milestone Decision Authority may approve EVM on FFP, time-and-materials, or LOE contracts, but such use is discouraged absent clear benefit.
- For efforts below \$20 million, the PM conducts a risk-based cost-benefit analysis to decide whether EVM adds value.
- Contracts that require EVM must also deliver Integrated Program Manager's Data Analysis Report (IPMDAR) data and complete an IBR within six months of award.

3.4.4 EVM Compliance

EVM clauses are flowed in the solicitation and award package (DFARS 252.234-7001 and 252.234-7002) alongside the Contractor Business Systems clause (DFARS 252.242-7005) to anchor validation and surveillance requirements [28]. Compliance expectations [25, 39]:

- The program office integrates EVM planning into the WBS, maintains the Performance Measurement Baseline, and ensures timely receipt and analysis of IPMDAR submissions.
- DCMA leads EVM system acceptance, validation, and ongoing surveillance against ANSI/EIA-748 and the DoD EVM Implementation Guide; DCAA supports with accounting system audits.
- Service focal points such as Acquisition Data and Analytics and the DON Center for EVM adjudicate applicability determinations and coordinate policy updates.
- SUPSHIP can execute validation and surveillance responsibilities for shipbuilding programs on behalf of DCMA.

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- SUPSHIP can execute validation and surveillance responsibilities for shipbuilding programs on behalf of DCMA.

3.4.6 EVM Principal Players

Programmatic, contracting, and oversight roles synchronize to sustain disciplined performance management [39].

PMO: Implements EVM on the contract, ensures solicitations and awards contain the required clauses, and works with the contracting activity to tailor reporting and Integrated Master Schedule (IMS) requirements.

DCMA: Serves as the DoD EVM Executive Agent by validating, accepting, and surveilling contractor systems, maintaining the official acceptance roster, and analyzing IPMDAR and schedule submissions (including the 14-point IMS review) to focus government attention on emerging issues.

DCAA: Conducts accounting system audits, corroborates cost data, and supports DCMA during surveillance events and reviews.

Acquisition Data and Analytics (ADA): Acts as the department-wide focal point for EVM policy, guidance, and competency management; issues interpretations to maintain consistent application across programs.

DON Center for EVM: Coordinates applicability determinations with the Deputy Assistant Secretary of the Navy for Acquisition Policy and Budget and the Office of the Secretary of Defense, and serves as the Navy's central point of contact for EVM matters.

SUPSHIP: Performs many DCMA/DCAA surveillance roles for shipbuilding contracts when delegated by the cognizant program office.

3.4.7 PMB

Figure 3.5 shows the characteristic S-curve depicting cumulative PV/BCWS, while Figure 3.6 summarizes the progression from defining the SOW to final Performance Measurement Baseline (PMB) adjustments. PMBs are:

- Scoped, scheduled, and budgeted plans for the authorized work
- Time-phased budgets that align to the master schedule
- The basis for cost and schedule performance management
- Effectively the PV for the entire project

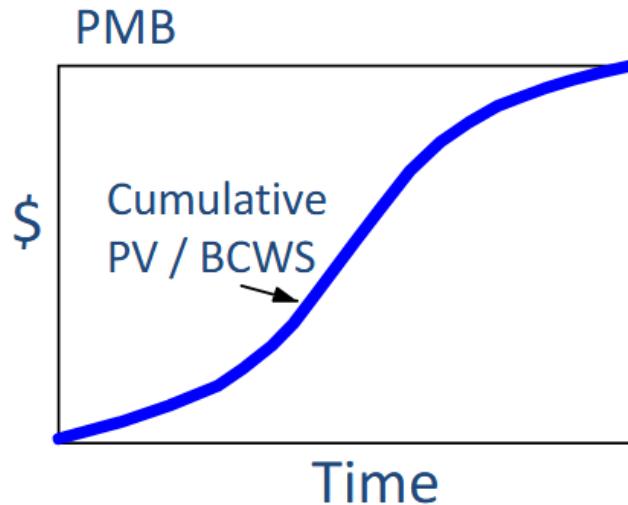


Figure 3.5. PMB Cost v.s. Time chart showing the "S"-curve. Source: 3.6.1. Introduction to EVM, 2025 [39].



Figure 3.6. The development flow for PMB. Source: 3.6.1. Introduction to EVM, 2025 [39].

PMB Development

STEP 1: *Define all work.* Decompose the effort using the WBS and align it with the organizational structure. Control accounts are the natural management points where Control Account Managers (CAMs) are assigned, and each control account contains work packages and (if needed) planning packages.

STEP 2: *Schedule the work.* Develop the integrated schedule (often visualized with Gantt charts) that sequences the WBS elements, includes key milestones, and forms the backbone of the time-phased budget.

STEP 3: *Budget the work.* Assign time-phased budgets to each work package, establish management reserve for in-scope known unknowns, and confirm that the sum of the control accounts equals the contract budget base.

Changes to the PMB must be formally controlled and documented. Reasons for changes include:

- Contract changes
- Internal replanning
- Formal reprogramming

3.4.8 EVM Reviews and Reports

Formal reviews validate the integrity of EVM data products before and after system acceptance [39].

Post-Acceptance Review

- Objective: ensure performance data remain accurate after system acceptance and identify any corrective actions required to reaffirm compliance.
- Timing: conducted as needed following system acceptance and prior to the next IBR.
- Led by the Review Director (typically DCMA) with membership tailored to the purpose of the review.
- Culminates in a formal report prepared by the Review Director.

Initial Compliance Evaluation

- Objective: validate that the Contractor's EVM system description matches actual practice and satisfies the EVMS criteria.
- Timing: executed prior to the initial IBR (and subsequently only if needed).
- Led by the DCMA Review Director with cross-functional support as required.
- Results documented in a report signed by the Review Director.

Integrated Baseline Review

- Participants: the contractor, PM and deputy, DCMA/DCAA/SUPSHIP personnel, and relevant technical staff.
- Purpose: joint assessment to verify the realism and accuracy of the PMB, confirm the entire technical scope is captured, and ensure resources and schedules are achievable.
- Timing: conducted within six months of contract award (or major replanning event) in accordance with the DoD EVM Implementation Guide and service policy [39].

Integrated Program Management Data Analysis Report

This contractually required report delivers cost, schedule, and technical status derived from the Contractor's EVM system, enabling the PMO to identify performance problem areas and emerging risks. It is required on every contract that mandates

EVM and must be delivered at least monthly. The data set is tailored for each contract based on risk, size, and integration considerations, but the canonical formats are:

1. WBS (most common)
2. Organizational categories
3. Program Management Baseline
4. Staffing
5. Explanation and Problem Analysis
6. IMS

A Contract Funds Status Report (CSFR) complements the IPMDAR by providing funding (price) information that reconciles to the cost-focused earned value data [39].

Problems

When using EVM, the following are indications that a problem exists [40]:

- Use of management reserves
- Significant revisions to the PMB
- Zero variance
- Sudden change in trends
- Unreasonable Total Cost Performance Index (TCPI)

3.4.9 EVM Data Analysis

Figure 3.7 shows the S-curve representation of the EVM variables; the gaps between the curves are the cost and schedule variances that drive performance assessments [40].

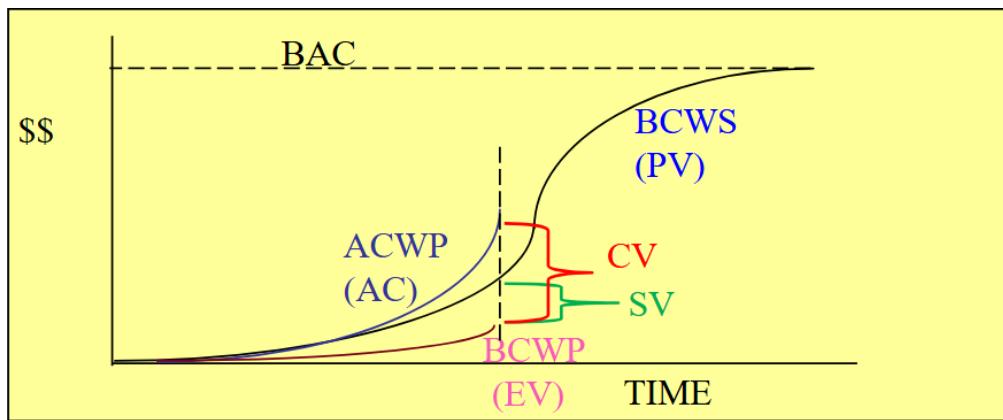


Figure 3.7. EVM chart showing the independent variables and variances. Source: 3.6.2. EVM Data Analysis, 2025 [40]

Data Analysis Steps

1. **Get current status:** capture the latest cost and schedule performance using CPI, SPI, and narrative explanations.
2. **Identify trends:** analyze indices and variance trajectories over time to highlight emerging risks and opportunities.
3. **Predict completion:** develop independent EAC and Variance at Complete (VAC) assessments to forecast final outcomes.
4. **Determine management actions:** decide where to apply resources, contract changes, or risk mitigations to recover performance [40].

Performance Measurement Techniques

Percent Complete: Applies to long-duration tasks lacking interim milestones; progress is reported as the earned value fraction of total budget.

Weighted Milestones: Uses milestone weights for long-duration tasks with clear waypoints, crediting earned value as milestones are completed.

Percent Start/Percent Finish: Suitable for short-duration tasks (less than two reporting periods) with credit apportioned at start and finish.

0/100 Method: Provides earned value only when the task is complete, offering a conservative measure for discrete, short tasks [40].

Equations

Standard cost and schedule performance calculations include [40]:

$$CV = EV - AC$$

$$SV = EV - PV$$

$$CPI = \frac{EV}{AC}$$

$$SPI = \frac{EV}{PV}$$

$$CV\% = \left(\frac{CV}{EV} \right) \times 100$$

$$SV\% = \left(\frac{SV}{PV} \right) \times 100$$

$$\% \text{ Complete} = \left(\frac{EV}{BAC} \right) \times 100$$

$$\% \text{ Spent} = \left(\frac{AC}{BAC} \right) \times 100$$

$$EAC = \frac{BAC}{CPI}$$

$$EAC = AC + \frac{BAC - EV}{\left(\frac{EV}{AC} \right)_{3 \text{ months}}}$$

$$EAC = AC + \frac{BAC - EV}{CPI \times SPI}$$

$$EAC = AC + \frac{BAC - EV}{0.8 CPI + 0.2 SPI}$$

$$VAC = BAC - EAC$$

$$TCPI = \frac{\text{Work remaining}}{\text{Budget remaining}}$$

$$TCPI_{EAC} = \frac{BAC - EV}{EAC - AC}$$

$$TCPI_{BAC} = \frac{BAC - EV}{BAC - AC}$$

4 Defense Acquisitions

4.1 Acquisition Policy

- Refs:
- [2] SECNAVINST 5400.15D, Jan. 19, 2021.
 - [3] SECNAVINST 5000.2G, Apr. 8, 2022.
 - [24] “Federal Acquisition Regulation (FAR)” 2025.
 - [25] DoDI 5000.85, Aug. 6, 2020.
 - [27] “Adaptive Acquisition Framework” 2025.
 - [28] “Defense Federal Acquisition Regulation Supplement (DFARS)” 2025.
 - [29] “Navy Marine Corps Acquisition Regulation Supplement (NMCARS)” 2025.
 - [41] “3.3.1. Acquisition Policy and Players” Mar. 26, 2025.
 - [42] DoDD 5000.01, Sep. 9, 2020.
 - [43] DoDI 5000.02, Aug. 31, 2022.
 - [44] DoD Acquisition Guidebook.

4.1.1 Summary

Statute drives authority. Title 10 charges the Military Departments to equip the force, while each annual NDAA refreshes acquisition authorities and reporting duties—know the latest delegation trail before advising a board [41].

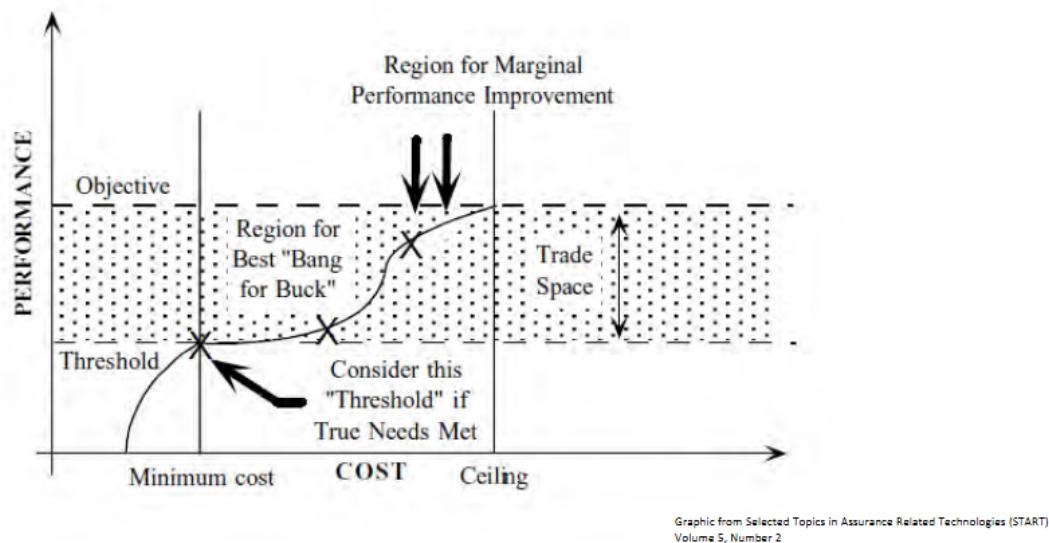
Policy = DoD 5000 series. DoDD 5000.01 establishes acquisition principles and senior roles; DoDI 5000.02 operationalizes the Adaptive Acquisition Framework (AAF) pathways; DoDI 5000.85 prescribes MCA execution details [25, 42, 43].

Regulation stack. FAR > DFARS > NMCARS translates statute and policy into enforceable contracting rules; SEC-NAVINST 5000.2G tailors the acaaf for acdon programs and makes ASN(RD&A) the SAE [3, 24, 28].

The main drivers that a PM must balance is cost, schedule, and performance as shown in Figure 4.1. The trade space for performance versus cost is shown in Figure 4.2, which shows the relation of performance and cost with the threshold and objective requirements.



Figure 4.1. The cost, schedule, and performance triangle that must be balanced and traded. Source: 3.3.1. Acquisition Policy and Players, 2025 [41].



3.3.1 Acquisition Policy and Players

Figure 4.2. Trade space of performance v.s. cost showing the range of viable options with the region of best “value.” Source: 3.3.1. Acquisition Policy and Players, 2025 [41].

4.1.2 Practitioner Steps (Board Prep Focus)

1. Confirm statutory authority and delegation: identify the Defense Acquisition Executive (DAE) (USD(A&S)) or delegated MDA, the SAE (ASN(RD&A)), and the resource sponsor accountable for the requirement [3, 41, 42].
2. Select the correct AAF pathway (or hybrid) and align entry/exit criteria, statutory reports, and decision forums (MS A/B/C, MDD, Business Case Analyses (BCAs), Congressional notices) [25, 43].
3. Map contracting rules to the pathway: FAR/DFARS clauses, competition requirements, and Tailored Acquisition Strategy approvals [24, 28, 41].

4. Crosswalk Navy overlays: SECNAVINST 5000.2G, SECNAVINST 5400.15D organization responsibilities, and PEO/DRPM charters for technical authority touchpoints [2, 3].
5. Prepare decision documentation: update the Acquisition Strategy /Systems Engineering Plan (SEP) /Test and Evaluation Master Plan (TEMP) , ensure statutory certifications (Clinger-Cohen, PPBE affordability caps) are current, and pre-brief the chain (Program Office → PEO → ASN(RD&A)) [25, 41].

4.1.3 Policy Stack and Authorities

Title 10, U.S.C. Establishes Service responsibilities (Subtitle C for DON organization, Subtitle A Part V for acquisition management) and empowers annual NDAs to adjust acquisition thresholds or pilot authorities [41].

DoD Directives/Instructions. DoDD 5000.01 sets acquisition principles, governance forums, and senior leader responsibilities; DoDI 5000.02 implements the AAF with six scalable pathways; DoDI 5000.85 gives MCA-specific statutory requirements (Joint Requirements Oversight Council (JROC) , cost reporting, baseline control) [25, 42, 43].

Regulations. FAR and DFARS governs all federal contracting; DFARS adds DoD-specific clauses (e.g., earned value, data rights, cybersecurity); NMCARS adds DON policy and ASN(RD&A) approval levels [24, 28, 29].

Service overlays. SECNAVINST 5000.2G tailors milestone documentation, Naval SYSCOM oversight, and Naval Accelerated Acquisition; SECNAVINST 5400.15D assigns PEO and SYSCOM responsibilities for acquisition program execution [2, 3].

Advisory guidance. The Defense Acquisition Guidebook (DAG) captures best practices—it is not directive authority, but boards expect you to know how it informs planning reviews and tailoring memoranda [44].

Info

Boards expect you to quote the controlling document *and* state who owns the decision. Memorize the policy ladder: Statute → Directive → Instruction → Regulation → Service overlay.

4.1.4 Acquisition Players and Decision Forums

DAE. USD(A&S) chairs the Defense Acquisition Board (DAB) , is MDA for ACAT ID/IAM programs unless delegated, and approves key acquisition policies [41, 42].

SAE. ASN(RD&A) serves as the DON SAE; appoints PEOs, assigns MDA for ACAT II and below, and ensures Navy acquisition compliance with DoD policy [2, 3].

Chief of Naval Operations/Resource Sponsor. Validates requirements and PPBE resourcing, provides integrated warfare/community priorities to ASN(RD&A) and the PEOs [41].

PEO/DRPM. Executes programs within delegated authorities; maintains acquisition baseline control, briefs ASN(RD&A) and DAB-level forums, and ensures SYSCOM technical authority integration [2, 25].

PM. Accountable for cost, schedule, performance; leads the IPT, maintains statutory certifications, and readies milestone documentation [25, 41].

Governance forums. Milestone Decision Reviews, the DAB, Configuration Steering Boards, Overarching IPTs, and Navy Program Executive Council reviews provide structured oversight and risk adjudication [25, 41, 42].

Note

Edge case: Rapid acquisition authorities (e.g., UCA) compress governance. Ensure delegation letters document any waived statutory certifications before you recommend skipping a DAB or ASN(RD&A) review [43].

4.1.5 Adaptive Acquisition Framework Pathways

The AAF can be visualized in Figure 4.3. The figure shows all six pathways with their purposes and general flow of the acquisition for each.

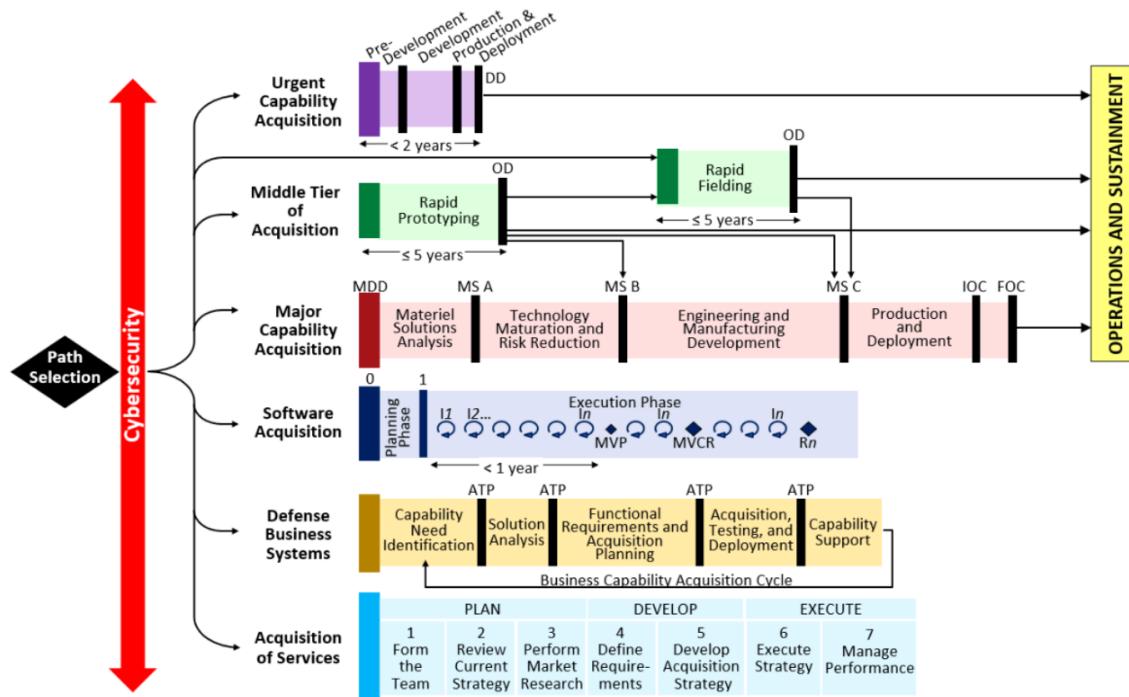


Figure 4.3. Adaptive Acquisition Pathways. Source: Adaptive Acquisition Framework, 2025 [27].

The MCA is the main acquisition pathway that EDOs will operate in. As shown in Figure 4.4, it can be broken down into five phases, four major decision points and three milestones.

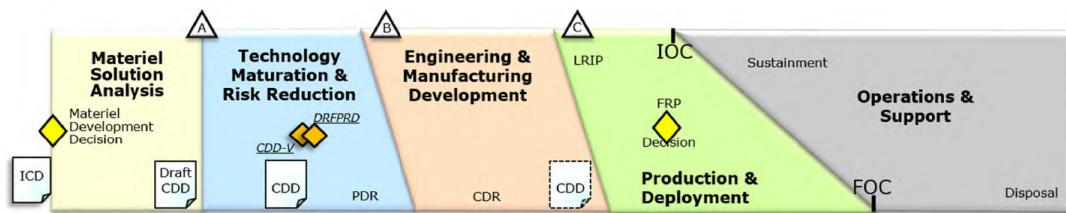


Figure 4.4. Major Capability Acquisition with phases, milestones, and decisions points. Source: 3.3.1. Acquisition Policy and Players, 2025 [41]

Major Capability Acquisition. Default for weapon systems; milestone-driven with statutory reports (SAR, DAES) and Live-Fire/TEMP requirements [25].

Middle Tier of Acquisition. Rapid prototyping (≤ 5 years to field) and rapid fielding pathways; report to USD(R&E)/USD(A&S) and Congress semi-annually [43].

Software Acquisition. Iterative DevSecOps delivery, tailored documentation (Software Acquisition Strategy) and continuous Authority to Operate emphasis [43].

Business Systems. Focuses on business process re-engineering, investment review board certification, and Clinger-Cohen Act compliance [43].

Defense Urgent Capability. Immediate warfighter needs; compressed oversight but still documents affordability and sustainment plans [43].

Services Acquisition. Managed via DoDI 5000.74 (referenced in DoDI 5000.02) with governance through functional domain leads; consider when an availability or modernization effort is better treated as a service [41, 43].

Info

Pathways can be combined (e.g., prototype under Middle-Tier then transition to MCA). Boards ask why your chosen path best fits cost/schedule urgency.

4.1.6 Navy Overlays and Touchpoints

SECNAVINST 5000.2G. Implements ASN(RD&A) Program Decision Meetings, requires risk-based tailoring plans, and codifies DON-level documentation (Acquisition Plan, Life-Cycle Sustainment Plan (LCSP) , POA&M) [3].

SECNAVINST 5400.15D. Aligns PEOs and SYSCOMs, clarifies technical authority (NAVSEA 05, NAVWAR 5.0) integration, and designates Deputy ASN(RD&A) portfolio responsibilities [2].

Resource Sponsor coordination. OPNAV N9, N4, or equivalent sponsor must endorse requirements and PPBE positions before ASN(RD&A) decisions [41].

Note

When SECNAV policy conflicts with older DoD memoranda, defer to the most current directive from the higher authority unless ASN(RD&A) grants written tailoring. Document the rationale in the Acquisition Strategy.

4.2 Milestones and Phases

- Refs: [25] *DoDI 5000.85*, Aug. 6, 2020.
[42] *DoDD 5000.01*, Sep. 9, 2020.
[43] *DoDI 5000.02*, Aug. 31, 2022.
[44] *DoD Acquisition Guidebook*.
[45] *DoDI 5000.80*, Dec. 30, 2019.
[46] *DoDI 5000.81*, Dec. 31, 2019.
[47] *DoDI 5000.87*, Oct. 2, 2020.
[48] *DoDI 5000.74*, Jan. 10, 2019.
[49] *DoDI 5000.75*, Jan. 24, 2020.
[50] *CJCSI 3470.01H*, Jan. 15, 2019.
[51] *CJCSI 5123.01H*, Aug. 31, 2018.
[52] *OPNAVINST 5000.42E*, Jul. 26, 2022.
[53] *10 U.S.C. § 4371: Critical cost growth in major defense acquisition programs*, 2023.
[54] “Technology Readiness Assessment Guide” Apr. 2020.

4.2.1 Defense Acquisition System Overview

The Defense Acquisition System (DAS) is the governance framework that aligns requirements, resourcing, and acquisition execution to deliver warfighter capability. It is policy-driven by DoDD 5000.01 and process-enabled through DoDI 5000.02, using the AAF to tailor pathways while preserving statutory oversight and Navy-unique controls [42, 43].

4.2.2 Adaptive Acquisition Framework Pathways (Board Snapshot)

MCA. Default for complex weapon systems; uses phased milestones with mandatory statutory certifications; emphasizes affordability trades, test rigor, and Navy two-pass / seven-gate touchpoints [25].

Middle Tier of Acquisition (MTA). Rapid prototyping or rapid fielding to deliver an operational capability within five years; minimizes documentation, but demands robust transition planning to MCA or sustainment funding [45].

Urgent Capability Acquisition (UCA). Accelerated path to field urgent capability within 2 years or provide an interim solution in less than 5; leverages tailored test, streamlined acquisition decision memoranda, and dedicated senior oversight [46].

Software Acquisition Pathway. Iterative, DevSecOps-focused delivery of software increments with continuous integration, enterprise cloud alignment, and recurring user feedback cadences [47].

Acquisition of Services Pathway. Structures service requirements, performance metrics, and contracting strategies to assure mission outcomes and oversight thresholds (e.g., Multi-Functional IPT requirements review)[48].

Defense Business Systems Pathway. Rationalizes business processes, data standards, and Business Capability Acquisition Cycle (BCAC) to unlock enterprise interoperability before investing in solutions [49].

Note

Pathways are not exclusive—an EDO may begin in MTA for prototyping, then transition to MCA for production once requirements and sustainment plans stabilize. Programs can also leverage UCA for an initial bridge while planning a transition to MCA.

4.2.3 Urgent Operational Needs Taxonomy

Joint Urgent Operational Need (JUON). Joint urgent gap requiring Combatant Commander sponsorship; validated by the Joint Rapid Acquisition Cell with rapid fielding oversight [50].

Joint Emergent Operational Need (JEON). Joint emergent gap tied to potential contingency; enables deliberate analysis but retains joint prioritization and Board-level visibility [51].

Urgent Operational Need (UON). Service-specific urgent need (e.g., Fleet Commanders); informs Navy resource prioritization and can transition to JUON/JEON if joint impact grows [52].

4.2.4 Baseline Discipline: Acquisition Program Baselines, Deviations, and Nunn–McCurdy

APB. The cost-schedule-performance contract between the MDA, resource sponsor, and PEO; defines objective and threshold values that bound trade space [25].

Program Deviations. Triggered when performance, schedule, or cost thresholds breach; the Program Manager must notify the MDA within 30 days and submit a corrective action plan within 60 [25].

Nunn–McCurdy Act. Statutory reporting when Program Acquisition Unit Cost (PAUC) or Average Procurement Unit Cost (APUC) breaches significant ($\geq 15\%$ current / 30% original) or critical ($\geq 25\%$ current / 50% original) thresholds; critical breaches require certification to Congress within 60 days or program termination [53].

4.2.5 JCIDS Flow into the Defense Acquisition System

ICD. Supports the MDD with validated capability needs and initial attributes [51].

CDD. Provides Key Performance Parameters (KPPs) and Key System Attributes (KSAs) to anchor Milestone B and the Technical Requirements Baseline [51].

Capability Production Document (CPD). Updates KPP/KSA values for production decisions and sustainment planning at Milestone C [51].

Note

Maintain requirements traceability matrices linking KPP thresholds to test plans and APB values for board discussions.

4.2.6 KPPs v.s. KSAs (Know the Difference)

KPP (Key Performance Parameter). A performance attribute of a system critical to mission success. Each KPP has a threshold (minimally acceptable) and objective (desired) value. Failure to meet a *threshold* normally triggers program reassessment or revalidation of the requirement. *Why it matters:* Drives design trades, tempers requirement creep, and is reportable in baselines and decision reviews [51].

KSA (Key System Attribute). Important performance attribute not critical enough to be a KPP. KSAs are managed and traded to balance cost/schedule/performance without jeopardizing mission effectiveness. *Why it matters:* Provides disciplined trade-space for the Program Manager and requirements sponsor [51].

Difference. KPPs are mission-critical and tightly controlled; KSAs are important but offer more flexibility. Both appear in the CDD/CPD with threshold/objective values, but KPPs carry higher visibility and risk if breached.

4.2.7 Acquisition Strategy Essentials

Purpose. Documents tailored acquisition approach, contract strategy, intellectual property posture, and affordability constraints for MDA approval [25].

Key Contents. Pathway selection, phasing plan, incentive structure, test and evaluation strategy, risk burn-down, sustainment concept, cybersecurity, international cooperation, and business case for software/data management [25, 42].

Approval Event. MDA concurrence at Milestone A (initial) with updates prior to Milestone B and significant re-baselining; Navy 2-pass/7-gate integrates resource validation before signature [52].

4.2.8 International Acquisition Objectives

Foreign Military Sales (FMS). Strengthen partner capability while leveraging U.S. economies of scale; requires disclosure review and Letter of Offer and Acceptance alignment [25].

Direct Commercial Sales (DCS). Contractor-led exports; Program Office ensures configuration control and technology-security compliance [25].

Cooperative Development. Shared investment with allies (e.g., Memoranda of Understanding) to reduce life-cycle cost and enhance interoperability [25].

Armaments Cooperation / International Programs Security. Integrates disclosure, export licensing, and technology protection plans into the Acquisition Strategy [25].

4.2.9 Navy Two-Pass / Seven-Gate Review

Pass 1 – Capability. Led by OPNAV N9 to mature the requirement: Gate 1 validates the capability gap, Gate 2 refines solutions and mission analysis, Gate 3 assesses affordability and alignment with Navy enterprises, and Gate 4 authorizes program initiation (supports MDD)[52].

Pass 2 – Resourcing. Led by OPNAV N8 to align budgeting: Gate 5 verifies contracting/test readiness before Milestone B (often synchronized with the Development RFP Release Decision), Gate 6 confirms production and sustainment resources prior to Milestone C, and Gate 7 evaluates sustainment performance and modernization plans [52].

Note

For board prep, highlight where SECNAV Gate Reviews or Defense Acquisition Board touchpoints overlay Navy gates to demonstrate cross-tier synchronization.

4.2.10 Technology Readiness Levels

Table 4.1 summarizes Technology Readiness Level (TRL) definitions with representative naval examples.

TABLE 4.1: TECHNOLOGY READINESS LEVELS WITH REPRESENTATIVE NAVAL EXAMPLES.

TRL	DEFINITION	EXAMPLE (EDO CONTEXT)
TRL 1	Basic principles observed	Novel corrosion-resistant alloy proven in laboratory
TRL 2	Technology concept formulated	Hypothesis for integrating alloy into hull structures
TRL 3	Analytical and experimental proof-of-concept	Coupon tests validating stress performance in relevant environment
TRL 4	Component validation in laboratory	Scale panel fabrication and testing under controlled loads
TRL 5	Component validation in relevant environment	Module integrated into land-based test site with salt-fog exposure
TRL 6	System/subsystem prototype in relevant environment	Full-scale hull section installed on test article or surrogate vessel
TRL 7	System prototype in operational environment	Prototype hull segment installed on operational ship during limited sea trials
TRL 8	Actual system completed and qualified	Final production drawings released, inspections passed for lead ship
TRL 9	Actual system proven in mission operations	Sustained operational deployment meeting performance metrics

Source: Technology Readiness Assessment Guide, 2020 [54]

Hint: Match TRLs to TMRRexit criteria: critical technologies should be \geq TRL 6 before Milestone B.

Note

Operational environment testing typically begins at **TRL 7** (system prototype in an operational environment). **TRL 8** means the actual system is completed and qualified (e.g., qualification/acceptance testing, certifications). **TRL 9** means the actual system is *proven in mission operations* (e.g., successful fleet employment meeting mission metrics).

4.2.11 T&E Organizations and Roles

OSD Director, Operational Test and Evaluation (DOT&E). Independent oversight of operational test adequacy, approves/concurs in TEMP for covered programs, and reports to Congress on operational suitability and effectiveness.

Service Operational Test Agencies. Navy *COMOPTEVFOR (COTF)*, *Air Force Operational Test and Evaluation Center (AFOTEC)* , *U.S. Army Test and Evaluation Command (ATEC)* , *Marine Corps Operational Test and Evaluation Activity (MCOTEA)* . Plan/execute IOT&E and report independent findings to the Service and DOT&E.

Developmental Test (DT). Program Office with SYSCOM Warfare Centers (e.g., Naval Air Warfare Center Aircraft Division (NAWCAD) , Naval Air Warfare Center Weapons Division (NAWCWD) , NSWC, NUWC) plan and run DT to verify requirements, qualify designs, and feed Operational Test Readiness Review (OTRR) .

Interoperability/Joint. *Joint Interoperability Test Command (JITC)* assesses joint interoperability/Net-Ready KPP compliance where applicable.

Ranges/Land-based sites. Service ranges and land-based engineering/test sites provide representative and operational environments to support DT/OT.

Artifacts. TEMP aligns DT/OT scope and phases; OTRR certifies readiness for IOT&E; SAR / DAES capture results for governance [25].

4.2.12 Major Capability Acquisition Lifecycle Overview

MSA. Shape the trade space and select a preferred materiel solution; conclude with an AoA recommendation and technology maturation plan [25].

TMRR. Mature technologies, refine requirements, and reduce integration risk to enter EMD; manage competitive prototyping where feasible [25].

EMD. Complete detailed design, verify system performance, and prepare for production and deployment decisions [25].

P&D. Produce capability, conduct IOT&E, field initial units, and decide on Full-Rate Production (FRP) [25].

O&S. Sustain readiness, execute modernization, and plan for disposal while feeding affordability back into PPBE cycles [25].

Figure 4.5 Shows the major phases, review and decision points within MCAs. The following are the reviews that occur during the phases:

Alternative Systems Review (ASR). Validates the preferred materiel solution and technology maturation approach emerging from the AoA; inputs include threat assessments, cost-schedule trades, draft system concepts, and updated Technology Development Strategy / SEP outlines, and the primary output is an ASR report that authorizes drafting authoritative system-level requirements for the upcoming System Requirements Review (SRR) [25, 44].

SRR. Confirms that system-level performance, interface, cyber, and logistics requirements trace to the validated ICD / CDD and are testable; requires a draft System Specification, mission threads, interface control documentation, and technical performance measures, and produces a baselined system requirements set and updated verification strategy feeding System Functional Review (SFR) planning [25, 44].

SFR. Demonstrates that the functional architecture and allocated requirements can satisfy the mission needs within cost/schedule constraints; leverages functional allocation matrices, preliminary hazard analyses, and draft reliability growth plans, and yields an approved functional baseline plus a risk/opportunity burn-down plan ahead of Preliminary Design Review (PDR) [25, 44].

PDR. Assesses whether the allocated baseline and preliminary design (drawings, models, manufacturability assessments, support concepts) are mature enough to enter detailed design; the review outputs include an approved allocated baseline, configuration-controlled action list, and direction for completing qualification hardware prior to Critical Design Review (CDR) [25, 44].

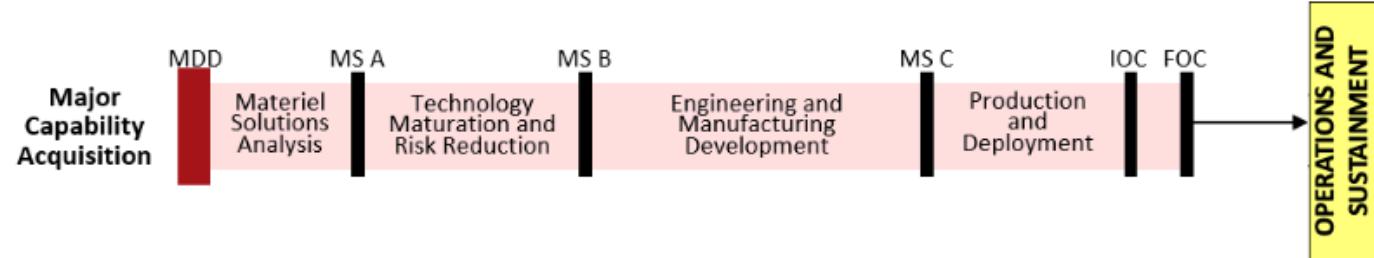
CDR. Confirms the detailed design meets all requirements with acceptable technical risk; inputs include product baseline technical data packages, qualification/analysis results, producibility assessments, and cybersecurity artifacts, and the decision produces an approved product baseline plus direction to release build-to packages and procure long-lead items [25, 44].

Test Readiness Review (TRR). Evaluates readiness to execute a specific test event by reviewing test articles, instrumentation, facilities, procedures, safety releases, and deficiency dispositions; a successful TRR outputs an authorization to start test with documented entrance/exit criteria and risk mitigations [25, 44].

System Verification Review (SVR). Verifies the integrated system meets the product baseline and is ready for production decision reviews; it uses completed verification cross-reference matrices, configuration audits, and qualification / Developmental Test (DT) results to produce a verified system baseline, deficiency adjudication list, and recommendation for Full-Rate Production Decision Review (FRPDR) preparation [25, 44].

OTRR. Certifies that production-representative assets, training, logistics products, safety artifacts, and test ranges are ready to support initial operational test; the review outputs the operational test readiness certification and any restrictions or corrective actions before DOT&E concurrence [25, 44].

Production Readiness Review (PRR). Determines whether manufacturing processes, supply chain, quality systems, and sustainment enablers can support LRIP / FRP quantities; requires control plans, process capability data, staffing/budget burn rates, and yields a decision to proceed into production along with corrective actions for any shortfalls [25, 44].



Lifecycle View of Major Capability Acquisition

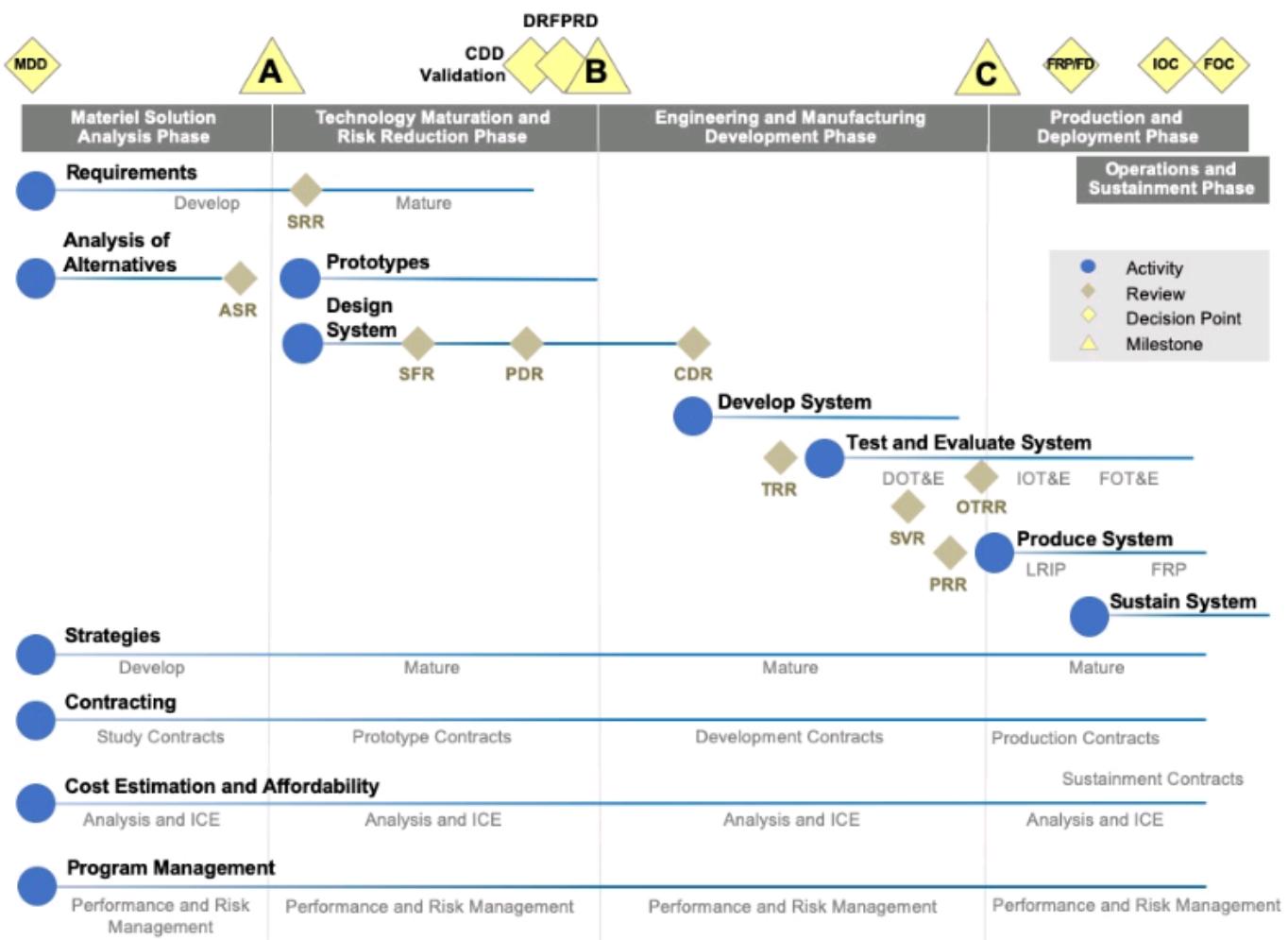


Figure 4.5. Lifecycle view for a MCA showing all functions and activities for each phase. Source: DoDI 5000.85, 2020 [25]

4.2.13 Materiel Development Decision

Inputs. Validated ICD, initial affordability analysis, preliminary acquisition strategy, and resource sponsor endorsement [43].

Decision. MDA authorizes entry into MSA (or an alternate pathway) and designates the lead PEO/PM [25].

Outputs. Acquisition Decision Memorandum (ADM), competitive AoA guidance, and direction to form the IPT structure [25].

4.2.14 Materiel Solution Analysis Phase Essentials

Purpose. Analyze alternatives, define the preferred materiel solution, and scope technology maturity and risk reduction tasks [25].

Key Activities. Conduct AoA, establish initial system performance metrics, develop early test strategies, and plan technology maturation for critical subsystems [25].

Entrance Criteria. Approved MDD, resourced AoA study guidance, and draft acquisition strategy [43].

Exit Criteria. Approved TMRR acquisition strategy update, technology risk assessments (i.e., TRL \geq 3–4), and draft CDD inputs for Joint staffing [25].

4.2.15 Milestone A Focus Areas

Purpose. Authorize entry into TMRR and approve the initial Acquisition Strategy and APB [25].

Board Topics. AoA results, technology maturation plans, affordability caps, cost estimates, and early test strategies [25].

Outputs. ADM, approved initial APB, direction for competitive prototyping, and signed Technology Development Strategy if required [25].

4.2.16 Technology Maturation and Risk Reduction Phase Essentials

Purpose. Reduce integration risk, mature the Technical Baseline, and prepare for Engineering & Manufacturing Development source selection [25].

Key Activities. Competitive prototyping (if directed), systems engineering trade studies, reliability growth, cyber-resilience planning, and Capabilities Development Document Validation (CDD-V) [25].

Entrance Criteria. Approved Milestone A ADM, funded risk-reduction plan, and established IMS aligned to Navy Gate 5 timeline [25, 52].

Exit Criteria. Technology Readiness Assessments showing TRL \geq 6, draft Milestone B documentation (e.g., SEP, TEMP), and configured product baseline ready for the Development Request for Proposal Release Decision (DRFPRD) [25].

4.2.17 Milestone B Focus Areas

Purpose. Authorize entry into EMD and establish the program as a major defense acquisition program with formal reporting [25].

Board Topics. Affordability caps, independent cost estimates, TEMP approval, LRIP planning, and production-representative prototype evidence [25].

Outputs. Updated APB, approved Acquisition Strategy revision, and contractual authority to release EMD RFPs [25].

4.2.18 Engineering and Manufacturing Development Phase Essentials

Purpose. Complete detailed design, build and test engineering development models, and validate manufacturing processes [25].

Key Activities. CDR, system verification, developmental test events, cybersecurity accreditations, and sustainment baseline development [25].

Entrance Criteria. Approved Milestone B ADM with resourced contracts, finalized technical baseline, and product-support planning aligned to Navy Gate 6 [25].

Exit Criteria. Successful IOT&E readiness, manufacturing readiness \geq TRL 8, and validated sustainment strategies supporting Milestone C [25].

4.2.19 Milestone C Focus Areas

Purpose. Authorize production and deployment following demonstration of operational effectiveness and suitability [25].

Board Topics. IOT&E results, sustainment and supply-chain readiness, affordability assessments, and updated manpower/- training plans [25].

Outputs. FRPDR plan, updated APB, and authority to obligate procurement funding for production lots [25].

4.2.20 Production and Deployment Phase Essentials

Purpose. Produce and deliver the system while validating operational performance and support concepts [25].

Key Activities. LRIP execution, IOT&E, Configuration Steering Board (CSB) governance, and ramp to Full-Rate Production [25].

Exit Criteria. FRP approval, attainment of Initial Operational Capability (IOC) , and sustainment plans ready for fleet release [25].

4.2.21 Operations and Support Phase Essentials

Purpose. Sustain mission effectiveness, execute modernization, and manage total ownership cost until disposal [25].

Key Activities. Performance-Based Logistics execution, Depot maintenance planning, Post-Deployment reviews, and CSBs for major updates [25].

Milestones. Full Operational Capability (FOC) , disposal decision documentation, and updates to capability requirements feeding future planning cycles [25].

Appendices

A Platinum Card

The *Platinum Card* is a primary study tool that will have most of the information required for your boards. Sources: EDO Coursebook Modules 3.1.1, 3.1.3, 3.1.4, and 3.1.6. Be able to draw and talk through Figures A.1–A.9.

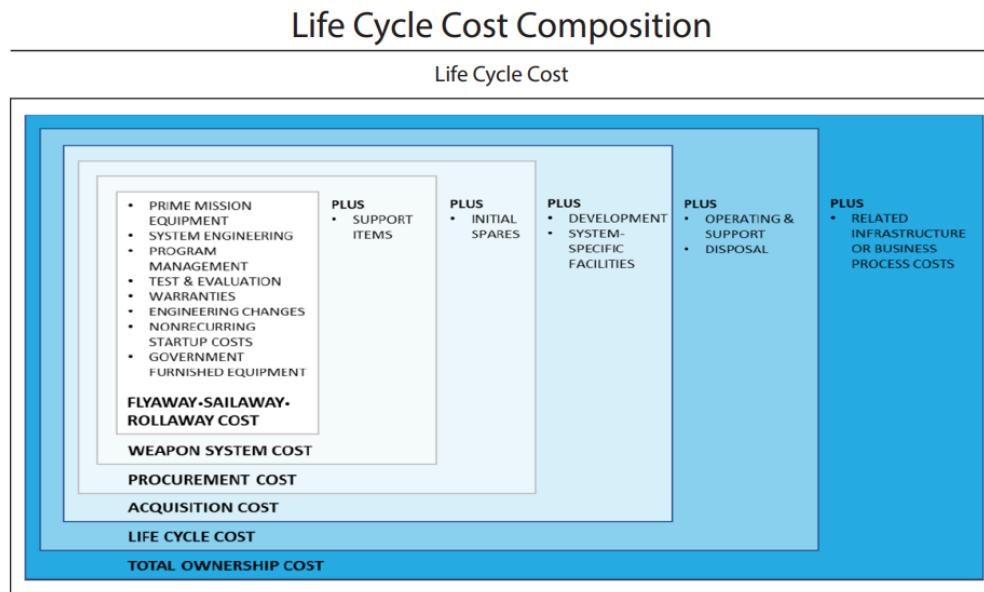


Figure A.1. Platinum Card: Life Cycle Cost Composition

Cost Estimating Requirements	
ACAT IB, IC & ID (MDAP)	
POE	Program initiation & all subsequent milestones, including FRP DR
CARD	MS A & all subsequent milestones including FRP DR - Draft 180 days prior to OIPT/milestone - Final 45 days prior to OIPT/milestone
CCE	MS A and all subsequent milestones including FRP DR
ICE	Required by law for all MDAP programs * - Prepared by OSD CAPE for ACAT ID, and ACAT IC at discretion of USD(A&S) - Prepared by component cost agency (AFCAA, DASA-CE, NCCA) for ACAT IC and ACAT IB (if no CAPE estimate) - In advance of any certification under Title 10, USC, Section 2366a (MS A) and Section 2366b (MS B) - In advance of any decision to enter low-rate initial production (LRIP) (MS C) or full-rate production (FRP DR) - In advance of any certification of MDAPs that experience critical cost growth (Title 10, USC, Sec 2433a)
*ICE statutory requirement (Title 10, US Code, Section 2434) and PL. 111-23, May 22, 2009 Source: DoDI 5000.02 January 7, 2015, Incorporating Change 3, August 10, 2017 and Weapon Systems Acquisition Reform Act of 2009	
ACAT IA	
	Program initiation & all subsequent milestones - Includes Economic Analysis
	MS A & whenever Economic Analysis is required - Draft 180 days prior to OIPT/milestone - Final 45 days prior to OIPT/milestone
	MS A and whenever an Economic Analysis is required
ACAT II & ACAT III: POE (and, at MDA discretion, an independent cost estimate prepared by the component cost agency) at program initiation and all subsequent milestones	
<p>AFCAA = Air Force Cost Analysis Agency DASA-CE = Deputy Assistant Secretary of Army (Cost & Economics) NCCA = Naval Center for Cost Analysis ACAT = Acquisition Category FRP DR = Full Rate Production Decision Review OIPT = Overarching Integrated Product Team CAPE = Cost Assessment & Program Evaluation ICE = Independent Cost Estimate POE = Program Office Estimate CARD = Cost Analysis Requirements Description MDA = Milestone Decision Authority USD(A&S) = Under Secretary of Defense (Acquisition and Sustainment) CCE = Component Cost Estimate MDAP = Major Defense Acquisition Program</p>	

Figure A.2. Platinum Card: Cost Estimating Requirements

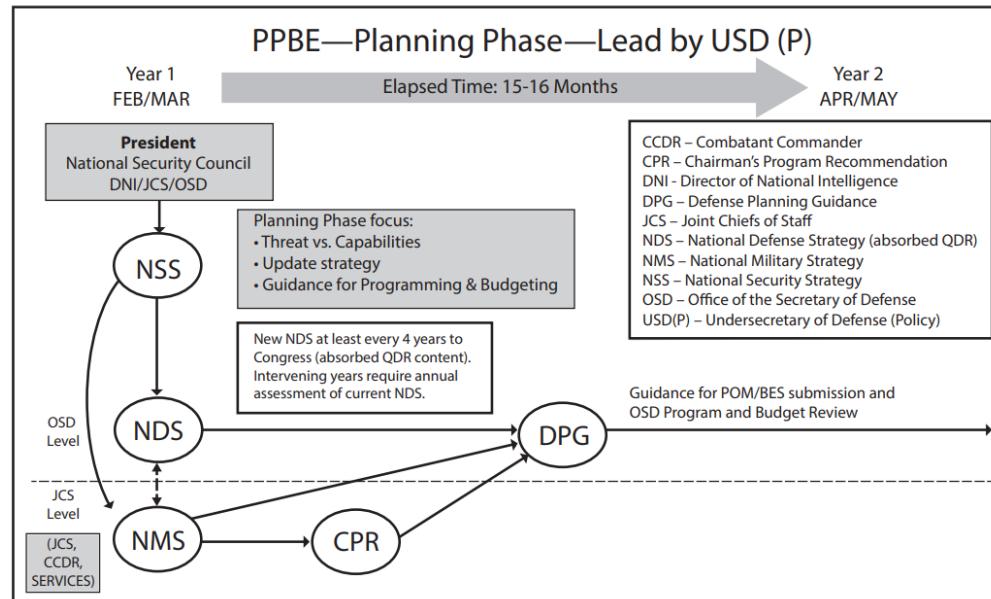


Figure A.3. Platinum Card: PPBE Planning Phase (Lead by USD (P))

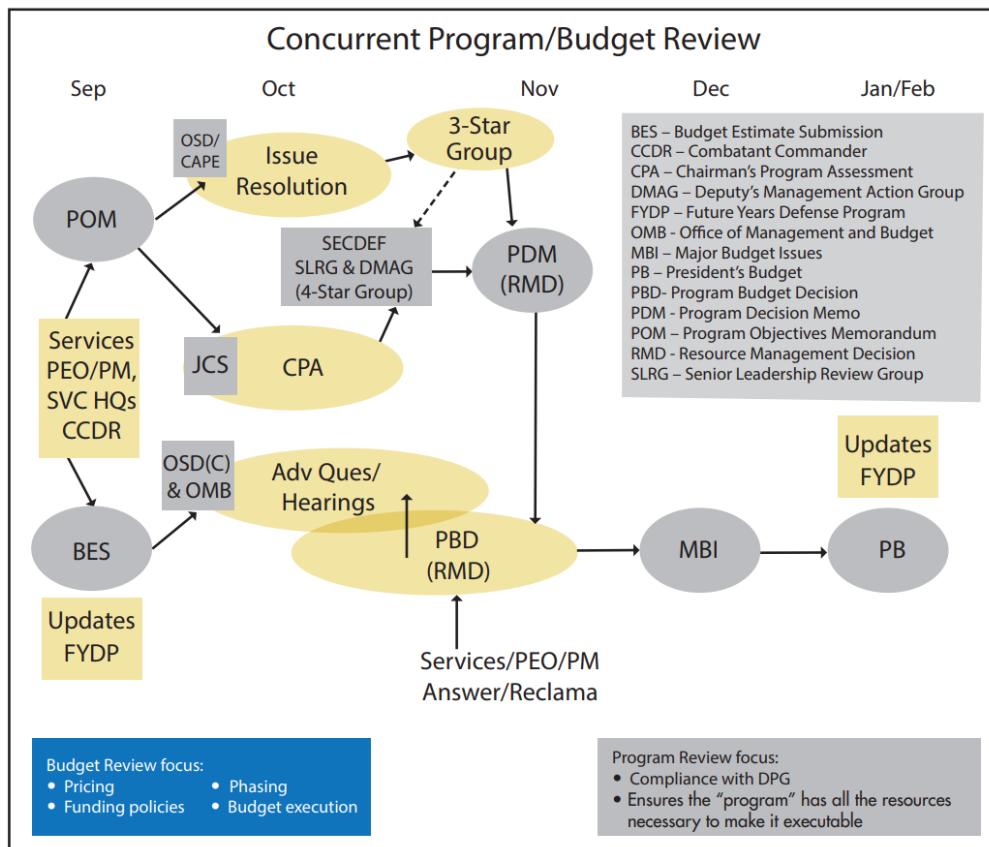


Figure A.4. Platinum Card: Concurrent Program/Budget Review

<h1>Below Threshold Reprogramming</h1>				
Amounts are cumulative over Entire Period of Obligation Availability				
APRN	MAX INTO	MAX OUT	LEVEL OF CONTROL	OBL AVAIL
RDT&E	Lesser of +\$15M or + 20%	Lesser of - \$15M or - 20%	Program Element	2 Years
PROC	Lesser of + 15 M or + 20%	Lesser of - \$15M or - 20%	Line Item	3 years SCN: 5 Years
O&M	+ \$15M	- \$15M	Budget Activity (or Defense Agency) Some Sub-Activity Limitations on Decreases (see reference below)	1 Year
MILPERS	+ \$15M	- \$15M	Budget Activity	1 Year
MILCON	Lesser of +\$2M or + 25%	No Specific Congressional Restriction	Project	5 Years

Reference Sources: DoDFMR 7000.14-R, Volume 3, Chapter 6 (Sept 2015) and Chapter 7 (Mar 2011) Joint Explanatory Statement of Congress Making Appropriations for the Department of Defense for Fiscal Year 2024

Figure A.5. Platinum Card: Below Threshold Reprogramming

<h1>Resource Allocation Process</h1>																																		
	2023			2024			2025			2026																								
	J	F	M	A	M	J	J	A	S	O	D	J	F	M	A	M	J	J	A	S	O	N	D											
FY22-26 Cycle	Execute 2nd Year RDT&E, Procurement and MILCON						Execute 3rd Year Procurement																											
FY23-27 Cycle	Execute 1st Year All Appropriations				Execute 2nd Year RDT&E, Procurement and MILCON						Execute 3rd Year Procurement																							
FY24-28 Cycle	Enactment			PB			Enactment			Appropriation			Execute 1st Year All Appropriations			Execute 2nd Year RDT&E, Procurement and MILCON			Execute 3rd Year Procurement															
FY25-29 Cycle	Planning		Programming/Budgeting DPG		Enactment		PB		Planning		Programming/Budgeting DPG		Enactment		PB		Execute 1st Year All Appropriations		Execute 2nd Year RDT&E, Procurement and MILCON		Execute 3rd Year													
FY26-30 Cycle	Planning						Programming/Budgeting DPG						Enactment			PB			Execute 1st Year All Appropriations			Execute 2nd Year												
FY27-31 Cycle													Planning			Programming/Budgeting DPG			Enactment			PB												

Figure A.6. Platinum Card: Resource Allocation Process

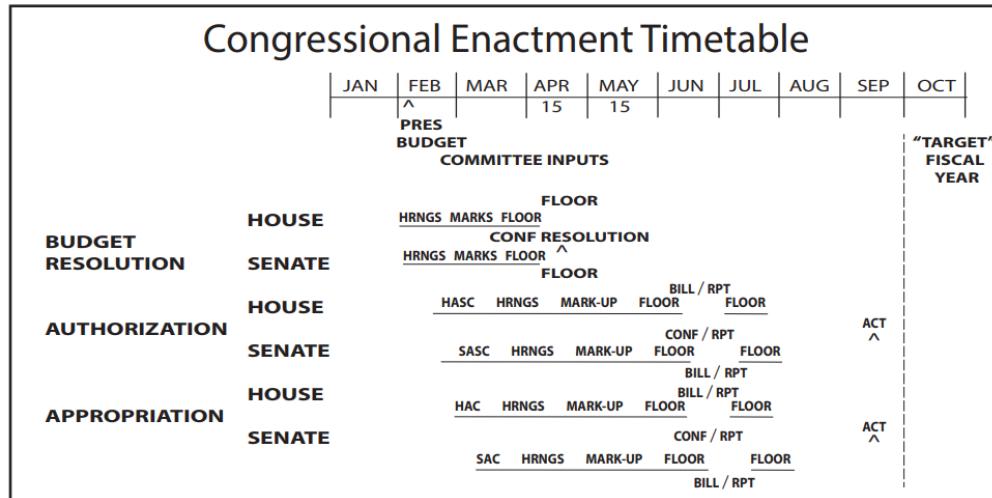


Figure A.7. Platinum Card: Congressional Enactment Timeline

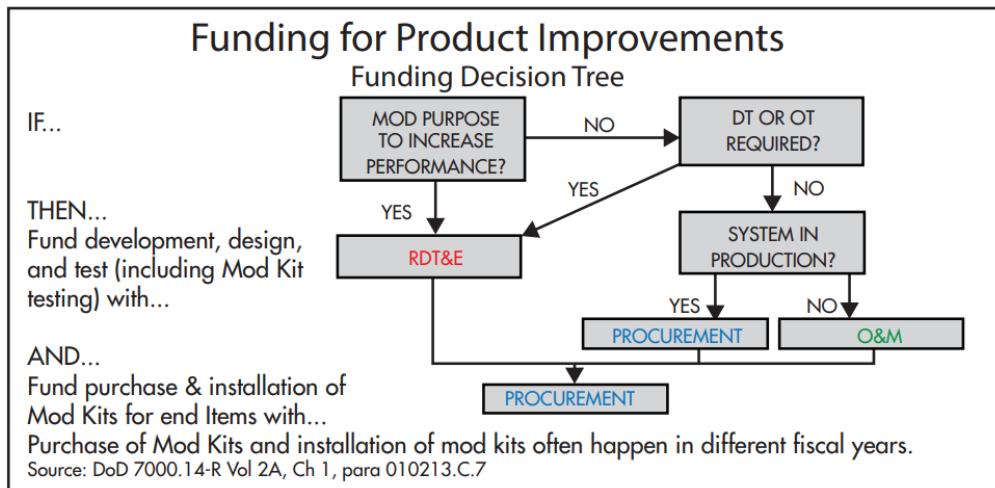


Figure A.8. Platinum Card: Funding for Product Improvements

RDT&E. Engineering changes requiring development/test.

Procurement. Production/installation of approved mods/end-items.

O&M. Minor mods/installation labor when authorized and not creating a new end-item.

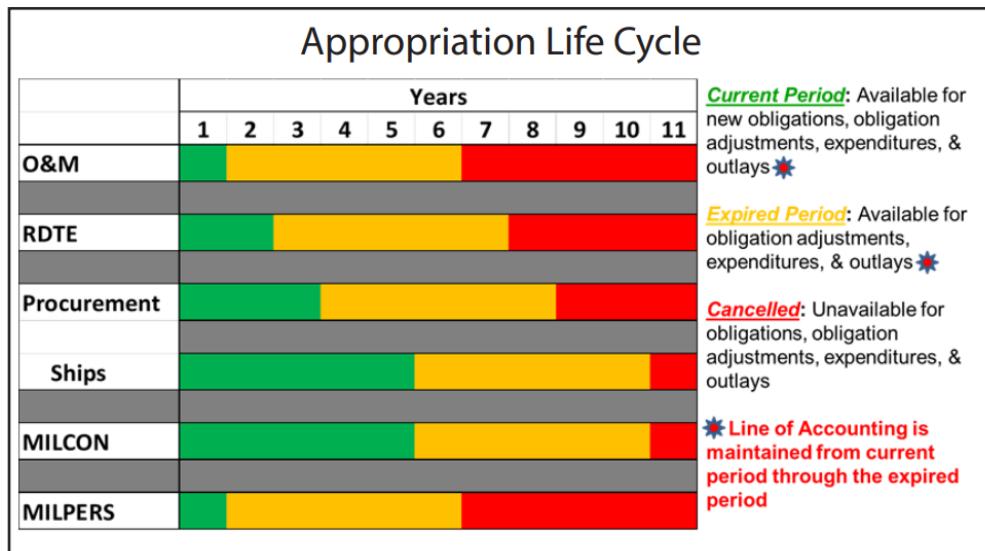


Figure A.9. Platinum Card: Appropriation Life Cycle

B Key Roles in Acquisition and Modernization

B.1 EDO Flag Officers (snapshot)

Verify names/billets the week of your board. Update: 29 Sep 2025.

Vice Admirals

VADM James P. Downey.

Commander, Naval Sea Systems Command (COMNAVSEA) .

VADM Johnny R. Wolfe Jr.

Director, Strategic Systems Program (SSP) .

VADM Seiko Okano.

Principal Military Deputy (PMILDEP) to ASN(RD&A).

Rear Admirals (Upper Half)

RADM Casey J. Moton.

PEO CVN.

RADM Kurt J. Rothenhaus.

Chief of Naval Research (CNR) .

RADM Jonathan E. Rucker.

PEO SSN.

RADM Brian A. Metcalf.

PEO Ships.

RADM Douglas L. Williams.

Director for Test, Missile Defense Agency (MDA) .

Rear Admirals (Lower Half)

RDML Peter D. Small.

NAVSEA Chief Engineer / Commander, NSWC/NUWC.

RDML Dan L. Lannamann.

CNRMC.

RDML Kevin R. Smith.

PEO USC.

RDML Dianna Wolfson.

Fleet Maintenance Officer, U.S. Fleet Forces (USFF) .

RDML Daniel W. Ettlich.

Director, Fleet Maintenance, U.S. Pacific Fleet (PACFLT) .

Reserve EDO Flags**RDML Robert J. Dodson (USNR).**

Deputy Commander, Supervision of Shipbuilding (SUPSHIP), NAVSEA.

RDML Michael S. Richman (USNR).

Deputy Director, Regional Strike Systems, SSP.

B.2 Key Roles in Acquisition and Modernization

Department acquisition governance.

Sources: SECNAVINST 5400.15D; SECNAVINST 5000.2G; DoDI 5000.85.

- ASN(RD&A), the SAE and CAE for the DON, sets acquisition policy, charters PEOs / DRPMs, and adjudicates milestone decisions when delegated by the Milestone Decision Authority.
- PEOs and DRPMs hold delegated program authority, establish baselines, and are accountable for translating capability needs into executable acquisition strategies.
- SYSCOM Commanders provide the workforce, infrastructure, and TA warrants that underpin PEO execution inside the Navy matrix construct.

Program Authority chain.

Sources: SECNAVINST 5000.2G; DoDI 5000.85.

- **PEO/PA:** Owns program outcomes, charters PMs, approves acquisition strategies and baselines.
- **DRPM:** Direct-report program leads for special access or priority portfolios with the same milestone authority as PEOs.
- **Ship Program Manager (SPM) /PM:** Accountable for cost/schedule/performance, leads risk management, orchestrates IPTs.

- **Ship Acquisition Program Manager (SHAPM)** : Delivers new hulls; coordinates design/build/activation sequencing.
- **Ship Lifecycle Manager (SLM)** : Drives sustainment and modernization packages for in-service assets.
- **Participating Acquisition Resource Manager (PARM) /Ship Project Director (SPD)** : Sponsors platform-level upgrades and alteration packages.

Technical Authority chain.

Source: SECNAVINST 5400.15D.

- **UTA / Chief Engineer:** Issues enterprise technical policy, owns warrants.
- **TWHs:** Certifies design compliance, adjudicates departures/concurrence packages.
- **Engineering Agents (ISEA, DA, AEA, SIA, TDA):** Execute lifecycle engineering; provide in-service engineering decisions under delegated authority.

NAVSEA headquarters roles.

Source: EDO Coursebook Module 2.1.2 (NAVSEA Organization, 2025 edition).

- **SEA 01 Comptroller:** BSO lead for NAVSEA financial governance and funds control.
- **SEA 02 Contracts:** Enterprise contracting authority, policy, and warrant management.
- **SEA 03 Cyber Engineering and Digital:** Drives cyber resiliency, digital engineering, and data transformation initiatives.
- **SEA 04 Industrial Operations:** Oversees public shipyards, maintenance execution, and quality assurance.
- **SEA 05 Chief Engineer:** Chief TA; issues warrants, certifies designs, and maintains technical standards.
- **SEA 06 Sustainment:** Manages product support strategies and lifecycle logistics integration.
- **SEA 07 Undersea Warfare:** Dual-hatted as PEO UWS; oversees undersea combat systems sustainment.
- **SEA 08 Nuclear Propulsion:** Three-hatted nuclear propulsion authority across DON and Department of Energy (DOE) roles.
- **SEA 09 Safety and Regulatory Compliance:** Aligns enterprise safety governance and reporting.
- **SEA 10 Total Force and Corporate Ops:** Manages workforce planning, corporate services, and governance.
- **SEA 21 In-Service Ships/CNRMC:** Leads surface-ship sustainment and modernization (PMS 321/326/339/421/443/451, SEA 21I, SURFMEPP).

NAVMAR enterprise directorates.

Source: EDO Coursebook Module 2.1.3 (NAVMAR Enterprise, 2024 edition).

- **Code 1.0 Comptroller:** Budget formulation/execution, BSO duties, and funds certification.
- **2.0 Contracts:** Contracting policy, strategy reviews, and award/administration oversight.
- **3.0 Counsel:** Acquisition law, ethics, protests, and claim resolution.
- **4.0 Logistics and Fleet Support:** Lifecycle logistics, technical data, and fleet distance support integration.
- **5.0 Chief Engineer/TA:** Enterprise architectures, interoperability, and cyber certification authority.
- **6.0 Program Management:** Portfolio governance, milestone preparation, and PEO integration.
- **7.0 Science and Technology:** S&T portfolio management, prototyping, and technology transition.
- **8.0 Corporate Operations:** Workforce, Chief Information Officer (CIO) services, facilities, security, and public affairs.
- **FRD-100 Fleet Support:** Deployed engineering assistance and sustainment response.
- **FRD-200 Installations:** Shore/afloat C4I installation planning and cutover execution.

Program Executive Offices (Navy portfolios).

Sources: SECNAVINST 5400.15D; EDO Coursebook Modules 2.1.4 and 3.1.5.

- **PEO CVN:** Designs, builds, and sustains nuclear-powered aircraft carriers (e.g., PMS 312/378/379).
- **PEO IWS:** Develops and sustains ship/submarine combat systems; mission-aligned IWS directorates cover sensors, weapons, C2, and allied integration.
- **PEO Ships:** Oversees surface combatant and amphibious ship construction and modernization.
- **PEO USC:** Leads LCS, FFG 62, expeditionary, and unmanned surface/undersea portfolios.
- **Team Submarines (PEO SSN, PEO SSBN, Program Executive Office, Columbia-Class Submarines (PEO Columbia), PEO UWS):** Manages attack/strategic submarine acquisition, in-service support, and undersea combat systems.
- **PEO C4I:** Delivers fleet C4I; PMW 1XX focus on capability development, PMW 7XX on platform integration.
- **PEO Digital:** Provides enterprise digital services (e.g., Flank Speed) across the DON.
- **PEO MLB:** Modernizes manpower, logistics, and business IT systems.

Contracting authority (KO family).

Sources: FAR; DFARS; NMCARS; EDO Coursebook Module 3.2.1.

- **PCO:** Plans the acquisition, synchs with PMs before solicitation, awards and signs contracts/mods.
- **ACO:** Oversees post-award performance, surveillance, and payment/contract administration (often DCMA / NAVSEA field activities).

- **TCO:** Leads partial/full terminations, settlement negotiations, and equitable adjustments.
- **KO warrant:** Defines the dollar/authority limits; only the warranted KO can bind or obligate the Government.
- **Contracting Officer's Representative (COR) / assistant PM / engineering support:** Provide technical surveillance and acceptance recommendations; cannot direct work or obligate funds (FAR Parts 1 and 42).
- **HCA:** Approves actions such as letter contracts and high-value single-award IDIQs; may delegate no lower than flag/Senior Executive levels within the DON per FAR 1.601 and DFARS/NMCARS supplements.
- **SAE (ASN(RD&A)):** Signs D&Fs for multiyear contracting, extraordinary relief, and other actions reserved to the Service Acquisition Executive under FAR Subparts 1.7 and 17.1.

Program Manager / KO partnership.

Sources: DoDI 5000.85; EDO Coursebook Module 3.2.1.

- PM integrates warfighter need, technical baseline, and budget; KO ensures statutory/regulatory compliance and contract enforceability.
- Both align on acquisition strategy, competition approach (Competition in Contracting Act (CICA)), incentives, and change management before RFP release or modification execution.

Source selection governance.

Sources: FAR Parts 1, 5, and 15; NAVSEA Source Selection Guide (2022); EDO Coursebook Module 3.2.2.

- **SSA:** Senior official who approves the Source Selection Plan, receives SSAC/SSEB recommendations, and signs the best-value decision memorandum.
- **SSAC:** Advisory council that synthesizes SSEB findings, compares proposals across factors, and briefs the SSA on trade-offs.
- **SSEB:** Multi-disciplinary evaluators (technical, management, past performance, cost/price) who rate proposals against Section M factors.
- **Small Business Professional / Competition Advocate:** Confirms set-aside decisions, reviews subcontracting plans, and endorses synopsis waivers.
- **Cost/Price Analyst & Legal Counsel:** Validate reasonableness determinations, alignment of Sections L/M, and clause sufficiency before release.
- **Award Fee Determining Official & Award Fee Board:** Plans award-fee periods, chairs performance reviews, and signs the determination memo authorizing or withholding fee payments (FAR Part 16; NAVSEA Source Selection Guide).

Fiscal control & certification.

Source: DoD FMR 7000.14-R Volume 3.

- **Funds Certifying Official/Comptroller:** Verifies purpose/time/amount before obligation; Anti-Deficiency Act (ADA) safeguard.
- **Program/Budget Analyst:** Tracks execution, monitors reprogramming thresholds, prepares obligation/expenditure burn-down.
- **Resource allocation chain:** OUSD(C) apportions to the Navy; OPNAV (N82/FMB) allocates to BSOs; SYSCOM comptrollers (e.g., SEA 01) issue suballocations to executing activities.

PPBE resource sponsors.

Source: EDO Coursebook Module 3.1.1 (PPBE, 2025 edition).

- **CAPE:** Provides independent cost assessments and program evaluation across the Department.
- **N8:** Builds the Navy POM, balancing capability and fiscal constraints across the FYDP.
- **N9:** Integrates warfare requirements and advocates mission-area investments.
- **N91:** Conducts cross-domain mission integration and orchestrates POM issue resolution.

Congressional resource chain.

Source: EDO Coursebook Module 3.1.2 (Congressional Enactment, 2025 edition).

- **HASC / SASC:** Authorize defense programs and policy in the annual NDAA.
- **HAC / SAC:** Produce appropriations bills that provide BA to execute Navy programs.
- **HBC / SBC:** Set topline guidance and 302 allocations through the budget resolution process.
- **CBO, CRS, GAO:** Supply independent scoring, research, and oversight that shape committee deliberations.

Cyber/Authorizations (when IT/C2 in scope).

Source: SECNAVINST 5000.2G.

- **Authorizing Official (AO) :** Grants Authority to Operate; enforces Risk Management Framework (RMF) controls that drive design and integration requirements.

B.3 Combatant Commands (Reference)

AOR: The geographic (or astrographic) area assigned to a CCDR for missions and forces. (Title 10)

Geographic (7):

- USAFRICOM

- USCENTCOM
- USEUCOM
- USINDOPACOM
- USNORTHCOM
- USSOUTHCOM
- USSPACECOM¹

Functional (4):

- USSOCOM
 - USSTRATCOM
 - USTRANSCOM
 - USCYBERCOM
-

¹USSPACECOM is treated by DoD as a **geographic (astrographic)** command with an AOR beginning at the Kármán line (~100 km)

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List of Acronyms

Acronym	Definition
AAF	Adaptive Acquisition Framework
AC	Actual Cost
ACAT	Acquisition Category
ACO	Administrative Contracting Officer
ACWP	Actual Cost of Work Performed
ADA	Anti-Deficiency Act
ADA	Acquisition Data and Analytics
ADM	Acquisition Decision Memorandum
AEA	Alteration Engineering Agent
AFOTEC	Air Force Operational Test and Evaluation Center
AO	Authorizing Official
AoA	Analysis of Alternatives
AOR	Accumulated Operating Result
APB	Acquisition Program Baseline
APN	Aircraft Procurement, Navy
APUC	Average Procurement Unit Cost
ARC	Acquisition Research Center
ASN(RD&A)	Assistant Secretary of the Navy for Research, Development and Acquisition
ASR	Alternative Systems Review
ATEC	U.S. Army Test and Evaluation Command
BA	Budget Authority
BAC	Budget at Completion
BB	Block Buy
BCA	Business Case Analysis
BCAC	Business Capability Acquisition Cycle
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
BoM	Bill of Material
BSO	Budget Submitting Office
BTR	Below-Threshold Reprogramming

Acronym	Definition
C4I	Command, Control, Communications, Computers, and Intelligence
CAE	Component Acquisition Executive
CAM	Control Account Manager
CAPE	Cost Assessment and Program Evaluation
CARD	Cost Analysis Requirements Description
CAS	Cost Accounting Standards
CASREP	Casualty Report
CBO	Congressional Budget Office
CCDR	Combatant Commander
CDD	Capabilities Development Document
CDD-V	Capabilities Development Document Validation
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CER	Cost Estimating Relationship
CFO	Chief Financial Officer
CICA	Competition in Contracting Act
CIO	Chief Information Officer
CIP	Capital Investment Program
CJCS	Chairman of the Joint Chiefs of Staff
CNO	Chief of Naval Operations
CNR	Chief of Naval Research
CNRMC	Commander, Navy Regional Maintenance Center
COMNAVSEA	Commander, Naval Sea Systems Command
COR	Contracting Officer's Representative
CPAF	Cost-Plus-Award-Fee
CPD	Capability Production Document
CPFF	Cost-Plus-Fixed-Fee
CPI	Cost Performance Index
CPIF	Cost-Plus-Incentive-Fee
CR	Continuing Resolution
CRS	Congressional Research Service
CSB	Configuration Steering Board
CSDR	Cost and Software Data
CSFR	Contract Funds Status Report
CTC	Cost-to-Complete
CV	Cost Variance
CVN	Nuclear-Powered Aircraft Carrier
D&F	Determination and Findings

Acronym	Definition
DA	Design Agent
DAB	Defense Acquisition Board
DAE	Defense Acquisition Executive
DAES	Defense Acquisition Executive Summary
DAG	Defense Acquisition Guidebook
DAS	Defense Acquisition System
DCAA	Defense Contract Audit Agency
DCAPE	Director, CAPE
DCMA	Defense Contract Management Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DFAS	Defense Finance and Accounting Service
DMAG	Deputy's Management Action Group
DoD	Department of Defense
DOE	Department of Energy
DON	Department of the Navy
DOT&E	Director, Operational Test and Evaluation
DRFPRD	Development Request for Proposal Release Decision
DRPM	Direct Reporting Program Manager
DT	Developmental Test
EA	Engineering Agent
EAC	Estimate at Completion
EDO	Engineering Duty Officer
EMD	Engineering and Manufacturing Development
EOQ	Economic Order Quantity
ERP	Enterprise Resource Planning
EV	Earned Value
EVM	Earned Value Management
FAR	Federal Acquisition Regulation
FDA	Food and Drug Administration
FFP	Firm-Fixed-Price
FMB	Financial Management Budget (OPNAV)
FOC	Full Operational Capability
FPEPA	Fixed-Price with Economic Price Adjustment
FPIF	Fixed-Price Incentive (Firm Target)
FPR	Fixed-Price Redetermination
FPRA	Forward Pricing Rate Agreement
FPRP	Forward Pricing Rate Proposal
FRD	Fleet Readiness Directorate

Acronym	Definition
FRP	Full-Rate Production
FRPDR	Full-Rate Production Decision Review
FY	Fiscal Year
FYDP	Future Years Defense Program
G&A	General and Administrative
GAAP	Generally Accepted Accounting Principles
GAO	Government Accountability Office
GPS	Global Positioning System
HAC	House Appropriations Committee
HASC	House Armed Services Committee
HBC	House Budget Committee
HCA	Head Contracting Activity
HUBZone	Historically Underutilized Business Zone
IA	Information Assurance
IBR	Integrated Baseline Review
ICD	Initial Capabilities Document
ICE	Independent Cost Estimate
IDIQ	Indefinite-Delivery, Indefinite-Quantity
IGCE	Independent Government Cost Estimate
IGT	Intragovernmental Transaction
IMS	Integrated Master Schedule
IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
IPAC	Intra-Governmental Payment and Collection
IPMDAR	Integrated Program Manager's Data Analysis Report
IPT	Integrated Product Team
IR	Internal Reprogramming
ISEA	In-Service Engineering Agent
J&A	Justification and Approval
JEON	Joint Emergent Operational Need
JITC	Joint Interoperability Test Command
JROC	Joint Requirements Oversight Council
JUON	Joint Urgent Operational Need
KO	Contracting Officer
KPP	Key Performance Parameter
KSA	Key System Attribute
LCC	Life-Cycle Cost
LCSP	Life-Cycle Sustainment Plan

Acronym	Definition
LEGPROP	Legislative Proposal
LH	Labor-Hour
LLTM	Long-Lead Time Material
LOE	Level of Effort
LPTA	Lowest Price Technically Acceptable
LRIP	Low-Rate Initial Production
LT	Letter Transfer
MCOTEA	Marine Corps Operational Test and Evaluation Activity
MDA	Missile Defense Agency
MDA	Milestone Decision Authority
MDD	Materiel Development Decision
MILCON	Military Construction
MILPERS	Military Personnel
MIPR	Military Interdepartmental Purchase Request
MSA	Materiel Solution Analysis
MTA	Middle Tier of Acquisition
MYP	Multiyear Procurement
N8	OPNAV Integration of Capabilities and Resources
N82	OPNAV Programming Division
N9	OPNAV Warfare Systems
N91	Warfare Integration Directorate
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NAVWAR	Naval Information Warfare Systems Command
NAWCAD	Naval Air Warfare Center Aircraft Division
NAWCWD	Naval Air Warfare Center Weapons Division
NDAA	National Defense Authorization Act
NMCARS	Navy Marine Corps Acquisition Regulation Supplement
NOR	Net Operating Result
NRO	National Reconnaissance Office
NSWC	Naval Surface Warfare Center
NUWC	Naval Undersea Warfare Center
NWC	Naval Warfare Center
NWCF	Navy Working Capital Fund
O&S	Operations and Support Phase
OCI	Organizational Conflict of Interest
ODC	Other Direct Cost
OMB	Office of Management and Budget

Acronym	Definition
OMN	Operation and Maintenance, Navy
OPN	Other Procurement, Navy
OPNAV	Office of the Chief of Naval Operations
OSD	Office of the Secretary of Defense
OT	Other Transaction
OTRR	Operational Test Readiness Review
P&D	Production and Deployment Phase
PA	Program Authority
PA Reprog	Prior Approval Reprogramming
PACFLT	U.S. Pacific Fleet
PARM	Participating Acquisition Resource Manager
PAUC	Program Acquisition Unit Cost
PB	President's Budget
PBL	Performance-Based Logistics
PCO	Procuring Contracting Officer
PDM	Program Decision Memorandum
PDR	Preliminary Design Review
PEO	Program Executive Office
PEO C4I	Program Executive Office, Command, Control, Communications, Computers, and Intelligence
PEO Columbia	Program Executive Office, Columbia-Class Submarines
PEO CVN	Program Executive Office, Aircraft Carriers
PEO Digital	Program Executive Office, Digital and Enterprise Services
PEO IWS	Program Executive Office, Integrated Warfare Systems
PEO MLB	Program Executive Office, Manpower, Logistics and Business IT
PEO Ships	Program Executive Office, Ships
PEO SSBN	Program Executive Office, SSBN
PEO SSN	Program Executive Office, Attack Submarines
PEO USC	Program Executive Office, Unmanned and Small Combatants
PEO UWS	Program Executive Office, Undersea Warfare Systems
PM	Program Manager
PMB	Performance Measurement Baseline
PMILDEP	Principal Military Deputy
PMO	Program Management Office
POE	Program Office Estimate
POM	Program Objective Memorandum
PPBE	Planning, Programming, Budgeting and Execution
PR	Purchase Request

Acronym	Definition
PRR	Production Readiness Review
PTA	Point of Total Assumption
PV	Planned Value
RCA	Request for Contract Action
RCOH	Refueling and Complex Overhaul
RDT&E	Research, Development, Test, and Evaluation
RFI	Request for Information
RFP	Request for Proposal
RMD	Resource Management Decision
RMF	Risk Management Framework
ROA	Return on Assets
ROS	Return on Sales
SAC	Senate Appropriations Committee
SAE	Service Acquisition Executive
SAR	Selected Acquisition Report
SASC	Senate Armed Services Committee
SAT	Simplified Acquisition Threshold
SBA	Small Business Administration
SBC	Senate Budget Committee
SBIR	Small Business Innovation Research
SCN	Shipbuilding and Conversion, Navy
SDVOSB	Service-Disabled Veteran-Owned Small Business
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
SEP	Systems Engineering Plan
SFR	System Functional Review
SHAPM	Ship Acquisition Program Manager
SIA	Systems Integration Agent
SLM	Ship Lifecycle Manager
SLOC	Source Lines of Code
SLR	Stabilized Labor Rate
SOM	SUPSHIP Operation Manual
SOW	Statement of Work
SPD	Ship Project Director
SPI	Schedule Performance Index
SPM	Ship Program Manager
SRR	System Requirements Review
SSA	Source Selection Authority

Acronym	Definition
SSAC	Source Selection Advisory Council
SSBN	Ballistic Missile Submarine, Nuclear
SSEB	Source Selection Evaluation Board
SSP	Strategic Systems Program
SUBMEPP	Submarine Maintenance Engineering Planning Program
SUPSHIP	Supervisor of Shipbuilding
SURFMEPP	Surface Maintenance Engineering Planning Program
SV	Schedule Variance
SVR	System Verification Review
SYSCOM	Systems Command
T&M	Time-and-Materials
TA	Technical Authority
TCI	Total Cost Input
TCO	Termination Contracting Officer
TCPI	Total Cost Performance Index
TDA	Technical Direction Agent
TDP	Technical Data Package
TEMP	Test and Evaluation Master Plan
TMRR	Technology Maturation and Risk Reduction
TOA	Total Obligational Authority
TOC	Total Ownership Cost
TRL	Technology Readiness Level
TRR	Test Readiness Review
TWD	Technical Work Document
TWH	Technical Warrant Holder
UCA	Undefinitized Contract Action
UCA	Urgent Capability Acquisition
UCF	Uniform Contract Format
UON	Urgent Operational Need
USFF	U.S. Fleet Forces
UTA	Ultimate Technical Authority
VA	Department of Veterans Affairs
VAC	Variance at Complete
VCJCS	Vice-Chairman of the Joint Chiefs of Staff
WBS	Work Breakdown Structure
WCF	Working Capital Fund
WOSB	Women-Owned Small Business
