

Department of the Navy Total Ownership Cost (TOC) Guidebook



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References

- (a) Secretary of the Navy Instruction 5000.2E “Implementation and Operation of the Defense Acquisition Systems and the Joint Capabilities Integration and Development System” of 1 Sep 11
- (b) Vice Chief of Naval Operations, Assistant Commandant of the Marine Corps, Assistant Secretary of the Navy (Research, Development and Acquisition) Joint Letter of 28 Jul 09, Total Ownership Cost Definition for the Department of the Navy
- (c) Under Secretary of Defense (Acquisition, Technology & Logistics) Memorandum for Acquisition Professionals: “Better Buying Power Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending,” of 14 Sep 10
- (d) Under Secretary of Defense (Acquisition, Technology & Logistics) Memorandum: “Implementation Directive for Better Buying Power - Obtaining Greater Efficiency and Productivity in Defense Spending” of 3 Nov 10
- (e) Chairman of the Joint Chiefs of Staff Instruction 3170.01G, Joint Capabilities Integration and Development System of 1 Mar 09
- (f) Office of the Secretary of Defense Cost Analysis Improvement Group: “Operating and Support Cost-Estimating Guide” of Oct 07
- (g) Department of Defense Acquisition Guidebook of 27 Jun 11
- (h) Under Secretary of Defense (Acquisition Technology & Logistics) Directive-Type Memorandum 11-009, “Acquisition Policy for Defense Business Systems” of 23 Jun 11
- (i) Under Secretary of Defense (Acquisition, Technology & Logistics) Memorandum for Defense Acquisition and Logistics Professionals: “Should-Cost and Affordability” of 24 Aug 11
- (j) Assistant Secretary of the Navy (Research, Development & Acquisition) Memorandum: “Implementation of Should-Cost Management” of 19 Jul 11
- (k) Assistant Secretary of the Navy (Research, Development & Acquisition) Memorandum: “Strengthening Sustainment Governance for Acquisition Program Reviews” of 5 Apr 11
- (l) Assistant Secretary of the Navy (Research, Development & Acquisition) Memorandum: “Department of Navy Strategic Sourcing Governance” of 218 Dec 11
- (m) Inspector General U.S. Department of Defense Report “Excess Inventory and Contract Pricing Problems Jeopardize the Army Contract with Boeing to Support the Corpus Christi Army Depot” D-2011-061 of 3 May 11

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- (n) Naval Sea Systems Command Instruction 4120.8 “Naval Sea Systems Command Policy for Commonality of Systems, Subsystems and Components” of 6 Apr 09
- (o) OPNAV Instruction 5200.38 “Navy Affordability Initiative Process” of 26 Aug 11

1.0 INTRODUCTION

The purpose of this guidebook is twofold. First, to reiterate an unequivocal intent that defense acquisition products be maximally affordable to acquire, own and operate. Secondly, to describe new departmental and naval processes addressing that intent.

The Assistant Secretary of the Navy for Research, Development and Acquisition (ASN (RD&A)) requires (reference (a)) that all activity across all phases of naval defense systems development and life cycle management result in systems that meet and sustain specified warfighting performance capability requirements at the lowest possible total ownership cost (TOC).

- Reference (b) directs that Navy and Marine Corps Program Executive Officers (PEOs), Program Managers (PMs), direct reporting Program Managers and their Resource Sponsors and supporting Systems Command (SYSCOM) commanders equate TOC with life cycle cost (LCC).
- In references (c) and (d), Under Secretary of Defense for Acquisition, Technology & Logistics (USD (AT&L)) directed the department make acquisition decisions weighted more upon life cycle affordability in order to deliver better value and control cost growth. Further, that in pursuit of that affordability, acquisition professionals must increase value with less or fewer resources.

This guidebook is addressed specifically to acquisition executives, resource and requirements sponsors, Program Executive Officers, Program Managers, cost estimators, SYSCOMs, Budget Submitting Offices (BSOs), Product Support Managers (PSMs) and others across the Department of Navy (DON) who must implement the above referenced Department of Defense (DoD) and DON life cycle affordability-centered policies and guides.

Reference (a) is the primary policy and process source in pursuit of TOC. It features improved processes for providing warfighting system performance capabilities with affordable systems readiness. A defense system's life cycle total ownership cost affordability is increasingly a predominant milestone decision-weight factor as reinforced throughout this guidebook's referenced policies and processes. Each chapter addresses some means towards maximal total life cycle cost affordability of defense systems and their supporting enterprise infrastructure through specific actions taken during all stages of systems development, sustainment, and disposal. The content of this guidebook does not in any way modify the content of reference (a) or other approved DoD or Navy instructions. Like reference (a)'s "Acquisition and Capabilities Guidebook," it is provided as a guide, outlining best practices for consideration of TOC in the requirements and acquisition processes.

Increasingly, there are opportunities to constrain or mitigate the growth of each individual defense system's life cycle sustainment and ownership costs via the reference (e) Joint Capabilities Integration and Systems Development (JCIDS) process of technical performance capability requirements generation. JCIDS starts formal systems acquisition process. It requires the specification of certain "affordability" and sustainment-related performance capabilities that, if set as challenging, but achievable criteria for prospective new defense system or major

upgrade programs, serve throughout subsequent systems engineering and program development as strong variables towards that system's eventual total cost to DoD. A challenging set of JCIDS operational reliability, maintainability and availability performance parameters; combined with a specific JCIDS target for "ownership cost" affordability, for once the system is fielded; constitutes a primary means to mitigate a program's eventual total cost.

For program management, TOC should be viewed as an expansion of the earlier Total Life Cycle System Management (TLCSM) decision-weight paradigm, since the goals of TOC and TLCSM are the same: comprehensive analyses allowing program management a clear decision to favor program alternatives that result in systems which are optimally affordable to own and operate, as well as acquire. Given the increased stake in affordable, cost mitigating outcomes per reference (a), the adequacy of systems studies to determine the best materiel and system solutions (e.g., the Analysis of Alternatives (AoA)) and the responsibility for making sourcing solution decisions are a matter of broad enterprise-wide governance (i.e., Resources and Requirements Review Board (R3B) and Gate Reviews). This broader, enterprise-wide stake and involvement in systems and infrastructure affordability is best characterized across the department by the broader term "TOC."

In addition to details regarding TOC mitigation and reduction processes provided by parts of this guidebook, our intent is to reinforce that TOC is now a *principal decision criterion* for all systems acquisition and their life cycle sustainment. TOC decisions must therefore be backed by strong metrics and analyses that can predict or assess life cycle costs to own and operate proposed new, upgraded or fielded systems performance capabilities.

1.1 Background

Defense system program costs to own and operate have been growing at a rate greater than inflation over the past decade. TLCSM, TOC, economy of scale commonality initiatives and Operations & Support (O&S) phase commercial investment programs are some of the initiatives to improve systems life cycle ownership affordability. Failure will result in a steady decline in new systems performance capability purchasing power, which will in turn affect our ability to meet future force goals.

Even with substantial increases in procurement and operations and maintenance funds from the supplemental appropriations associated with the Global War on Terror, Navy has purchased 34% fewer ships and 18% fewer aircraft over the period FY04-09 than originally planned.¹ The imperative to base acquisition decisions weighted increasingly on TOC affordability is reflective also of manpower costs, which are rising at a rate that is greater than inflation. Over the same FY04-09 period, the total force declined by 15%, but the constant dollar cost of the force declined by only 10%.² Costs to maintain the current end-strengths are projected to rise at a rate greater than inflation through at least FY13.³

¹ Based on analysis of the FY04-10 President's Budget submissions available at: www.finance.hq.navy.mil/fmb/10pres/books.htm.

² Based on analysis of end-strength and Military Personnel, Navy funding from the President's budget submissions available at: www.finance.hq.navy.mil/fmb/10pres/books.htm.

³ From N1's POM-08 brief.

As DoD (and Navy) funding remains constant or declines, and as Navy's purchasing power declines as a result, *increasing the decision weight priority for alternatives that can mitigate and reduce TOC becomes our clearest path to a capable and optimally affordable Fleet*. The greatest relative potential for TOC reduction is new programs and major upgrades where the opportunity to influence the specification of system sustainment-related performance capabilities can mitigate eventual TOC. However, the majority of TOC opportunities for the acquisition workforce to take across the spectrum of system life cycles occur during upgrade and during the ongoing sustainment of currently fielded systems and equipment.

1.2 Purpose and Use

This guidebook will assist all DON organizations engaged in Fleet requirements generation and subsequent systems development, acquisition and sustainment in understanding and applying the TOC-related requirements in reference (a). Specifically, it:

- Describes how TOC mitigation and investment improves the life cycle affordability of DON weapons systems and have become a major focus for program governance
- Details how major development program TOC mitigating plans and progress are briefed at all governance Gate Reviews
- Describes TOC criteria as a governance Probability of Program Success (PoPS) health metric
- Provides the DON definition of "commonality" and standardization as a tactic to optimize TOC
- Describes Navy and Marine Corps "Strategic Sourcing" Program
- Provides Navy and Marine Corps business rules for the yearly affordability initiatives investment process
- Defines "logistics enablers" that affect TOC

1.3 TOC and Life Cycle Cost

Reference (b), Joint Vice Chief of Naval Operations (VCNO), Assistant Commandant of the Marine Corps (ACMC), and ASN (RD&A) letter, establishes that the definition of TOC, as applied to all Department TOC efforts and initiatives, shall follow the LCC categories defined by the Office of the Secretary of Defense (OSD) Office of Cost Assessment and Program Evaluation (CAPE) in the Cost Analysis Improvement Group (CAIG) "Operating and Support Cost-Estimating Guide", of Oct 07 (reference (f)). Per reference (f), LCC consists of:

1.3.1 Research and Development

Research and Development (R&D) costs consist of development costs incurred from the beginning of the conceptual phase through the end of the system development and demonstration phase, and potentially into low-rate initial production. It typically includes costs of concept refinement trade studies and advanced technology development; system design and integration; development, fabrication, assembly and test of hardware and software for prototypes and/or engineering development models; system test and evaluation; system engineering and program management; peculiar and common support

equipment; peculiar training equipment/initial training; technical publications/data and initial spares and repair parts associated with prototypes and/or engineering development models.

1.3.2 Investment

Investment costs consist of production and deployment costs incurred from the beginning of low-rate initial production (LRIP) through completion of deployment. Typically, investment costs include costs associated with producing and deploying the primary hardware; system engineering and program management; peculiar and common support equipment; peculiar training equipment/initial training; technical publications/data; initial spares and repair parts associated with production assets; interim contractor support that is regarded as part of system production and is included in the scope of the acquisition program baseline; and military construction and operations and maintenance associated with system site activation.

1.3.3 Operations and Support

Operations and Support (O&S) costs consist of sustainment costs incurred from initial system deployment through the end of system operations. It includes all costs of operating, maintaining, and supporting a fielded system. Specifically, this consists of the costs of personnel (government organic and contractor), equipment, supplies, software, environmental costs including environmental permits and hazardous materials management, energy expenses including acquisition, storage and transportation and services associated with operating, modifying, maintaining, supplying, training and supporting a system in the DoD inventory. These costs may include interim contractor support when it is outside the scope of the production program and the acquisition program baseline. O&S costs include costs directly and indirectly attributable to the system regardless of funding source or management control. Direct costs refer to the resources immediately associated with the system or its operating unit. Indirect costs refer to the resources that provide indirect support to the system's manpower or facilities. For example, the pay and allowances (reflected in composite standard rates) for a unit-level maintenance technician would be treated as a direct cost, but the (possibly allocated) cost of medical support for the same technician would be an indirect cost.

1.3.4 Disposal

Disposal costs consist of costs associated with demilitarization and disposal of a military system at the end of its useful life. Planning and executing demilitarization may not always be adequately considered when preparing life cycle cost estimates. However, it is important to factor the cost of demilitarization and disposal early in the life cycle of a system because these costs can be significant. Costs associated with demilitarization and disposal may include disassembly, materials processing, decontamination, hardware, collection/storage/disposal of hazardous materials and/or waste, safety precautions, environmental considerations and transportation of the system to and from the disposal

site. Systems may be given credit in the cost estimate for resource recovery and recycling considerations.

Defense system program LCC and TOC are discussed in paragraph 5.2.2 of the [Defense Acquisition Guidebook](https://acc.dau.mil/CommunityBrowser.aspx?id=289207) (reference (g)): <https://acc.dau.mil/CommunityBrowser.aspx?id=289207>. It is sometimes useful to apply an “enterprise-wide” perspective to TOC, which may be defined to include a margin of cost of a defense system program to the naval enterprise as a whole. TOC reduction planning should encompass this marginal cost that extends beyond the scope of LCC, but which can be allocable to individual defense system programs. Initiatives and investments that seek to reduce a program’s TOC should consider whether that initiative or investment raises or lowers enterprise-wide TOC as a measurable share of broader supply chain, IT, transportation, facilities, maintenance infrastructure and business process systems. Examples of these TOC category costs that are beyond LCC, but attributable to a specific program, might include changes to the cost for delivering fuel, calibrating common tools and test equipment, skills training, safety compliance and changes in the cost for management of overhead.

1.4 The Future of TOC

As early as the Capabilities Based Assessment (CBA) process, the department begins to build a narrative and an analytic case for using TOC as a primary means to prioritize defense system program decisions. Program management’s responsibility for TLCSM requires that all fundamental program decision-making heavily weigh those decision factors and alternatives that are most conducive to total system life cycle sustainment effectiveness *and to life cycle sustainment affordability* (para 2.5.4.9.1.1 of reference (a)). These decisions are increasingly prefaced by the cost and business case analyses that begin with the CBA and AoA process and precede a Milestone A decision to begin program engineering and technical development. Program TOC estimates and analysis built on AoA findings continue to evolve as major decisions are made and validated during progressive Gate Reviews (reference (a)). Total life cycle or TOC affordability will play a major role in shaping the evolution of design and development; especially in establishing an effective life cycle sustainment program, which can be expected to directly affect the majority of total funds eventually expended on most major programs.

The JCIDS process (reference (e)) Initial Capabilities Document (ICD) sets the narrative for naval warfighting systems performance capability parameters and guides how the AoA will assess technical performance and associated cost analysis of viable materiel alternatives. From a total program/total life cycle affordability perspective, the JCIDS performance criteria related to operational sustainment (reliability, availability, maintainability and ownership cost) are strong variables in mitigating eventual total program TOC.

Reference (h) describes a Business Capability Lifecycle (BCL) model that is to be used as an incremental acquisition approach for Defense Business Systems (DBS). The BCL model can be viewed as the counterpart to reference (e) JCIDS for the Defense Acquisition System and as a tool to develop an overarching framework for the planning, design, acquisition, deployment, operations, maintenance and modernization of DBS. Life cycle TOC optimization is as important a DBS development and sustainment priority, as it is for weapon systems.

An example of pursuit of TOC reduction in a DBS program is the Global Combat Support System - Marine Corps (GCSS-MC) program. For post-development support, the program integrated IT Enterprise tool requirements across Marine Corps Systems Command and other activities. As a result, overall GCSS-MC accreditation, implementation, and sustainment saw a \$1.2 million reduced cost requirement. A further \$2 million per year is being saved by reducing numbers of full time equivalent (FTE) Data Base Administrators (DBAs) used to support formal school training. Job task analysis determined that certain DBA tasks associated with repair and training could be transferred GCSS-MC instructors, rather than using dedicated DBA support personnel. Training platforms remained stable with the fewer number of dedicated DBAs, in terms of numbers of unplanned outages.

The process of cost analysis and projection of life cycle TOC affordability is expected to improve over time, as materiel sourcing and system development decisions are made increasingly in view of how decisions will affect eventual total program TOC. This improved cost analysis rigor will eventually extend into the post-fielding and deployment phase to better capture the actual costs to own and operate systems and thereby provide a more solid basis for initial materiel alternatives analysis and life cycle product support business case analyses.

2.0 TOC-RELATED PROGRAM GOVERNANCE REQUIREMENTS OVERVIEW

2.1 Applicability/Exceptions

The TOC-related requirements and initiatives described in this guidebook align with the Two-Pass/Six-Gate DON Requirements and Acquisition Governance Process defined in reference (a). This Gate governance process applies to all pre-MDAP (Major Defense Acquisition Program) programs, all MDAP ACAT I (Acquisition Category) programs, all pre-MAIS (Major Automated Information System) programs, all MAIS ACAT IA programs and selected ACAT II programs. Additionally, all ACAT level programs are required by reference (a) to assess PoPS for their Milestone Reviews. TOC metric criteria are instituted within the structured PoPS process.

All ACAT programs must actively plan and execute TOC mitigation and reduction initiatives during every facet of systems development, operations and sustainment. Programs must demonstrate progress towards their specific TOC initiatives during all formal acquisition process design reviews, assessments, governance Gate Reviews and milestone decision forums. The tangible result expected of TOC effort is that major systems design and engineering, configuration and investment decisions are driven in strong consideration of mitigating or reducing TOC.

2.2 Assigning TOC Accountability

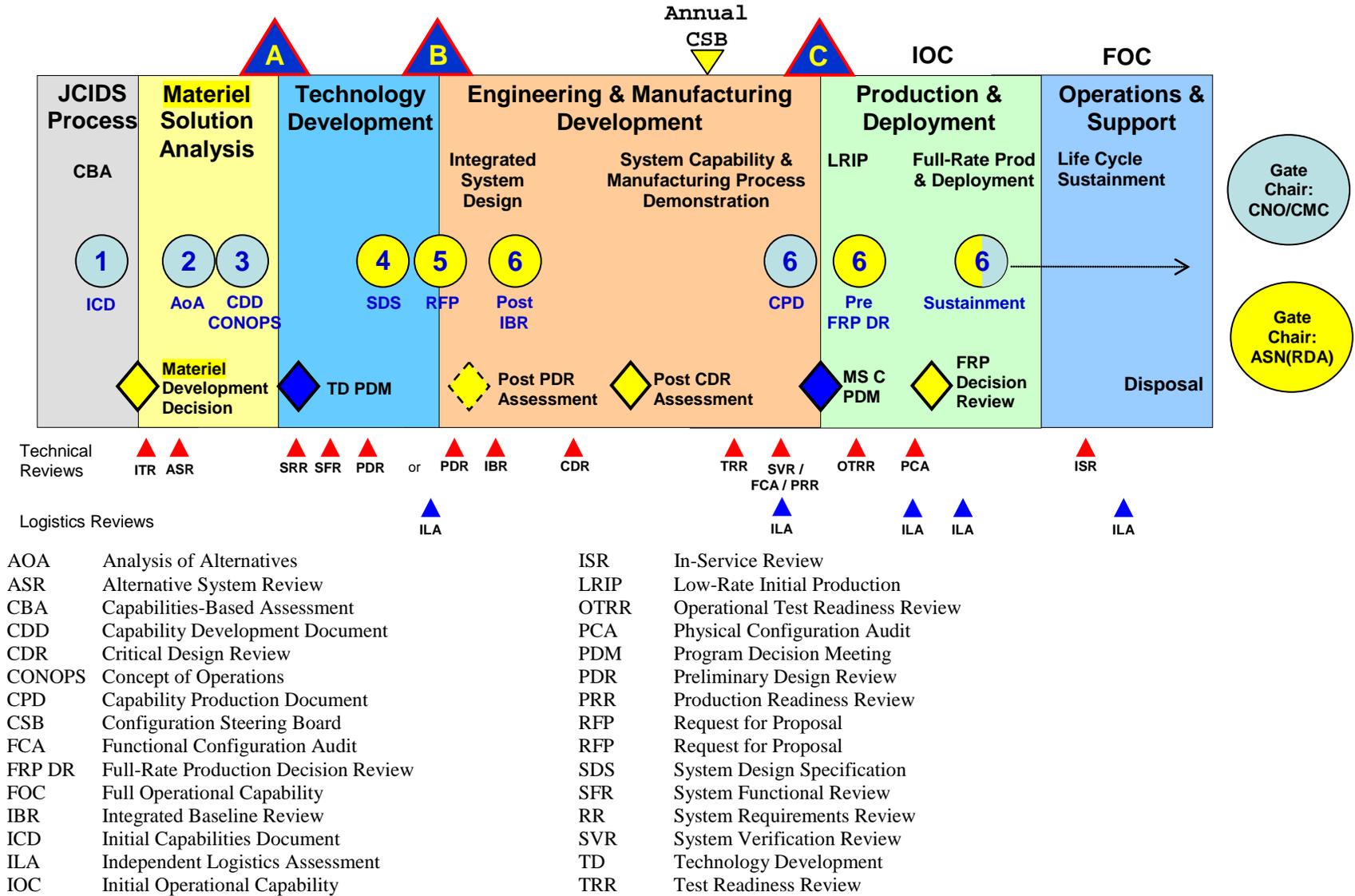
The role of the PSM is newly legislated to own, develop and implement a major program's comprehensive product support strategy. That strategy will be outcome-based and expressed at minimum "in terms of weapon system materiel availability, materiel reliability and operations and support cost affordability" (Product Support Manager Guidebook, Apr 11). Weapon, IT and business system sustainability, product support and life cycle affordability in support of the Program Manager are the main goals for PSM work. Diligence in planning and executing a program of effective and optimally affordable product support means that the PSM has necessarily become the strongest advocate within a major acquisition program for those development decision alternatives that are "TOC mitigating" in life cycle result, and that are "TOC reducing" in sourcing, commonality and investment decisions as the system develops and throughout operations. For less than major ACAT programs, the Deputy or Assistant Program Manager for Logistics (DPML/APML) serve these same PSM roles and same TOC advocacies. As principal TOC advocates, PSMs and DPML/APMLs must focus not only on sustainment technical and operational effectiveness, but also on the life cycle affordability of that sustainment.

2.3 Summary of TOC-Related Requirements

Figure 1 depicts the DON Requirements/Acquisition Two-Pass/Six-Gate Process (reference (a)). Shown are several decision milestones, governance Gate Reviews, technical reviews, logistics assessments, and Gate Reviews associated with a development program initiated at Milestone A.

Figure 1: DON Requirements/Acquisition Two-Pass/Six-Gate Process

Program Initiation at Milestone A



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Table 2-1 shows TOC-related planning, products, and status that may be presented at Gate Reviews. Gate Reviews, whether convened as such, or as in Navy under the auspices of the Chief of Naval Operation (CNO)'s R3B, will ensure that a program's strategy and initiatives for mitigating or reducing TOC are suitably planned, presented, resourced, and timed as integral to the system's development.

Any and all ACAT strategic and planning documents may be called upon for review prior to R3B/Gate Reviews and during the formal program reviews and assessments that precede each governance event. Each key document (e.g., the Acquisition Strategy (AS), the Life Cycle Sustainment Plan (LCSP), the Service Cost Position (SCP), etc.) should feature and highlight aspects of TOC planning and execution. As programs demonstrate progress towards TOC reduction and present that progress at Gate and other reviews, TOC advocates (e.g., OPNAV N4 for Navy) will collect key lessons of TOC affordability initiative and apply towards future TOC Guidebooks.

Note that the slides the department designates as comprising a mandatory core set of Gate Review briefing content slides, is not static. Some of the Table 2-1 slides may be required by subsequent direction to this guidebook, or as requested by the Gate Review board secretariat or chair to be presented at certain Gate Reviews (i.e., as a core slide). The remainder will be elective. Regardless of their status as a core or elective Gate Review or lesser ACAT governance process slide, all of the Table 2-1 slides should be considered to be briefed to present a comprehensive program of TOC mitigation and reduction.

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Table 2-1: Summary of TOC-Related Reporting Requirements by Gate

Core Reporting Slides	Page # of Description	GATE								
		1	2	3	4	5	6 IBR	6 CPD	6 FRP DR	6 Sustainment
AoA Proposed Study Guidance	16	X								
TOC Estimate	18		X	X	X	X	X	X	X	
TOC of Alternatives	20		X							
TOC Profile for Preferred Alternative	21		X							
Warfighter Review of AoA Results	22		X							
Updated TOC Profile	24			X	X	X	X	X	X	X
TOC Drivers	26			X	X	X	X	X	X	
Cost Estimate versus Acquisition Program Baseline (APB) - \$M/B Base Year	28				X	X	X	X	X	
Life Cycle Product Support Sustainment	29				X	X	X	X	X	X
TOC Estimate History (guidebook only)	30				X	X	X	X	X	X
Evaluation of TOC Reduction Planning Initiatives & Investment	35									X

3.0 TOC CONTENT FOR R3B/GATE REVIEWS AND POPS HEALTH METRICS

The following are Gate Review recommended briefing template slides, plus guidance on how to represent an ACAT program's TOC planning and execution progress. Assessing potential total program life cycle affordability is a manifest purpose of program governance of all categories of acquisition programs and is especially critical to be projected and defended at R3Bs and Gate Reviews.

Acquisition program health is a key feature briefed at each Gate Review using PoPS metrics. To aid this health assessment, this guidebook includes the metric criteria for TOC that corresponds to each Gate Review related phase of systems development and progress.

3.1 Gate 1 Validate ICD and AoA Study Guidance

Slide 1



AoA Proposed Study Guidance

- Capability discussion
 - Describe new capability that is being introduced (if applicable)
 - Describe changes to the capability that is being replaced
 - Describe relationship with other program increments and/or capabilities
 - Describe total ownership cost implications to achieve desired capabilities
 - Describe supportability capabilities to achieve desired capabilities
- Technical synopsis
 - Who's performing
 - Duration of AoA
 - Models to be used
 - Highlight alignment with Joint planning scenarios
 - Outside reviewers of originating organization
- TOC related guidance
 - Describe how the relative TOC of each alternative will be assessed
 - TOC Evaluation Criteria
 - Potential Ownership Costs (OC) Thresholds and Objectives from OC Key System Attributes (KSA)
 - Initial performance parameters and capabilities related to Ownership/Manpower/Reliability, Availability, and Maintainability (RAM)/Key Performance Parameters (KPPs)/KSAs

Purpose: The AoA Proposed Study Guidance slide describes comprehensive TOC estimating that must be conducted during the AoA study. Reference (a) defines a TOC-driven priority, that the AoA study analysis of possible materiel (i.e., weapon and IT systems) solutions to new warfighter performance capability has an expanded scope for cost analysis. In practice, AoA study guidance and direction has expanded from historically a procurement-cost only perspective

to one that addresses a prospective system's likely total life cycle cost to own and operate. This change allows an earlier picture to emerge of total life cycle cost affordability, and so allows more informed decisions that are based on the eventual shape and size of a perspective new acquisition program. Having more realistic life cycle cost affordability picture is intended to affect the earliest Gate Review related decisions, such as the Materiel Development Decision (MDD).

Usage: This slide is only used at Gate 1.

Scope: This slide should be prepared in tandem with development of the ICD, so that it highlights systems performance capability gaps to be addressed in the AoA study. Given the need to ensure that systems are affordable to both develop and to sustain over a projected service life, the TOC related guidance here involves O&S phase costs for current or similar systems that are providing capabilities, about to be updated or replaced. Guidance should also include the sources for systems readiness and cost data, which the AoA study team must compile and analyze. AoA study TOC guidance should be sufficiently detailed that it informs the selection of a materiel solution from among AoA study recommended candidates.

Responsibility: Program sponsors control the process for identifying, shaping and refining new systems performance requirements. They have life cycle funding responsibilities for any new program initiated.

Processes for this slide: At this point, technical performance parameters are outlined and described, but not quantitatively specified. The AoA will help refine a set of technical parameters to be acquired or developed, each of which will be assigned a range of threshold and objective performance values. To do so, the AoA begins with a wealth of data associated with the ownership cost of existing, fielded "legacy" systems that are to be upgraded or replaced by the prospective new development program. The state of technology in areas related to requested new performance capability is often also known. AoA guidance should therefore highlight cases where TOC may vary widely, based on ready availability (commercially derived, for example) of technology versus cost required to separately develop new performance capabilities. AoA study guidance will require that study findings of materiel alternatives consider the variable life cycle costs of organic versus contractor sustainment support and report how candidate solutions differ in cost. Study findings should also relate potential cost avoidance associated with substantial use of an existing logistics sustainment infrastructure such that economies of scale are to be expected, versus a higher life cycle cost to sustain a more unique technology or configuration of components.

PoPS metric criteria at Gate 1: AoA guidance establishes that assessment must extend to projecting a defense system's life cycle cost to develop, own and operate (i.e., TOC).

3.2 Gate 2 Validate Analysis of Alternatives Findings

Purpose: TOC slides at the Gate 2 Review present AoA study analysis findings and resultant AoA recommendations. At this Gate, AoA study results are scrutinized for completeness and for how thoroughly analysis points to one or a few preferred alternatives, rationalized on the basis of

TOC affordability and on the strength of technical performance. Cost estimates for Gate 2 may not be limited to the findings of the AoA.

Layout: There are four TOC-related slides at the Gate 2 Review:

Table 3-1: Gate 2 TOC-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate for each alternative.
2	TOC of Alternatives	Presents additional fidelity by breaking down each alternative’s TOC Estimate by appropriation.
3	TOC Profile for Preferred Alternative	Presents a life cycle perspective of the distribution of TOC by appropriation across the life cycle for the preferred alternative.
4	Warfighter Review of AoA Results	Presents a subjective assessment from the Warfare Enterprise of the relative impact of various requirements on development cost and O&S cost.

Slide 1



Total Ownership Cost Estimate

All Alternatives

PROGRAM NAME
GATE 2 (CORE)
DATE UPDATED

- Key assumptions in the estimate
 - Compare to CARD Document and other program documentation
- Significant cost drivers and sensitivity analysis
 - Prioritize and highlight drivers that are most sensitive to cause cost changes
 - Highlight cost drivers that are directly KPP-related
- Major cost risks
- Limitations or significant uncertainties of the estimates
 - *The above set of bullets may take more than one slide to convey the requisite information*

Purpose: The purpose of this Gate 2 slide is to focus on all systems performance and operational factors that will strongly affect TOC. Estimate and analyses must be briefed at this stage of development in terms of TOC *mitigation*, prior to selecting one or more materiel alternatives for further development. A source of information includes, but is not limited to, the AoA study.

Usage: This is a standard slide to be used for TOC-related estimates at all Pass 1 and 2 Gate Reviews. Continuous revision of TOC Estimates extend throughout systems development and into the life-long series of Sustainment Gate Reviews, increasingly incorporating actual cost as systems fielding occurs.

Scope: This slide should be prepared for each AoA study alternative identified as viable and feasible, and therefore a subject of equitable Gate Review consideration.

Role: At Gate 2, this TOC Estimate slide is prepared by the AoA study team leader and the Naval Center for Cost Analysis (NCCA).

- **Key Assumptions.** Discuss key assumptions related to the TOC Estimate based on the Cost Analysis Requirements Description (CARD) provided for each alternative. In subsequent Gates these assumptions should be described based on updated CARD, ACAT program life cycle cost estimates, and the SCP established for the program.
- **Significant Cost Drivers and Sensitivity Analysis.** For each alternative, discuss the major cost drivers and whether they are non-negotiable (e.g., nuclear power) or can be considered within trade space.
- **Major Cost Risks.** For cost drivers or each alternative to which TOC is highly variable, discuss major programmatic, technical and schedule cost risks and any known mitigation capabilities.
- **Limitations or significant uncertainties of the estimates.** Discuss how the assumptions, cost drivers with high uncertainties and their related cost risks affected AoA study findings.

Note on Methodologies and data sources for developing the TOC estimates: The methodologies, data sources and composition of direct and indirect cost elements should be addressed, along with how these elements comply with NCCA certified procedures.

Slide 2



Total Ownership Cost of Alternatives

For Each Alternative and Appropriation

PROGRAM NAME
GATE 2 (CORE)
DATE UPDATED

\$ in M/TY	AoA #1	AoA #2	AoA #3	AoA #4
Research, Development, Test, and Evaluation (RDT&E)	\$\$	\$\$	\$\$	\$\$
Procurement	\$\$	\$\$	\$\$	\$\$
Operations & Maintenance (O&M or OM)	\$\$	\$\$	\$\$	\$\$
Military Personnel (MP)	\$\$	\$\$	\$\$	\$\$
Military Construction (MILCON)	\$\$	\$\$	\$\$	\$\$
TOTALS	\$\$	\$\$	\$\$	\$\$

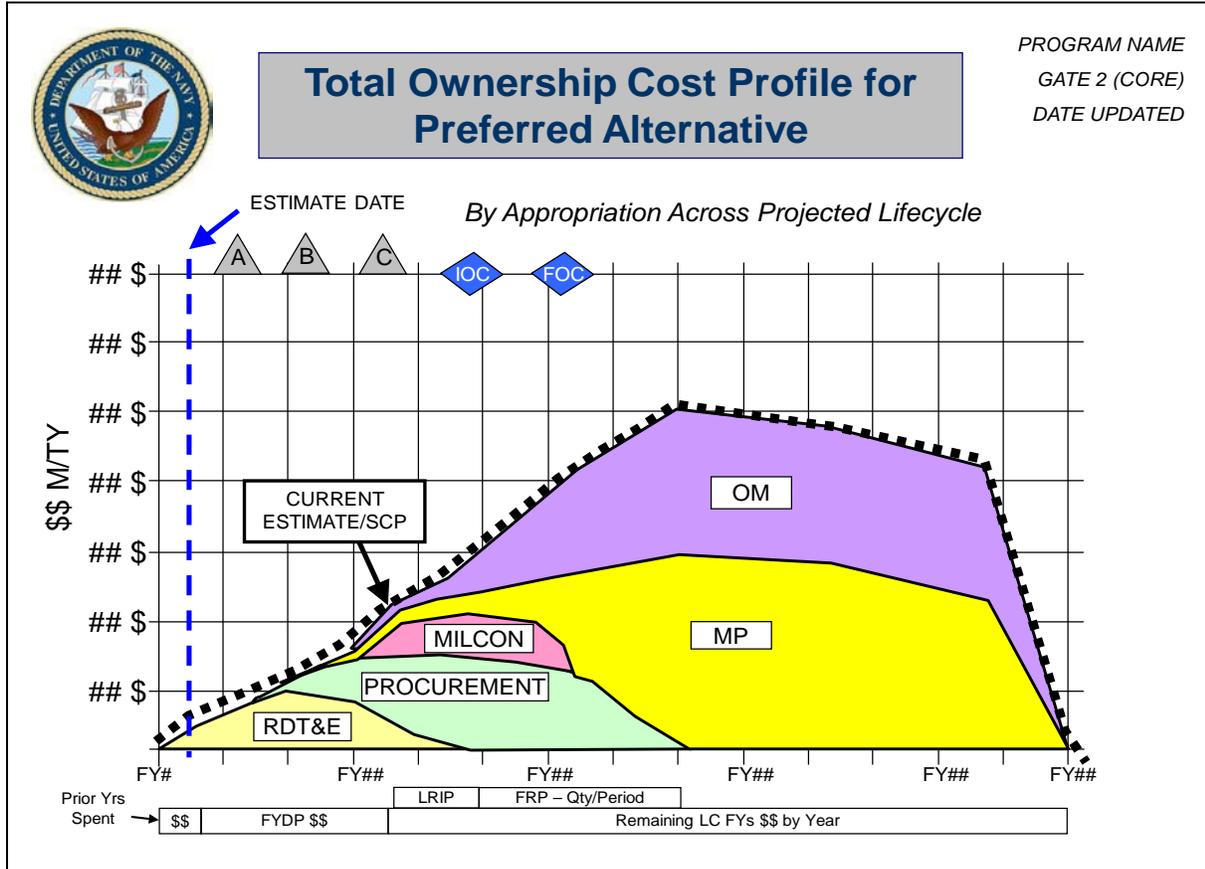
Purpose: Slide 2 presents AoA study TOC findings in terms of appropriation estimates. The intent is a comparison to aid Gate 2 discussion to help target a preferred alternative.

Usage: This slide is only used at Gate 2.

Scope: All viable, feasible materiel alternatives identified by the AoA study.

Roles: This slide is prepared by the AoA study team leader and the NCCA.

Slide 3



Purpose: If a “preferred alternative” is being recommended at Gate 2, then this slide graphically depicts TOC in terms of relative percentages estimated as required in each appropriation category.

Usage: This slide originates at Gate 2 and is built upon for each subsequent Gate Review.

Scope: This slide should be prepared based on the AoA report for the most viable “materiel” alternative. Ensure that the dotted line represents a formal SCP, if established (see reference (a)).

Roles: Prepared or validated by NCCA.

Processes for this Slide: This slide represents a TOC Estimate for the preferred alternative. A TOC Estimate serves until a formal SCP is established.

Life Cycle / TOC Cross Reference Grid: The grid on which the TOC profile by appropriation is depicted should be built to accommodate the scope of the life cycle and the TOC Estimate for the alternative. Represent the key acquisition phases, milestones and events from the AoA study plan. Populate the various layers related to each appropriation in a cumulative fashion, using the Component appropriations of the TOC Estimate from (as a start) the AoA report. Represent the outline of the cumulative appropriations as the TOC Estimate or SCP (if available).

Slide 4



Warfighter Review of AoA Results

PROGRAM NAME
GATE 2 (CORE)
DATE UPDATED

• **Warfighter assessment of importance of key requirements vs. cost implications for selected alternative:**

Key Requirement	Development Cost Implication	Operations & Support Cost Implications	Warfighter Assessment
Speed >40 knots	Very High	Very High	Less important
Speed >30 knots	High	Low to Medium	Important
Quietness 4X 688I	Very high	High	Less important
Quietness 2X 688I	High	Low	Very important
Depth > xxxx feet	Very high	Low	Less important
Firepower	Medium to High	Low	Important
Survivability	High	Low	Very important
New Combat System	High	High	Important

ILLUSTRATIVE
Example for a
Submarine

Cost Legend
Low = Low cost implication; Medium = Medium cost implication;
High = High cost implication; Very High = Very high cost implication

ILLUSTRATIVE
Example for a
Submarine

Purpose: The purpose of this slide is to highlight direct warfighter and operational command assessment of the relative importance of evolving key performance considerations, given the ICD and AoA study performance findings and given all projections of life cycle cost.

Usage: This slide is to be used only at Gate 2.

Scope: This slide should be prepared based on performance capabilities highlighted in the ICD that are likely to be specified as “key” performance parameters in the Capability Development Document (CDD) and synchronized with any ongoing work on the CONOPS.

Roles: Ideally, AoA study cost analysis work has engaged U.S. Fleet Forces Command (USFF) and other warfighter interests. Fleet representatives should also participate at Gate 2, given the focus on performance capabilities and the TOC of defense system programs that may result from Gate 2 deliberations. This slide requires a relative prioritization by the Fleet. The intent is to present their view of the relative importance of key performance attributes, in view of life cycle TOC affordability implications from the AoA study.

Processes for this Slide: Without a mitigating TOC perspective, warfighters might view any increase in capability as the only cost decision variable affecting them. But given a view, for example, that a decision for 35 knots of top speed, vice 45 knots might increase operational availability and also reduce the life cycle TOC of a new surface ship by a factor of 2X, they might consider that the lesser performance parameter threshold is sufficient to meet the threat. This decision alternative should be expressed in terms of not just individual systems perspective TOC, but on the ability to afford (procure and sustain) multiple systems within a family of systems.

PoPS metric criteria at Gate 2: Results of AoA cost affordability analysis contribute to a Gate Review comparison of life cycle cost among viable alternatives and to a first TOC Estimate and SCP for the most viable alternative. TOC analysis further contributes towards setting threshold/objective bounds of the future CDD OC KSA parameters and other quantitative, performance-related, cost parameters that are encouraged to be specified (reference (i)).

3.3 Gate 3 Approval of JCIDS CDD and CONOPS

Purpose: At the Gate 3 Review, TOC related aspects of the results of continuing cost analysis, trade studies, and other analyses related to capability requirements are presented. The context of Gate 3 is CDD and CONOPS development. At this Gate, the TOC focus is:

- Discuss configuration alternatives in the context of TOC, its cost drivers, their impact across the life cycle, and the means to mitigate or control the cost drivers
- Identify the rationale for selecting the recommended configuration(s) and the basis for eliminating other configurations
- Present TOC planning, and the status of TOC analysis, requirements and tasks.

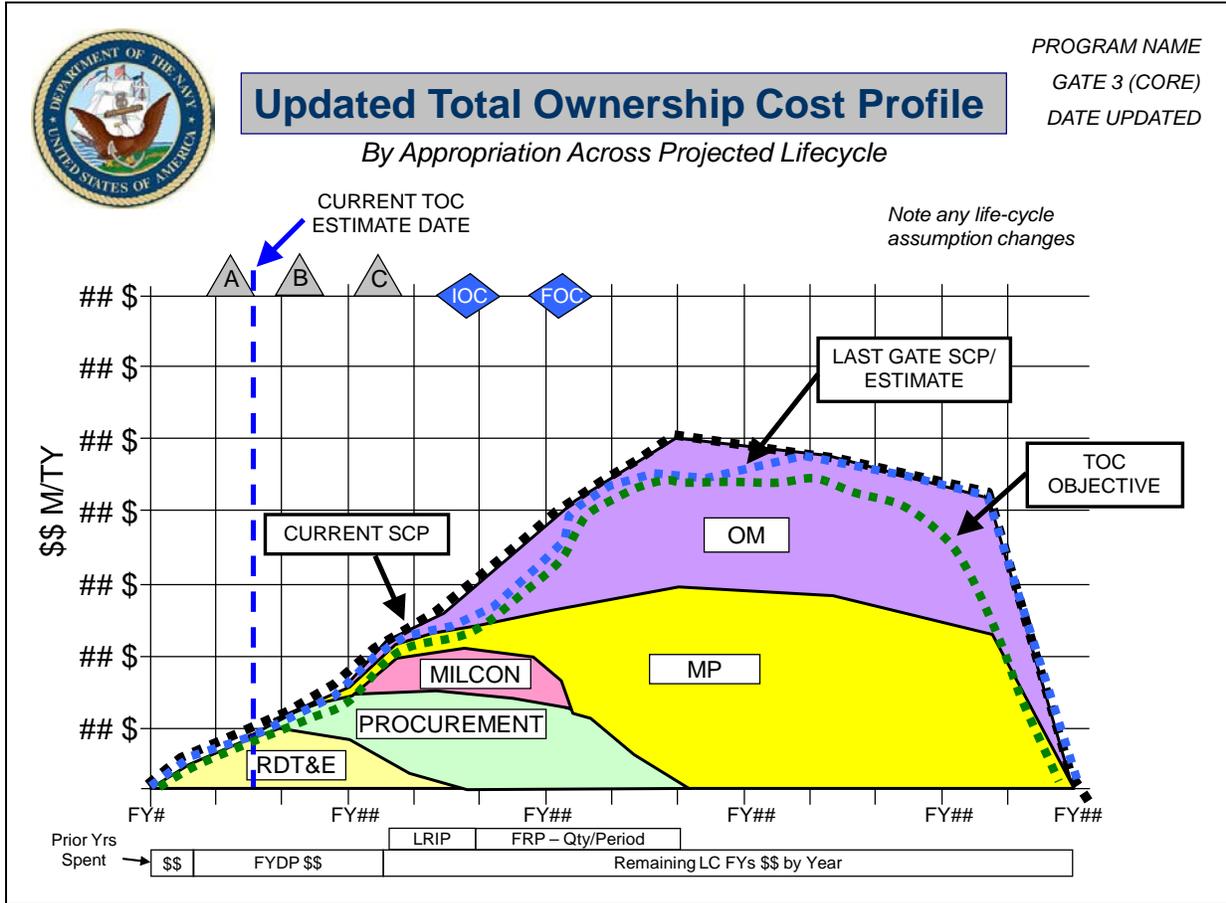
Table 3-2: Gate 3 TOC-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate.
2	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle for the preferred alternative including comparisons to the estimate at Gate 2 and the TOC Objective.
3	TOC Drivers	Presents an overview of the major TOC drivers and the plans to mitigate them as the program proceeds.

Slide 1

Slide 1 (“Total Ownership Cost Estimate” slide from the Gate 2 set) is applicable also to Gates 3 through 6-series. Please refer to section 3.2 for guidance related to developing this slide. Specific guidance related to developing Gate 3 slides 2 and 3 is provided on the following pages.

Slide 2



Purpose: This slide is similar to the Gate 2 slide “TOC Profile for the Preferred Alternative,” but with two additional elements:

- Portrayal of the previous Gate 2 TOC Objective/SCP (if presented at the last Gate)
- Portrayal of a TOC Objective, if one has been derived from the SCP. A *TOC Objective* should be viewed as an “objective” value to the SCP’s “threshold” value. It represents the sum of a program’s specific initiatives and investments to target reduction in life cycle TOC. That is, discrete program initiatives that are either programmed or at least cost estimated and designed to lower the SCP “threshold” towards the TOC Objective. Examples of targeting the TOC Objective line would be:
 - Program change expressly for economy-of-scale adoption of a standard process or tool
 - Procuring a less expensive commodity that has been verified to be operationally suitable for common usage
 - Investing in newer commercially tested technology components or subsystems that will improve system reliability at little or no additional long run O&S cost
 - Each program conducts “should cost” analysis (reference (j)) that is done in juxtaposition to its “will cost” estimate. Comparison of “will” versus “should” cost

should be accompanied with several actionable recommendations (i.e., “should cost” initiatives) proposed specifically to mitigate or reduce TOC.

- This slide informs the Gate Review as to:
 - Amount and distribution of appropriations across the life cycle (e.g., MILCON)
 - Change in the TOC Estimate or SCP from the last Gate
 - Current estimated SCP versus a program TOC Objective (to the SCP’s “threshold” value)

Usage: This slide is used at Gate 3 and built upon for each subsequent Gate Review.

Roles: The PM should prepare this slide with NCCA, using the appropriate SYSCOM independent cost estimating functions.

Procedures: Building this slide is similar to building the Gate 2 slide profile with the exception that the SCP/TOC Estimate from the prior Gate is represented and established as a TOC Objective that is less than the SCP, since it is based on planned TOC initiatives to bring the SCP line downwards towards the TOC Objective line.

Data sources and references: The data source for this slide is the TOC Estimate for the preferred alternative(s) from Gate 2 and the current SCP for the current Gate (if an SCP is required; if not, the current SYSCOM cost estimate should be used).

Slide 3



Total Ownership Cost Drivers

PROGRAM NAME
GATE 3 (CORE)
DATE UPDATED

- Discuss Significant Cost Drivers
 - Prioritize and highlight drivers that are most sensitive to cause cost changes
 - Highlight drivers which are directly KPP-related cost drivers
 - Cost drivers by phase
- Identify Reduction Plan for each Cost Driver
 - Planned trade studies
 - Acquisition strategies
 - Others

Purpose: This slide highlights major TOC drivers for the program and the plans to mitigate each as the program proceeds.

Usage: This slide is used at all Gates after Gate 3.

Scope: This slide is intended to be broad in scope. PEOs, PMs and program sponsors should list all major drivers of TOC whether they are related to requirements, technical and/or manufacturing challenges, procurement strategies (including quantities and schedule), sourcing strategies or others. The plans to mitigate each cost driver should also be summarized which may include additional trade studies to explore the cost “knee in the curve” of various levels of capability, trade studies on how to mitigate key technical challenges, analysis to determine the best acquisition approaches, etc. It may be best to display the cost drivers and mitigation plans in a table for this chart with clarifying information available in back-up. Overall, decision makers should understand the major drivers of program TOC and how the PEO/PM, Resource Sponsor, and Fleet (once fielded) will address them as the program proceeds.

Role: The PEO/PM and Resource Sponsor prepare this slide, with support from functional experts and planners associated with identified TOC mitigation planning and execution.

Data sources and references: The data sources for this slide include the ICD/CDD, trade studies, acquisition strategies, the program’s LCSP, “replaced systems” sustainment plans, and other sources that were necessary to generate TOC cost drivers analysis and TOC mitigation plans.

PoPS metric criteria at Gate 3: Results of AoA ownership cost affordability and other TOC analysis is reflected in the budget, SCP and SCP's TOC Objective.

3.4 Gate 4 Approval of Systems Development Specification

Purpose: TOC slides presented at Gate 4 Review present results of trade studies and other analyses related to various capability requirements and configuration alternatives in the context of the JCIDS and systems design specification (SDS) development. Specifically, the Gate 4 review should:

- Provide the basis for discussion of the various configurations in the context of their TOC, cost drivers, and the plans to mitigate the cost drivers
- Identify the rationale for selecting the recommended configuration(s) and the basis for eliminating other configurations
- Support the Gate Review decision makers in assessing whether or not to proceed to the next phase and related Gate or to modify the program’s direction.

Table 3-3: Gate 4 TOC-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate.
2	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle including comparisons to the estimate at Gate 3 and the TOC Objective.
3	TOC Drivers	Presents an overview of the major TOC drivers and the plans to mitigate them as the program proceeds.
4	Cost Estimate versus APB - \$M/B Base Year	Presents the current and past SCP or SYSCOM estimate to the APB threshold.
5	Life cycle Product Support Sustainment	Presents a “Sustainment Quad Chart” to summarize Product Support planning and execution. The LCSP and its adjunct LRFS tool must provide details to substantiate this chart.
6	TOC Estimate History	Presents a historical perspective of TOC estimate changes over all previous gates and milestones.

Gate 4 slides 1, 2 and 3 are updated slides from prior Gates. Please refer to earlier sections of this guidebook for descriptions of how to develop each slide. Specific guidance related to developing slides 4, 5 and 6 is provided in the following Gate 4 section. Slide 5 is a mandatory

slide for this Gate Review and all those hereafter and should be used uniformly as well as a focus for program review and governance, regardless of ACAT.

Slide 4



**Cost Estimate versus APB – \$M/B
Base Year**

PROGRAM NAME
GATE 4 (CORE)
DATE UPDATED

SCP/Syscom vs. APB – Base Year \$M/B

	SCP or SYSCOM estimate (current)	SCP or SYSCOM estimate (prior)	Acquisition Program Baseline threshold (date)	Current Estimate Exceeds APB by
Quantity	650	700	700	-50
Average Production Unit Cost	2.7	2.6	2.6	0.1
Program Unit Acquisition Cost	4.5	4.2	4.3	0.2
Flyaway/ Sailaway	43.4	43.4	45.0	-1.6
Weapon System Cost	126.5	126.5	131.4	-4.9
Procurement Cost	1253.7	1253.7	1337.9	-84.2
Acquisition Cost	1495.3	1495.3	1606.0	-110.7
TOC (LCC)	4378.9	4378.9	5150.0	-771.1

For programs requiring an SCP, use the SCP; for all others, use the official SYSCOM estimate. If the program does not yet have an approved APB, annotate the APB column as "projected" or "draft."

Purpose: This slide highlights how current and prior TOC related estimates the program compare to the approved APB.

Usage: This slide is to be used at Gates 4 through Gate 6 FRP DR.

Scope: This slide should be prepared using the current SCP (or SYSCOM cost estimate if an SCP is not required), the previous SCP estimate (or SYSCOM cost estimate if an SCP is not required) and the approved APB.

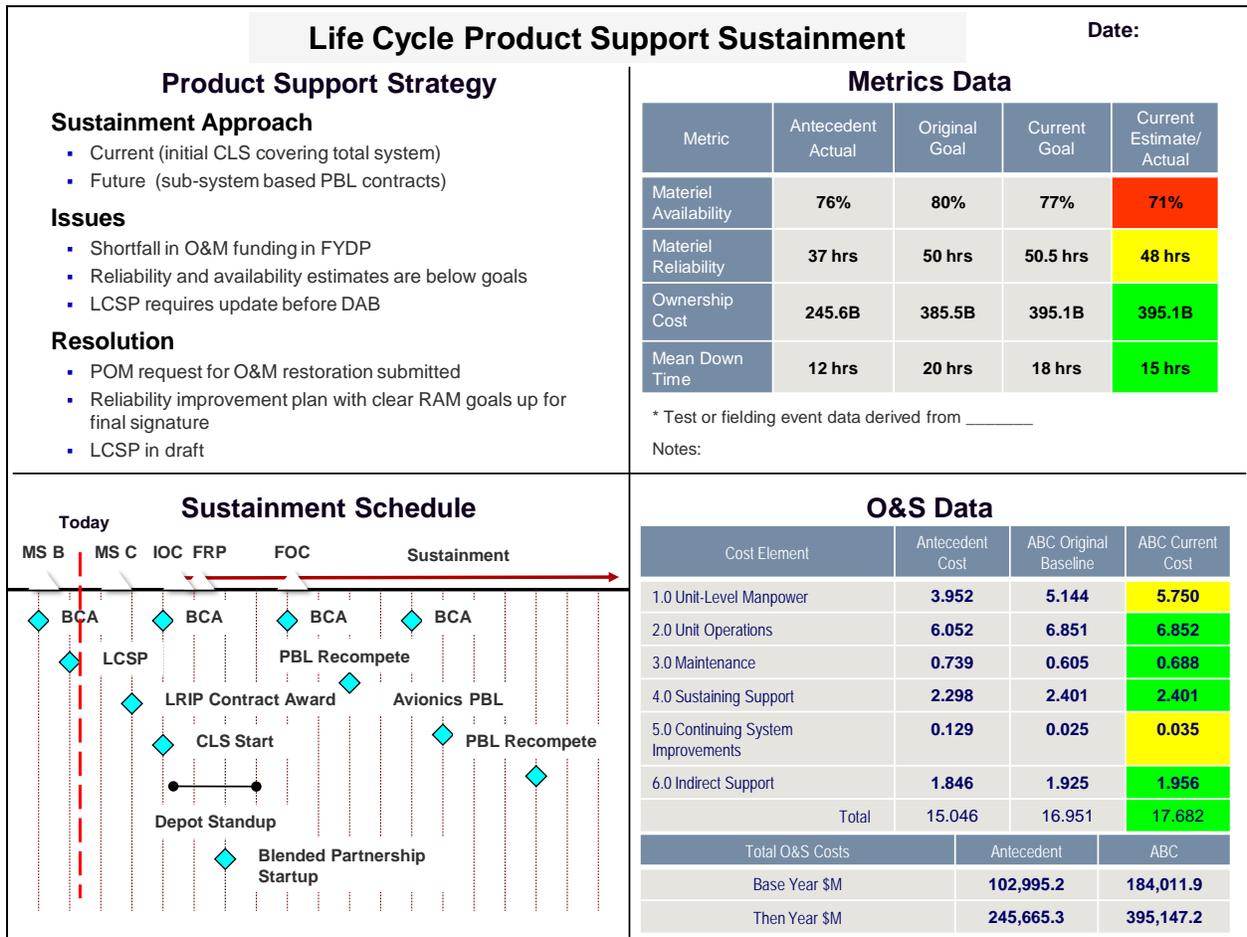
Roles: NCCA leads in preparing this slide, in collaboration with the appropriate SYSCOM cost estimating function if an SCP is not required.

Processes for this slide: Quantity and costs of the program should be highlighted per the categories listed on the slide. It is important to highlight not only the quantity being procured and the unit cost, but also the overall TOC. The TOC (LCC) should match the current and

previous SCPs or SYSCOM estimates. If the APB does not list a TOC (LCC) threshold, specify N/A.

Data sources and references: Current and previous SCPs or SYSCOM TOC estimates and most recently approved APB.

Slide 5

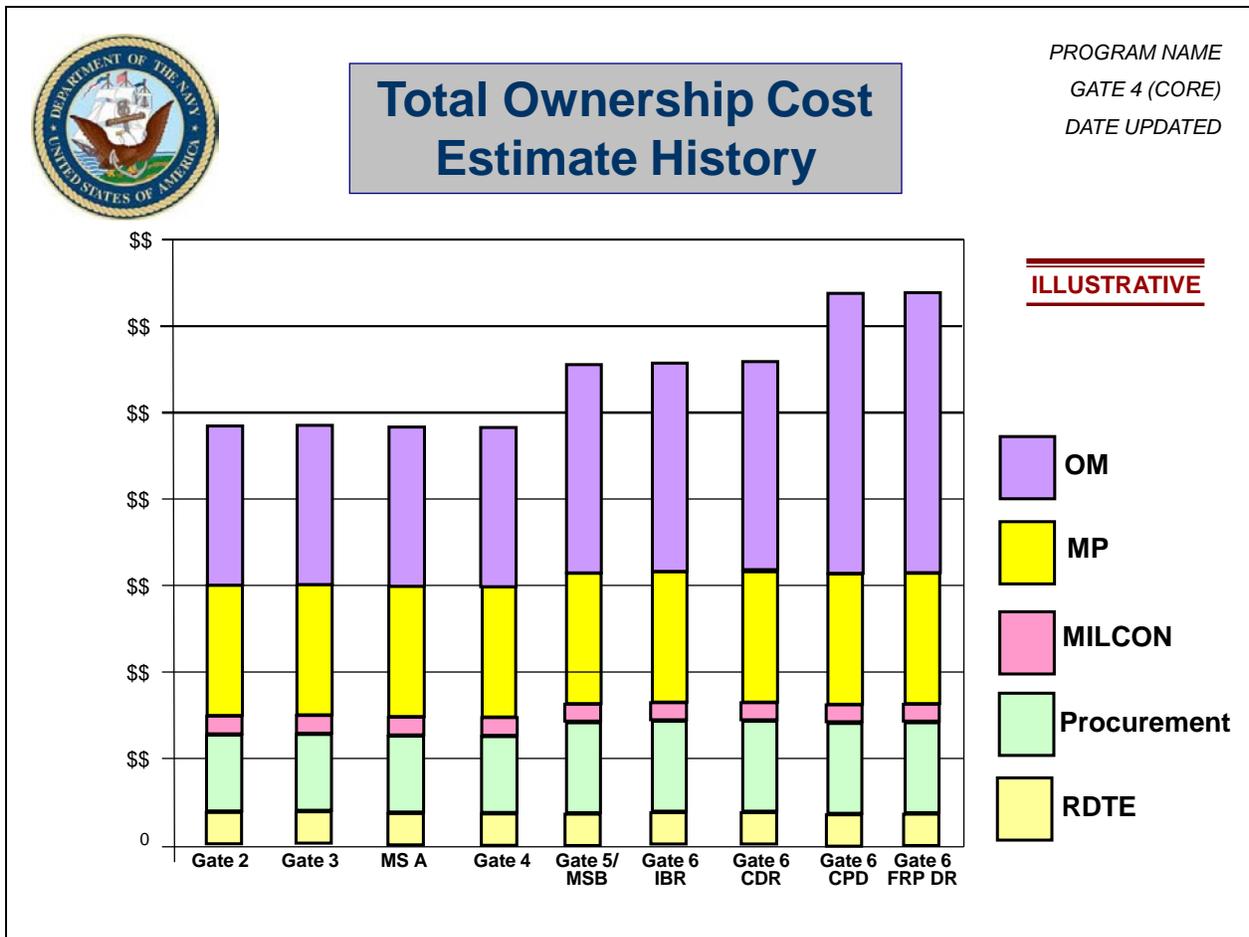


first prepared to support Milestone B decisions and updated for all subsequent major program reviews.

Scope: As a briefing slide required for all Service’s acquisition category programs, this slide’s format is only minimally configurable and must follow reference (k) and subsequent format standardizations (reference (k)). Slide content is a summary of the program’s LCSP and LRFS per reference (a). Resources to plan and execute a product support and sustainment must be sufficient to enable all systems KPPs to perform to threshold performance values, beginning at IOC and within the CDD’s OC KSA affordability parameters.

Roles: This slide is prepared and maintained by the program’s Life Cycle Logistician or MDAP PSM.

Slide 6



MSB Milestone B

Purpose: The purpose of this slide is to provide a historical perspective of TOC Estimate and SCP changes over the various gates and milestones. It provides a long-term historical understanding of the program’s TOC trends.

Usage: The TOC Estimate history slide is not required at the Gate Reviews. However, PEOs and PMs may find it useful to develop this slide as a more detailed execution level backup for the updated TOC profile chart, first created at Gate 3 and for subsequent gates.

Scope: This slide should include the TOC Estimates for the preferred alternative at Gate 2 and the SCP or SYSCOM generated TOC Estimates at Gate 3 and beyond.

Procedures: Building this slide is identical to building the bar chart portion of the TOC profile slide introduced at Gate 2 and updated at Gate 3 and subsequent gates.

Data sources and references: The data source is the TOC Estimates defined in “Scope” above.

PoPS metric criteria at Gate 4: Acquisition strategies and systems design and development are driven by analyses intended to bring the SCP down to TOC Objective levels of cost.

3.5 Gate 5 Approval of Request for Proposal

Purpose: At Gate 5, the contracting strategy will be further matured and more specific plans for contract proposals will be presented. It is essential that the program office include an incentive structure for TOC mitigation and reduction, to successfully accomplish TOC goals and objectives.

Table 3-4: Gate 5 TOC-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate.
2	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle including comparisons to the estimate at Gate 4 and the TOC Objective.
3	TOC Drivers	Presents an overview of the major TOC drivers and the plans to mitigate them as the program proceeds.
4	Cost Estimate versus APB - \$M/B Base Year	Presents the current and past SCP or SYSCOM estimate as compared to the APB threshold.
5	LRFS	Presents an updated LRFS to show programmatic resources required to execute life cycle sustainment.
6	TOC Estimate History	Presents a historical perspective of TOC Estimate changes over all previous gates and milestones.

All of the Gate 5 slides are updates to slides developed at Gate 4 and prior gates. Please refer to sections 3.2-3.4 for descriptions and instructions for developing each slide.

PoPS metric criteria at Gate 5: Ongoing TOC analysis has driven Cost Review Board findings and Full Funding Certification and changes to the SCP and TOC Objective.

3.6 Gate 6 Post-IBR Sufficiency Review at Post-Integrated Baseline Review

Purpose: This Gate is the first in a series of Sufficiency Reviews and occurs after the IBR has been conducted. TOC focus of the review is to evaluate program progress as related to the TOC Objective.

Table 3-5: Gate 6 Post-IBR-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate.
2	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle including comparisons to the estimate at Gate 5 and the TOC Objective.
3	TOC Drivers	Presents an overview of the major TOC drivers and the plans to mitigate them as the program proceeds.
4	Cost Estimate versus APB - \$M/B Base Year	Presents the current and past SCP or SYSCOM estimate as compared to the APB threshold.
5	LRFS	Presents an updated LRFS to show programmatic resources required to execute life cycle sustainment.
6	TOC Estimate History	Presents a historical perspective of TOC Estimate changes over all previous gates and milestones.

All Gate 6 Post-IBR slides are updates to slides developed at Gate 5 and prior gates.

PoPS metric criteria at Gate 6 Post-IBR: Any update to the SCP plus revision of the TOC Objective Estimate are adjusted to reflect the establish program baseline budget. TOC analysis is conducted to assess cost effects of (for example) Preliminary Design Review (PDR) results, update of the LCSP and adjunct LRFS cost estimates.

3.7 Gate 6 CPD Sufficiency Review at JCIDS Capability Production Document

Purpose: This Gate is the third of the four Sufficiency Reviews with the purpose of endorsing or approving the CPD prior to Milestone C. The TOC focus continues to be evaluation of program progress as related to the TOC objective.

Table 3-6: Gate 6 CDP TOC-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate.
2	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle including comparisons to the estimate at Gate 6 Post-CDR and the TOC Objective.
3	TOC Drivers	Presents an overview of the major TOC drivers and the plans to mitigate them as the program proceeds.
4	Cost Estimate versus APB - \$M/B Base Year	Presents the current and past SCP or SYSCOM estimate as compared to the APB threshold.
5	LRFS	Presents an updated LRFS to show programmatic resources required to execute life cycle sustainment.
6	TOC Estimate History	Presents a historical perspective of TOC Estimate changes over all previous gates and milestones.

All Gate 6 CPD slides are updates to slides developed at Gate 6 Post-CDR and prior gates.

PoPS metric criteria at Gate 6 CPD: TOC analysis, based on systems development and LCSP/LRFS refinement, has adjusted the CPD’s OC KSA parameter’s range of threshold and objective values and has updated the TOC Objective.

3.8 Gate 6 Pre-FRP DR Sufficiency Review at Pre-Full Rate Product Decision

Purpose: At this Gate, life cycle sustainment and product support planning is the focus for TOC, as the program progresses through the Production and Deployment phase and approaches the O&S phase. TOC reduction plans and initiatives should be included in modernization plans. The LRFS as well as Program Objective Memorandum (POM) requirements will be reviewed.

Table 3-7: Gate 6 Pre-FRP DR TOC-Related Slides

Slide #	Slide Title	Content
1	TOC Estimate	Presents the various assumptions and other elements that drove the TOC Estimate.
2	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle including comparisons to the estimate at Gate 6 CPD and the TOC Objective.
3	TOC Drivers	Presents an overview of the major TOC drivers and the plans to mitigate them as the program proceeds.
4	Cost Estimate versus APB - \$M/B Base Year	Presents the current and past SCP or SYSCOM estimate as compared to the APB threshold.
5	LRFS	Presents an updated LRFS to show programmatic resources required to execute life cycle sustainment.
6	TOC Estimate History	Presents a historical perspective of TOC Estimate changes over all previous gates and milestones.

All Gate 6 Pre FRP-DR slides are updates to slides developed at Gate 6 CPD and prior gates.

PoPS metric criteria at Gate 6 Pre-FRP DR: Revised TOC analysis of production, operational test and evaluation, and initial fielding and sustainment has driven a revised SCP and TOC objective in substantiation of a FRP full funding decision.

3.9 Gate 6 Sustainment Sufficiency Review at Post-IOC Sustainment

Like all gates in the Gate 6 series, Gate 6 Sustainment is conducted to review program performance and health. The exception is that at this point (Post-IOC) initial operations, sustainment, maintenance and supply support has begun and actual performance data is being recorded and can be a factor of analysis in support of this Gate. Gate 6 Sustainment is focused on actual systems performance compared to KPP threshold parameter levels and also on how well the LCSP program is sustaining systems performance to KPP thresholds levels. In addition to technical performance, Gate 6 Sustainment determines if program TOC Estimates are proving correct, in view of actual performance and associated sustainment-related cost data.

Table 3-8: Gate 6 Sustainment TOC-Related Slides

Slide #	Slide Title	Content
1	Updated TOC Profile	Presents an updated life cycle perspective of the distribution of TOC by appropriation across the life cycle including comparisons to the estimate at Gate 6 Pre-FRP DR and the TOC Objective.
2	LRFS	Presents an updated LRFS, to show programmatic resources required to execute life cycle.
3	Evaluation of TOC Reduction Planning Initiatives & Investments	Presents a summary of execution results in reducing TOC for a mature program and highlights proposed TOC reduction investments.

Slides 1 and 2 are updates to slides developed at prior gates. A description of slide 3 (“Evaluation of TOC Reduction Planning Initiatives & Investments”) is provided below.

Slide 3



**Evaluation of Total Ownership Cost
Reduction Planning Initiatives and
Investment**

PROGRAM NAME
GATE 6
SUSTAINMENT
(CORE)

DATE UPDATED

- Key O&S Phase cost drivers and root causes
- Update prior program TOC planning and ongoing execution
- Show execution results in terms of reducing cost towards the TOC objective
- Proposed investment/modernization, targeting the SCP/TOC objective delta within any span of the O&S phase that is not yet being addressed by a TOC reduction initiative

Note: May require multiple slides

Pre-decisional – Not for Release

10

Purpose: The normal course of program development is expected to have incorporated TOC mitigation strategies into core acquisition planning and execution of those plans. As development proceeds, additional initiatives and investments targeted at life cycle TOC reduction should be underway and their cost savings or avoiding results measured. At this point,

resources for inherent TOC-related program development should be funded and executed, as shown in previous gates. These earlier design, development and procurement actions were the biggest and best opportunities to mitigate total system/total life cycle cost. At this point, a mature program is looking for affordability investment, commonality, economies of scale and sub-system/parts modernization opportunities as a means to lower TOC in fielded systems and is starting operations with its initial configuration and logistics sustainment structure already in place.

Usage: This and subsequent Gate 6 Sustainment Reviews.

Roles: Slide is prepared by the PM.

Scope: The program is expected to anticipate and overcome aspects of program design, configuration or sustainment that adds cost or otherwise does not serve to lower SCP down to the desired Objective line.

Procedures: Build this slide from the basis of what is not initially proving to be affordable about the system or about the LCSP sustainment program, in terms of initial indications that costs to sustain or costs for products and services are not as affordable as planned. Then, relate initiatives to reduce those TOC costs. Show an investment strategy that is funded to completion by the program or readiness sponsor.

PoPS metric criteria at Gate 6 Sustainment: TOC analysis continues and is expanded to include actual fielding, training, operations and sustainment costs to date. TOC analysis also provides return-on-investment rationale for specific modernization and common usage/economies-of-scale initiatives, to reduce program cost downwards towards the TOC Objective.

4.0 STRATEGIC SOURCING STRATEGIES

4.1 Definition

So important are the needs to reduce systems' total expenditure through economy of scale savings and to boost Navy's buying power, that proactive investment programs have been established, including a program to optimize the procurement of products and services. The latter is described in paragraph 4.2 and related "investment programs" to reduce TOC are described in paragraph 4.3.

4.2 Department of the Navy Strategic Sourcing Program

Reference (1) has chartered a Department of Navy process and governance structure for strategic sourcing initiatives. The charter and scope of initiatives covers all possible commodities procured by DON. The definition of "commodities" as covered by the program potentially includes all category of supply or service that can be aggregated within or across business units and locations over time. A test for which supply or service commodities are subject to "strategic sourcing" cost savings initiative is that they have similar characteristics in terms of:

- Markets
- Suppliers
- Value
- Technology
- Vulnerabilities
- Management
- Similar scope of procurement and management
- Subject to economies of scale
- Potential to affect (mitigate or reduce) DON total costs

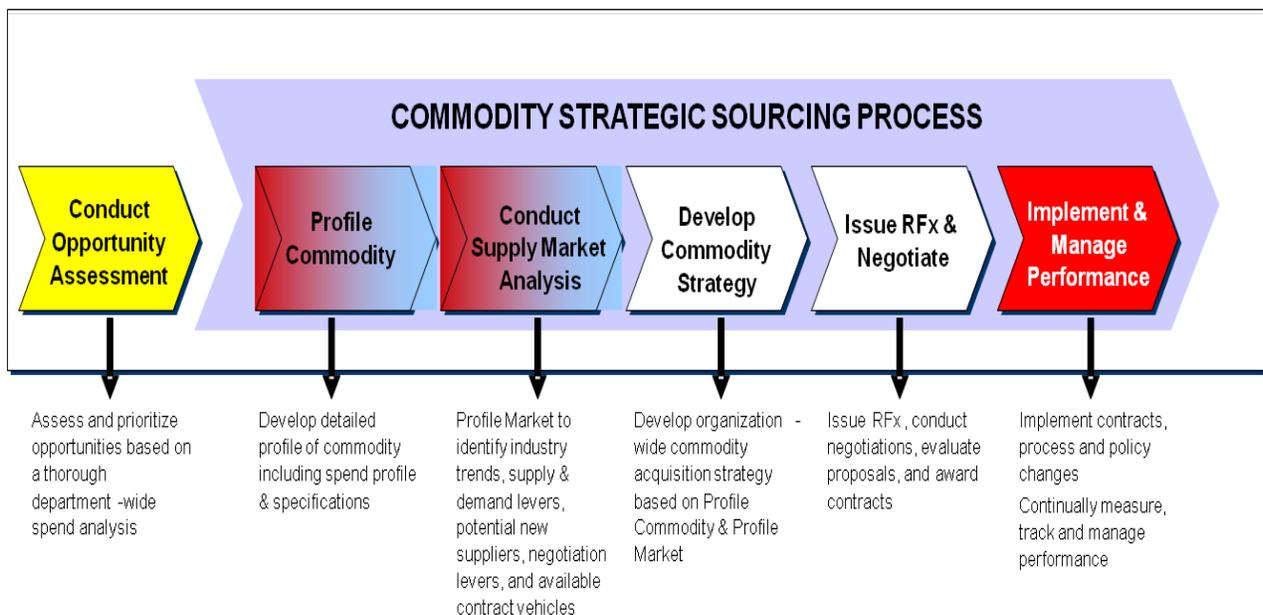
The above scope is expanded further by adding to the process a senior level strategic sourcing official. This new position was established to better seek out and advocate strategic sourcing opportunities and to coordinate the efforts of Commodity Teams that assess commodity candidates for savings potential. The Strategic Sourcing Program Management Office (SSPMO) is located at the Naval Supply Systems Command (NAVSUP). Please contact them at NAVSUP (N7) for support in identifying opportunities for collaboration on common and strategic sourcing of commodities and materiel. Strategic sourcing program analysis is triggered at the SSPMO by a monitored view of redundant purchases and frequent or repetitive but uncoordinated use of the same small pool of commodity and service vendors. As an office and process that focuses on "better buying power" for Navy, it should be consulted by every program that seeks economy of scale TOC reduction opportunities.

Per reference (1), Navy's strategic sourcing process and the SSPMO:

- Supports and guides customers through the strategic sourcing process on their commodities and services requirements generation for affordable consolidation and leverage

- Posts information on the ASN(RD&A) Acquisition “One Source” webpage about strategic sourcing solutions
- Produces annual strategic sourcing goals for organizations responsible for commodities market research and procurement
- Produces sourcing initiatives to the Naval Strategic Sourcing Working Committee based on strategic direction and priority guidance, opportunity assessments, and inputs from Strategic Sourcing Officials
- Identifies DON opportunities to leverage best practices related to strategic sourcing
- Advises BSOs regarding commodity teams on adding strategic sourcing into procurement strategies
- Ensures that industry supplier and socio-economic issues are addressed in customer strategic sourcing decisions
- Awards commodities contracts, monitors contract performance, reports compliance, and recommends strategic sourcing policies and guidance

Figure 2: Commodity Strategic Sourcing Process



RFx Request For (Proposal or Quote)

4.3 Commonality and Standardization

The Department of Defense has defined “commonality” as the “quality which applies to materiel or systems possessing like and interchangeable characteristics enabling each to be used, operated, or maintained by personnel without additional specialized training.” The implicit goal of all forms of “economy of scale” commonality and standardization in Navy is demonstrable cost savings and effectiveness leading to reduced life cycle TOC. Navy defense system program sponsors and acquisition program offices, and especially supply management and maintenance organizations, should routinely extend their perceived purview beyond the scope of insular needs for individual systems and assemblies to actively seek out and test opportunities for commodity

commonality and standardization. These organizations should recommend strategic sourcing actions whenever those opportunities appear to have cost savings and avoidance consequences. There are commonality-related specifications, design, procurement and sourcing opportunities throughout the life cycle of every weapon and information system and across the span of the sustainment, infrastructure and provider enterprise. Throughout systems design, procurement and engineering change; commonality, standardization and strategic sourcing diligence requires a default consideration; towards use of standardized parts, assemblies, components, services, tools, applications and processes.

A feature of formal commonality and standardization programs is the pre-certification of parts, tools and assemblies that can and should have wide-ranging adoption across Navy and also have easily accessible procurement sources. In terms of performance, these parts and assemblies are deemed (pre-certified) to adequately serve across a broad span of platforms and systems. When decisions are made with a sole focus on individual procurement programs and viewed in isolation with no expanded view across multiple systems or infrastructure, Navy loses flexibility to seek economies of scale. Partnerships with industry should include incentive and reward for all parties to seek and adopt common usage whenever there is Navy-wide cost benefit and where technical performance between alternatives is comparable. Incentives to find optimal commonality should not be constrained by the procurement cost of one selection that is marginally more than another alternative, if it can be shown that the marginal cost of such selection does not outweigh a total life-cycle cost benefit to Navy. In the best of circumstances, action taken to reward or require commonality for economy of scale cost savings also results in technical performance and readiness improvement.

If a formal commonality program, as discussed below, involves sourcing pre-certification; where a commonality authority for Navy tests and pre-certifies the technical performance, inherent reliability and suitability or cost advantage of common items; then a degree of burden is generated for procurement agents and program offices to show why the common and pre-certified product, process or service cannot be adopted for use. The Navy, to a limited degree, investigates their materiel and commodity sources as a form of pre-certification. A notable result is standardized commodity contracts intended to encourage procurement agents to seek common materiel from approved sources.

An incentive for Navy to actively find commodities and materiel that are suitable for commonality and to drive their default usage across systems and platforms, is that the most egregious examples of not doing so are sometimes pointed out as failure to act. Specifically, those are instances of unnecessary overpayment for procured parts and assemblies made perhaps with a presumption that these were necessarily unique or inseparable items. Recent examples (reference (m)) are paying \$1,678.61 for a plastic gate roller assembly that was available from Defense Logistics Agency (DLA) for \$7.71, a \$12.51 DLA gear bought instead by Navy for \$644.75, and \$71.01 per unit for a set of metal pins that could have been acquired for 4 cents. The cost to the department over time of failing to seek common or standard alternatives can be considerable. Diligence in pressing for a common solution or standard part alternative should be routine; inherently for cost savings and avoidance, but also to limit instances of paying more for commodities than is necessary.

The opportunities for employing commonality to reduce TOC constantly evolve over time, as technology and manufacturing advances evolve and are applied to systems, tools and automated information systems. Whether pursued as a formal commonality/standardization program or on individual initiative, policies to seek commonality should be strong and not impeded by in-place, long-term, individual weapon systems' overarching performance-based product support arrangements. To be effective, the pursuit of candidates for common solution usage requires unconstrained evaluation of common parts, assemblies, components and sub-systems across a Fleet portfolio, platform and infrastructure-wide basis. Industry partners should also have incentive for pursuing common solutions involving repairable items where there is a total life cycle ownership cost advantage.

Purchasing agents and commodity analysis teams should continuously seek out for substitution those like and similar parts and materiel that can be identified as suitable for common and standard usage. Materiel sourcing and procurement decisions that result in proliferation or uniqueness in platform and major systems configuration constitutes risk to Navy's ability to afford the operational availability of warfighting performance capability. Unmanaged reliance on unique parts that may have had marginal procurement cost or technical advantage can lead more quickly to Diminishing Manufacturing Sources and Material Shortages (DMSMS) dilemmas.

4.4 Applied Commonality and Standardization

An example of a discrete program of strategic sourcing commonality is the "Maritime Hull, Mechanical, and Electrical (HM&E) Standardization" process chartered by a Joint Systems Command Executive Committee (EXCOMM). The HM&E Standardization program is proactive, in that it analyzes allowance parts lists and other sources to identify commodities that are suitable for strategic sourcing standardization procurement. The process reinforces its commodity standardization recommendations in, for example, cross-platform ships design with analysis of costs and other metrics to support the business case. A major end state goal of HM&E commonality and Naval Aviation strategic sourcing initiatives is to be able to maintain select lists of pre-certified commodities and related vendors so shipyards, depots, and repair facilities can then make frequent reference and use.

The Naval Sea Systems Command's (NAVSEA) commonality and standardization process (reference (n)) analyzes systems in the Fleet to identify components for use across acquisition, operations, and sustainment communities. The NAVSEA commonality effort focuses on variation reduction of systems sub-system or components which meet cross platform requirements and reduces TOC. The effort has developed a repository, "the Virtual Shelf" (<https://acc.dau.mil/commonality>), for use by any public or private organization to select those commodities or items. These items can be applied to commodity sourcing if the demand is deemed sufficient. The commonality effort also defines cost in the related specifications and standards and eliminates those costs through modification of the specification or standard. A Commonality Oversight Board, comprised of senior Navy officials, makes an acceptance or rejection decision of the technical and cost analysis results as to the applicability of each candidate component to system(s) use. The result of the process is that components are identified and tagged for strategic sourcing commodity contracts, making them more easily

available to private shipbuilders and ship repair facilities under contract to the Government. Examples of recent NAVSEA related TOC reduction initiatives include:

- Silver Reclamation Program – Cost avoidance through reclamation, reduction in need for raw material
- Electrolytic Chlorine Generator Repair – Cost avoidance through consolidation of capability at depots
- Consumable Materials Vending Machines – Cost avoidance of pier side labor through automation

Another general category of processes that can incorporate some degree of strategic sourcing are programs established to lower systems O&S phase costs or improve readiness by investing in newer, inherently more reliable replacement parts, materiel, or sub-systems. The Naval Aviation Enterprise's (NAE) future readiness initiative is one example. An NAE collection of "strategic initiatives" include, for example, direction and guidance for how the Enterprise collectively can help find and assess new Science and Technology project investments that, if transitioned to development and introduced, will reduce TOC and improve the readiness of aviation systems and equipment. Another strategic initiative provides specific, checklist guidance for NAE members who engage in Integrated Logistics Assessments (ILA) and in the Systems Engineering Technical Reviews, again for the purpose of advocating "TOC equities" and helping find the means to mitigate or reduce TOC in systems design and development. Like the Naval "Environmental Readiness" community, the NAE has instituted a means to participate in requirements generation and systems performance specification JCIDS and in ACAT program governance (Gate Reviews), in part to advocate systems trade-offs so that systems subsequently introduced into NAE operations represent optimal TOC affordability. For information, visit: http://www.public.navy.mil/airfor/nae/pages/future_readiness.aspx and https://www.portal.navy.mil/comnavairfor/Naval_Aviation_Enterprise/Future_Readiness/Shared%20Documents/Forms/AllItems.aspx

Section 5 describes in greater detail another such program that, while it is not exclusively a strategic sourcing/commonality program, it encourages solutions and efficiencies that often rely on materiel or process commonality and standardization for cost savings. The Navy's yearly TOC affordability investment program solicits life cycle ownership cost reduction investments among systems in advanced stages of development or already fielded which may, as part of the return on investment (ROI) prospect for that initiative, entail adoption of commonality among multiple systems.

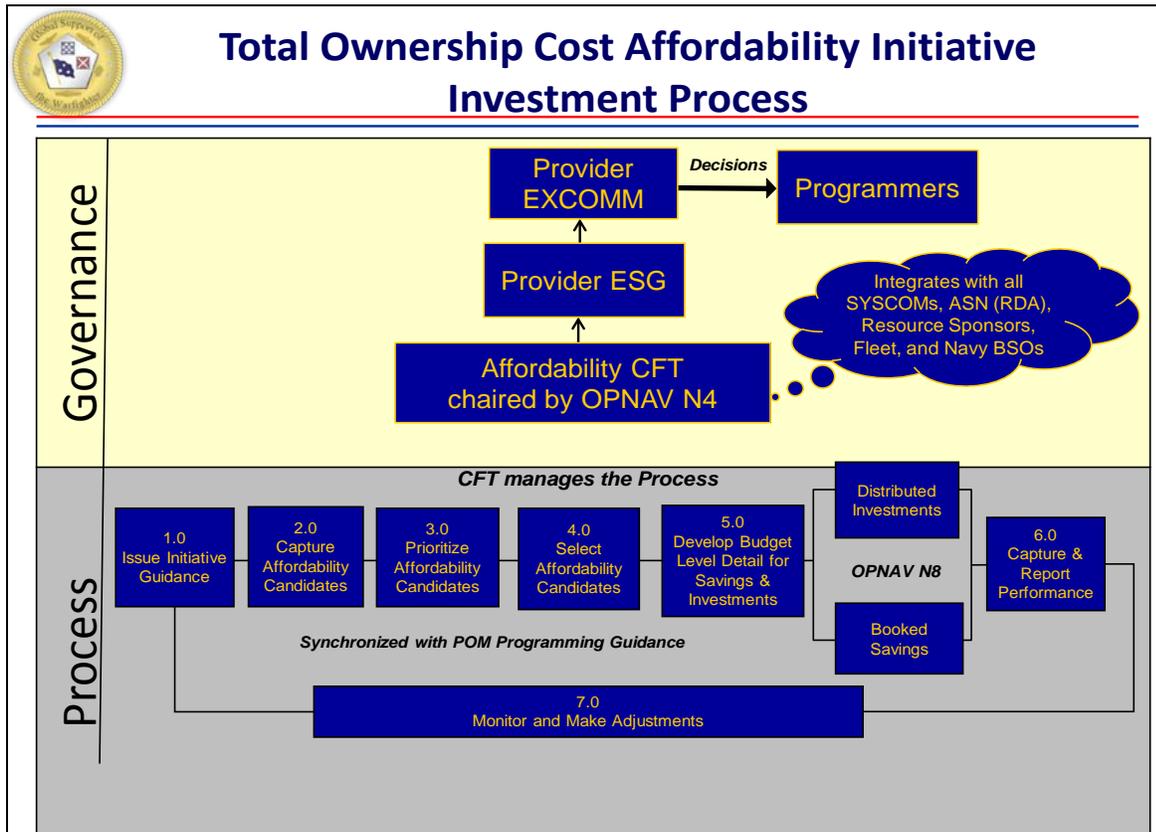
5.0 TOC AFFORDABILITY INITIATIVE INVESTMENT PROCESS

Reference (o) defines the Navy-wide program for TOC affordability. It defines business rules for capturing and tracking ROI from dedicated TOC reduction initiatives and investment. The Department of Navy’s Provider Enterprise (PE); comprised of senior ASN (RD&A), CNO and SYSCOM leaders of acquisition, resource, manpower, research and logistics functions; tasked N4 to establish and manage a process to identify, rate and rank, prioritize and recommend TOC savings initiatives in which to invest. The following is a synopsis and further elaboration of the TOC initiative investment process of OPNAVINST 5400.38.

Investment for the purpose of ownership cost reduction has antecedents in the USD (AT&L) program for Modernization/TOC Reduction. Since 1999, the Reduction of Total Ownership Cost (R-TOC) program has funded pilot programs to test Services’ TOC reduction goals.

The details of the Navy’s cyclical investment process follow the schematic outline of figure (3) below. This process is augmented, at the start of each yearly cycle, by additional N4 guidance memorandum and N8 POM guidance via a Warning Order (WARNORD). Yearly guidance will reflect any changed circumstances in TOC direction or investment priorities for that year.

Figure 3: TOC Affordability Initiative Investment Process



CFT Cross Functional Team
 ESG Executive Steering Group

5.1 Process Roles & Responsibilities

- OPNAV N4 – Leads and coordinates the affordability initiatives investment process. This includes issuing an annual affordability initiative policy guidance memorandum in tandem with yearly N8 POM budget guidance, and maintaining process selection criteria and format via this TOC guidebook. N4 ensures that cumulative results of funded initiatives are regularly reported to the VCNO and other senior leadership, which affects their priorities for future affordability investment areas. N4 maintains a record of past and current affordability initiatives to track execution and savings.
- Affordability CFT Members – Chaired by OPNAV N4, the standing Affordability CFT reviews all draft affordability initiative guidance prior to N4 and N8 issuance. Any recommendations for the upcoming cycle are thoroughly vetted through their CFT organizations and the PE to reflect the latest leadership TOC reduction investment priorities. The CFT leads the technical and cost savings assessment of each submitted initiative.
- PE Executive Steering Group (ESG) – The PE ESG reviews and provides feedback on draft CFT affordability initiatives guidance. The PE ESG reviews CFT prioritized initiatives, adjudicates any issues, ranks initiatives, and then submits the prioritized list to the PE EXCOMM.
- The PE EXCOMM (includes the VCNO and ASN (RD&A)) – The PE EXCOMM provides guidance and priorities for each year’s affordability initiative cycle. It approves funding those initiatives that best meet the investment process criteria and estimated savings return on investment. N4 then coordinates the PE EXCOMM list of approved investment initiatives with appropriate program sponsors and BSOs.
- Affordability Initiatives Program Sponsors and OPNAV N80 – OPNAV N80 distributes investment funds, extracts the projected Future Years Defense Program (FYDP) savings that the initiative should generate from current budgets, and generates the necessary Program Budget Information System (PBIS) load sheets.
- Affordability Initiative Candidate Originators – Responsible for the thoroughness of investment candidate business case and schedule and for the endorsement by all key government and industry partners who must act to accrue investment savings vice solely cost avoidance.

5.2 Process Cycle Timing

The process begins each year when OPNAV N4 and the CFT issue an affordability initiatives guidance memorandum containing the schedule and reflecting any changed leadership priorities for that year’s investments plus any changes in process methodology. OPNAV N8 issues an annual program WARNORD for POM build purposes that coincides with N4’s guidance memorandum.

A link to past year investment candidates, funded or not, will be included in guidebook updates to serve as examples.

Initiatives can be submitted to N4 at any time, but N4 will formally solicit initiatives only as part of the formal POM process schedule.

The majority of affordability initiative savings is expected to occur during the timeframe of the FYDP in which the investment was made.

5.3 Process Template and Criteria

Any program or project office may propose an affordability initiative. There is no prescribed template, but the following criteria should accompany each initiative candidate's narrative description and submitted data package:

a. Structured Business Case and Cost Analyses

- Define the algorithm and calculations used for determining cost savings.
- Estimate present value cost to Navy if nothing is done regarding the cost driving process, system or component that the initiative seeks to improve.
- Schedule requested for investment resources to produce savings within FYDP timeframe and beyond and to produce optimal performance results.
- Levels of funds needed to logistically sustain resultant initiative capability as fielded, and for subsequent investment to generate further savings.
- Technical and manufacturing maturity of any commercial or other-Service elements to the initiative. Technical maturity must be Technical Readiness Level (TRL) 6 (demonstrated technology) at minimum.
- Schedule of accruing savings and funds type, including break-even point.
- Endorsement or certification of the soundness of business and cost analysis processes and accuracy of benchmark costs.
- Dependence on uncontrollable factors expressed as project risk.
- Feasibility to extend and adopt beyond the span of immediate partnership for additional commonality savings.

b. Quantitative Technical and Cost Related Metrics

- Schedule of metric measurement, including any intermediate (progress) benchmark measurement.

c. Fielding and Sustainment

- Criteria for testing, fielding and Fleet acceptance.

d. Endorsement Signatures

- Navy and commercial partners whose affordability initiatives role and organizations are key to initiative execution, fielding and sustainment success.
- Endorsement from the Fleet, if there is one clear "customer" for the initiative's end product or service who must install and operate.

- Endorsement from BSOs projected to benefit from return-on-investment savings.

5.4 Process Methodology

Step 1

In anticipation of the issuance of yearly N4 and N8 POM guidance, affordability initiative originators should construct an investment candidate and business plan for execution of that initiative. Originators are encouraged to check and ensure that no similar affordability initiative is ongoing. N4 retains a spreadsheet database for this purpose. Prior, unselected initiatives may be revised and resubmitted. Initiatives may also have origins in the affordability and reliability improvement investment initiatives of other, established Enterprise or SYSCOM investment programs that similarly seek to improve system or component readiness and reduce TOC. Initiatives are submitted to N4, via their chain of command, to begin consideration.

Step 2

N4 reviews all initiative candidates and data for completeness and enters each into a spreadsheet database of past successful and deferred affordability initiatives. N4 then distributes each candidate for review to the Affordability CFT.

Step 3

N4 and the Affordability CFT work with the originating individual or team to understand the nature of the initiative, assess technical feasibility, understand the premise for cost savings and determine if the initiative coincides with similar ongoing or concurrently proposed initiatives. Candidate assessment continues until there is high confidence in the business case; especially measurement criteria and metrics, estimate for required investment funds necessary to execute and projected schedule and amount of return on investment. Endorsement from the one or more BSOs where projected savings will be assessed is recommended, but not required to start the process. BSO endorsement and consideration will be addressed and documented by the Affordability CFT in forming their recommendations.

Step 4

The Affordability CFT leads a technical feasibility and business case maturity review of each affordability initiative candidate and the NCCA assesses each originator's methodology for cost efficiency projection, cost measurement and cost savings calculations.

N4 returns CFT/NCCA questions or concerns to the originators, who may revise their submission. Initiative originators may also delete a submitted initiative up to the point that the yearly prioritized list of candidates is submitted to PE EXCOMM, VCNO and ASN for selection.

Step 5

After CFT assessment, a prioritized list of recommended candidate initiatives is sent to the PE ESG for endorsement. The PE ESG may inquire further into the technical or business case details of a candidate initiative or discuss their assessment of that candidate with the CFT. The PE ESG then sends their prioritized list of investment candidates to the PE EXCOMM for approval.

Step 6

The PE EXCOMM discusses the prioritized candidate initiatives and upon their approval, directs the cognizant program sponsors to distribute investment funds and to extract the projected savings to accrue from those investments from FYDP budgets. For this purpose, PBIS load sheets are drafted, distributed, coordinated between initiative originators and any representative CFT member and then submitted to N80 and N4.

Step 7

Originators execute the funded initiative in line with any business plan that may have been submitted in step 1. Benchmark events and cost savings progress is recorded for reporting purposes. Recorded events should include successful product or process testing, fielding, acceptance and adaption into Navy usage.

5.5 Capturing and Reporting Results and Savings

Once work has begun, originators and others who manage and execute the now-funded initiative must closely coordinate technical and especially cost savings results with the CFT, OPNAV N4, affected sponsors and BSOs. BSOs must complete PBIS database load sheets that document savings by budget line item that are under their cognizance. Completing the PBIS load sheet entails coordination between the initiative and the impacted BSO. The ASN Financial Management and Comptroller (FM&C) is expected to arbitrate any issue as to amounts and timing of accrued savings.

Specific tasks during initiative execution:

- OPNAV N4 – Coordinates a semi-annual report of initiative progress and performance against the approved plan. N4 and the CFT will submit a cumulative affordability initiatives performance report to the PE ESG. This report will also discuss trends and recommend process and procedural changes, which the PE ESG must approve.
- NCCA – Reviews each initiative’s cost measurements and savings calculations.
- Initiative Originators – Works with BSOs to track and capture savings data.
- Affordability CFT – Maintains liaison between initiative owners and CFT component organization stakeholders and helps consolidate performance data for submission to OPNAV N4.
- Initiative Originators – Coordinate initiative technical and savings progress, as reported by Fleet or infrastructure customers and stakeholders, with NCCA and affected BSOs for the purpose of accrued savings validation. Originators must capture progress on a semiannual basis or as otherwise specified in the affordability initiative’s proposal and

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business plan. Regular progress reporting continues throughout the FYDP or until the affordability initiative is completed, beginning in the year that savings begin to accrue.

6.0 LOGISTICS ENABLERS TARGETING TOC AFFORDABILITY

6.1 Definition

For the purposes of this guidebook, “logistics enablers” are formative actions that cumulatively seek maximal product support sustainment for fielded capability that is also optimally affordable to operate and sustain, regardless of changes to system configuration, usage, or operational environment. These actions are taken throughout the performance capabilities requirements generation and materiel solution development phases by program sponsors and other stakeholders to life cycle sustainment effectiveness and ownership cost affordability. Logistics enabling actions are continued and built upon by PSMs, once an ACAT program is formally initiated and the AS and LCSP documents are first formulated.

The term “logistics enabler” has expanded beyond a tactical logistics connotation and is being used in association with the initial systems acquisition process, including requirements generation. Engaging in logistics enabler activity during initial systems acquisition is an acknowledgement that such efforts increase the prospect that the resultant defense system will be logistically sustainable at minimal ownership cost.

The warrant for operations and sustainment commands and their representatives to take or to press for logistics enabler action at initial systems acquisition stages is that these commands are eventually responsible for sustaining and continuously improving materiel readiness. As bill payers, their expectations for effort during early acquisition processes are for resultant operational capabilities (i.e., defense systems) that feature logistics life cycle support at optimal total ownership cost.

6.2 Logistics Enabler Actions and Responsibilities

Discrete logistics enabler opportunities and formal tasks can be listed, since they are tied to standard steps and processes within the overarching acquisition process (including requirements generation) for systems development programs. The following list of recurring logistics enabler categories and participants discuss actions that contribute substantially to the earliest acquisition decisions made for systems performance capabilities specification, materiel solution analysis, ACAT program governance and decision forums and program technical and logistics reviews and assessment.

1. CBA – A wide range of Fleet operational, program sponsor and sustainment stakeholder offices work together to construct this phase’s pivotal JCIDS ICD. The ICD outlines shortfalls in warfighting performance capability and the operational and sustainment environments in which an envisioned future capability will operate. For the CBA phase, logistics enabling actions include:
 - a. Program sponsors ensure that ICDs fully describe the joint operations and sustainment environments into which the new capabilities will be introduced, so that a complete view of a prospective system’s development program can emerge. Logistics enabler action entails a thorough review and contribution to draft ICDs by offices responsible for

functions that affect and are affected by new systems development programs. These functions are inherently logistical and factor in any new development program's life cycle product support, system sustainment-related performance and life cycle ownership cost.

- b. Offices responsible for the paragraph 1.a. functions above work with program sponsors to ensure that each draft ICD describes the joint maintenance and logistics infrastructure environment into which the envisioned new capability must operate and be affordably sustained. A complete ICD picture of the operational and sustainment infrastructure environment is essential because the decision to pursue a materiel solution (Materiel Development Decision event) is in large part ICD-based. Offices associated with these functions vary, but functions that may need to be accounted for in the review and content of draft ICDs or AoA guidance, include:
 - (1) Environmental readiness
 - (2) Energy and fuel efficiency
 - (3) Logistics and supply support infrastructure
 - (4) Maintenance and facilities infrastructure
 - (5) Development planning (systems engineering)
 - (6) Commonality and standardization
2. Sustainment and LCC analysis – The first formal analysis of an evolving new system capability's perspective LCC occurs when ICD materiel capabilities needs are matched to one or more potential materiel solution during the AoA process. AoA study guidance is directed by R3B/Gate Review governance to analyze relative LCC perspectives for each proposed alternative. During the AoA, logistics enabling actions are:
- a. The R3B/Pass 1 Gate Reviews – direct that the AoA study assess the likely LCC/TOC of each viable materiel alternative based on assessment of a probable life cycle product support strategy for that candidate alternative within the logistics and sustainment infrastructure. Second, ensure that AoA study team term “cost” in their analysis results as primarily LCC or TOC. That is, AoA study results should be clear as to what cost category is being described since the scope of AoA cost analysis is no longer procurement, unit, or acquisition cost alone.
 - b. The MDA – approves an AoA study plan that conveys R3B/Gate Review direction. Specifically, each viable materiel alternative candidate is assessed for the likely scope and range of life cycle product support as a factor in determining the likely LCC of those viable candidates.
 - c. DASN (Cost and Economics (C&E)) – As the principal advisor to DON leadership on issues of LCC and TOC, ensure that the baseline of cost and readiness data retrieved for the AoA analysis, plus the currency of cost analysis tools and cost estimating methodology to be used, is sufficient to determine an LCC estimate for each viable alternative.
3. Sustainment-related performance parameter specification – Once initial performance capabilities and their development parameters have been defined (JCIDS ICDs), viable materiel candidates assessed (AoAs), and an MDD made, the acquisition process focuses on the CDD. CDDs continue the narrative refinement of the operations and sustainment environment from the ICD and are reviewed by the same paragraph 1 distribution of life

cycle sustainment and ownership cost affordability related functions. Targeted logistics enabler action includes:

- a. The R3B/ Gate Reviews 2 and 3 – direct program sponsors to construct the sustainment-related performance capability parameters (including a performance-based “affordability requirement”) and the associated total program OC parameter for purposes of the draft CDD. This direction will use, at a minimum, the Gate Review 2 and 3 benchmark criteria and metrics for the functions of “Sustainment” and “TOC Estimating” per reference (a).
- b. Program Sponsors – draft CDDs that propose sustainment-related technical performance capabilities among all technical performance parameters specified for systems development. Sustainment performance development parameters are inherent to most systems. The following are the most common and must be considered for most draft CDDs are:
 - (1) Availability – Operational Availability (A_o) for systems undergoing development and Materiel Availability (A_m) for fielded and operational systems as a measure of available inventory Materiel Reliability (MR) – One or more parameters for some “mean time between failure” rate and mean time between “operational mission critical failure” rate
 - (2) Maintainability – One or more parameters for some “mean time to repair” rate
 - (3) OC – Cost to operate and sustain per some discrete period of time, or per event, or some other quantitative cost-related performance metric.

Program sponsors’ CDD drafts distributed for review and approval must ensure that Availability is a KPP for major program and (Joint Requirements Oversight Council (JROC) interest programs. In ACAT programs of any size, if A_o is specified as a capability parameter, then MR and maintainability must also be specified. In major or JROC interest programs, these two parameters, plus the performance-related OC parameter, are required with KSA development priority and decision weight. In less than major program and non-JROC interest ACAT programs, Services and program sponsors have the responsibility to determine the extent to which the above sustainment-related performance parameters rise to KPP and KSA level prioritization. Draft CDDs are the venues for this determination. In CPDs, the program sponsor must identify the CDD-specified sustainment parameters and metric thresholds, whether those parameters are specified at KPP level or not.

- c. Logistics Stakeholders – review all draft CDDs for three specific purposes:
 - (1) Ensure that narrative descriptive content addressing their sustainment-related functional area is current and accurate.
 - (2) Ensure that the draft sustainment and ownership cost-related performance parameters of paragraph 3.b. specify a realistic, but challenging range of threshold and objective design and development values. In the case of incremental development, this means that sustainment-related performance is targeted to be more operationally effective as well as more ownership cost affordable than current and past increments of capability. From a logistics enabler perspective, such scrutiny and oversight of draft CDD sustainment and OC threshold and objective ranges helps ensure realistic resource planning and programming for development of the subsequent new product support program.

- (3) Recommend a sub-set of sustainment performance and affordability CDD parameters be designated as KPP and KSAs, in those cases where prospective ACAT size and designation are beneath major program status or are not JROC interest. Whether a sub-set of sustainment-related parameters should rise to KPP or KSA status in these cases is a Service determination and for DON is determined per SECNAV 5000-series “requirements generation” policy (reference (a)).
4. Acquisition Program Governance (Gate Reviews) – All 10 Gate Reviews, which span the entire life cycles of naval defense system, have logistics enabling criteria reflected primarily by sustainment and TOC Estimating metrics and briefing content. Section 2 of this guidebook details these and who must engage in logistics enabling action. Table 2-1 of Section 2 outlines the TOC-specific elements of each Gate Review.
5. OPNAV N4 has a specific set of logistics enabler roles and responsibilities. References (a) and (b) direct the following enabler roles:
 - a. Assist ASN (RD&A) in establishing acquisition-related policy and procedures dealing with life cycle logistics effectiveness and affordability throughout all stages of defense system acquisition.
 - b. Serve as the fleet operational readiness resource sponsor.
 - c. Serve as a principal member on the ACAT program governance forums (R3B and Gate Reviews) that direct or fundamentally shape systems sustainment-related performance capabilities as well as program life cycle product support.
 - d. Engage in and support JCIDS specification of sustainment performance capability criteria for all new development and major upgrade programs.
 - e. Review new major program Navy draft LCSP prior to approval by the program’s Milestone Decision Authority (MDA).
 - f. Serve as Navy’s TOC Advocate. “TOC” is defined as being synonymous with LCC for defense system development purposes in reference (b). See Section 5 for a TOC-specific initiative.
 - g. Participate in the AoA studies and ILAs that assess potential or actual system’s life cycle sustainment effectiveness and affordability.

7.0 RECENT LOGISTICIAN GUIDEBOOKS FEATURING TOC

7.1 Logistics Assessment Guidebooks

Independent Logistics Assessments provide program management, governance boards and milestone decision authorities with a snapshot-in-time measure of a defense system program's product support planning and execution. Specifically, assessments determine the adequacy of the logistics and product support under development to sustain a system's warfighting performance capability to levels of system operational readiness, availability and sustainment affordability as specified by the JCIDS requirements generation process.

Logistics assessment requires a large degree of independence, impartiality, and autonomy in order to view and compare each ACAT program's product support program in terms of:

- Whether life cycle logistics progress is typical of a program at a specific milestone stage and for a program of particular size
- Affect on the capacities of the overarching logistics infrastructure into which the system must be logistically sustained and supported
- Ownership cost affordability of the product support program, especially in terms of overall sustainment affordability to Navy if one of a portfolio of systems is to be mutually sustained

The frequency and timing for logistics assessments is being standardized across the DoD. Timing is just prior to and in support of major program milestones B, C and FRP decision points. Post-IOC and other forms of in-service reviews of sustainment performance, TOC affordability, and the product support strategy are also regularly reviewed, approximately every five years beyond initial operations. System user and maintenance organizations help in these post-fielding assessments, which focus on metrics-driven findings and corrective actions that satisfy user operational needs. A recent factor that triggers post-FRP assessments is the requirement to revisit the fundamental product support business strategy at five year intervals, once the capability has been initially fielded. These further assessments are intended to coincide with the IOC date and the FOC date. Post-milestone assessments encompass the entire program's performance and TOC affordability. They are opportunities to directly engage operating and sustainment command customers and sponsors as both a source for logistics assessors and as decision makers for the program's future course. The assessment focus after fielding, beyond a revisit of the core product support business strategy, is on readiness and cost driver deficiencies in fielded product support and on any logistics shortfalls that require immediate program management or sustainment infrastructure corrective action.

7.1.1 DoD Logistics Assessment (LA) Guidebook – July 2011

An independent (from the ACAT program) logistics assessment, using methodology derived from DON's Independent Logistics Assessment process, must be performed at each major milestone or at least every five years to ensure adequacy of supportability planning and execution. Assessed results provide program governance and management with valuable, decision-making information. Logistics assessments reviews, occurring after full rate production, are encouraged to include operational command sustainment staff directly involved

in the sustainment and support of the system under assessment. This guidebook and the Defense Acquisition Guidebook document the newly established Post-IOC Sustainment Review, which is similar to the series of DON Post-IOC Gate Reviews in its coverage of TOC reduction initiative reporting.

7.1.2 DON Independent Logistics Assessment (ILA) Handbook – March 2011

SECNAVINST 5000.2E is the overarching authority and policy for conducting ILAs within the structure of ACAT program governance and management. An ILA SECNAV Instruction further defines the requirement for ILA certification. SECNAVINST 4105.1 describes the process for determining an acquisition program's product support planning status, adequacy, and degree of sustainment effectiveness and TOC affordability risk from a TLCSM perspective. Handbook NAVSO P-3692 is the DON's assessor guide and element-by-element criteria for conducting ILAs.

7.2 Product Support Manager (PSM) Guidebook – April 2011

The PSM Guidebook was signed by the Assistant Secretary of Defense for Logistics and Materiel Readiness (L&MR) in April 2011. The Guidebook defines a Product Support Business Model (PSBM), as recommended in the November 2009 Weapon System Acquisition Reform: Product Support Assessment (WSAR-PSA) Report. The PSM Guidebook describes the PSBM as "...the methodology by which DoD intends to ensure achievement of optimized product support through balancing maximum weapon system availability with the most affordable and predictable total ownership cost."

This guidance, which is targeted also to Life Cycle Logisticians and particularly to the mandated PSM position, describes how to develop and execute a product support strategy and manage via a LCSP. It reiterates that "Planning for Operation and Support and the estimation of total ownership costs shall begin as early as possible." It specifically supports USD (AT&L)'s November 2010 memorandum, "Better Buying Power," by addressing the themes of increased competition, long-term affordability, controlling cost growth, and innovation in industry. The Defense Acquisition University provides "rapid development training" briefing for the PSM role and responsibilities at <http://www.dau.mil/images/Pages/RDT.aspx>.

7.3 DoD Product Support Business Case Analysis (BCA) Guidebook – April 2011

The DoD Product Support Business Case Analysis (BCA) Guidebook was signed and released by the Principal Deputy Assistant Secretary of Defense (L&MR) in April 2011. The Guidebook is in response to the 2009 Weapon Systems Acquisition Report Product Assessment Team (WSAR-PSA) Report recommendation to clarify and codify policies and procedures pertaining to the use of analytical tools, including BCAs, in the life cycle product support decision making process. In addition, the DoD Product Support BCA Guidebook supports Dr. Carter's November 2010 memorandum, "Better Buying Power," (references (c) and (d)) by providing thorough financial and non-financial analysis to decision makers so they can make more informed, affordable choices.

The BCA Guidebook provides its users a standardized BCA process. That process relies in part on cost analyses performed during systems development and on readiness and cost analysis performed after the system began operations. The initial product support BCA relies on legacy sustainment performance and cost data and on the focused cost estimates for materiel alternatives during the AoA process that preceded program initiation. Sustainment and life cycle cost analysis during the AoA is conducted with the intent to strongly steer initial systems specification, development, and an Acquisition Strategy towards TOC affordability. LCC consideration and influence on the earliest system configuration, sourcing, and trade-off decisions should be made based on AoA study findings. LCC estimates and analyses built on thorough AoA findings play a major role in the evolution of design, development, and establishment of an effective LCSP. The LCSP is an adjunct to the Acquisition Strategy and, for the DON, includes a LRFS. The string of AoA and BCA analysis that leads ultimately to the LRFS contributes strongly to a SCP and a view of the systems likely LCC/TOC.

7.4 Integrated Product Support (IPS) Element Guidebook – November 2011

The IPS Element Guidebook complements the PSM Guidebook. It describes the standard 12 IPS elements, which are derived from Integrated Logistics Support (ILS) elements, which varied slightly across Services. IPS elements are a focus for the enterprise-level role of the PSM.

To an even greater extent than ILS elements, the scope of IPS elements covers all aspects of life cycle support. Following is a summary of the changes from the traditional ten ILS elements:

- A new IPS element, “Product Support Management,” has been introduced to address the role of the PSM as a “key leadership” position within PEO and PM. This element reflects a enterprise-wide scope that involves cross-functional work; such as (product support) contract provision development and management, budget planning and execution, IPT leadership, cost estimating and other business, financial and operational responsibilities.
- A second new IPS element is Sustaining Engineering, which carries design and development “systems engineering” functions forward into design interface activities for product support and sustainment during the O&S phase.
- Maintenance Planning and Management now includes management activities such as executing the planning strategies during fielding and deployment and continuing through the O&S phase.
- Training and Training Devices is now Training and Training Support. The whole concept of training is no longer fragmented into classroom training with special devices, such as simulators, to add realism. Distance learning and the whole immersion of the student within the simulation area now makes the concept of training a continuous and more realistic experience.
- Facilities has been expanded to Facilities and Infrastructure. Due to trends, such as globalization and reliance on information technologies, product support operations are no longer just “brick and mortar” facilities.
- Computer Resources Support is now Computer Resources, to account for the significant role that information technology and the necessary computer infrastructure plays to develop strategies for and to execute Life Cycle Product Support

7.5 Operating and Support Cost Management Guidebook – TBD 2012

The Operating and Support Cost Management Guidebook is currently in development with DUSD (Logistics & Materiel Readiness). The purpose of this guidebook is to present a document that addresses O&S cost considerations across the various decision making and management activities throughout a major weapon system's life cycle. Specifically, this guidebook is designed to assist Program Managers (PMs) and Product Support Managers (PSMs) by standardizing O&S cost concepts, explaining how they are employed and providing recommendations on how to manage them throughout a weapon system's life cycle. Decision makers have a greater ability to affect O&S costs within the context of the earliest life cycle decisions where many design characteristics and acquisition and unit costs are set. Therefore, it is important to provide decision makers with cost-related analysis that relates how these earliest decisions will affect eventual total O&S costs.

All Guidebooks may be found at the Defense Acquisition University / Acquisition Community Connection website: <https://acc.dau.mil/CommunityBrowser.aspx>

Appendix A: Acronyms

ACAT	Acquisition Category
ACMC	Assistant Commandant of the Marine Corps
ADM	Acquisition Decision Memorandum
A _m	Materiel Availability
A _o	Operational Availability
AoA	Analysis of Alternatives
APB	Acquisition Program Baseline
APML	Assistant (or Deputy) Program Manager for Logistics
AS	Acquisition Strategy
ASN	Assistant Secretary of the Navy
AT&L	Acquisition, Technology and Logistics
BCA	Business Case Analysis
BCL	Business Capability Lifecycle
BSO	Budget Submitting Office
CAA	Capability Affordability Assessment
CAIG	Cost Analysis Improvement Group
CAPE	Cost Assessment and Program Evaluation
CARD	Cost Analysis Requirements Description
CBA	Capabilities Based Assessment
CDD	Capability Development Document
C&E	Cost and Economics
CFT	Cross Functional Team
CKS	Contracting Knowledge Site
CLS	Contractor Logistics Support
CNO	Chief of Naval Operations
CONOPS	Concept of Operations
CPD	Capability Production Document
DASN	Deputy Assistant Secretary of the Navy
DBA	Data Base Administrator
DBS	Defense Business Systems

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DLA	Defense Logistics Agency
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DoD	Department of Defense
DON	Department of the Navy
DPM	Deputy Program Manager
DPML	Deputy Program Manager for Logistics
DUSD	Deputy Undersecretary of Defense
ESG	Executive Steering Group
EXCOMM	Executive Committee
FM&C	Financial Management and Comptroller
FOC	Full Operational Capability
FRP	Full Rate Production
FRP DR	Full Rate Production Decision Review
FTE	Full Time Equivalent
FYDP	Future Years Defense Program
GCSS-MC	Global Combat Support System – Marine Corps
HM&E	Hull, Mechanical, and Electrical
IBR	Integrated Baseline Review
ICD	Initial Capabilities Document
ILA	Independent Logistics Assessment
ILS	Integrated Logistics Support
IOC	Initial Operational Capability
IOT&E	Initial Operational Test and Evaluation
IPS	Integrated Product Support
IT	Information Technology
JCIDS	Joint Capabilities Integration and Development System
JROC	Joint Requirements Oversight Council
KPP	Key Performance Parameter
KSA	Key System Attribute
L&MR	Logistics and Materiel Readiness
LA	Logistics Assessment

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LCC	Life Cycle Cost
LCL	Life Cycle Logistics / Life Cycle Logistician
LCSP	Life Cycle Sustainment Plan
LRFS	Logistics Requirements and Funding Summary
LRIP	Low Rate Initial Production
MAIS	Major Automated Information System
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MDD	Materiel Development Decision
MP	Military Personnel
HM&E	Hull, Mechanical, and Electronics
MILCON	Military Construction
MR	Materiel Reliability
MS	Milestone (A, B, or C)
NAE	Naval Aviation Enterprise
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NCCA	Naval Center for Cost Analysis
O&S	Operations and Support
OC	Ownership Cost
O&M	Operations and Maintenance (or OM)
OPNAV	Office of the Chief of Naval Operations
OPNAV N4	Deputy CNO (Fleet Readiness and Logistics)
OSD	Office of the Secretary of Defense
OUSD	Undersecretary for Defense, Acquisition
PBIS	Program Budget Information System
PDR	Preliminary Design Review
PE	Provider Enterprise
PEO	Program Executive Office
POM	Program Objectives Memorandum
PoPS	Probability of Program Success

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PM	Program Manager
PSBM	Product Support Business Model
PSM	Product Support Manager
R&D	Research and Development
R3B	Resources and Requirements Review Board
RD&A	Research, Development and Acquisition
RDT&E	Research, Development, Test and Evaluation
RFP	Request for Proposal
RFx	Request For (Proposal or Quote)
RAM	Reliability, Availability, and Maintainability
RO	Requirements Officer
ROI	Return on Investment
R-TOC	Total Ownership Cost Reduction
SAR	Selective Acquisition Report
SCP	Service Cost Position
SDS	System Design Specification
SECNAVINST	Secretary of the Navy Instruction
SETR	Systems Engineering Technical Review
SSPMO	Strategic Sourcing Program Management Office
SYSCOM	Systems Command
TLCSM	Total Life Cycle System Management
TOA	Total Obligation Authority
TOC	Total Ownership Cost
TRL	Technology Readiness Level
USD	Undersecretary of Defense
USFF	U. S. Fleet Forces Command
VCNO	Vice Chief of Naval Operations
WARNORD	Warning Order
WSAR-PSA	Weapon System Acquisition Reform: Product Support Assessment