

Recommendation 42: Reduce budgetary uncertainty, increase funding flexibility, and enhance the ability to effectively execute sustainment plans and address emergent sustainment requirements.

Problem

Budgetary uncertainty and limited funding flexibility have hampered the ability to effectively execute sustainment plans and address emergent sustainment requirements. DoD sustainment suffers for the following reasons:

- Sustainment is underemphasized in the lifecycle cost estimate (LCCE) during program planning.
- Trades are made during early phases of development that could negatively affect the program in the sustainment phase.
- Sustainment receives inadequate attention in the early acquisition phases.
- The sustainment phase lacks adequate planning, programming, and budgeting.
- Decisions are made by higher authority in response to emergent requirements.
- Ambiguity in DoD financial regulations causes sustainment requirements to be budgeted in the wrong appropriation account.
- Programs cannot be supported because funding in the correct appropriation is not available during execution years.
- Sustainment requirements budgeted in an O&M appropriation are affected by the availability of funding when they are needed in execution year.

Background

In the defense acquisition community, several terms are used to refer to the costs associated with maintaining weapons systems. It is a common mistake that the acquisition community believes that O&S and the appropriation O&M are interchangeable, but they are not. There is also a misperception that all O&S activities are only funded with the O&M appropriation and that is not true either.

O&M is a category of appropriations accounts enacted by Congress each year as part of the annual defense appropriations law. O&M funds *some* of O&S functions but not all of them. O&M appropriations also provides funding for some civilian employee salaries; military base operations to include utilities, security, and building maintenance and repairs; medical care; IT infrastructure; recruitment activities; training; and other needs.

O&S refers to the category of *costs* that are used for program sustainment. O&S is not a standard part of appropriations law, but is referenced in law and DoD policy. DoD is explicitly required to collect data

on O&S costs, but there is no reference to operating and sustainment in 10 U.S.C. § 101, Definitions.¹ The DoD D/CAPE defines O&S costs as those for “personnel, equipment, supplies, software, and services associated with operating, modifying, maintaining, supplying, and otherwise supporting a weapon system in the DoD inventory.”² These costs can be funded with O&M, Research, Development, Testing, and Evaluation (RDT&E), or Procurement appropriations.

Sustainment refers generically to the process of keeping a weapons system or other technology in good working condition. For many complex or technologically advanced systems, sustainment represents the largest single portion of the total cost over the life of the system. Again, these activities can be funded with O&M, RDT&E, or Procurement appropriations.

Cost Categories

The total cost of a DoD acquisition program varies depending on the definition of *cost*. The *procurement cost* of a program refers to the amount expended from the procurement appropriation account for prime mission equipment, support items, and initial spares. *Program acquisition cost* refers to the combined procurement cost; research, development, and testing cost; and military construction costs. Program acquisition cost can also include some O&M costs, referred to as *acquisition O&M*. The *lifecycle cost* consists of the program acquisition cost, operating and support costs, and disposal cost. The operating and support cost and disposal cost are generally funded from the O&M appropriation accounts.

Former USD(AT&L) Frank Kendall includes lowering lifecycle cost among 10 principles for achieving better buying power in DoD. Kendall wrote that “controlling life-cycle cost is one of our jobs; staying on budget isn’t enough,” and warned against “poor decisions that result in short-term savings at the expense of high long-term costs.”³

Underemphasis on Lifecycle Cost

With respect to the cost thresholds, these different definitions are important because they affect whether or not programs experience Nunn–McCurdy breaches.⁴ If a program’s per-unit procurement cost or program acquisition cost exceeds certain thresholds, the program faces termination.⁵

The fate of programs can depend on both procurement cost and program acquisition cost—but not lifecycle cost. Although deferring costs into the longer term may in some cases be the most effective way of managing initial investment costs and enabling the program to continue, by keeping the program within cost thresholds, that decision may push costs out of the developmental and production phases and into the sustainment and disposal phases of a program’s lifecycle.

¹ Guidance on Life-Cycle Management, 10 U.S.C. § 2337a.

² Office of the Secretary of Defense – Cost Assessment and Program Evaluation, *Operating and Support Cost-Estimating Guide*, March 2014, 2-3, accessed September 10, 2018, https://www.cape.osd.mil/files/OS_Guide_v9_March_2014.pdf.

³ Frank Kendall, “Better Buying Power Principles: What Are They?”, *Defense AT&L*, January-February 2016, Principle 4, accessed November 6, 2018, <http://www.dtic.mil/dtic/tr/fulltext/u2/1016057.pdf>.

⁴ *Nunn–McCurdy breach* refers to 10 U.S.C. §§ 2433 and 2433a, which specify that if a program’s unit costs exceed certain thresholds, the program in question must be terminated unless the Secretary of Defense certifies that it is essential to national security.

⁵ Percentage growth thresholds are based on both cost definition and time period in which projections were made.

Literature on Lifecycle Cost

Several organizations have published documents assessing the possibility of making total lifecycle costs—particularly sustainment costs—a greater factor in program decision making. MDAPs are already required to provide a *full lifecycle cost analysis* in their Selected Acquisition Reports to Congress, but this analysis does not factor into Nunn–McCurdy cost breaches.⁶

GAO last updated its *Cost Estimating and Assessment Guide* in 2009, so its conclusions may be somewhat outdated. The document notes that:

“DOD starts more weapons programs than it can afford, creating competition for funding that encourages low-cost estimating and optimistic scheduling, overpromising, suppressing bad news, and for space programs, forsaking the opportunity to identify and assess potentially better alternatives. Programs focus on advocacy at the expense of realism and sound management.”

A 2011 paper from the Software Engineering Institute decried the problems with accurately projecting the O&S costs of weapons systems. The paper noted that “the difficulty of accurate cost estimation is compounded by the fact that estimates are now prepared much earlier in the acquisition lifecycle, well before there is concrete technical information available.”⁸

A 2014 MIT paper by an Air Force program manager showed that historically, actual lifecycle cost estimates for MDAPs exceeded their initially projected lifecycle costs by 20 to 506 percent. The paper’s “Recommendations” section appeared to suggest incentives for analysts to adopt the rosier-possible assumptions to justify low cost projections: “Department-wide assumptions should be set above the DoD Component level to ensure fairness in quantifying systemic cost risk for MDAPs.”⁹

In 2014, DoD’s CAPE office published a detailed analysis of the cost elements and estimation methodologies for program O&S costs. The analysis emphasized the difficulty of projecting O&S costs in their entirety, noting that for items such as indirect support and depot maintenance it was “difficult, if not impossible, to compare these costs to available funding.”¹⁰

Lifecycle Cost Data

Past analyses suggest that for most major types of MDAP, O&S costs make up a large percentage of the lifecycle cost. According to the 2014 CAPE analysis, space systems are the only exception (see Figure 2-18).

⁶ Selected Acquisition Reports, 10 U.S.C. § 2432(c)(3).

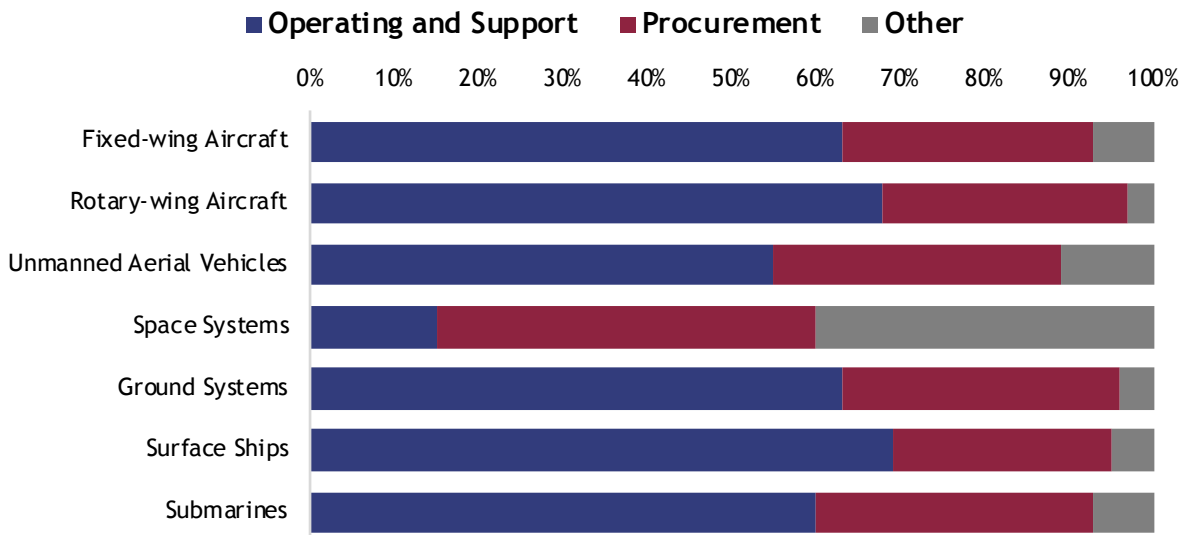
⁷ GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-35P, March 2009, 42, accessed June 29, 2017, <http://www.gao.gov/assets/80/77175.pdf>.

⁸ Robert Ferguson et al., *Quantifying Uncertainty in Early Lifecycle Cost Estimation (QUELCE)*, Software Engineering Institute, December 2011, accessed November 5, 2018, https://resources.sei.cmu.edu/asset_files/TechnicalReport/2011_005_001_15419.pdf.

⁹ David Petrucci, *Improved Affordability in DoD Acquisitions through Strategic Management of Systemic Cost Risk*, Massachusetts Institute of Technology, February 2014, 90, accessed June 29, 2017, http://seari.mit.edu/documents/theses/SDM_PETRUCCI.pdf.

¹⁰ Office of the Secretary of Defense – Cost Assessment and Program Evaluation, *Operating and Support Cost-Estimating Guide*, March 2014, accessed September 10, 2018, https://www.cape.osd.mil/files/OS_Guide_v9_March_2014.pdf.

Figure 2-18. Percentage of Program Lifecycle Cost Average for MDAP Categories¹¹



For individual programs, O&S as a share of total costs can be even higher. According to an independent analysis prepared for the Marine Corps Deputy Commandant for Aviation, O&S accounted for roughly 80 percent of total H-1 helicopter upgrade program costs.¹² The high O&S costs associated with major programs suggest that if Congress and DoD wish to apply useful metrics to program review, those metrics must incorporate sustainment in some way.

Programs may also benefit from making the same stakeholders responsible for decisions and costs throughout each phase of a program’s lifecycle. If a program office is responsible for initial acquisition costs but not sustainment costs, the office may face disincentives to increase up-front investment as a way of reducing long-term costs. DoD programs do not generally have a single stakeholder responsible for managing all O&S costs. There is no single source of O&S funding; this authority is fragmented among multiple organizations and appropriation line items.

Discussion

DoD spends billions of dollars annually to operate and sustain weapon systems. With the amount of dollars at stake, DoD has placed more attention on controlling total lifecycle costs with initiatives aimed at ensuring that weapon systems are not only affordable but effective over the long term. These costs include, among other things, repair parts, maintenance, and personnel. They have historically accounted for about 70 percent of total weapon system costs.¹³

¹¹ Ibid, 2-3. “Other” category consists of RDT&E and Military Construction funding.

¹² Joseph Dyer and Peter Williams, “Marine Light Attack Helicopter Independent Readiness Review,” April 12, 2017, provided to Section 809 Panel.

¹³ O&S costs are estimated to make up as much as 70 percent of the total lifecycle cost of DoD’s major weapon systems. FY 2012 NDAA, Report 112-26 to accompany S. 1253, June 22, 2011.

Sustainment Programming, Planning and Budgeting

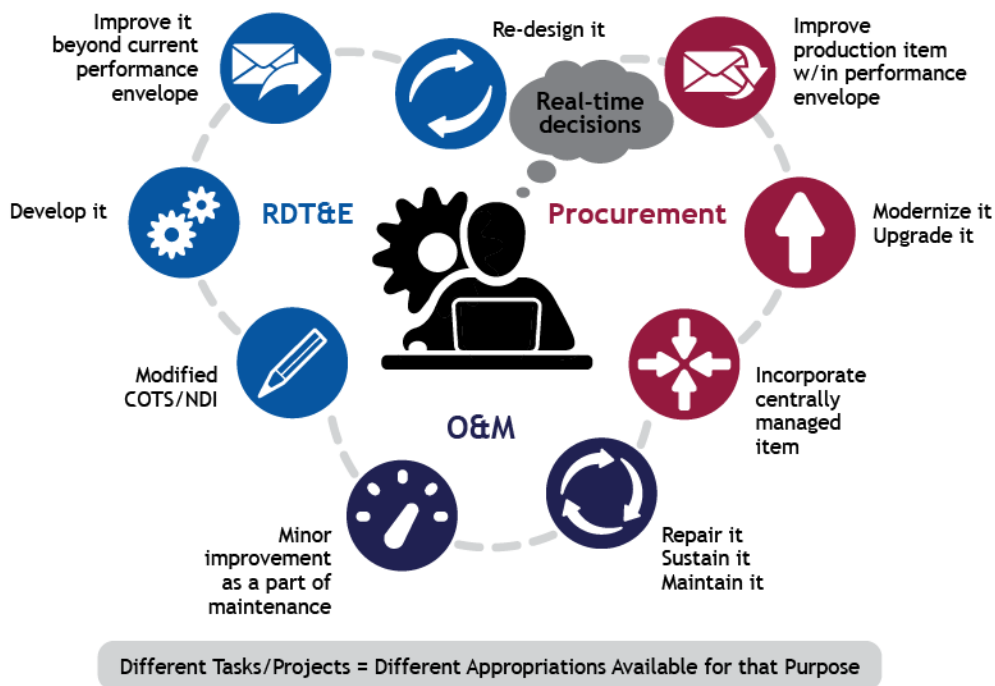
At present, programs do not always have sufficient funding flexibility for sustainment. Estimating sustainment costs frequently, budgeting for sustainment within appropriations will help address recurring sustainment issues. Sustainment requires a combination of RDT&E, procurement, and O&M funding to successfully execute the full range of lifecycle sustainment actions. Stable funding is key to successful execution and having funding of the correct type in place at the right time requires program offices to forecast, program, and budget accurately for sustainment.

Establishing an SPB, aligned with the APB, will enable the level of planning, programming, budgeting, and cost estimation necessary to enable DoD prioritization for funding. The sustainment cost estimate should be as definitive as possible, based on the information available at the time that it is made, and should be regularly refined and improved as more and better information becomes available. An SPB initiated during program development and matured and reviewed prior to each milestone decision would provide for the necessary forecast and oversight of sustainment funds, and also provide valuable insight into the effects on lifecycle costs of decisions made at the program, portfolio, and Military Service or operational employment level. Transparency of budget allocations would also allow program offices to establish long-term relationships with both commercial and organic depot facilities, enabling more efficient planning/execution of depot work and should lead to lower sustainment costs. These long-term relationships with suppliers will provide benefits to warfighters and the DoD.

Unclear Guidance on Appropriation Funding

Programming and budgeting for sustainment activities are further inhibited by issues with funding types, procurement restrictions and obligation expiration periods (commonly called *color of money* issues). Uncertainty about funding rules can inhibit programs by not adequately projecting funding requirements. There are three types of sustainment activities: product improvements, technical refresh and DMSMS, which includes obsolescence that have resource implications that affect what type of appropriation is used, driven by a determination of whether the cost is an expense or an investment. The DoD FMR describes several conditional circumstances on whether or not a cost is an expense or an investment. To further complicate the resource decision, an expense can be funded with O&M or RDT&E appropriations and an investment can be funded with Procurement, MILCON or RDT&E appropriations. Expense/investment thresholds also affect this determination. As depicted in Figure 2-19, the resource decision criteria described in the FMR leads to much confusion which impacts proper programming, budgeting and execution of sustainment activities.

Figure 2-19. Complexity of Product Support Strategy Funding¹⁴



Realizing the confusion depicted in the graphic above and the product improvement graphic below, the Section 809 Panel reached out to DAU to use the Hacking for Defense methodology with a team of students to “develop a way for product support managers and program managers to budget and plan for obsolescence of parts and components of a weapon system.”¹⁵ “Through their discovery interviews and hypothesis testing, the team reframed the problem to be: “There is no clear DoD guidance on obsolescence.”¹⁶ The team specifically found that program managers and financial managers are misinterpreting the FMR with regard to obsolescence. Figure 2-20 was presented by DAU and has been used as a guideline by resource managers to help clarify FMR product improvement appropriation selection criteria, but has been applied for obsolescence and tech refresh requirements, too. The research team found situations in which a required component had gone out of production and a replacement component was available but also happened to provide a capability enhancement. In such cases, program managers and financial managers were asserting that the capability enhancement required RDT&E funding to finance the replacement component. This assertion may be a misinterpretation of the FMR. The misinterpretation causes program managers and financial managers to perform unnecessary workarounds to obtain RDT&E funding that the program has not been appropriated and could cause delays in delivering capability to warfighters. These costs and delays

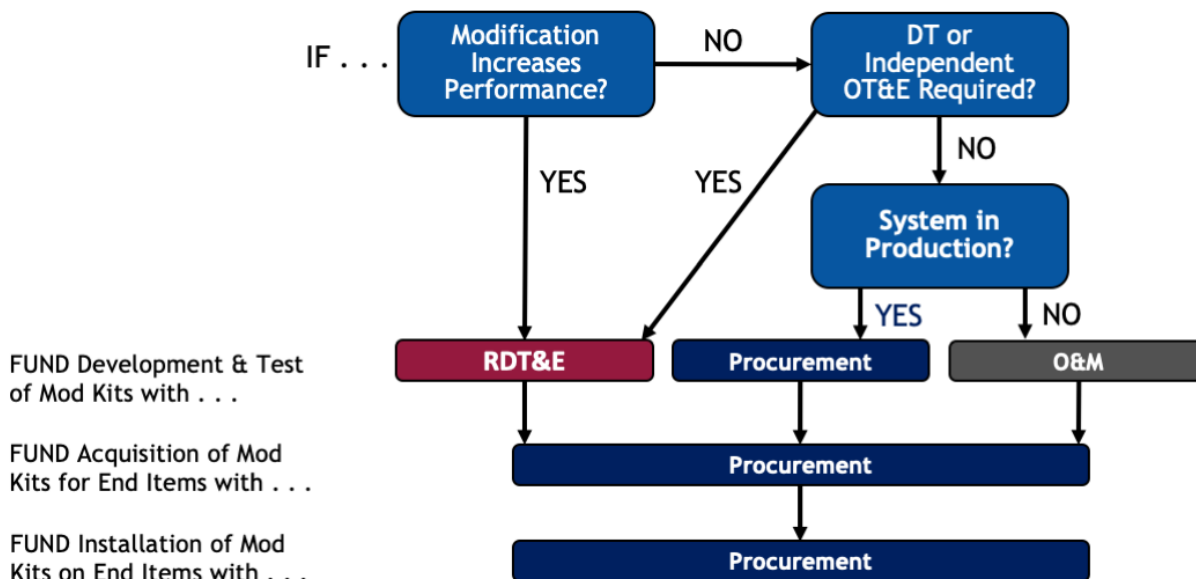
¹⁴ Figure adapted from “Department of Defense Product Support Manager Guidebook,” release 2011, DAU, figure 12, accessed September 12, 2018, <https://www.dau.mil/guidebooks/Shared%20Documents%20HTML/PSM%20Guidebook.aspx>.

¹⁵ David L. Gallop, PhD, *Defense Acquisition University (DAU) Hacking for Defense/Leading Innovation (H4D/LI) Pilot-2 Info Paper*, May 21, 2018, provided to Section 809 Panel, September 20, 2018. David L. Gallop, PhD, “In Innovation Insurgency: Hacking for Defense at DAU,” *Defense AT&L Magazine*, May-June 2018, 2-7, accessed September 12, 2018, <https://www.dau.mil/library/defense-atl/DATLFiles/May-Jun2018/DATL%20MayJune2018b.pdf>.

¹⁶ David L. Gallop, PhD, *Defense Acquisition University (DAU) Hacking for Defense/Leading Innovation (H4D/LI) Pilot-2 Info Paper*, May 21, 2018, provided to Section 809 Panel, September 20, 2018.

could be avoided with clarifying language in the FMR.¹⁷ The team proposed that clarifying language be added to the FMR and job aides be developed for the PM and business communities.

Figure 2-20. Current Product Improvement Funding Policy¹⁸



Funding for spare parts serves as another example of why confusion frequently arises. Spare parts may be funded differently based on whether they are considered provisioning spares, replenishment spares, depot level repairs, or obsolescence. The FMR states that initial spares (provisioning spares) and repair parts will be procured along with procurement of the end item and funding will be budgeted based on a first-year obligation rate of 92 percent. The O&M accounts will finance the purchase of depot-level repairables and consumable repair parts, primarily through the Defense Working Capital Fund, for maintenance of all Class IX equipment (excluding medical-peculiar repair parts). Each of these examples may be funded by a different appropriation type and each funding source may face a different year of expiration.

The DoD FMR can often be confusing and subject to interpretation, as in the obsolescence and spares examples above. This confusion results in delayed decision making and lack of agile support to warfighters. The resource decision criteria require simplification, and solutions such as the one depicted in Figure 2-21 need to replace the product-improvement funding policy depicted in the graphic above. Three of the sustainment activities—product improvement, technical refresh, and DMSMS should follow one decision flow chart called product investment because ultimately all of these activities are an investment in the end item.

- The RDT&E appropriation should be applied for the analytical nonrecurring cost to find a solution for obsolescence or product improvements. When there is an emergent, unexpected

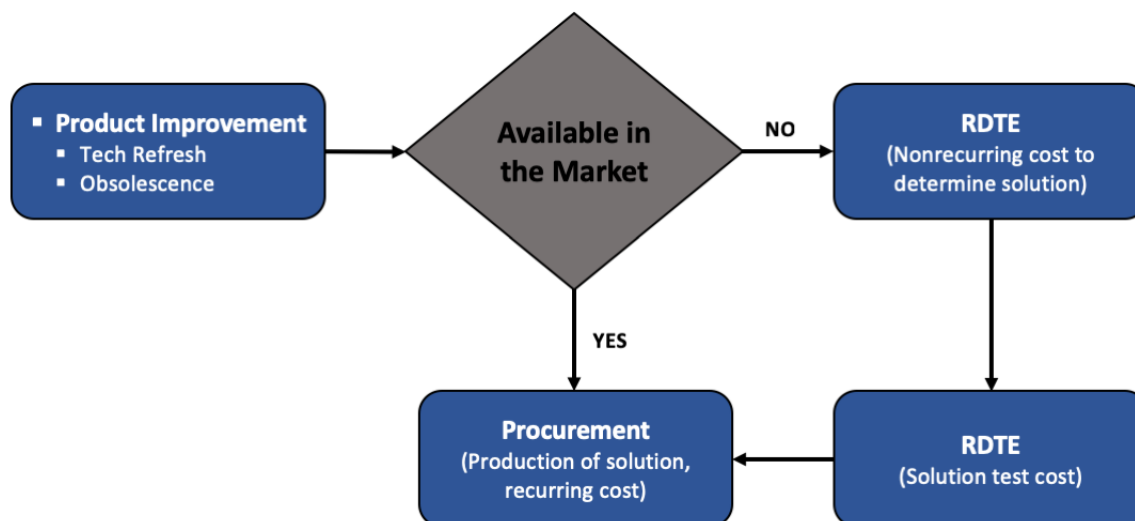
¹⁷ Ibid.

¹⁸ Figure adapted from presentation by Dana Stewart, *Color of Money: Funding Policies and Fiscal Law*, May 20, 2015, Defense Acquisition University, 19, accessed September 12, 2018 http://ndiatvc.org/images/downloads/DAU_Training/dau_color_of_money.pdf.

obsolescence or DMS, the program office can pursue reprogramming or use of O&M (form, fit, function item replacement), whichever addresses the situation most appropriately.

- The procurement appropriation should be applied for the recurring cost of the investment of the end item, such as scheduled tech refresh and modification kits. This concept still meets the original intent of the FMR that all costs are either an investment or an expense.

Figure 2-21. Proposed Product Investment Decision Tree



Most importantly, it is critical for PMs to recognize that the SPB is dynamic and forecast risk when establishing the SPB cost estimate and plan for RDT&E and procurement postproduction requirements. The investments (Procurement and RDT&E appropriations) are the costs that result in the acquisition of, or addition to, end items. These costs benefit future periods and generally are long term.¹⁹ The O&M appropriation is an expense, and expenses are the costs incurred to operate and maintain the organization and system. That is why an investment account and an expense account should be used for sustainment activities. Because investment accounts will be used for the three types of sustainment activities—product improvements, technical refresh, and DMSMS—these activities can be tied to budget line numbers (BLINs) and PEs. This connection offers more traceability and transparency of costs for these sustainment activities, as well as the total capital investment. Being able to trace program trades of funding for sustainment requirements can be further expanded by establishing separate budget projects and cost categories within the PEs and BLINs. Having this traceability also offers the cost estimating community historical data to improve on and address the sustainment cost estimating weakness described by CAPE.

Sustainment Underfunded/Emergent Requirements Affect Resources Available

Sustainment requirements can be underfunded for a variety of reasons. Too many categories of appropriations accounts, as just described, can lead to situations in which sustainment professionals are unsure which appropriation account to use to cover a given type of cost. Competing requirements among different stakeholders can also lead to chronic underfunding. During the year of execution,

¹⁹ DoD Financial Management Regulation, Volume 2A, Chapter 1, Section 01021 - Funding Policies.

situations can occur as mishaps, material shortages, and emergent requirements such as operational contingencies that affect both needed and available resources.

Acquisition program funding flows from Congress to the Military Services through a variety of appropriations and is channeled to organizations that will ultimately support the product. Examples of program funding include manpower, training, spares, engineering, depot repair, and support equipment. Sustainment funding has often served as the program manager's *bill payer* to meet unplanned program issues during development and production. This results in inaccurate program and budget estimates for sustainment requirements leading to underfunding in the year of execution. The establishment of the SPB should help establish an improved cost estimate and give accountability from the PM through the PAE to report any budget variances to the baseline.

Conclusions

It is critical to establish financial enablers that reduce budgetary uncertainty, increase funding flexibility, enhance the ability to effectively execute sustainment plans, and address emergent sustainment requirements.

DoD should establish an SPB in conjunction with the APB to monitor system requirements through acquisition and O&S. Currently, after IOC there are no formal milestones or events to measure system sustainment/readiness goals tied to the PEO/PM. Currently, sustainment trades are being made without clearly understanding or communicating the overall effect to system readiness and the lifecycle cost of the program. This issue can be mitigated with improved cost estimating methodologies and models for programming and budgeting sustainment funding. PMs should program for system sustainment risk and always establish an RDT&E line for postproduction analytical requirements and program for procurement to address possible obsolescence and product improvements. Doing so will allow PMs to establish long-term strategies to improve sustainment performance or incentivize lifecycle cost reductions.

Planning and investments for sustainment activities are often complicated by complex and ambiguous guidance on funding types. DoD can remedy this problem by clarifying statutes, regulations, and policies regarding funding, and redefining appropriation criteria in the FMR to provide more flexibility. As described above, sustainment planning should be aligned to maximize use of RDT&E and procurement appropriations. O&M may be used for maintenance, repair, and operations.

Once the program enters the execution year, the PEO (or under the proposed portfolio management structure PAE) and PMs need the financial agility to rapidly address emergent sustainment requirements. As described in *Volume 3, Section 4*, budget flexibility can be achieved by the following:

- Increasing the Procurement and RDT&E BTR thresholds, which will permit leadership to more easily move funding as needed within appropriations accounts.
- Delegating BTR authority to the lowest practical level (PEO/PM) with the most knowledge of the program.

Requiring programs to budget for the postproduction phases of their lifecycles will enable leadership to more accurately forecast required future resources via the SPB, reducing the degree to which expanded reprogramming authorities are needed.

Moving some of the sustainment activities to the investment accounts versus annual funding allows PMs to negotiate long-term supplier agreements that can reap savings on contractor supported systems, or performance-based logistics contracts. Although, for those activities still funded by O&M, the PM needs the increased flexibility to fund those requirements affected by continuing resolutions and O&M appropriations accounts should be allowed a 1-year, 5 percent carryover authority.

Extending the period of availability for sustainment funding with the carryover proposal, will reduce pressure to spend money for the sake of spending money driven by obligation end-period spending. In addition to addressing the effects of continuing resolutions, it could also eliminate the pressure driven by appropriation execution performance metrics. This carryover authority in the O&M appropriation accounts would give the sustainment community more time to acquire needed capabilities in years when funding is released late and permit sustainment acquisition professionals to smooth out the end-period surges in contract spending that occur each year.

As described, these recommended financial enablers should provide improved planning, programming, and execution of sustainment activities, which would improve the development, implementation, and tracking of the overall lifecycle cost of a program.

Implementation

Legislative Branch

- Congressional changes to implement sustainment funding recommendations are included in the Section 809 Panel's *Volume 3, Recommendations 46 through 49*.
 - Recommendations 46 through 48 includes a recommendation that FMR rules be modified to allow for more flexible reprogramming of funds at the portfolio level. These modifications would have to be approved by the congressional defense committees. This would allow for more efficient management of acquisition portfolios in general.
 - Recommendation 49 includes a recommendation that defense O&M appropriations accounts be granted a 1-year, 5 percent carryover authority. This would allow for a smoothing across time periods in the funding for many of DoD's sustainment needs.

Executive Branch

- Clarify the definitions of appropriations account categories in the FMR to provide more flexibility for sustainment activities. In particular, clarify the distinction between expenses and investments.
 - Update FMR Volume 2A, Chapter 1, Section 010201(B)(1) to allow O&M appropriations to be used to purchase supplies, services, or solutions that are necessary to address these

expense needs. Expenses are the costs incurred to operate and maintain the organization and systems, such as services, supplies, and utilities.

- Update FMR Volume 2A, Chapter 1, Section 010201(B)(2) to make the R&D investment cost category provide new and innovative technologies and allow Procurement appropriations and RDT&E appropriations to be used for purchasing supplies, services, or solutions necessary to address these nonrecurrent investment needs. Investments are the costs that result in the acquisition of, modification or addition to, end items. These costs benefit future periods and generally are of a long-term character such as real property and personal property.
- Other Executive Branch changes to implement sustainment funding recommendations are included in the Section 809 Panel’s *Volume 3* Recommendations 41 and 46 through 49.
 - Recommendation 41 includes a recommendation to establish a Sustainment Program Baseline (SPB) in conjunction with the APB to report system requirements through acquisition and O&S. APBs and SPBs would together constitute cost estimates for the total lifecycle cost of programs. This change would provide a more transparent and accurate assessment of the true costs of program sustainment.
 - Recommendations 46 through 48 include a recommendation that portfolio managers be given approval to make decisions on below-threshold reprogramming actions in cases for which a viable funding offset has been identified within the same portfolio. This flow down of decision authority should be accompanied by increased reprogramming thresholds and adjustment of the 20 percent rule for reprogramming within Procurement or RDT&E appropriations accounts, allowing for more efficient management of acquisition portfolios in general.
 - Recommendation 49 includes a recommendation that defense O&M appropriations accounts be granted a 1-year, 5 percent carryover authority, to be implemented by the DoD Comptroller and other comptroller authorities in DoD. This carryover authority would allow for a smoothing across time periods in the funding for many of DoD’s sustainment needs.

Implications for Other Agencies

- There are no cross-agency implications for this recommendation.

RECOMMENDED REGULATORY REVISIONS

DoD 7000.14-4 Financial Management Regulation Volume 2a, Chapter 1

0102 FUNDING POLICIES

010201. Criteria for Determining Expense and Investment Costs.

A. No Change.

B. Basic Distinctions Between Expense and Investment Costs. The criteria for cost definitions consider the intrinsic or innate qualities of the item such as durability in the case of an investment cost or consumability in the case of an operating cost and the conditional circumstances under which an item is used or the way it is managed. In all cases where the definitions appear to conflict, the conditional circumstances will prevail. The following guidance is provided to determine whether a cost is either an expense or an investment. All costs are classified as either an expense or an investment.

1. Expenses are the costs incurred to operate and maintain the organization *and systems*, such as ~~personal~~ services, supplies, and utilities. *Operation and Maintenance appropriations may be used to purchase supplies, services, or solutions that are necessary to address these expense needs.*

2. Investments are the costs that result in the acquisition of, *modification* or an addition to, end items. *Research and development efforts are a category of investment costs that can provide new and innovative technologies.* These costs benefit future periods and generally are of a long-term character such as real property and personal property. *Procurement appropriations and Research, Development, Test, and Evaluation appropriations may be used to purchase supplies, services, or solutions that are necessary to address these nonrecurrent investment needs.*

C. Policy for Expense and Investment Costs

1. DoD policy requires cost definition criteria that can be used in determining the content of the programs and activities that comprise the Defense budget. The primary reasons for these distinctions are to allow for more informed resource allocation decisions and to establish criteria for determining which costs are appropriate to the various defense appropriations.

2. The cost definition criteria contained in this policy are only applicable to the determination of the appropriation to be used for budgeting and execution. Cost definitions for accounting purposes are contained in Volume 1.

3. Costs budgeted in the Operation and Maintenance (O&M) and Military Personnel appropriations are considered expenses. Costs budgeted in the Procurement, *Research,*

Development, Test and Evaluation (RDT&E), and Military Construction appropriations are considered investments. Costs budgeted in the Research, Development, Test and Evaluation (RDT&E), Base Realignment and Closure (BRAC), and Family Housing appropriations include both expenses and investments. Definitions for costs within the Defense Working Capital Funds are provided in Chapter 9 and in Section 010214.

4. Items procured from the Defense Working Capital Funds will be treated as expenses in all cases except when intended for use in weapon system outfitting, government furnished material (GFM) on new procurement contracts, or for installation as part of a weapon system modification, major reactivation, or major service life extension.

D. Procedures for Determining Expenses versus Investments. The following criteria will be used to distinguish those types of costs to be classified as expenses from those to be classified as investments for budgeting purposes:

1. Expenses. Expenses are costs of resources consumed in operating and maintaining the Department of Defense. When costs generally considered as expenses are included in the production or construction of an investment item, they shall be classified as investment costs. Military personnel costs are an exception to this rule. The following guidelines shall be used to determine expense costs:

- a. Labor of civilian, military, or contractor personnel.
- b. Rental charges for equipment and facilities.
- c. Food, clothing, and fuel.
- d. Supplies and materials designated for supply management of the Defense Working Capital Funds.
- e. Maintenance, repair, overhaul, ~~rework of equipment~~.
- f. Assemblies, spares and repair parts, ~~and other items of equipment that are not designated for centralized item management and asset control and which have a system unit cost less than the currently approved dollar threshold of \$250,000 for expense and investment determinations. This criterion is applied on the basis of the unit cost of a complete system rather than on individual items of equipment or components that, when aggregated, become a system.~~ The concept of a system must be considered in evaluating the procurement of an individual end item. A system is comprised of a number of components that are part of and function within the context of a whole to satisfy a documented requirement. ~~In this case, system unit cost applies to the aggregate cost of all components being acquired as a new system.~~
- g. Cost of incidental material and items that are not known until the end item is being modified are conditional requirements and are considered expenses because the material is needed to sustain or repair the end item.

h. Engineering efforts to determine what a modification will ultimately be or to determine how to satisfy a deficiency ~~are~~ *may be investments or expenses. The non-recurring cost to determine a solution can be an investment funded with RDT&E.*

i. Facilities sustainment, O&M-funded restoration and modernization projects. Planning and design costs are excluded from the cost determination for purposes of determining compliance with the amounts established in 10 U.S.C. 2805 for minor construction projects; however, design costs are not excluded from capitalization.

2. Investments. Investments are costs to acquire capital assets such as real property and equipment. The following criteria shall be used to determine those costs to be classified as investments:

a. All items of equipment, including assemblies, ammunition and explosives, modification kits (the components of which are known at the outset of the modification), spares and repair parts not managed by the Defense Working Capital Funds, that are subject to centralized item management and asset control.

b. All equipment items that are not subject to centralized item management ~~and asset control and have a system unit cost equal to or greater than the currently approved expense and investment dollar threshold of \$250,000 (for working capital funds investment criteria see Volume 2B Chapter 9 section 090103C). The validated requirement may not be fragmented or acquired in a piecemeal fashion in order to circumvent the expense and investment criteria policy.~~

c. Construction, including the cost of land and rights therein (other than leasehold). Construction includes real property equipment installed and made an integral part of such facilities, related site preparation, and other land improvements. (See paragraph F below for special guidance concerning real property facilities.)

d. The costs of modification kits, assemblies, equipment, and material for modernization programs, ship conversions, major reactivations, major remanufacture programs, major service life extension programs, and the labor associated with incorporating these efforts into or as part of the end item are considered investments. All items included in the modification kit are considered investment ~~even though some of the individual items may otherwise be considered as an expense~~. Components that were not part of the modification content at the outset and which are subsequently needed for repair ~~are~~ *may be considered* expenses. The cost of labor for the installation of modification kits and assemblies is an investment.

e. Supply management items of the Defense Working Capital Funds designated for weapon system outfitting, government-furnished material on new procurement contracts, or for installation as part of a weapon system modification or modernization, major reactivation or major service life extension.

f. Also considered as investments are support elements such as data, factory training, support equipment and interim contractor support (ICS), which are required to support the procurement of a new weapon system or modification.

3. Conditional Cases. The following are conditional cases that take precedence over the criteria contained in paragraphs 1 and 2 above:

a. A major service-life extension program, financed in procurement, extends the life of a weapon system beyond its designed service life through large-scale redesign or other alteration of the weapon system.

b. Depot and field level maintenance is the routine, recurring effort conducted to sustain the operational availability of an end item. Depot and field level maintenance includes refurbishment and overhaul of end items, removal and replacement of secondary items and components, as well as repair and remanufacturing of reparable components. The maintenance effort may be performed by a depot maintenance activity in the Defense Working Capital Fund, by a direct funded DoD activity, by another government agency, or by a contractor.

c. Maintenance, repair, overhaul, and rework of equipment are funded in the operation and maintenance appropriations. However, maintenance of equipment used exclusively for research, development, test, and evaluation efforts will be funded by the RDT&E appropriations. Continuous technology refreshment is the intentional, incremental insertion of newer technology to improve reliability, improve maintainability, reduce cost, and/or add minor performance enhancement, typically in conjunction with depot or field level maintenance. The insertion of such technology into end items as part of maintenance is *may be* funded by ~~the operation and maintenance procurement~~ appropriations. However, technology refreshment that significantly changes the performance envelope of the end item is considered a modification and, therefore, an investment (See section on “Product Improvement” 010212 C. 7.) *All non-recurring engineering effort may be an investment funded with RDTE appropriation.* This definition applies equally to technology insertion by commercial firms as part of contractor logistics support, prime vendor, and similar arrangements and to technology insertion that is performed internally by the Department.

e. Initial outfitting of an end item of investment equipment, such as a ship or aircraft, with the furnishings, fixtures, and equipment necessary to make it complete and ready to operate is a part of the initial investment cost. Material procured through the Defense Working Capital Funds for initial outfitting will be financed by procurement appropriations when drawn from the supply system. This concept includes changes to the allowance lists of ships, vehicles, and other equipment. Changes to allowance lists will be budgeted as investment costs. Procurement appropriations are not required to satisfy initial outfitting requirements if assets are available for issue through

reuse/redistribution programs, such as the Navy's Consumable Asset Reutilization Program.

F. Expense/Investment Cost Determination

Expense/Investment Cost Determination						
Is the item a	If	Then	If	Then	If	Then
Centrally Managed/Asset Controlled Item?	Yes	Is the item purchased from DWCF?	Yes	Is the item part of a full funding effort? *	Yes	Classify as Investment
					No	Classify as Expense
			No	Classify as Investment		
	No	Is the unit cost more than \$250,000?	Yes	Classify as Investment		
No			Classify as Expense			
* When intended for use in weapon system outfitting, government furnished material on new procurement contracts or for installation as part of a weapon as part of a weapon system modification, major reactivation or major service life extension.						

010202. Full Funding of Procurement Programs (No Change)

010203. Multiyear Procurement (No Change)

010204. Buy-to-Budget for Acquisition of End Items (No Change)

010205. Transportation (No Change)

010206. Engineering Change Orders (No Change)

010207. Factory Training (No Change)

010208. Interim Contractor Support

Interim contractor support (ICS) is the maintenance and support of a new weapon system provided by a commercial vendor pending transition to organic support. Because ICS is a major component of the initial logistics support of a newly fielded system and integral to program acquisition, ICS funding requirements should be budgeted in the Procurement appropriations. However, ICS is intended to provide support for the brief period between initial item deployment and the permanent organic support. All acquisition strategies should attempt to minimize ICS requirements and duration. ICS will only be funded in Procurement appropriations until the organic support date specified in the acquisition program baseline is

achieved. Continued funding of ICS after the baseline support transition date will be approved on an exception basis.

010209. Commercial Off-the-Shelf (COTS) and Non-Developmental Item (NDI) Procurement

- A. Items purchased directly from a commercial source that can be utilized without alteration or modification are classified as COTS or NDI. All COTS and NDIs, including the first article and associated first article acceptance testing ~~should~~ *may* be funded in the Procurement or O&M appropriations, ~~as determined by the Expense and Investment criteria.~~ If an end item requires design and development in order to accept the COTS or NDI, or if Operational Test & Evaluation (OT&E) is required to determine military suitability and effectiveness; or if Live Fire Test & Evaluation (LFT&E) is required to determine whether the COT/NDI possesses survivability and lethality characteristics needed by operational forces, then the entire effort is not COTS or NDI, and funding for that effort should be budgeted in RDT&E. If a COTS or NDI is required for RDT&E test purposes, the cost is funded in RDT&E. *RDT&E appropriations may be applied for the analytical nonrecurring cost to find a solution for obsolescence or product improvements.*
- B. *Where there is an emergent unexpected obsolescence or DMS, the program office may pursue reprogramming or use O&M (Form, Fit, Function Item Replacement), whichever addresses the situation most appropriately.*

010210. Spares and Repair Parts

A. This Section provides instructions applicable to funding requests for spares and repair parts procured with direct appropriations in the Procurement Title.

1. Initial Spares and Repair Parts. Initial spares and repair parts will include those repairable components, assemblies, and subassemblies required as initial stockage at all levels including the pipeline to permit fielding of new end items. Whole spare engines will be classified as initial spares through the life of system. Funding will be budgeted based on a first year obligation rate of 92 percent.

2. War Reserve Spares and Repair Parts. War reserve material (WRM) spares and repair parts for initial stockage will be budgeted in replenishment except for whole spare engines in accordance with the above definitions. See Section 010215, Defense Working Capital Funds - War Reserve Materiel, for additional budgeting WRM policies.

B. The Operation and Maintenance (O&M) accounts will finance the purchase of depot level repairables (DLRs) and consumable repair parts, primarily through the Defense Working Capital Fund (DWCF), for maintenance of all Class IX equipment (excluding medical peculiar repair parts).

C. Spares budgeting can be aggregated by weapon system except for Selected Acquisition Report (SAR) systems.

010211. Direct and Reimbursable Budget Plans. (No Change)

010212. Budgeting for Information Technology and Automated Information Systems

A. Information Technology and Automated Information Systems that are not embedded in weapons systems and/or major end item procurements are budgeted according to the investment and expense criteria (see 010201) and the appropriation or fund's purpose.

B. The correct appropriation for budgeting an IT effort is dependent on the activity and the underlying tasks that make up the IT effort. *IT software development, provided there is no change in the congressionally approved purpose of the appropriation, may be properly budgeted in (and subsequently funded through) RDT&E, Procurement, or O&M.* RDT&E activities and Working Capital Fund activities follow unique procedures as noted in the following paragraphs. All other activities budget for IT efforts based solely on the underlying purpose for the IT effort.

1. An IT effort may require funding for more than one appropriation. The underlying purpose for each discrete task within an IT effort determines the correct appropriation for budgeting of that task. ~~An effort~~ *An IT software development effort* that is so broadly defined that it contains separate tasks appropriate to budgeting in different appropriations ~~should be separated into discrete tasks, each of which is budgeted in the correct appropriation.~~ *may be properly budgeted in (and subsequently funded through) RDT&E, Procurement, or O&M.*

2. The following guidelines are provided to help determine which appropriation to use:

3. RDT&E appropriations: Development, test and evaluation requirements, including designing prototypes and processes, should be budgeted in the RDT&E appropriations. The RDT&E funds should be used to develop major upgrades increasing the performance envelope of existing systems, purchase test articles, and conduct developmental testing and/or initial operational test and evaluation prior to system acceptance. In general, all developmental activities involved in bringing a program to its objective system are to be budgeted in RDT&E.

a. Reaching the objective system, as defined in the requirements documents, is a critical determinate. Some software programs, particularly those following a spiral or incremental development pattern, may be approved for initial fielding even though the early capability is below the objective system requirements. The follow-on development and test activities required to reach the objective system performance will be budgeted in RDT&E.

b. Commercial-off-the-shelf (COTS) systems that require engineering design, integration, test, and evaluation to achieve the objective performance will be budgeted in RDT&E.

c. The acquisition, operation and maintenance of IT systems that are used exclusively to support RDT&E activities will be budgeted and funded within an RDT&E appropriation.

4. Procurement appropriations: Acquiring and deploying a complete system ~~with a cost of \$250,000 or more~~ is an investment and ~~should~~ *may* be budgeted in a Procurement appropriation. Complete system cost is the aggregate cost of all components (e.g., equipment, integration, engineering support and software) that are part of, and function together, as a system to meet an approved documented requirement. ~~For modification efforts, only the cost of the upgrade (e.g., new software, hardware, and technical assistance) is counted towards the investment threshold.~~ The total cumulative cost of the system is not considered when deciding what appropriation to use to fund modernization.

a. Procurement of fully developed and tested modification kits and associated installation, including technical assistance is financed from Procurement appropriations. Equipment purchased after successful system testing and a favorable fielding decisions is funded with procurement dollars.

b. Proprietary software carries a copyright from the vendor that prohibits duplication or modification. Essentially, the purchaser is buying a license from the vendor to use the software on a particular system. Proprietary software, *depending on acquisition details, may be* ~~is an investment, subject to the expense investment criteria, unless it is financed on an "annual fee" basis. In the latter case, it is an expense item~~ properly financed in RDT&E, *Procurement*, or O&M.

5. O&M appropriations: Expenses incurred in continuing operations and current services are budgeted in the O&M appropriations. ~~Modernization costs under \$250,000 are considered expenses, as are one-time projects such as developing planning documents and studies.~~

a. Software releases categorized as iterations on the basic release and not involving significant performance improvements or extensive testing are considered a maintenance effort. Minor improvements in software functionality which are accomplished during routine maintenance may also be O&M funded.

b. Items purchased from a commercial source that can be used without modification (e.g., COTS and nondevelopmental items) will be funded in ~~either the Procurement or O&M appropriations, as determined by the expense and investment criterion.~~

6. The IT systems developed and acquired through the Defense Working Capital fund will be reflected in the Capital Budget if the system is \$100,000 or more. Systems costing less than \$100,000 ~~are~~ *may be* funded through the Operating Budget.

7. Capitalization of Software Cost. For accounting purposes, the total cost of software should be capitalized when the total cost of the system exceeds the Department's capitalization threshold amount, which is currently \$100,000. Capitalization of software is not dependent on the appropriation used to fund its purchase or development. Further information on capitalization may be found in the DoD FMR, Volume 4, Chapter 6, paragraph 060210.

010213. Research, Development, Test and Evaluation (RDT&E) - Definitions and Criteria

A. Definitions. The term "research and development (R&D)" is intended broadly to include the work performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government. It includes R&D in all fields, including the physical sciences, engineering, etc.

1. Research is systematic study directed toward fuller scientific knowledge or understanding of the subject studied.

2. Development is systematic use of the knowledge and understanding gained from research, for the production of useful materials, devices, systems, or methods, including the design and development of prototypes, *modifications* and processes.

B. General Criteria. When, after consideration of the following criteria, there is doubt as to the proper assignment of costs between appropriations, the issue should be resolved in favor of using RDT&E funding. In general, the types of costs to be financed by RDT&E and related appropriations are:

1. RDT&E Appropriations

a. RDT&E will finance research, development, test and evaluation efforts performed by contractors and government installations, including procurement of end items, weapons, equipment, components, materials and services required for development of equipment, material, or computer application software; its Development Test and Evaluation (DT&E); and its Operational Test and Evaluation (OT&E) as provided for in paragraph C.5. (Test Articles and Test Support) below.

b. The operation of R&D installations and activities engaged in the conduct of R&D programs, including direct and indirect efforts, expense and investment costs.

c. The acquisition or construction of industrial facilities costing less than \$750,000 at government owned, government operated (GOGO) facilities under the criteria of DoD Directive 4275.5 as provided for under 10 U.S.C. 2805 (unspecified minor construction). Use of RDT&E funds for acquisition and construction at contractor owned or contractor operated government facilities is authorized under 10 U.S.C. 2353, Contracts; Acquisition, Construction, or Furnishings of Test Facilities and Equipment.

2. Related Appropriations

a. All construction at R&D installations and activities other than that covered above will be funded in the Military Construction appropriations.

b. Equipment and material approved for production and intended for operational use or inventory upon delivery will be funded in the Procurement appropriations. Product improvement ~~within the current performance envelope on~~

~~systems in production, will~~ ~~may~~ be funded in the Procurement appropriations ~~as long as no development or operational tests by an independent operational test agency are required.~~

c. Family housing construction, operation and maintenance at R&D installations and activities will be funded in the Family Housing appropriations.

d. Expenses of Headquarters R&D management, organizational management analyses, test and evaluation for system sustainment personnel and command support, ~~and product improvement within the current performance envelope for systems out of production~~ will be funded in the Operation and Maintenance (O&M)

C. Specific Determinations. Additional details on the determination of proper funding for specific items or efforts are provided in the following paragraphs.

1. Organizational Funding Criteria (No Change)

2. Facilities Construction and Modification (No Change)

3. Equipment (No Change)

4. Establishment of Pilot Line and Tooling Requirements (No Change)

5. Test Articles and Test Support

a. (1) (2) (3) (No Change)

b. Conduct of testing that is not associated with RDT&E, or testing conducted after fielding or acceptance for operational use, such as the examples noted below, will be financed in the Procurement or O&M appropriations, as appropriate.

(1) Acceptance, quality control and surveillance testing of articles obtained for other than RDT&E purposes.

(2) Routine testing in connection with logistic support.

(3) Testing related to the operation and maintenance of equipment and material acquired for use under appropriations other than RDT&E.

(4) Testing required to prove the capability of facilities to produce items which have been approved for production will be funded by procurement as part of the initial acquisition cost.

c. The acquisition of commercial or nondevelopmental items for testing and operational evaluation that do not require RDT&E engineering, design or integration effort will be financed by ~~O&M or Procurement appropriations (as determined by the Expense and Investment criteria).~~ O&M appropriations will finance personnel and command support costs for test and evaluation of commercial and nondevelopmental

items by field units for doctrine, operational, or organizational purposes. If the commercially available item is modified and requires testing prior to approval for service use or inventory it is to be funded in RDT&E as are all developmental items.

d. Articles (including end items, weapons, equipment, major test vehicles such as ballistic missile boosters or upper stages, components and materials) of types regularly procured to meet established general requirements such as operational training, operational use, or inventory which are assigned or allocated on a priority basis for use in support of approved R&D programs and which are not consumed in testing, may be financed by Procurement appropriations ~~using the expense and investment criteria~~. In addition, excess items or O&M that can be made available on a priority basis from existing inventory will be reassigned for use in R&D test and evaluation programs without reimbursement. However, all items, expected to be consumed in R&D test and evaluation will be financed by RDT&E appropriations.

e. Consumable rounds of ammunition or rounds of similar tactical missiles otherwise procured in quantity for inventory under existing procedures, may be issued on a priority basis for use in R&D testing without reimbursement.

f. The acquisition of test articles ~~will~~ **may** be financed by ~~O&M or~~ Procurement appropriations ~~(as determined by the Expense and Investment criteria)~~, and personnel and command support costs will be financed by O&M appropriations for all test and evaluation (T&E) subsequent to acceptance for operational use and T&E to demonstrate the operational employment or develop operational tactics (i.e., subsequent to RDT&E efforts).

6. Modification and Refurbishment of Test Articles

a. Costs associated with modifying or reconfiguring an existing item for R&D test purposes will be funded in RDT&E. When an item that has been diverted from another use is not consumed in R&D testing, any costs necessary to return the item to serviceable condition or to its pre-existent configuration will be financed in RDT&E.

b. If an article initially acquired with RDT&E funds as part of an RDT&E test effort is still available at the completion of the test program, it may be reassigned for operational use or inventory. The cost to modify such an article for operational use would be borne by the Procurement and O&M appropriations, as appropriate.

7. Product Improvement

a. "Product improvement" of major end items and major components of major end items currently in production or in the operational inventory, is subject to the following:

~~(1) Redesign of an item to increase the current performance envelope, including related development, test and evaluation effort, will be financed in RDT&E. RDT&E appropriations may be applied for the analytical nonrecurring cost to find a solution for obsolescence or product improvements and conduct testing of solution.~~

~~(2) The procurement appropriation may be applied for the recurring cost of the investment of the end item, such as scheduled tech refresh and modification kits.~~

~~(3) Where there is an emergent unexpected obsolescence or DMS, the program office may pursue reprogramming or use O&M (Form, Fit, Function Item Replacement), as appropriate.~~

~~(2) Engineering services or related manufacturing efforts applied to an item currently in production to extend its useful military life within the current performance envelope should be funded by Procurement appropriations as long as no developmental testing (DT) or operational test and evaluation (OT&E) by an independent operational test agency is required. If DT or OT&E by an independent operational test agency is required, RDT&E finances the improvement. The phrase "an item currently in production" implies that the item has end item procurement funding in the year the product improvement effort is to take place.~~

~~(3) Engineering services or related manufacturing efforts applied to an out of production, but still operational item to extend its useful military life within the current performance envelope should be financed by O&M appropriations as long as no developmental testing (DT) or operational test and evaluation (OT&E) by an independent operational test agency is required. If DT or OT&E is required by an independent operational test agency, RDT&E finances the improvement.~~

~~(4) In both cases (2) and (3) above, the determination that the improvement is "within the current performance envelope" and that "no development testing (DT) or operational test and evaluation (OT&E) by an independent operational test and evaluation agency is required" should be determined after formal coordination with the Director, Operational Test and Evaluation.~~

~~b. While existing off-the-shelf equipment may be procured with Procurement funds, items that require engineering design, integration, test, or evaluation effort shall be procured with RDT&E funds in sufficient numbers to support such effort. may apply RDT&E for the analytical nonrecurring cost to find a solution and procurement funds to procure the item. Where there is an emergent unexpected obsolescence or DMS, the program office may~~

pursue reprogramming or use O&M (Form, Fit, Function Item Replacement), whichever addresses situation most appropriately.

c. Costs of fully developed and tested modification kits and associated installation costs should be financed from Procurement appropriations. If DT or OT&E by an independent operational test agency is required, RDT&E finances the RDT&E effort and the kits required for RDT&E testing. Procurement funds would then be used to procure the follow-on kits.

d. Aircraft engine component improvement costs are budgeted in the RDT&E appropriations to provide for continuing improvements in the aircraft engines in the areas of reliability, maintainability, durability, correction of Service-revealed deficiencies, safety of flight, time-between-overhaul, etc. "Component Improvement" is established at the point in time when:

(1) There has been a Government acceptance of the first procurement funded engine, and

(2) The engine has successfully completed stringent qualification or verification testing to demonstrate initial production suitability subject to:

(a) Compliance with contractual specifications, performance guarantees and military specifications, as applicable to individual Service requirements;

(b) Completion of endurance testing representative of the anticipated Service use to include completion of specified post test inspections, certification, and penalty runs;

(c) Demonstration of prescribed performance capability; and

(d) Accomplishment of prescribed durability, reliability, and environmental testing.

8. Ships and Ship-type Vehicles (No Change)

9. Space Systems (No Change)

10. Training Devices. A training device is composed of components and software that have been designed or modified to demonstrate or illustrate a concept or simulate an operational circumstance or environment. The initial or prototype training device and all its support costs through service acceptance for operational use will be funded in RDT&E. RDT&E will not fund beyond the initial system unless more than one full system is required to demonstrate the training device performance. The initial or prototype training device that employs new or off-the-shelf computers and system components, but has training system unique software and interface components, will be developed and procured with RDT&E funds. Typically, these training devices have small quantity requirements and the initial or

prototype device is used for operational training. Modifications or updates to existing training devices will normally be funded in the applicable Procurement or O&M appropriation, ~~subject to the expense and investment criteria~~. Any necessary development effort or *nonrecurring engineering to determine and test the solution* for these modifications or updates will be funded in RDT&E.

11. Joint Test and Evaluation (No Change)

12. Manufacturing Technology (No Change)

13. Development Efforts Related to Future Leased Services (No Change)

14. Subsystem Integration into Weapon Systems (No Change)

15. Engineering change orders (No Change)

010214 – 010226 (No Change)

0103-0110 (No Change)