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REFINING GOVERNANCE TO ENABLE OPTIMIZED SPACE
SYSTEM SUSTAINMENT SERVICES (S4) CONTRACTS

by

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PREFACE AND ACKNOWLEDGMENTS

Space and Missile Center Logistics Functional Staff (SMC/SL) for Air Force Program Executive Officer for Space (AFPEO/SP) requires better characterization of space system sustainment services (S4) contract requirements sets in order to determine, justify and receive approval for optimal contract strategies. The SMC sustainment community has communicated the negative impacts of several recently awarding fixed-price and incentive contracts to Department of Defense (DoD), Air Force, and SMC senior leaders. SMC leaders have reaffirmed their commitment to consider any S4 acquisition and contracting strategy without prejudice, when the proposed strategy is fully analyzed and justified.

This paper provides a thorough assessment of key DoD and Air Force policy, guides, and studies pertaining to Air Force S4 contracting, in order to generate insights leading to optimized S4 contracts. The goal of the author, and all SMC and DoD leaders, is to award S4 contracts providing maximum military capability per dollar spent.

In addition to insights gained from the seventeen doctrinal sources assessed herein, intellectual contribution to this paper were provided by Mr. Louis “Lou” Johnson Jr., SMC/SL Director; Mr. Michael “Mac” McDonald, Chief, Logistics Plans and Policy (SMC/SLX); Mr. Robert “Bob” Mansfield, Odyssey Systems Consulting Group; Dr. William “Bill” Chadick, MCR Incorporated; Mr. Bruno Mediate, Global Positioning System Product Support Manager (PSM) (SMC/GPL); Mr. Tim McIntyre, Military Satellite Communications (MILSATCOM) PSM (SMC/MCL); Mr. Michael Hennessy, SMC Acquisition Center of Excellence (SMC/PID); and several other talented SMC personnel. Valuable editing and writing style advice were provided by fellow Air Command and Staff College (ACSC) classmate, Capt. Zachary “PAW” Sauerman, United States Air Force (USAF); and the course advisor, Dr. Gregory F. Intoccia.

ABSTRACT

This paper provides a comprehensive critique and assessment of current Department of Defense (DoD) and Air Force policy and guidance, relative to managing space system sustainment service (S4) contracts. Five most relevant directives, ten most relevant guides, and two most relevant studies are assessed in order to determine governance adequacy, and provide insights into current weaknesses and gaps requiring countermeasures.

Key findings of this research paper include 1) the current S4 requirements analysis and definition process is inadequate, 2) there is an unqualified bias for, and overuse of, fixed-price and incentive contracts resulting in negative consequences, 3) current sustainment cost reporting is deficient and non-compliant with policy, 4) past practices of cost-plus-award-fee contracts had many issues, 5) the space sustainment management workforce requires increased knowledge and tools to help realize optimized S4 contracts, 6) Air Force standard sustainment management data systems are poorly integrated and inadequate, 7) data rights management practices in Space and Missile Systems Center (SMC) require better guidance and staffing, and 9) current depot maintenance laws and policies, hinder best value space sustainment.

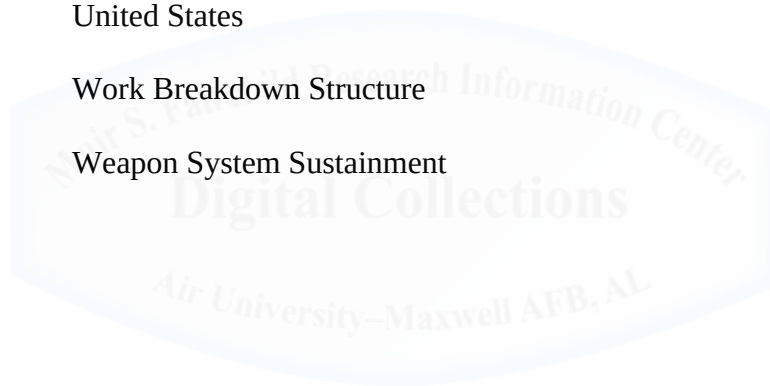
LIST OF ABBREVIATIONS

ACAT	Acquisition Category
AFI	Air Force Instruction
AFPEO/BES	Air Force Program Executive Officer for Business Enterprise Systems
AFPEO/CM	Air Force Program Executive Office for Combat and Mission Support
AFPEO/SP	Air Force Program Executive Officer for Space
AFSPC	Air Force Space Command
ASD/L&MR	Assistant Secretary of Defense for Logistics and Materiel Readiness
BBP	Better Buying Power
BRAC	Base Realignment and Closure
C2	Command and Control
CAP	Critical Acquisition Position
CPD	Capability Production Document
CAPE	Directorate of Cost Assessment and Program Evaluation
CES	Cost Element Structure
CJCS	Chairman, Joint Chiefs of Staff
CLIN	Contract Line Item Number
CLS	Contractor Logistics Support
CPAF	Cost Plus Award Fee
CPFF	Cost Plus Fixed Fee
CPIF	Cost Plus Incentive Fee
CSSG	Air Force Contract Sustainment Support Guide

CWBS	Contractor Work Breakdown Structure
D&F	Determination and Finding
DAF	Department of the Air Force
DID	Data Item Description
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
EVM	Earned Value Management
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FDO	Fee Determining Official
FFP	Firm Fixed Price
FIAR	Financial Improvement and Audit Readiness
FPIF	Fixed Priced Incentive (Firm-Target)
FY	Fiscal Year
GAO	Government Accountability Office
ILCM	Integrated Life Cycle Management
IMS	Integrated Master Schedule
IMSC	Air Force Installation and Mission Support Center
IMP	Integrated Master Plan
IP	Intellectual Property
KLP	Key Leadership Position
KPP	Key Performance Parameter

KSA	Key System Attribute
LCL	Life Cycle Logistics
LCSP	Life Cycle Sustainment Plan
MDA	Milestone Decision Authority
MIL-STD	Military Standard
NDAA	National Defense Authorization Act
O&S	Operations and Support
ODC	Other Direct Costs
OFPP	Office of Federal Procurement Policy
OMB	Office of Management and Budget
OPTEMPO	Operational Tempo
OSD	Office of Secretary of Defense
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
PBL	Performance-Based Logistics
PCO	Procurement Contracting Officer
PEM	Program Element Monitor
PM	Program Manager
PS-BCA	Product Support-Business Case Analysis
PSI	Product Support Integrator
PSM	Product Support Manager
QAP	Quality Assurance Personnel
REA	Request for Equitable Adjustment
RFI	Request for Information

RFP	Request for Proposal
ROI	Return-on-Investment
S4	Space System Sustainment Services
SAF/AQ	Assistant Secretary of the Air Force for Acquisition
SE&I	System Engineering and Integration
SecDef	Secretary of Defense
SMC	Space and Missile Systems Center
SMC/SL	Directorate of Logistics
SPO	System Program Office
US	United States
WBS	Work Breakdown Structure
WSS	Weapon System Sustainment



SECTION 1 – INTRODUCTION

Many Air Force **space system sustainment services** (S4) contracts: 1) are experiencing unplanned contract administration burdens, 2) have incomplete requirements analyses, 3) include overly complex and burdensome incentives, and 5) facilitate unintended profits for contractor not tied to increased military capabilities.¹ S4 contract strategies are being approved without sufficient analysis and justification of the contract and incentive type(s).²

Can a thorough assessment of current Department of Defense (DoD) and Air Force policy, guides and key studies, as they pertain to development, approval, and management of Space and Missile Center (SMC) S4 contracts, provide clarifying insights, identify gaps and biases, and help identify enabling actions needed to improve and optimize S4 contracts? The answer to this research question is “affirmative”. The thorough governance assessment presented herein will spur valuable insights for SMC decision makers, functional leaders, materiel leaders, sustainment program managers, contracting officers, and other sustainment management practitioners, improving their understanding of current policy and guidance, and supporting the need for the ten enablers presented in Section 6 of this paper.

The desired future state is one where 1) contract type determination is based on thorough requirements characterization and price risk analyses, 2) approved contract type(s) enable delivery of maximum capability per dollar spent, 3) incentives, when used, are clear, simple, non-contradicting of other incentives, and support key objectives; 4) comprehensive sustainment cost tracking and reporting are accomplished on every awarded S4 contract valued at \$50 million and above, and 5) consistent, value-based government contract administration is conducted by highly skilled, trained, and experienced government personnel.³

This paper employs an *evaluative framework* approach, assessing and annotating insights for each of the seventeen key doctrinal documents relating to S4 contracting in its own separate subsection. This approach adds a little volume and redundancy, but is by design in order to clearly show common mandates and the differences between the doctrine, which all direct and guide sustainment contracting and management approaches for SMC personnel. The employed framework approach allows each reader to see for them self the common insights and doctrinal gaps in need of countermeasures, and helps prove this paper is a comprehensive and thorough body of work, adding credibility and confidence to the findings and recommendations.

The three categories of doctrine being assessed in this paper are: five most relevant directives in Section 3; ten most relevant DoD and Air Force guides in Section 4; and two most relevant studies in Section 5. Section 6 captures the most relevant findings from the doctrine assessment sections and presents ten enablers for achieving optimized S4 contract outcomes.

Implementing the prescribed insights captured in each assessment subsection and summarized in Section 6 of this paper will result in more capability delivered to the warfighter for each dollar spent, better cost management and accountability, and purpose driven / efficient contract administration of awarded S4 contracts. These enablers include processes to better define requirements, improve cost reporting, improve sustainment data management, improve data rights management, correctly structure and manage award fee contracts, improve personnel skills, apply modernization initiatives to fielded systems, and seek exemptions to depot maintenance laws for space systems.

All policy and guides assessed in this paper have been approved by DoD and Air Force senior leaders, and have undergone extensive peer review from highly qualified and experienced government personnel and other subject matter experts from industry and academia. The two

studies assessed in this paper where widely distributed and underwent extensive peer review from highly qualified and experienced government personnel, and other subject matter experts from industry and academia. This paper takes a non-attribution approach, avoiding specifically identifying SMC people, leadership positions, organizations, or specific contracts.

The premise of this paper is ***current directives and guidance, relative to S4 contracting, must first be well understood by SMC decision makers, materiel leaders, functional staff directors, PMs, and other practitioners in order to discern the current state, understand governance gaps, and then support the prescribed process improvements identified throughout this paper and in section 6.***⁴

SECTION 2 – BACKGROUND

The AFPEO/SP Logistics Functional Staff (SMC/SL) seeks to characterize and articulate space sustainment contract requirements in order to determine and justify optimal contract strategies for senior leader approval. Department of Defense (DoD), Air Force, and Space and Missile Center (SMC) senior leaders are committed to unprejudiced review of any services acquisition contract and incentive type presented with adequate analysis and rationale. However, some recently awarded SMC S4 contracts using fixed-price-incentive-[firm-target] (FPIF), firm-fixed-price (FFP), and cost-plus-incentive-fee (CPIF) contract strategies have resulted in 1) unplanned contract modifications, 2) increased contract administrative efforts, 3) unplanned funding needs, 4) competing and overly complex incentive schema, 5) increased costs per capability delivered, and 6) unintended contractor profits not tied to increased delivered capabilities.⁵

DoD and Air Force policy currently prescribe an unqualified preference for fixed-price and incentive contracts.⁶ This “default” preference results in missed opportunity for best value. Just as cost-plus award fee (CPAF) contracts must be justified via cost-benefit-risk-analysis supporting a Determination and Finding (D&F) for Head of Contracting Activity (HCA) approval, fix-price and incentive type contracts should likewise be justified. Any contract and incentive type, when inappropriately applied, results in lower value delivered per dollar. Sub-optimized contracts often provide unintentional natural motivators for contractor profit not tied to increased key outcomes for the government.⁷ SMC attempts to shift price risk to the contractor via FPIF S4 contracts is not being realized, as many of the task requirements in S4 contracts are not stable in the execution year and so not suitable for contractor risk-based pricing.⁸

A widely read 2006 Government Accountability Office (GAO) Report indicated deficient analysis pertaining to use of CPAF contracts for weapon system development and production resulted in significant excess costs in DoD weapon system contracts.⁹ However, for broad scope S4 contracts, the issues with CPAF over the last 20-years have most often been “how CPAF were implemented”. Too many and conflicting factors along with a chaotic evaluation processes cause issues, rather than CPAF being inherently the incorrect contract type.¹⁰

DoD and Air Force contracting directives mandate an analysis of the technical risk, cost risk, and price history be conducted for each requirement set in order to determine the optimal contract type.¹¹ For S4 contracts, individual task complexity and quantity of outputs for each requirement type in a given year are usually not predictable enough for a contractor to accurately bid hours and personnel skills, via functional control accounts and work packages, to support a fixed-price contract. Nor is there a sufficiently stable price history for a years’ worth of effort for each required sustainment task to bid fix-price. Leaders and practitioners developing and

approving S4 contract strategies must understand the complexity and unstable quantity of many space system sustainment tasks. The actual complexity and hours are often only known as the dynamic operational tempo transpires each day, week, month and year.¹² Cost-reimbursement type contracts should be evaluated for S4 and may prove to be, when supported by sufficient analyses, the optimal contract type to achieve maximum output per dollar, while allowing for strong cost-management oversight. CPAF can be designed and managed to provide best value, while offering flexibility and responsiveness to real-world dynamics, and facilitating sound and efficient government oversight and management of the contract.¹³

At present, there are significant “how-to” gaps in DoD and Air Force policy and guidance pertaining to S4 requirements analysis needed to make correct contract type determinations.¹⁴ Additionally, policy initiatives like Performance Based Logistics (PBL) are confusing, and mandates for organic depot maintenance are most often not best value.¹⁵ The current sustainment contract guidance gaps are a result of a historic lack of focus on sustainment services contracting by USD(AT&L) and Assistant Secretary of the Air Force for Acquisition (SAF/AQ). These policy gaps are now in the beginning stages of being assessed and mitigated, and still have a very long way to go to achieve what is needed for optimized S4 contracts.¹⁶

The Air Force faces daunting budget challenges. The Air Force must simultaneously recapitalize numerous aging fleets of aircraft, reconstitute trained forces, develop new capabilities to counter emerging threats in the two newest warfighting domains (cyberspace and space), operate and maintain fielded Air Force systems executing the global war on terrorism, as well as execute other enduring missions such as the “pivot-to-the-pacific” and defense of Europe. The imperative for smarter spending requires 1) identifying threat and capability priorities most needing the available investment and operations and support (O&S) funding, 2) optimizing the

labor mix and skillsets of military, civilian government employees, and contract support personnel, and 3) developing streamlined re-engineered business processes to acquire and sustain the mission force. Limited resources must be allocated to the highest priorities, and re-allocated as threats and priorities change. To do this, the value achieved per dollar must be known so expense and investment decisions can be adjusted and optimized to realize maximum national defense capabilities with the available budget. An over-exuberance to incentivize cost cutting via fixed-price contracts must not be allowed to result in less capability delivered to the warfighter per dollar spent. The aim of this paper is to increase the baseline knowledge of current policy and guidance as they related to selecting optimal contract strategies for S4, and provide enablers to fill governance gaps and create a better future state.

SECTION 3 – INSIGHTS FROM ASSESSING FIVE MOST RELEVANT DIRECTIVES

Appropriately, Section 3A begins this thorough body of work by assessing the statutory foundation expressing Congressional intent for establishing and managing product support strategies. Sections 3B and 3C assess the implementing DoD and then Air Force instructions, which per doctrinal rules focus more on various “what” directives needed to execute the applicable statutory requirements, than they do on the detailed “how” processes. The few applicable excerpts of DoD and Air Force policy assessed below are indicative of the scant leadership focus relative to optimizing sustainment strategies. Section 3D then provides a summary of the criteria contained in the federal acquisition regulation (FAR) relating to contract and incentive type selection, and then Section 3F finishes Section 3 with an assessment and prescribed insights for applying Military Standard 881C Work Breakdown Structure(WBS) and WBS Dictionary to define requirements and supporting tasks for each S4 contract.

Section 3A - National Defense Authorization Act (NDAA) for Fiscal Year 2010 (FY10). Section 805 – Life Cycle Management and Product Support (2009)

The National Defense Authorization Act (NDAA) for Fiscal Year 2010 (FY10), Section 805 – *Life Cycle Management and Product Support*¹⁷ began a much-needed renaissance of product support within the DoD weapon system management community. Congress recognized product support planning is often not sufficiently addressed, total life cycle cost assessments and needed data rights are not being adequately pursued, and overall product support needs are often not robustly pursued until late in the development cycle, and then sometimes not very well.

FY10 NDAA, Section 805, mandated establishing the Product Support Manager (PSM) position in order to improve product support planning and execution throughout the system life cycle.¹⁸ The PSM supports the PM by conducting comprehensive product support planning and execution. The PSM is to be designated a Key Leadership Position (KLP) for acquisition category (ACAT) I programs, and a Critical Acquisition Position (CAP) for ACAT II and III programs. Each PSM position is to be staffed by a Level 3 certified Life Cycle Logistician (LCL) and must be Acquisition Corp qualified via a Bachelor Degree, including 24 semester hours of business courses. Next, the FY10 NDAA, Section 805 directs weapon system PMs to maximize competition and employ the best value product support providers from industry or the Department of Defense (DOD) to optimize support at the system, subsystem, and component levels. PMs are to “maximize value to the Department of Defense by providing the best possible product support outcomes at the lowest operations and support cost”¹⁹. Further, the PSM, in support of the PM, will achieve desired product support outcomes through development and implementation of optimized product support arrangements, with best value proven via costs and risk analyses. PSMs periodically reassess the performance of product support providers and the

associated product support arrangements and adjust or establish new arrangements, in order to optimize and improve product support outcomes. Optimized product support outcomes aim to maintain and improve weapon system capabilities, mitigate emerging threats, manage costs to obtain best value, and account for all Operations and Support (O&S) expenditures, as required by DOD Instruction 5000.02, Enclosure 1, Table 7.²⁰

Section 3B – Department of Defense (DoD) Instruction 5000.02 – Operation of the Defense Acquisition System (2015)

Department of Defense Instruction (DoDI) 5000.02, *Operation of the Defense Acquisition System*, is certified by Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]) and approved by the Secretary of Defense. It implements NDAA mandates pertaining to weapon system management. DoDI 5000.02 is DoD's primary policy for weapon system acquisition and sustainment management.²¹ It is referenced and followed by PMs, engineering, PSMs and all functional and support personnel involved in acquiring and sustaining DOD weapon systems.

DoDI 5000.02 Enclosure 6 – *Life Cycle Sustainment* mandates the PM, with support from the PSM, develop and implement “an affordable and effective performance-based product support strategy.”²² Enclosure 6 further mandates development of the Life Cycle Sustainment Plan (LCSP) to document the evolving product support planning activities, organization, and agreements. The LCSP is approved by the milestone decision authority (MDA) before each milestone beginning at Milestone A. Once in the Operations and Support (O&S) phase, the LCSP becomes the sustainment management execution plan and must be updated by the PSM and approved by the MDA every five years.²³

The product support strategy contained in the LCSP must capture the mandated sustainment metrics of system availability, system reliability, logistics response time, and O&S cost projections as they apply to the specific system(s) addressed in the LCSP. The LCSP should also refer to the intellectual property (IP) strategy, including associated license rights, and all data rights needed to review design during development, as well as sustain and improve the fielded system.²⁴

Data rights and cost reporting are two of the most important factors precluding more effective and affordable weapon system sustainment across the Air Force Program Executive Officer for Space (AFPEO/SP) portfolio. Sustainment costs reporting, per a prescribed data-item-description (DID) (DI-FNCL-81831 *Contract Sustainment Report*) is mandated by DoD Cost Assessment and Program Evaluation (CAPE) Directorate and the Air Force Cost Analysis Agency (AFCAA). Although the *Contract Sustainment Report* mandate has been in policy for five years, only three awarded SMC S4 contract include it. Better sustainment cost reporting will help support DoDI 5000.02 “should-cost” analyses for new and follow-on S4 contracts, enable statutory compliance with the Financial Improvement and Audit Readiness (FIAR), and the support the USD(AT&L) mandate to “be good cost managers”.²⁵ Similarly, data rights management still requires significant improvements in many space system program offices and the contracts they manage, even though data rights has been a legal, policy and DoD leadership focus area for several years, and the SMC Data Rights Guide, currently in its Seventh Edition, was originally published by SMC Office of the Staff Judge Advocate (SMC/JA) in 2009. The primary data rights management gap in SMC is lack of skilled and trained data management specialists assigned to SMC Engineering Directorate (SMC/EN) and the system program offices (SPO).²⁶

Performance-Based Logistics (PBL), mandated in DoDI 5000.02, prescribes performance-based product support arrangements be implemented to deliver warfighter requirements and incentivize product support providers to reduce costs through innovation.²⁷ The DoD PBL Guide, providing detailed guidance, is assessed in Section 4J of this paper.

The last topic addressed in this section is the mandate to use organic depot maintenance. The “organic depot maintenance” laws were last revised in the 1990s, as the Base Realignment and Closure (BRAC) actions were being implemented. The organic depots are retained to mitigate contractor provided weapon system maintenance risks, providing an alternative maintenance source to the commercial providers. 10 USC §2466 (50/50) requires at least 50 percent of Air Force depot maintenance (measured at the service level) be performed by the organic depots. 10 USC §2466 applies to any system meeting the requirements of 10 USC §2464 (Core), which is every weapon system with a Chairman, Joint Chiefs of Staff (CJCS) wartime tasking. Provisions for Public-Private-Partnerships (PPP) in 10 USC 2474 allow for some adjustments to the 50/50 calculations.²⁸

The current trend in program offices acquiring newer aircraft and other new Air Force systems is to recommend contractor logistics support rather than invest in organic depot standup and operations. The motivations and real world factors driving these program office preferences in the space systems portfolio are 1) satellite mission assurance requirements, 2) quicker technology turn cycles and emerging threats requiring more frequent system configuration changes, and 3) superior flexibility, capabilities, and adaptability on the contractor side.²⁹ An enabler on this topic is included in Section 6J of this paper.

Section 3C – Air Force Instruction 63-101/20-101 – Product Support Strategies (2016)

AFI 63-101/20-101, certified by Assistant Secretary of the Air Force for Acquisition (SAF/AQ), and approved by the Secretary of the Air Force, directs and defines the Air Force integrated life cycle management (ILCM) mandates for Air Force (AF) personnel developing, reviewing, approving, or managing Air Force systems, subsystems, end-items, technical services, and other activities associated with acquiring and sustaining Air Force weapon systems. It is the primary weapon system program management, system engineering, and product support policy in the Air Force. AFI 63-101/20-101 implements various Title 10 mandates, other laws, and directives from Department of Defense (DoD) Instruction (DoDI) 5000.02, *Operation of the Defense Acquisition System*, as well as several other DoDIs. The assessment below for AFI 63-101/20-101 focuses on directives pertaining to sustainment management, which by extension apply to S4 contracting.³⁰

AFI 63-101/20-101 states, the PM/PSM shall ensure the system product support strategy and the associated sustainment contracts help achieve and maintain the sustainment Key Performance Parameters (KPP) for availability and Key System Attributes (KSA) for reliability, and logistics response time, while controlling overall program ownership costs.³¹ The objective of sustainment management, otherwise known as product support management, conducted to a large degree via contracts for space systems, is two-fold. The first objective is maintaining hardware, software, and technical procedures associated with fielded systems to keep the system operating as designed. The second sustainment management objective is making incremental improvements and updates to fielded systems hardware, software and procedures, while

leveraging new technology opportunities to provide increased capabilities and mitigate emerging threats.

AFI 63-101/20-101 describes product support as “a continuous and collaborative set of activities aimed at establishing and maintaining readiness and the operational capability of a system or subsystem throughout its life cycle”.³² The PM/PSM must assess and adjust support requirements and support performance of fielded systems, adapting to emerging threats and evolving military needs.³³ The PM/PSM executes sustainment, employing and managing one or more Product Support Integrators (PSI), who integrate and accomplish product support tasks, such as maintenance, supply, engineering analyses and studies, designing and fielding enhancement, and other necessary technical and management activities.³⁴

Performance Based Logistics (PBL), as defined in AFI 63-101/20-101, instructs the PM to develop and implement a comprehensive product support strategy to achieve operational readiness outcomes.³⁵ AFI 63-101/20-101 requires contracts to link incentives to performance outcomes using objectively measurable outcome when possible, and otherwise identify and use subjective measures tied to desired performance outcomes.³⁶ Chapter 8 of this AFI directs sustainment services contracts “support and enhance the warfighting capabilities of the Air Force and the Unified Commands”.³⁷ This statement makes it clear, seeking to minimize cost at the expense of not meeting essential warfighter requirements should be avoided. FFP, FPIF, or CPIF type contracts focus on incentivizing cost reduction as a mandatory precursor to incentivizing maximizing capability per dollar spent. S4 requirements often do not allow for a stable price or cost basis at the tasks level until a discrete need arises during the contract execution period, in response to real world operations.³⁸

AFI 63-101/20-10 further mandates “Contractor Logistics Support (CLS) contracts be crafted to identify ranges of outcome performance with thresholds and objectives and the target price for each level of capability”.³⁹ This implies the ability to buy performance levels for a stable level of effort or task. Or it requires the contractor to control the investment decisions for the applicable system or sub-system. Contractor control of investment funds is not permitted in the Air Force without SAF/AQ approval (no such approval has been granted for space systems), but smaller subsystem or component level upgrades are possible using weapon system sustainment (WSS) funds. This mandate to identify and pre-price various performance levels does not fit the S4 requirement set characteristics. The AFI goes on to direct pre-priced support levels be established for various operation tempo (OPTEMPO) and ranges of support in order to respond to real world dynamics. This concept only works if the support level and associated requirements ranges are predictable; not generally the case for S4.

A more suitable and common sense approach for most S4 requirements sets is a cost reimbursable type contract, executing within budgetary constraints, using cost management processes to enable government program office participation in prioritizing and costing discrete tasks and products during the execution year. This strategy best meets the mandate to “achieve and maintain the sustainment KPP for availability and KSAs for reliability, and response time, while controlling overall program ownership costs”.⁴⁰ Next assessed in this paper are the Federal Acquisition Regulation (FAR) sub-parts relating to *Use of Contract Types*.

Section 3D - Federal Acquisition Regulation (FAR) – Applying Contract Types (2016)

The Federal Acquisition Regulation (FAR), approved by the Office of Federal Procurement Policy (OFPP) in the Office of Management and Budget (OMB), governs the

"acquisition process" by which United States federal government agencies acquire (i.e., purchase or lease) goods and services, via contract using appropriated funds. FAR Part 16 - *Types of Contracts* includes criteria for applying various fixed price and cost reimbursement contracts and their associated incentives. Contract incentives should be designed to relate profit or fee to objectively or subjectively defined results achieved by the contractor.⁴¹ Although objective performance measures are preferred, they are not always practical. ***The incentive program should not be overly complex and must avoid incentives counteracting other incentives.*** Not every requirement needs an incentive or award fee, as other natural incentives are inherent in the contract, such the possibility of future work, a negotiated fixed fee, and award of contract options and extensions. Any ambiguity in government contracts typically results in a finding favoring the contractor. So, clear non-conflicting requirement and incentives are essential. Assessed below are FAR Sub-Parts 16.401 and 16.402 addressing use of contract incentives.

FAR Sub-Parts 16.401 and 16.402 – Contract Incentives

DoD and Air Force policy expresses an unqualified preference for fixed-price and incentive type contracts. Incentive contracts require objective measures and must first incentivize cost reduction before incentivizing performance. Fixed-price incentive contracts are preferred when contract costs and performance requirements are reasonably certain and well understood. All incentive contracts, since they add contract administration burden, must realize benefits exceeding the government administrative costs, and any other additional contract costs associated with administering the incentive program.⁴² Using FPIF and FFP in S4 contracts often adds cost risk to the government contrary to espoused theory, as the contractor will bid-to-risk, and will not accomplish tasks exceeding the level of effort basis of the proposal. Likewise, with

CPIF, the contractor's proposal will focus on strategies to maximize fees earned vice the changing priorities needed for operations and support.⁴³

Conversely, an award-fee contract is suitable for use when 1) it is neither feasible nor effective to devise objective incentives for cost, schedule, and technical performance; 2) contract objectives will be enhanced by motivating the contractor toward exceptional performance; and, 3) additional administrative effort and cost of administering the award-fee program is justified by a risk and cost benefit analysis included in the Determination and Findings (D&F). "Award fee shall not be earned if the contractor's overall cost, schedule, and technical performance in the aggregate is below satisfactory".⁴⁴

All CPAF will have an Award Fee Plan describing 1) the evaluation period (often the same timeframe as a contract option period); 2) the total fee pool and allocation across periods; 3) rating criteria; and 4) the evaluation process. The Table below lists a range of possible award-fee earned for each award-fee rating.⁴⁵

Award Fee Rating and Range of Allocated Fee Earned

Award-Fee Rating	Award-Fee Pool Earned	Description
Excellent	91%--100%	Contractor has exceeded almost all of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.
Very Good	76%--90%	Contractor has exceeded many of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.
Good	51%--75%	Contractor has exceeded some of the significant award-fee criteria and has met overall cost, schedule, and technical performance

		requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.
Satisfactory	No Greater Than 50%.	Contractor has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.
Unsatisfactory	0%	Contractor has failed to meet overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period.

Section 3E - Military Standard 881C – Work Breakdown Structures (WBS) for Defense Materiel (2011)

Applying the WBS to Space Sustainment Solicitations and Contracts

“The Defense Acquisition System (DoDI 5000.01) requires a disciplined approach establishing program goals over the life cycle, and streamlined effective management accountable for credible cost, schedule, and performance reporting”.⁴⁶ The WBS provides a standard approach for defining and managing the various product and services work elements. Whether one is procuring a newly developed product, or a sustainment services requirements set, the WBS is organized using a hierarchical architectural product structure of system and subsystems, and may be further allocated to hardware and software components. Then the WBS Dictionary process supplants the WBS and is applied to each products and services task, compiled from the various contributing functional resource accounts, include the functional personnel (such as engineering, program management. logistics), material, time, and other direct costs (ODC) such as travel, for each product and service to be delivered, and identified in the WBS.⁴⁷

The initial program office WBS is derived by analyzing system requirements documents, and system, subsystem and item specifications, to include all support equipment and training systems. The WBS structure and subsequent WBS Dictionary allocation should be tightly integrated with other management tools and processes such as the risk assessment, performance work statement (PWS), cost element structure (CES), and contract line item number (CLIN) structure. An integrated management approach enables accurate visibility, status reporting, and other management data to facilitate work prioritization by the contractor, as approved by the PM and procurement contracting officer (PCO). A WBS should be used as the starting point for structuring a PWS. The objective of the WBS, and the supporting WBS Dictionary, is to provide a thorough and disciplined process to provide the military user with all the intended capabilities possible within planned and approved cost, schedule, and performance parameters.⁴⁸

Applying the WBS Dictionary to Sustainment Services Contracts

In addition to developing an initial Program WBS, the government PM develops a WBS Dictionary defining the various WBS task elements for the products and services to be procured. The effort required to develop the Program WBS and WBS Dictionary pay dividends in developing the PWS and helping to assess the technical and cost risk associated with the requirements set. The contractor then expands the WBS Dictionary as part of the allocated Contract WBS (CWBS); including both *specified requirements* from the PWS and additional *derived requirements* needed to accomplish each *specified requirement*. The WBS Dictionary should be updated and maintained real-time for the life of the contract to reflect actual work required and then facilitate reporting actual completed work and associated costs.⁴⁹

Contractors load, allocate, and share resources across WBS elements in the planning and proposal phases and reallocate during execution to realize resource efficiencies. The incentive /

award-fee program should be structured to motivate additional savings or output per dollar during contract execution.⁵⁰

The CWBS is the foundation for government insight and cost reporting during contract execution. WBS Dictionary *Functional Control Accounts* combined into *Work Packages* should be linked via a matrix to PWS tasks, product and data deliverables, CLINs, the OSD/CAPE cost element structure (CES), the Risk Management Plan, and when applicable, the integrated master plan (IMP), integrated master schedules (IMS), and earned value management system (EVMS).⁵¹

MIL-STD-881C contains Common WBS Elements for use in development and production including WBS Elements tailored for space system acquisition,⁵² but no Common Elements are included for sustainment services type efforts. Given the critical need and utility of the WBS and WBS Dictionary process for sustainment services workload management, the Air Force Logistics and Product Support Division (**SAF/AQD**) should request support from USD(AT&L) to develop sustainment services Common WBS Element definitions, and add them to a MIL-STD-881 revision.

A primary goal of this paper is highlighting gaps in policy and guidance preventing optimized S4 contracting strategies. The USD(AT&L) Better Buying Power (BBP) 1.0 initiative introduced in 2010, and the subsequent BBP 2.0 (2012), and BBP 3.0 (2015) have focused on various practices to facilitate delivery of affordable warfighting capabilities from a system acquisition point of view. Sustainment services contracting best practices may be addressed in a yet to be scheduled BBP 4.0. Significant sustainment contract strategy doctrinal gaps still exist and must be addressed. The BBP 3.0 initiative, and its applicability to S4 contracting will be thoroughly assessed in Sections 4H and 4I of this paper.

Integrated Master Schedule (IMS), Integrated Master Plan (IMP), Earned Value Management (EVM) Application in Sustainment Service Contracts

MIL-STD-881C addresses use of an Integrated Master Plan (IMP), Integrated Master Schedule (IMS), and Earned Value Management (EVM). These three tools are intended to track planned and scheduled events of a system development activity against actual execution.

Acquisition leaders and PMs sometimes suggest the IMP, IMS, and EVM be applied to track sustainment task activities for which they were not intended. This is problematic given the reactionary task nature of most S4 requirements, caused by changing operations tempos, non-linear breakage rates, and the need to respond to unplanned/unknown emerging threats. The IMP is a baseline execution plan intended to track accomplishments of key development tasks. The IMS is the detailed planning schedule for the IMP. DoD and Air Force doctrine should be updated to exclude use of the IMP, IMS, and EVM for sustainment services activities.⁵³

Use of earned value management (EVM) in broad-scope, dynamic, cost reimbursement type sustainment services contracts are an inadvisable practice given planning estimates and execution year actuals will differ. For most S4 requirements, planning estimates are used for budgeting rather than pricing, knowing available funds will need to be shifted to the highest priority tasks in the execution year. Thus, grading value earned against unstable estimates will create counter-value administrative challenges and is not the intent of EVM as designed. Conversely, a tailored WBS / WBS Dictionary processes and sustainment cost reporting will provide for best value management of S4 contracts, satisfying the intent of an EVMS for S4.⁵⁴

SECTION 4 – INSIGHTS FROM ASSESSING TEN MOST RELEVANT DOD AND AIR FORCE GUIDES

The purpose of any DoD and Air Force guide is to provide implementation “how-to” guidance, as well as clarification and further interpretation of information included in directive type policy. Sections 4A through 4J below provide insights and identify areas needing improvement for each of the ten assessed guides, as they relate to planning and executing space system sustainment services (S4) contracts. The ten most relevant DoD and Air Force guides cover 1) application of contract types, 2) incentive use, 3) relevance of USD(AT&L) Better Buying Power (BBP) initiatives, and 4) Performance Based Logistics (PBL) application.

Section 4A - DoD Guidance on Using Incentive and Other Contract Types (2016)

The *DoD Guidance on Using Incentive and Other Contract Types*, published in 2016, was developed in response to the USD(AT&L) Better Buying Power (BBP) 3.0 and the 2014 *Annual Report on the Performance of the Defense Acquisition System*. This guide articulates a DOD preference for incentive-fee and fixed-price contract types as appropriate. This guide focuses on development and production contracts with no mention of sustainment services requirements.⁵⁵ However, the stated preference for fixed-price and incentive contracts has been widely applied to S4 contracts without a comprehensive requirements characterization analysis being conducted.⁵⁶

Contract Type as an Element of Overall Contractor Compensation

This guide suggests the contract type and negotiated pricing approach should provide the contractor with the **greatest incentive** for efficient and economical performance.⁵⁷ The one problematic word set in this sentence is “greatest incentive”, as it has led to over use of overly

complex incentives. The incentive program has become its own goal, losing focus on best value for the government and enabling value-based government administration of contracts. Not only are the overly complex incentive programs hard for most practitioners to understand, but often result in contradictions and ambiguities of priorities during execution, as the work statement requirements and the incentive program motivators clash; Additional effort and costs for the government and unintended profits for the contractor are a common result.⁵⁸

Assessing Contract Performance Risk

This guide wisely states “risk associated with the work to be performed is the most important factor when selecting contract type”. Government personnel should assess the requirement stability, predictability and price history for each product and service being purchased.⁵⁹ For S4 tasks having an unknown complexity and quantity over a period of a year, it is not advisable to employ a fix-price arrangement. S4 requirements including deficiency analyses, obsolescence mitigations, hardware repair actions, software changes, satellite anomalies, urgent technical / engineering actions, mission enhancements, or other materiel needs included in many S4 contracts are seldom good candidates for FFP or FPIF contracts.⁶⁰ The complexity and cost of each of these mentioned tasks cannot be defined to the level needed to pre-price the requirements set prior to contract award. The type of work to be performed, and the type of skilled personnel needed to perform the work is definable and predictable, but the complexity and quantity of each occurrence of each requirement type is not predictable enough to allow a contractor to resource load and price each anticipated task, prior to the specific anomaly, failure, deficiency, enhancement, or other operational need actually arising. S4 contracts must facilitate support in response to real world situations such as varying operating tempo, emerging threats,

and actual failures. These factors then drive the quantity and complexity (hours and applied skills) of each required task in the execution year.⁶¹

Space ground system sensor/user segments, although having dual and triple-string design redundancy, are often low-density – with between one and twenty end-items deployed per system. These systems exhibit low-failure-cycle predictability over longer periods of time, and are often old / one-of-a-kind systems, experiencing significant obsolescence and technical refresh challenges. Satellite command and control (C2) segments are software intensive, and ride on commercial computer hardware and software requiring periodic technical-refresh to stay compatible with other computer networks and mitigate cybersecurity risks. The space segments (on-orbit satellites) are comprised of the “bus” which is the space vehicle providing structure and power for the hosted payload. The payload might be a position-navigation-timing device, a communication device, or a sensing device in any of many frequency spectrums.

A standard assessment model is needed to characterize S4 requirements for each of the three segments, looking at task complexity variance, quantity variance and other factors, to assess the capability of a contractor to predict price for each task over a year, leading to selection of the appropriate contract type.⁶²

Evaluating Uncertainties in Requirements Performance

This guide directs the PM to 1) identify uncertainties of performance including the history and predictability of the complexity, quantity, and risks of each requirement; and 2) assess cost / price risk for each requirement.⁶³ The precise resources required to accomplish S4 requirements are often as difficult to predict, and thus price, as complex development efforts. Stable design, repeatable tasks, and stable quantities of tasks facilitates high-confidence fixed-price estimates; this does not describe the nature of most S4 requirements which are often

reactionary, of various complexities, of varying quantities, and applied to an often obsolete or emerging baseline, due to cybersecurity and other threats and capability needs.⁶⁴

Fixed-Price Contract Considerations

This guide states, a “fixed price contract places maximum risk for performance and profit on the contractor.”⁶⁵ This is true for stable products and services with a price history. However, when the government applies fixed-price to unstable / dynamic requirements, the performance and price risk shifts to the government, government contract administrative burden goes up, and the contractor may receive excess profit for some cool burning tasks, while requesting equitable adjustments (REA) for hot burning tasks and out of scope emerging needs. Every experienced PM and PCO knows, “when ambiguities exist in the contract, regardless of contract type, the doctrine of contra proferentum applies, which means any ambiguities are construed against the [government].”⁶⁶ Applying FPIF for many S4 requirements has resulted in ambiguities and unplanned costs for S4 efforts.⁶⁷

One critical mandate not fully appreciated by S4 PMs, and resisted by contractors, is sustainment cost reporting per the OSD/CAPE cost-element-structure (CES), even for fixed-price contracts. Future should-cost analysis and FIAR compliance requires inclusion of DI-FNCL-81831 on every contract value at \$50 million or more.⁶⁸

Using Cost-Reimbursement Contracts

A cost-reimbursement type contract is used when the government will share cost risk with the contractor, while precluding an inflated price bid to cover risk. Cost-reimbursement contracts provide little inherent incentive for a contractor to limit costs, but incentives can be applied to increase contractor profit commensurate with reducing costs. These CPIF contracts should only be applied if a stable and repeatable baseline for performance can be well defined.⁶⁹

For many S4 contracts, cost incentives can have conflicting and negative effects on maximizing capability per dollar spent. Fervent cost reduction focus should not circumvent meeting user needs.⁷⁰ For S4 contracts with dynamic requirements, clear requirements definitions and insight via a WBS Dictionary process, and accomplishing the mandated cost reporting will result in better cost management and increased output per dollar compared to an incentive type contract.⁷¹

Deriving Value from Incentive Contracts

Incentive contracts must first incentivize cost reduction; however, reducing cost requires a discrete deliverable against which cost can be reduced, otherwise true cost reduction cannot be measured, and the contractor may demand maximum fee. An incentive or award-fee should only be used to motivate superior cost performance and not merely achieve basic contract requirements.⁷² The extra government contract administrative burden of an incentive program must yield significant positive value. Applying even one unnecessary or overly complicated incentive or award-fee factor results in wasted labor for the contractor and the government, and increased cost for products and services delivered.

Award-Fee Contract Use

Award fee, which may be used in fixed-price or cost-reimbursement contracts, is used to drive objective or subjectively measured behavior and performance goals where an objective formula-based incentive targets for cost, schedule, and technical performance is not feasible. Cost-plus-award-fee (CPAF) contracts may be used when the PM seeks to motivate quality, timeliness, flexibility, technical ingenuity, output per dollar, and cost-effective management for requirements not able to be definitively priced at the beginning of the performance period.⁷³

Approval to use award fee for S4 contracts must be supported by a risk and cost benefit analysis, to include the extra cost of government award-fee administration, and then included in a

Determination and Findings (D&F) for Head of Contracting Activity (HCA) approval.⁷⁴ The Award Fee Plan includes the criteria, evaluation methods, and total fee in the pool for each period, and is signed by the government and contractor before each performance period begins. The award fee criteria must motivate the contractor in the areas being incentivized while implicitly requiring the contractor to meet all minimal objectively measured performance requirements, not incentivized in the award fee, in order to earn any Award Fee.⁷⁵

The contractor begins each period with zero percent award fee earned and earns up to 100 percent, if all clearly stated and achievable objectives are met. The amount of the award-fee pool should be sufficient but not excessive to motivate the sought-after outcomes, and must be developed with consideration of the amount of base-fee (base-fee may be zero to three percent), and the complexity of the work. Award fee cannot be paid until the end of the performance period (often aligning with a one year option period). Base fee may be incrementally paid.

Award fee incentives must not interfere or conflict with cost controls or any objectively measured incentive or performance requirements, should only include minimal factors to motivate special performance goals, and must be paid consistent with reaching overall contractor performance outcomes. No one incentive reward should be so large as to encourage ignoring another. The overall incentive strategy must avoid competing incentives. The contractor may submit a self-assessment and present their case to the Fee Determining Official (FDO), however, the final decision of the amount of award fee earned for the period is a unilateral and subjective, although supported, FDO decision.⁷⁶

Section 4B – Defense Acquisition University (DAU) Contract Types Brief (2016)

This widely viewed Defense Acquisition University (DAU) Brief includes the following quote: “There shall be a preference for fixed price contracts. Cost reimbursement contracts shall be used only when circumstances do not allow for a fixed-price type contract,” (White House Memorandum, March 4, 2009).⁷⁷ This vaguely qualified statement is promulgated in various DoD and Air Force guides and policies. It creates a “silver-bullet” assumption in the mind of many decision makers and senior functional leaders who are led to believe fix-price contracts are the default low risk approach. The truth is, any contract type applied to S4 without conducting a thorough requirements characteristics analysis may result in lower value per dollar, unplanned contract modifications, and additional contract administration effort compared to the optimal contract type. DoD and Air Force weapon system services acquisition policy and guidance must be updated to require a vigorous but standard requirements analysis process be applied for selecting any contract type – fixed-price or not.

This DAU Brief also includes the following quote: “Provide the contractor with the greatest incentive for efficient and economical performance” (FAR Part 16.103(a)).⁷⁸ The “greatest incentive” statement is being interpreted as “many incentives or broad application of incentives”, resulting in excessive incentive factors, and overly complex incentive strategies. Conventional-wisdom is fix-price and cost-incentive contracts are low cost risk and low administration burden for the government, this is not true when FFP, FPIF, or CPIF are misapplied to dynamic S4 requirements. These misapplied contract strategies have resulted in contractor requests for equitable adjustment (REA), increased government administration, need to obtain unplanned funds, and unintended profits for the contractor.⁷⁹

FAR 16.301-2 directs cost-reimbursement contracts when the agency cannot define a priced requirement or when uncertainties in contract performance prevents accurate estimates of hours and costs.⁸⁰ The FAR and policy include these vague and minimal qualifiers pertaining to use of fixed-price contracts, but do not point to a model or tool to help leaders and practitioners understand how to determine when exceptions to the fixed-price default should be applied. Models and tools to assess S4 requirements sets must be developed and implemented.

Section 4C - Award Fee Use – USD(AT&L) Memorandum (Assad – 2007)

Mr. Shay Assad, Director, Defense Procurement and Acquisition Policy for USD(AT&L), issued this “Award-Fee Use” memorandum in 2007 to emphasize proper use of award fee contracts per FAR 16.405-2. The memo specifies, cost-plus-award-fee (CPAF) contract are suitable for use when valuable technical performance, cost or schedule objectives cannot be defined to a level required to support a fix-price arrangement. Fixed-price contracts require a stable requirement output and high confidence price history for the deliverable. Further, before CPAF may be selected for use, the Head of the Contracting Activity (HCA) must certify, via a Determination and Finding (D&F), objective incentive targets applicable to cost, technical performance or schedule would be neither feasible nor effective for the acquiring the product or service, and thus a FPIF or CPIF contract is not suitable. The memo goes on to state, a mix of CPIF and CPAF in a contract is often advisable and absolutely allowed, so long as the incentive criteria do no contradict the award-fee criteria.⁸¹ Although this memo clearly summarized the criteria for using a fixed-price or CPAF contract, many decision makers and leaders interpreted the memo as discouraging CPAF contracts. A comprehensive S4 requirements analysis model and toolset could overcome concerns with appropriate application of CPAF contracts.⁸²

Section 4D - Department of the Air Force (DAF) Award-Fee Guide (2010)

This Air Force Award Fee Guide, just like the DoD guides, indicates award-fee contracts are a last choice behind fixed price or incentive contracts; only to be used when the others have been determined inappropriate.⁸³ And once again, how to determine when FFP, FPIF, CPIF, and CPFF are more suitable than CPAF is not sufficiently defined.

This guide and most or all other current award-fee guides and policy were written in response to the United States (US) Senate chartered 2006 Government Accountability Office (GAO) Report describing how much money DoD wasted using award fee contracts.⁸⁴ The author of the “2010 Air Force Award-Fee Guide”, rather than describing how to assess requirements and optimize the award-fee process, felt compelled to remind the reader, “Contractors have received award-fees amounting to 90-100 percent of the available award fee pool for meeting technical performance requirements despite simultaneously experiencing significant cost overruns and schedule delays.”⁸⁵ Most SMC award-fee contracts of the past were design poorly, and the evaluation and fee approval processes had fatal flaws. But rather than strongly discourage award-fee and showing an unqualified preference for the new “silver-bullet” contract type, DoD and the Air Force should instead address award-fee concepts of success. Maximizing the effectiveness of award-fee strategies requires 1) limiting the factors to those improving key outputs worth paying extra fee, and 2) ensuring the evaluation and fee approval processes support the PM’s leverage to motivate key contractor behaviors. DoD and Air Force have not assessed the real root-cause of past award-fee program failures, and thus have not identified suitable mitigating countermeasures.⁸⁶

Award-Fee Administrative Functions

Award-Fee Plan. Captures the award-fee strategy and terms and conditions (award-fee pool allocation, evaluation criteria, methodology to be used to evaluate contractor's performance) governing the award fee process.⁸⁷ Success requires limiting the evaluation factors to a minimal set applicable to key contract outcomes. Award-fee factors and fee-allocation should be re-evaluated lead-time away before each evaluation period begins in order review and adjust factors and fee-allocation to maximize award-fee motivational effectiveness for the evaluation period.

Award-Fee Pool. The award-fee-pool is the total available award-fee for all evaluation periods and base fee (if applied) for the life of the contract.⁸⁸ The amount of the award-fee pool, the amount of base-fee (zero-three percent) and the allocation of the total fee-pool across the total contract period must be balanced and optimized for maximum results.

Performance Monitors/Quality Assurance Personnel (QAP). Competent and well trained performance monitors are one of the keys to an effective and successful award-fee program. As such, performance monitors must be intimately familiar with contract requirements they are monitoring and the award-fee plan so they can accurately and expertly evaluate how well the contractor achieved outcomes against the requirements and rating criteria. Performance monitors must articulate and justify their findings, supported by documented strengths and weaknesses in their areas of responsibility. The performance evaluation is the foundation leading to the correct award-fee earned, and an award fee program managed with integrity.⁸⁹

Award-Fee Review Board (AFRB). The AFRB Chairperson is appointed by the Fee-Determining-Official (FDO) and selects the remaining AFRB members. The AFRB Chairperson approves assigned performance monitors. The AFRB evaluates the contractor's overall

performance for the evaluation period in accordance with the Award-Fee Plan. The AFRB uses peer and leadership reviewed inputs from the various performance monitors to verify all minimum requirements were met, and then assesses each performance areas against the prescribed performance factor.⁹⁰

AFRB Recorder. The AFRB Recorder, designated by the AFRB Chairperson, is the administrative backbone of the award-fee process. The recorder coordinates and records actions of the performance monitors, AFRB, and FDO.⁹¹

Fee Determining Official (FDO). The FDO is a senior leader designated by position in the award-fee plan, who will credibly determine the amount of award fee earned by the contractor in each evaluation period.⁹² The FDO's determination is based on a recommendation of the AFRB and the FDO's own judgment. The FDO must carefully consider when overruling the recommendation of the AFRB, and should provide a clear written rationale when doing so in order to maintain the PM's credibility and leverage over contractor performance. Undermining the government PM in the award-fee process will significantly weaken the effectiveness of the award-fee program.

Procurement Contracting Officer (PCO). Since the award-fee process is a legally binding contractual process, the award-fee plan, changes thereto, and FDO determinations of the award-fee earned are officially communicated to the contractor via the PCO. The PCO ensures all documents substantiating the award-fee earned, to include all performance monitor's evaluations, are included in the official contract file and retained as required; at least until contract closeout.⁹³

Optimizing Government Award-Fee Administration

Government award-fee program effectiveness is maximized as follows: 1) establish a minimal set of award fee factors to motivate only the most important aspects of contractor efforts supporting key system performance outcomes; 2) highly train and properly employ all performance monitors; 3) highly train all Award-Fee Review Board (AFRB) members; 4) effectively administer a highly disciplined award-fee program; and 5) encourage the FDO's help to maximum the PM's influence with the contractor for day-to-day contract execution. The FDO should never undermine the program manager. One way to ensure this is for the FDO to take the time to carefully analyze and document rationale for deviations from AFRB recommended award, and for the FDO to be consistent in their judgment pertaining to the rationale for approved award-fee. The AFRB members and performance monitors must observe the FDO being fair and consistent.⁹⁴

Multiple Incentive Contracts

When using multiple incentive types on a contract, for example CPIF for some tasks and CPAF for others, or even FFP for some tasks and CPAF for others, the program manager and contracting officer must carefully balance the amount of incentive provided for each requirement set so each incentive / awards (fee) matches the priorities of work to be incentivized and importance of effected outcomes. Care must be taken to ensure no incentive or award fee unintentionally conflicts with sought after outcomes in other areas. A rule of thumb is to keep incentives focused and of a limited number so program office team members and the contractor are very clear on priorities. Additionally, all single and multiple incentive contracts must preclude rewarding a contractor for outstanding technical performance or delivery of results exceeding their value to the Government; there comes a point at which the Government does

desire to pay more for additional performance. The ceiling thresholds should be defined and communicated to all parties and stakeholders.⁹⁵

Award-Fee Funding

Award-fee is a contingent liability against the year of funds matching the work to be performed. Award-Fee for non-severable tasks begun in one year and completed in another may retain the previous year award-fee funds to pay the future liability. For severable work, to be completed in a single year, the available award-fee funds are either earned in the year or must be used for other work applicable to the year. Unearned fee may no longer be carried forward to be earned in the next evaluation period. Program managers should plan to use and exploit unearned award-fee funds from their contract, and other contracts as well, to complete required work begun the same year as any available unearned award-fee funds.⁹⁶

Section 4E - DoD Contract Pricing Reference Guide (CPRG) – Volume 4 (2012)

The Contract Pricing Reference Guide (CPRG) includes five volumes. These volumes were developed jointly by the Federal Acquisition Institute ([FAI](#)) and the Air Force Institute of Technology ([AFIT](#)), and are now maintained by the Office of the Deputy Director of Defense Procurement and Acquisition Policy for Cost, Pricing, and Finance. The CPRG provides detailed discussion and examples for applying pricing policies to pricing problems. CPRG Volume 4 is meant to help DOD program management teams assess and select the optimal contract and incentive type based on price history, risk, and requirements assessment. This guide suggests one element of determining contract type is the cost risk allocation between the government and the contractor.⁹⁷ There are however other requirements characteristics to consider. Applying FFP and FPIF contracts to S4 contracts, where one might assume the cost risk is shifted to the

contractor, the government may actually assume a larger share of cost risk, resulting in contract modification, unplanned funding need, and the associated additional government contract administration actions.⁹⁸ More important than the vaguely defined cost risk is the ability of the government to manage cost risk within the confines of the contract. While in principle it is good to select a contract type resulting in reasonable contractor risk while incentivizing economical contract performance, in practice for S4 requirements the government's attempt to achieve the stated objectives have resulted in overly-complicated incentive schemas, unintended profit for the contractor, and gaps in satisfying capability requirements.⁹⁹

The Best Contract Type

The best contract type attracts sufficient highly qualified offerors to compete for the work, and provides the best value to the government for required products or services delivered.¹⁰⁰

Hierarchy of Selecting a Contract Type

The premise of fixed-price and incentive type contracts being preferred over cost-reimbursement, fix-fee, or award fee type contracts must be reassessed for S4 to arrest the current negative consequences. All S4 contracts, whether FFP, FPIF, CPIF, CPFF, or CPAF require use of a contractor cost accounting system capturing accurate allocated cost for products and services provided.¹⁰¹ This cost accounting process should be like a continuous basis-of-estimate (BOE) evaluation process conducted by both the contractor and the government. Use and tailoring of the WBS Dictionary process via DI-MGMT-81334, optimized for S4 requirements, and compliance with the mandated sustainment cost report via DI-FNCL-81831 are two key enablers of effective S4 workload management.

Award-Fee Objective

The objective of CPAF contracts is to incentivize the contractor to provide more than the minimum level of performance, when desired, when worth the extra fee, and when worth the additional government administrative burden.¹⁰²

Principal Risk to be Mitigated via a Cost Reimbursement Contract

Cost reimbursement contract are suitable when requirements are “highly uncertain with speculative labor hours, labor mix, and/or material requirements”.¹⁰³ This statement describes the nature of many S4 requirements.

Contractor Obligation in Cost-Reimbursement Contracts

Cost reimbursement contracts require the contractor to make a good faith effort to meet the government's needs within the estimated cost and Schedule.¹⁰⁴ The government must have a process to validate the good-faith effort is occurring and is achieving optimized results. The answer to this challenge is the foundation of profession sustainment management and something every experienced sustainment manager knows. Namely, a close shoulder-to-shoulder working relationship with the contractor is needed to define, track, and adjust resource allocation against changing priorities during the execution period. The WBS Dictionary and Sustainment Cost Report are facilitate the S4 co-management paradigm, leading to maximum operational capabilities per dollar spent. SMC senior leaders are well advised to empower the highly capable and experienced SMC sustainment professionals and support the need for new requirements analysis and cost reporting tools, as well as the other eight enablers described in Section 6 of this paper.

Section 4F – Space and Missile Systems Center (SMC) Contracting Directorate (PK) Buyers Folder - Selecting a Contract Type (2016)

The SMC-PK Buyers Folder is a reference share-site maintained by the SMC Contracting Directorate (SMC/PK) to provide guidance to SMC contracting officers and buyers. While the guidance provided is derived from the FAR and matches other DoD and Air Force policy and guides,¹⁰⁵ it lacks comprehensive tools, processes, and guidance needed to assess S4 requirements and thus definitively justify when CPAF, FFP, FPIF, CPIF, or CPFF should be applied.

SMC would benefit from selecting a contract type to optimize value to the government rather than trying to determining a vaguely defined cost risk allocation between the contractor and the government. SMC functional leaders who review S4 contract strategies might assume they can shift cost risk to the contractor via FPIF for the sustainment requirements set, and lock in cost saving. This is not proving to be true. SMC has over-applied FPIF in S4 contracts and tried to incentive system availability and reliability parameters not within the contractors' control. When the contractor then focuses on the contractual incentivized factors, real world priorities requiring flexibility and responsiveness are occasionally neglected.¹⁰⁶

DOD contract type selection guidance focuses heavily on assessment of cost and performance risk allocation between the contractor and government. This concept is easily understood for simple fixed-price tasks such as mowing the lawn, producing multiple build-to-print component, buying commercially available products with a catalog price, or providing services where a steady number of personnel are employed such as a receptionist or a security crew. These repeatable conditions do not exist for many S4 tasks, which are more accurately

characterized as varied, dynamic, reactionary, and only predictable in broad categories and ranges used to develop planning cost estimates.

Again, SMC/PK Buyer's guide directs sound high level theory such as 1) the selected contract type should be based on an objective assessment of conditions involved in the acquisition, and commensurate with the level of technical and cost uncertainty, and 2) the exercise of sound judgment requires avoiding preconceived ideas or customs (predecessor contract) not relating to the current situation.¹⁰⁷ The SMC/PK Buyers Folder does not however provide analysis tools and processes to definitively achieve these stated objectives.

Section 4G - Air Force Contract Sustainment Support Guide (CSSG) (2013)

Air Force Contract Sustainment Support Guide (CSSG) Use and Application

The Air Force Contract Sustainment Support Guide (CSSG), published by the Undersecretary of the Air Force for Logistics (SAF/IE) in 2013 recommends the application of 16 best practices for contracted weapon system support, with the goal of achieving affordability, flexibility, scalability, and cost visibility¹⁰⁸ -- good goals for sure. The CSSG promises to fill a critical gap in weapon system sustainment contracting practices, but never delivers. Instead, the team of consultants and Air Force personnel who developed this guide focused only on supply chain management (SCM) centric issues. As a result, the best practices addressed in CSSG are applicable to contractor support for larger commodity based workloads rather than low-density space system sustainment services (S4) requirements. However, there are still a few nuggets of value in the Air Force CSSG as follows: 1) "Cost visibility is essential for successful cost management, cost reduction, and informed program decision making";¹⁰⁹ 2) on-line tools facilitating a common operating picture of maintenance, supply, deficiency reporting, Air Force

Form 1067s tracking, and other core processes will create improved levels of service and costs savings;¹¹⁰ and 3) the four contracting phases are a) Requirements Identification/Development Phase, b) Request for Proposal (RFP) Development Phase, c) Proposal Review/Fact Finding/Negotiating Phase, and d) Execution Phase.¹¹¹

Application of Performance Based Logistics (PBL) Contracting

The Air Force CSSG, like several DoD and Air Force policies and guides, advocates for Performance Based Logistics (PBL), but does provide a much needed qualification statement: “The [current] USAF [PBL] focus is on the component level and large populations of commodities, moving away from tip-to-tail PBL”.¹¹² The CSSG also wisely warns practitioners to only lock in minimum fixed-price levels of service or number of products supported, since there is no easy / affordable way to reduce service levels for a fixed-price contract when funding shortfalls occur, higher priorities come about, or other reasons arises to reduce requirements.¹¹³

The unclear and sometimes conflicting definitions of PBL, contained in DoD and Air Force policy and guides creates staffing consternation for SMC functional staff and program offices executing S4 requirements. These various definitions have been partly to blame for over-applying incentives in FPIF contracts which are outside the control of the contractor -- misapplying the edict to “buy performance”. Misapplication of PBL concepts against the S4 non-commodity type requirements is resulting in lower capability delivered per dollar spent.¹¹⁴

Applying Firm Fixed Price (FFP) for Variable Levels of Demand

The concept of pre-pricing variable firm-fixed-price (FFP) levels of support for repair output levels, or various operation tempo levels may work for large commodity workloads supporting a fleet of aircraft¹¹⁵ but is not practical for most S4 contracts, as the variables are too many, task demands are typically low density, and space systems technical baselines tend to

evolve often.¹¹⁶ AFI 63-101/20-101 also advocates PBL strategy without needed qualification.¹¹⁷

Moving on now the USD(AT&L) crown jewel initiative for improving DoD weapon system acquisition tradecraft: The Better Buying Power (BBP) Initiative.

Section 4H - Better Buying Power (BBP) 3.0 (2015)

The USD(AT&L) Better Buying Power (BBP) initiative was developed by the Honorable Aston Carter, Secretary of Defense (2015-2017) when he was the USD(AT&L) in 2010, and Mr. Frank Kendall, the Deputy under Carter and then USD(AT&L) until 20 January 2017.¹¹⁸

Although BBP was created for weapon system development and production efforts, the principles, if correctly tailored, add value for S4 contracting strategies. For example, the “should-cost” mandate of BBP, originally applied only to development program, is enabled for S4 via the DI-FNCL-81831 *Contractor Sustainment Report* and is mandatory for all contracts over \$50 million, per DoDI 5000.02. The data gathered in this cost report facilitates should-cost analysis for follow-on contracts of the subject system and analogous systems as well. Conversely, misapplying BBP, such as over-application of fixed-price contracts for S4 can result in out-of-scope determinations, requests for equitable adjustments (REA), and unplanned contract modifications in order to accomplish needed sustainment work.¹¹⁹

The BBP assessment and insights below will show how the eight BBP 3.0 Focus Areas and supporting criteria for each area¹²⁰ can be applied to improve S4 contract strategies. The particular set of requirements being supported will dictate the actual contracting strategies, so the insights below may not be unequivocally universal.¹²¹

BBP Focus Area 1 -- Achieve Affordable Programs

a. Continue to set and enforce affordability caps¹²²

1. For most S4 tasks affordability goals are best met by prioritizing and managing the myriad of sustainment tasks in real time, as the execution year unfolds, while allocating, tracking and controlling costs.
2. Mr. Frank Kendall, USD(AT&L) (2012-2017), directed all program managers to be “good cost managers”. Sustainment program managers do this by applying the correct contracts type for each requirement set and providing oversight and approval of contractor resource allocation against real-world capability priorities.

BBP Focus Area 2 -- Achieve Dominant Capabilities While Controlling Lifecycle Costs

a. Strengthen and expand “should cost” based cost management¹²³

1. The key to strengthening “should-cost” analysis for sustainment is knowing what is being spent on each task, and obtaining high quality sustainment cost reporting per DI-FNCL-81831.

b. Anticipate and plan for responsive and emerging threats by building stronger partnerships of acquisition, requirements and intelligence communities¹²⁴

1. Space system sustainment management activities must be “integrated” with planning and execution of investment modifications to the fielded system and acquisition of replacement systems. Configuration baseline changes for fielded space systems must be coordinate and shared with acquisition divisions so new systems meet and exceed each fielded system capability.
2. Cybersecurity, emerging threats, and other capability gaps and needs must be communicated, planned for, and supported with budget submissions.

c. Institutionalize stronger DoD level Long Range R&D Program Plans¹²⁵

1. The Chief Sustainment Engineer in each SPO must participate and contribute to architectural roadmap planning for the directorate.

d. Strengthen cybersecurity throughout the product lifecycle¹²⁶

1. This is similar to Focus Area 2.b above – Emerging threats must be known, monitored, managed, and mitigated at the speed of need since they impact operational effectiveness.

BBP Focus Area 3 -- Incentivize Productivity in Industry and Government

a. Align profitability more tightly with Department goals¹²⁷

1. For space sustainment, this means all applied incentive-fee and award-fee factors must be linked to and enable performance attributes or mission outcomes.

b. Employ appropriate contract types, but increase the use of incentive type contracts¹²⁸

1. Using an incentives type contract means CPIF or FPIF. These contract types, by definition, incentive cost reduction before incentivizing performance improvements. In order to incentive cost reduction, a requirement must have a defined and repeatable output, complexity, and quantity in order to establish a cost baseline to target for cost reduction; Many S4 requirements do not fit this criterion. As such, “increase use of incentive type contracts” must not mean “misapply incentive type contracts”, and is poor advice for most S4 contract requirements.¹²⁹
2. When cost reduction is incentivized for sustainment outputs the quality and performance of the product or service must be measurable to ensure it is not degraded below a lower threshold as cost is reduced. Monitoring and verifying

acceptable performance as costs are being reduced is imperative if FPIF or CPIF are used.

3. The most important goal in most S4 efforts is maximum output of capability per dollar spent since validated and approved requirements for fielded space system are seldom met with available funding levels. In sustainment, priorities are adjusted as condition in the operational environment change. The contract type must facilitate flexible and optimal support to the warfighter in the dynamic operational environment.

c. Expand the superior supplier incentive program¹³⁰

1. The *superior supplier* mandate is contradicted by mandates to re-compete services contracts over shorter periods. However, the *superior supplier* concept has merit for S4 requirements, but S4 contract efforts should first demonstrate superior cost-management through use of optimal contract types and compliance with mandated sustainment cost reporting, so these contract management processes and skills can then be applied to ensure the longer term *superior supplier* arrangements are structure correctly to achieve best value.

d. Ensure effective use of Performance-Based Logistics¹³¹

1. Some look at PBL as a pure “buy performance” vice managing transactions. For example, for a given component such as an aircraft Auxiliary Power Unit (APU) there is a repair price history of \$1000 and an average of one failed APU a year per aircraft. Given 100 aircraft in the fleet, the program office contracts with Company X to keep serviceable APUs on the fleet for \$80,000 a year, saving the government \$20,000 a year. The contract length is 7-years. Company X is able to

realize an average repair cost of \$600 per repair, resulting in a profit of \$200 dollar per repair, but Company X also reduced the number of failures by modifying a high failure component on the APUs resulting in a reduction from 100 repairs a year to 50 repairs per year. The return on investment, realized in two years resulted in 5-years of additional profit. This type of PBL approach may be considered when large quantities of a commodity items are used within a system; this is not the case for most SMC managed S4 requirements.

2. The second broad definition of PBL is more ambiguous and merely means applying performance measures to a contract. Applied performance measures must be within the contractor's control. For example, the contractor has only limited control of component reliability using available WSS funds since investment funds are managed by the government and not within the contractor's decision purview. Applying performance measures not controllable by the contractor will result in contract requirements re-work, and granting exceptions to contractor performance requirements, additional contract administration efforts, and increased/unplanned costs.

e. Remove barriers to commercial technology utilization¹³²

1. Use of "Commercial-off-the-Shelf (COTS)" hardware and software is common in space command-and-control (C2) segments. While COTS is an appropriate and smart foundation for space C2, the COTS hardware and software must still be integrated, tested, refreshed, and certified for cybersecurity. The "make-or-buy" decision is used in military systems just as is it in the commercial sector. Quite

often, selecting a less reliable, less robust, and less capable, but more affordable, commercial product is a sound buying decision for military application.

f. Improve the return on investment in DoD laboratories¹³³

1. Sustainment program managers should and do reach out to DOD laboratories as
1) a potential enhancement / replacement product source, 2) for information on
current technologies and their associated maturity levels, and 3) as an independent
validation source of contractor developed products.

g. Increase the productivity of corporate IRAD¹³⁴

1. This criterion is development centric and typically not applicable to sustainment.

BBP Focus Area 4 -- Incentivize Innovation in Industry and Government

a. Increase the use of prototyping and experimentation¹³⁵

1. Prototyping, experimenting, and testing are always engineering best practice, whether
doing a low-dollar enhancement / replacement project or a major weapon system
development effort. The bread boarding, prototyping, and testing strategy must be
tailored for the amount of risk being mitigated and the amount of effort/cost justified.
The most common application of this BBP Focus Area Criteria are Air Force “fly-
offs” on large weapon systems before down-selecting to a single source; this
leverages competition to obtain a better product. However, this engineering practice
should be applied and tailored for smaller and non-competitive product development
as well.

b. Emphasize technology insertion and refresh in program planning¹³⁶

1. Managing the technical-cycle is an essential task in both acquisition and
sustainment. Keys to technical-cycle management in sustainment are 1) planning

for technical-refresh of computer based systems, 2) mitigating obsolescence issues, and 3) limiting sustainment modification scope so each increment can be developed and delivered in less than three-years. When development programs take too long, they get behind the commercial technical capabilities cycle, leading to outdated capabilities delivered to the warfighter. Emerging cybersecurity and other threats are a recent major driver for quicker technology insertion. Sustainment program managers must plan and execute sound contracting strategies to facilitate timely technology insertion.

c. Use Modular Open Systems Architecture to stimulate innovation¹³⁷

1. Open-system-architectures in new systems and enhancements to fielded systems enables standard interfaces and enterprise solutions to reduce lifecycle costs. Program managers should strive to select open-system components applying the best standards to enable affordable capability and cybersecurity upgrades.

d. Increase the return on and access to small business research and development¹³⁸

1. Best value in sustainment is always a primary goal. Many cross-cutting support tasks may be accomplished better and more affordably if sourced to a small business rather than included in a large prime weapon system contract. Examples of enterprise opportunities for small business support in space system sustainment are data management, COTS procurement and management, cybersecurity certification support, and supply chain management.

e. Provide draft technical requirements to industry early and involve industry in funded concept definition¹³⁹

1. This applies in sustainment as it relates to accomplishing early market research for sustainment requirements and strategies through requests for information (RFI), draft request for proposal (RFP) releases, and industry day events.

f. Provide clear and objective “best value” definitions to industry¹⁴⁰

1. Defining performance objectives is critical for both major acquisitions and sustainment services. Knowing what capabilities the product or service must provide is key to establishing and communicating priorities and procuring best value. Tying source selection criteria and incentive / award fee to key outcomes is an application of this principle.

BBP Focus Area 5 -- Eliminate Unproductive Processes and Bureaucracy

a. Emphasize acquisition chain of command responsibility, authority and accountability¹⁴¹

1. SMC must better define sustainment requirements characteristics and analyze which contract and incentive type(s) will result in best value for the unique requirements set. As SMC leaders gain confidence in awarded contracts being the optimal type and are confident in the way these contracts are administered, then S4 acquisition strategy review, approval and contract award cycle times will be significantly reduced.

b. Reduce cycle times while ensuring sound investments¹⁴²

1. Sustainment engineering review of system performance trends and emerging threat data are the key data drivers for initiating sustainment projects and modifications. As with BBP Focus Area 5.a above, when leaders understand and trust the data driving decisions and priorities, and leaders understand the risks

they are assuming in their decisions, then review and approval cycle times are reduced.

c. Streamline documentation requirements and staff reviews¹⁴³

1. Thoroughly understanding the purpose of each program document and the scope and purpose of a sustainment modification or services contract will facilitate better document tailoring strategies to ascertain when a document is or is not required, when an annex to an existing document will suffice, and when a new document is needed. Carefully tailored program document approaches result in less time spent on staff review, coordination, and adjudication of critical, substantive and administrative comments.

d. Remove unproductive requirements imposed on industry¹⁴⁴

1. This one is often overblown by industry to deflect blame for overruns onto the government, or in other cases the contractor aims to minimize government insights. Obviously, each contract reporting requirement must be reviewed to ensure it serves a value-added purpose. Essential processes and tasks become more efficient when the government creates optimized standard processes and tools and then directs the standard processes on all S4 solicitations exceeding a specified dollar value. Contractor assertion of an unproductive program reviews or claims of mandated cost reporting being too costly to accomplish must be challenged and dispelled. Key reviews, oversight and reporting can be efficiently implemented with standard tools and processes. Contractors must not be allowed to hinder reasonable government insight into work progress, risks, and costs.

BBP Focus Area 6 -- Promote Effective Competition

a. Create and maintain competitive environments¹⁴⁵

1. The foundation of promoting competition is data rights. SMC must staff and train data management specialist for SMC/EN and the product directorate engineering divisions, who can help develop data rights contract clauses for each weapon system contract, and then assess data deliveries to ensure compliance and sufficiency. Competition like most good things has a point of diminishing returns. The frequency of re-competing work must yield a return on investment. Additionally, the application and limitation of policy initiatives such as “strategic supplier”, PBL, organic depot, and others must be well understood in order to either derive best value or justify why each initiative should not be applied. Developing product support business case models and tools to de-conflict competing initiatives is essential to improving SMC S4 acquisition and contract management business practices, to achieve more value, and reduce requirements development, review, and approval cycle times.

b. Improve DoD outreach for technology and products from global markets¹⁴⁶

1. Knowing the art of the possible and what other countries are doing and have developed is essential. Development and operations partnerships with allies can result in increased effects and lower costs. However, buying products from foreign sources for US military systems must be reviewed on a case-by-case basis by technical and legal personnel using standard review criteria. Risks include substandard parts, loss of US industrial capabilities, and cybersecurity risks associated with computer components.

c. **Increase small business participation, including more effective use of market research**¹⁴⁷

1. Similar to what was described in 4.d above, small business capabilities should continue to be assessed and used when appropriate for S4 requirements, as they are one of the key cost control factors for DOD and any business, given small business lower overheads and quest for innovative asymmetric advantage. Market research must continue to assess risks and capabilities of small business to determine if they can successfully take on the prime contractor roll. FedBizOpps is the US government site where small businesses are informed of anticipated contracts, RFP releases, and industry day events. Small businesses can meet with the large business at the industry days to pursue subcontractor opportunities, or small businesses can provide their portfolio information to large businesses anytime.

BBP Focus Area 7 -- Improve Tradecraft in Acquisition of Services

a. **Strengthen contract management outside the normal acquisition chain – installations, etc.**¹⁴⁸

1. The SMC solution for this BBP criterion is including all space operational wing level weapon system support requirements on the SPO contract. Wing operations personnel should focus on warfighter effects rather than weapon system PM and PCO work better accomplished by the SPO. The operational wing personnel will perform contracting officer's representative (COR) duties for the operational wing level tasks on the SPO contract. Limit wing and installation contracts to non-weapon system services and then seek acquisition training for the base-level

contracting requirements set from Air Force Program Executive Office for Combat and Mission Support (AFPEO/CM) and Air Force Installation and Mission Support Center (IMSC).

b. Improve requirements definition for services¹⁴⁹

1. This is a key foundational and critical deficiencies in S4 contracting requiring a solution. A detailed requirements characterization model for the typical set of S4 tasks and products, addressing complexity, quantity, and predictability of occurrence will enable selecting the optimal contract and incentive type(s). SMC should initiate a rapid-improvement-event, facilitated by a Six-Sigma-Black-Belt, and supported by commercial software tool vendor to analyze and create the needed model and toolset. The potential management, cost, and warfighting capability return-on-investment (ROI) derived from solving this gap are significant.

c. Improve the effectiveness and productivity of contracted engineering and technical services¹⁵⁰

1. The decision trades for using contracted engineering and technical services must consider the organic program office engineering skills and capacities, and what engineering and technical services should be accomplished by the prime weapon system sustainment contractor vice a third-party system engineering and integration (SE&I) contractor. Organizational conflict of interest (OCI) issues must be mitigated prime and SE&I contractor relations, and associate contractor agreement must be put in place. When contemplating using an SE&I contractor, the cost/benefit should be

assessed for each contracted task vice SPO or prime contractor accomplishing the function.

BBP Focus Area 8 -- Improve the Professionalism of the Total Acquisition Workforce

a. Establish higher standards for key leadership positions¹⁵¹

1. The Product Support Manager (PSM), a mandatory *Key Leadership Position (KLP)* for ACAT I programs,¹⁵² would benefit from new “sustainment program manager” courses focusing on activities unique to weapon system sustainment management, such as sustainment services contracts, WSS funding rules, the nature of sustainment requirements. Current Life Cycle Logistics (LCL) and PSM courses focus on product support planning with no offerings addressing weapon system sustainment services contract planning and execution.
2. Establishing the PSM position via the 2010 NDAA was a leap forward in ensuring product support is addressed in acquisition, as was the ASD/L&MR mandated Life Cycle Sustainment Plan (LCSP). A remaining issue for developing sustainment program managers and PSMs is correcting the poor interlink of the Life Cycle Logistics (LCL) and Program Management (PM) career fields. The PSM supporting fielded systems is essentially a sustainment PM and so requires more program management training, and the PSM supporting a development program needs to better understand sustainment execution.

b. Establish stronger professional qualification requirements for all acquisition specialties¹⁵³

1. The years of experience for Level III PMs and LCL professions should be extended from the current four years to perhaps six. The classroom training

linkage to real world practices could be improved and the type of tasks and assignments for Level III LCL could be better defined, expanded, and documented in personnel records as sub-shreds; for example, all Level III PM and LCL personnel should have participated in a source selection for a contract valued at greater than \$100 million, for either an ACAT acquisition or a sustainment services effort. And Level III Sustainment PMs could be differentiated from a Level III Acquisition PM. A Level III Acquisition PM might be awarded a Level II in Sustainment PM but then require two years working in sustainment to achieve Level III. This sub-shredding would drive higher qualified sustainment PM and LCL personnel. Additionally, Product Support Planning LCL personnel should first work Product Support Execution, as one cannot plan well for requirements they have never executed.

c. **Strengthen organic engineering capabilities**¹⁵⁴

1. This is important and essential. Many current sustainment engineers have been tasked with project and program management type work rather than technical management and engineering tasks. Just as operators should focus on improving warfighter effects using available systems, engineering should be made to re-focus on technical and architectural management rather than PM work. DoD should focus engineers on the technical track, and provide and mandate more continuing education relating to emerging technologies.

d. **Ensure development program leadership is technically qualified to manage R&D activities**¹⁵⁵

1. If engineering personnel are immersed in current and emerging technologies they can assess technical risk and maturity levels, and convey key information to the program managers and leadership. While DoD PM and LCL personnel should have some technical acumen, better qualified engineers supporting them is a key part of the solution. Standard engineering oversight practices to monitor contractor progress should be developed and instituted across SMC to provide optimal insight into contractor activities while also facilitating contractor success.

e. *Improve our leaders' ability to understand and mitigate technical risk*¹⁵⁶

1. For S4 requirements the previously recommended model and toolset will facilitate requirements characterization and clarity, leading to better understanding and risk mitigation. As in the previous criterion, better qualified sustainment engineers will help the program office understand and mitigate technical risks.

f. *Increase DoD support for STEM education*¹⁵⁷

1. This is indeed a national security issue. STEM education should be encouraged and valued in all level of education. Students with acumen and interest should be fast tracked and financially supported in STEM education, and government and industry internships for college students should be increased. STEM personnel should be recognized and honored throughout SMC, the Air Force and the nation.

Section 4I – Ten Better Buying Power (BBP) Principals (Kendall - 2016)

Frank Kendall, previous Under Secretary of Defense for Acquisition, Technology and Logistics (USD[AT&L]) (2012-2017), and his USD(AT&L) predecessor the Honorable Ashton Carter, Secretary of Defense (Feb 2015 – Jan 2017) developed the iterative *Better Buying Power (BBP)* initiative to help guide weapons system managers' efforts acquiring and sustaining DOD

systems. Mr. Kendall published the Ten BBP Principles (January 2016) in response to demand from the field.¹⁵⁸ Insight derived from each BBP Principle relating to S4 acquisition are provided below.

Principle 1: Continuous improvement will be more effective than radical change¹⁵⁹

Mr. Kendall warns against acquisition reform fads, which ironically is how some leaders have viewed and applied BBP. In SMC, incentive type contracts have been used for sustainment requirements not stable enough to define a cost basis for discrete outputs.¹⁶⁰ Mr. Kendall stressed applying the art of thinking, analysis and making reason-based decisions rather than looking for the silver bullet universal solution to every problem. The result of one-size-fits-all contracts has and will be costly contract modifications and undue profits for contractors.¹⁶¹

Principle 2: Data should drive policy¹⁶²

Goals and objectives must be defined and then measured against performance standards. Sound management requires measuring outcomes. Data analysis looks for the meaningful correlations vice the unimportant. Applied contract and incentive structures for each S4 requirement set must be based on an analysis of the requirements predictability/stability and the ability of a contractor to define and propose a fair and repeatable price.¹⁶³

Principle 3: Critical thinking is necessary for success; fixed rules are too constraining¹⁶⁴

This principle advises the avoidance of cookie-cutter solutions. PMs and PSMs must think through the nature of each requirement, balance complex factors, and then pursue optimal S4 contracting and management strategies.¹⁶⁵

Principle 4: Controlling life-cycle cost is one of our jobs; staying on budget isn't enough¹⁶⁶

Being a cost manager means knowing how each dollar is spent. It requires assessing priorities and the value received for every dollar. Detailed standard cost reporting is mandatory and, contrary to many contractors' protestations, can be done efficiently using the prescribed DI-FNCL-81831.¹⁶⁷

Principle 5: People matter most; we can never be too professional or too competent¹⁶⁸

Competent, trained and experienced engineers, logisticians, program/business managers, financial analysts, legal staff, and contracting officers are the foundation of effective S4 acquisition and contract management. These essential functional skills must be acquired, nurtured and applied to achieve maximum warfighting capabilities.¹⁶⁹

Principle 6: Incentives work—we get what we reward¹⁷⁰

Crafting effective incentives is very importance. Excessive and conflicting incentive must be avoided. Incentives may be applied to acquire intellectual property rights objectives, open-system-architectures, better management of the technical cycles, and better exploitation of contractors' monetization strategies.¹⁷¹

Principle 7: Competition and the threat of competition are the most effective incentives¹⁷²

Competition objectives should focus on achieving maximum value for the warfighter and taxpayer. Contractors and organic support providers responding with the best warfighter value per dollar should be awarded the work. The outdated organic depot maintenance laws from another era should be repealed, or at least waived for space systems. Organic depot maintenance stand-up ROI are not realized for the typical low-density space C2 and sensor segments, which often have quickly evolving baselines and numerous obsolescence issues.¹⁷³

Principle 8: Defense acquisition is a team sport¹⁷⁴

All stakeholders' skills and contributions must be leveraged and exploited to provide best value solutions.

Principle 9: Our technological superiority is at risk and we must respond¹⁷⁵

Investments in relevant research and development (R&D) must be increased, managed better and brought to market for military and commercial applications. STEM education and resultant skills must be advocated, honored, and rewarded, or US competitors and adversaries will gain the superior position. Military systems must be updated at the speed of technology advances, need, and threats, and bureaucratic limiters and low-value processes must be eliminated.¹⁷⁶

Principle 10: We should have the courage to challenge bad policy¹⁷⁷

Bad policy must be identified and negative impacts articulated to the policy owners. SMC personnel should strive for improved and streamline policy and process, and eliminate all no-value / low-value steps.

Section 4J - DoD Performance Based Logistics (PBL) Guidebook (2016)

Performance Based Logistics (PBL) has been advocated as the preferred sustainment strategy since the 2001 Quadrennial Defense Review (QDR) stating, "DoD will implement PBL to compress the supply chain and improve readiness for major weapons systems and commodities".¹⁷⁸ In contrast to the original supply chain and commodity focus of PBL, seeking to buy fixed price performance for services and supplies vice a transaction based approach, the 2016 Performance Based Logistics (PBL) Guide keeps this original focus and then adds a second definition of PBL as a broad overarching sustainment management concept. A large number of

discussions, meetings, papers, guides, training classes, workshops, and even Congressional debates over the last 15-years have taken place on the value and meaning of PBL.

Limiting PBL application to commodity and other large stable workloads will prevent wasting innumerable staff and program office hours.¹⁷⁹ An assessment of each of the *Ten PBL Tenets* applicability to S4 contracting is provided below, following the PBL policy and overview information.

PBL per AFI 63-101/20-101, Para 6.5

The PBL section of AFI 63-101/20-101 directs product support strategies be based on best value determination, as supported by the Product Support Business Case Analysis (PS-BCA), assessing the best mix of public and private capabilities, infrastructure, skills base, past performance, and proven capabilities to meet a set of performance objectives, and 10 USC §2464 (Core) and 10 USC §2466 (50/50) requirements.¹⁸⁰ However, “best value” and complying with Title 10 organic depot statutes are often incongruent objectives.¹⁸¹ AFI 63-101/20-101 makes no mention of PBL requiring purchase of a pure performance vice using a transaction based approach.

PBL Defined

PBL, synonymous with performance-based life cycle product support, seeks outcomes for product support activities acquired through performance-based arrangements, delivering Warfighter requirements and incentivizing product support providers, be they contractor or organic, to reduce costs through innovation.¹⁸² All worthy goals, but this definition omits inclusion of “maximize capability delivered per dollar”. This creates a cost reduction focus for S4 at the expense of capability needs.¹⁸³

Performance Based Contracting (Arrangements)

A *Performance Based Contract* “describes requirements in terms of results to be obtained rather than the methods of performance. In other words, the task should describe the desired result or outcome rather than how work is to be performed”.¹⁸⁴ This is good advice, however, the models, tools and decision trees to help PMs and PSMs implement this advice have not been provided, thus struggle and confusion abound. Additionally, at the space C2 / Sensor system and subsystem levels the support provider is not in full control of system reliability since they do not control investment funding decisions.¹⁸⁵

S4 contracts may apply measurable performance standards in terms of quality, timeliness, and quantity, objectively measured when possible, and subjectively measurable when objective measure cannot not be defined at the time contract terms are being developed.¹⁸⁶ For most S4 requirements the types of tasks to be performed are known when developing the RFP, but the complexity and number of each task to be accomplished over a year is most often not known with certainty. S4 planning estimates are often different than the actual realized executed activities, due to the normal dynamics of space sustainment support.¹⁸⁷

Ten Tenets of Performance Based Logistics (PBL)

The *Ten PBL Tenets* are allocated to *five arrangement tenets* and *five organization tenets*.¹⁸⁸ A short assessment of each tenet as it relates to S4 requirements is provided below.

Five PBL Tenets Tied to Arrangements (Tenets 1-5)

PBL Tenet 1 - Acquire clearly defined Warfighter-relevant outcomes, not just sustainment services or replacement equipment.

The goal here is to broaden the perspective of what is being purchase. These outcomes should seek lower cost per product or service delivered, lower cost per unit of output, increased system reliability, and increased overall capabilities.

PBL Tenet 2 - Use measurable and manageable metrics to accurately assess the product support provider's performance against delivery of targeted Warfighter outcomes.

The mandatory Sustainment Metrics directed by DoDI 5000.02 are System Availability, System Reliability, Logistics Response Time, and Operations and Support (O&S) Costs. The calculations for these measures can be obtained from Air Force Pamphlet 63-128 Annex 6, and the system specific standard for each measure are obtained from the Capability Production Document (CPD) or created by the program office engineers. Trending analysis of these metrics are used to prioritize investment decisions for system enhancements, service life extensions, and technical refresh efforts.¹⁸⁹

PBL Tenet 3 - Provide significant incentives to the support provider tied to the achievement of the outcomes, for aspects of performance within their control.

“Within their control” are the key words. And. the words “significant incentives” should be replaced with “value-added incentives”. Over incentivizing and the resultant paying more fee than warranted is a common poor practice in S4 contracts.

PBL Tenet 4 - Firm Fixed Price (FFP) contracts are generally the preferred contract type - Fixed Price Incentive Firm (FPIF) and Cost Plus Incentive Fee (CPIF) may be effective.

PBL preference for fixed-price contracts is a current doctrinal problem in DoD. At a minimum, this demonstrates the commodity repair line and aircraft fleet maintenance paradigm of PBL rather than being directly applicability to S4 requirements. Blindly applying fixed-price contracts, without requirements analysis is just as ill-advised as blindly or poorly applying

CPAF. This tenet requires an edit to direct an analysis of requirements characteristics before determining the contract and incentive strategy.¹⁹⁰

PBL Tenet 5 - Provide sufficient contract length for the product support provider to recoup investments on improved product (e.g., Mean Time Between Failure (MTBF) and sustainment processes (e.g., manufacturing capabilities).

This applies only when the product support provider has the authority and pricing structure to incentivize implementing system component replacements and production process enhancements. Otherwise contract length should be evaluated based on optimizing re-competition timeframes to harvest best value from support providers. Too frequent re-competition drives up costs for the contractor and the government. This tenet assumes significant quantities of reparable items and stable workload demand.¹⁹¹

Five PBL Tenets Tied to Organization (Tenets 6-10)

PBL Tenet 6 - PBL knowledge and resources are maintained for the Government team and product support providers.

Data deliverables, data rights, and other archival data should be retained in appropriate databases or files, including system health metric trending data, and operation and sustainment cost reports. Data is used to help make investment decisions and facilitate “should-cost” analysis for follow-on and analogous efforts.¹⁹²

PBL Tenet 7 - Leadership champions the effort throughout their organization(s).

SMC decision makers, functional staff leaders, and materiel leaders require a better understanding of the nature and characteristics of sustainment requirements, the rules of WSS funding, execution year dynamics, and other S4 support challenges. An S4 requirements model and toolset would facilitate better leadership understanding to support their risk acceptance of proposed S4 contract strategies.¹⁹³

PBL Tenet 8 - Everyone with a vested interest in the outcome is involved.

All stakeholders must participate in product support planning, management, and oversight, as appropriate and as documented in various policy, charters, and plans. These stakeholders include program office personnel and materiel leaders, decision makers, functional staffs throughout the chain-of-command, Major Command personnel, and operational wing representatives.

PBL Tenet 9 - Supply chain activities are aligned to the desired PBL outcome versus disparate internal goals.

This tenet deserves more discussion and study. Many contractors such as Boeing and Lockheed-Martin evaluate their suppliers and rate them. Performance of government organic supply chain managers (SCM) and depot maintenance providers supporting space systems are not evaluated or assessed in meaningful ways. Organic SCMs and depot maintenance activities have demonstrated less capability and flexibility than space system sustainment prime contractors.¹⁹⁴ PS-BCAs must be used as mandated to compare contractor and organic support provider capabilities, costs, and risks to ensure a well-supported best value approach.¹⁹⁵

PBL Tenet 10 - Risk management is shared between the Government, customer, and support provider.

There are many fallacies pertaining to sharing risk between the government and a support provider. For organic providers, the program office assumes significant risk since consequences for organic poor performance are not defined. For contracted work, many government personnel assume a fixed-price contract shifts more risk to the contractor than it actually does; incorrectly applied fix-price contracts will often result in contract modifications, need for unplanned funds, excess profits for the contractor, and unplanned program office labor in order to manage and modify a non-optimal contract type.¹⁹⁶

SECTION 5 – INSIGHTS FROM ASSESSING TWO MOST RELEVANT STUDIES

Two most relevant studies effecting S4 contracting are assessed below, and derived insights relating to S4 contracting strategies are provided. Each of these studies was conducted by well-known and highly credible entities, and each study was peer reviewed by numerous government, contractor and academic professional experts.

Section 5A - Government Accountability Office (GAO) Report on DoD Contract Incentive Waste (2006)

This GAO Report, published in 2006, is a watershed report in DoD; still powerful eleven years later.¹⁹⁷ GAO correctly identified millions of dollars were wasted by using *Cost Plus Award Fee (CPAF) Contracts* but this report resulted in a mistaken assumption in DoD leaders' minds of CPAF contracts being an inherently flawed contract type. This section will help dispel fallacies associated with CPAF contracts and explain how past problems with CPAF contracts used for S4, were caused by excessive number of factors, poorly focused factors, and flawed administration of the award-fee evaluation process. CPAF, when designed and administered correctly can enable maximum military capability per dollar, flexibility, and responsiveness.¹⁹⁸

Stated Purpose of GAO Study

DOD spends over \$200 billion annually to acquire products and services for weapon systems. For DOD contracts awarded in 1999-2003, thirteen percent used CPAF Contracts. The 2006 GAO study sought to help DOD use incentives and award fees more effectively.¹⁹⁹

GAO Study Findings

The GAO "Testimony Before the Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate" on 5 April 2006 are summarized in this sub-section

as follows:²⁰⁰ DoD often fails to use sound business management practices for weapon system acquisition and sustainment. “[DoD] key decision makers [were often] complacent about cost growth, schedule delays, quantity reductions, and performance shortfalls. DoD structural and management practices relating to use of award-fee typically did succeed in holding contractors accountable for achieving desired outcomes and generally undermined the incentive program effectiveness in motivating contractor performance. Problems in award fee structures include using criteria not related to key performance elements and desired outcomes, and paying contractors a significant amount of available award fee for average work, thus not realizing excellent performance. Seventy percent of contracts assessed in 1999-2003 with only average performance were awarded an average of 80 percent award fee. This is a clear illustration of a broken process driving unintended results.²⁰¹ Currently applied incentive criteria included in a few S4 FPIF contracts are not driving desired results either; Any contract when not appropriate for the requirement set or not designed correctly provides non-optimized results.²⁰²

The award-fee earned at the beginning of the assessment period is zero; The award-fee administrators must not act as, or assume, the contractor starts the period earning 100 percent of available fee and then decrement for failures to perform – award-fee is earned for “exceptional performance”, evaluated against what is often qualitative but documented criteria, as assessed by the quality evaluators and Award-Fee-Review Board (AFRB).²⁰³

Three past SMC S4 CPAF contract administration weaknesses are 1) too many factors applied not applicable to key outcomes, 2) under-trained Contracting Officers Representatives (COR) (otherwise known as Performance Monitors or Quality Assurance Personnel [QAP]) responsible for evaluating and annotating positive and negative contractor performance (this weakness was partially mitigated in 2014 when AFSPC conducted a Special Inspection and

SMC/PK followed up with COR Training; and 3) Fee-Determining-Officials (FDO) altering AFRB recommended award-fee earned without conducting a thorough analysis and providing written rationale, thus undermining the program manager's credibility and leverage over the contractor. A requirement for FDO standard analysis and written rationale for overruling the AFRB recommendation should be added to the 2010 AF Award Fee Guide.²⁰⁴

DOD has not studied and validated whether award and incentive fees actually improve contractor performance and acquisition outcomes.²⁰⁵ However, many program managers and Air Force materiel leaders interpreted the critique of award-fee contracts by GAO to mean the award-fee concept is fundamentally flawed and so they have encouraged fixed-price-incentive (firm-target) contracts for development and sustainment efforts, resulting in new problems.²⁰⁶

Programs lack well assessed and defined requirements, use unrealistic program cost estimates, and move forward with product development efforts relying on immature technologies, resulting in cost and schedule overruns and failed acquisition programs of record – All too often, program expectations at inception and actual delivered cost, schedule, and performance do not match.²⁰⁷ Sub-optimized contract and incentive types can no longer be tolerated. PMs must better assess and employ tailored contracting solutions and effective business management practices to drive high return-on-investment in weapon system sustainment “services” contracts.²⁰⁸ Solutions include 1) better cost and technical requirements characterizations to align with execution year dynamics, 2) improved government management processes, 3) sustainment cost tracking and reporting to capture the amount spent on each task in order to facilitate sound fiduciary oversight and support future should-cost analysis, 4) and effective cost-management processes during the execution year to ensure resources are shifted and applied to highest priorities in real time.²⁰⁹

Award-Fee, when used, must motivate “exceptional performance . . . in areas, such as quality, timeliness, technical ingenuity, [flexibility, responsiveness], and cost-effective management”.²¹⁰ Performance monitoring must be accomplished by well-trained evaluators from the program office to measure and assess how well the contractor is meeting award-fee criteria and ultimately achieving outcomes.²¹¹

The common practice of paying contractor most of the available award fee, averaging 90 percent over 63 contracts in 1999-2033, created an expectation of being rewarded when performance is mediocre.²¹² CPAF are often not the wrong contract type for S4 requirements, but past Award Fee Plans included too many or the wrong performance factors and the administrative processes did not hold the contractor accountable to deliver prescribed outcomes, or in many cases desired outcomes were not well defined.²¹³ Award-Fee-Plans must clearly define performance factors and criteria the contractor must meet to earn award-fee.²¹⁴

The GAO study highlighted use of award-fee contracts for development efforts attempting to mitigate poor developmental planning and immature technology. The result was overruns in cost and scheduled and failed or restructured programs.²¹⁵ The fallout of poorly applied award-fee contracts for development efforts impacted approval to use CPAF for S4 contracts. The eventual outcome of this disruption to the space system sustainment community must be a mandated model-based-analysis for all S4 requirements, with the output of the analysis being a prescribed optimal contract type. Additionally, the model should guide the sustainment program managers to develop the correct number of award-fee criteria, focusing on key outcomes for S4. This in turn will streamline government contract administration of S4.²¹⁶

Before a contract type and incentive approach are devised, realistic cost, schedule, and technical goals of the product or service being bought must be determined with a reasonable

level of confidence, so target goals can be established.²¹⁷ Without first establishing high confidence and achievable performance goals, award-fees are wasted on sub-par performance by contractors. Use of incentive and award fees will not fix the broader management issues relating to DoD purchase of products and services, such as the need for better requirements definition, managing the technical cycle and evolving threats, managing funding perturbation, demanding in-depth cost reporting, and conducting effective cost management.²¹⁸

Section 5B - Contractor Logistics Support (CLS) in the United States Air Force (RAND - 2009)

This RAND Study, sponsored by Office of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ), is the most significant and comprehensive Contractor Logistics Support (CLS) study to date. The RAND Study states, Air Force weapon system sustainment contracts lack detailed cost and performance reporting, limiting the ability to assess the cost and performance of CLS relative to initial estimates or organic performance of comparable work. This foundational deficiency precludes developing a high-fidelity cost models for weapon system sustainment.²¹⁹ The cost reporting gap in sustainment contracts can be mitigated via enforcement of the mandated sustainment cost report (DI-FNCL-81831) on all contracts valued \$50 million or more.²²⁰

The Air Force is facing severe budget challenges; every dollar counts. The Air Force is faced with a critical imperative to simultaneous recapitalization aging aircraft, develop new capabilities in response to emerging threats in cyberspace, space, air-defense/anti-access (AD/A2), catch up on deferred training, maintenance and other readiness needs, and add manpower, all while executing the global war on terror and other enduring missions, including countering China's aggression in the southern pacific region, and Russia's adventurism in

Eastern Europe.²²¹ In this environment of limited resources and competing demands, all resources must be allocated efficiently to changing priorities. Since space systems are an integral part of all current US military operations, then support to space systems must flex and evolve along with real world threats, operations tempo, and priorities, enabled by flexible and responsive contracts and dynamic allocation of limited funding.²²²

Increased Levels of Contract Sustainment Support (CSS)

Air Force contract sustainment support (CSS) (often called Contractor Logistics Support [CLS]), relative to organic maintenance and supply support, is increasing over the last decade, primarily for newly produced systems. CSS is believed to be more cost effective and responsive by program office personnel, given the motivation and innovation of competitive market forces. Additionally, the commercial sector is superior in marketing their capabilities (a major weakness of organic support managers), and providing flexible full-service solutions to meet real-world needs – a “one-stop-shop” vice the partial solutions provided by most organic depot organizations.²²³ Two other areas where contractors outperform the organic maintenance and supply support organizations are hiring and training qualified personnel, and contracting for supplies and services – These two areas are historically a challenge for organic organization and not something they do with the speed of need. Improved labor markets for technology and manufacturing sectors in the United States will make competition for semi-skilled/skilled labor even more challenging for the organic depots. The organic depots’ viability for supporting new systems will be questioned by more leaders.²²⁴

A key area leading to inefficiencies across the Air Force organic maintenance and supply enterprises is antiquated data sharing and management systems. Failed Business Enterprise Systems (BES) acquisition efforts over the last 10-years put organic BES tool capability

significantly behind the commercial sector. Antiquated and proprietary data systems are still being pursued by the AFPEO/BES versus quickly exploiting modified commercial data management solutions, although this trend is changing with implementation of DoDI 5000.75.²²⁵ The result of antiquated data management systems is less than optimal data sharing and management, and loss of cost avoidance opportunities. The more significant long-term result will be the organic enterprise failure to compete, and continued loss of program office advocacy compared with the more agile, modern, innovative commercial sector pool of support providers.²²⁶

Assessing Performance of Contractor Sustainment Support Providers

The government must measure and reward contractor behaviors tied to key outcomes and should only hold the contractor accountable for outcomes under their control.²²⁷ Performance metrics included in the contract must be tailored and varied depending on the type of support being purchased (maintenance, supply, engineering, modifications), and level of support (system, sub-system, component), as well as the interdependencies with other support providers not under the control of the prime contractor, such as Defense Logistics Agency (DLA) or organic maintenance and supply sources not subordinated to the prime contractor in a Direct Sales Partnership.²²⁸

Several factors, such as level and scope of support, and amount of contractor control over expense and investment funds, determine how much the contractor can influence the mandatory sustainment metrics of 1) availability – a function of maintenance, supply, system redundancy, and test and modification schedules; 2) reliability – a function of inherent design, system age, quality of maintenance performed and spare parts installed, and other factors; 3) logistics response time – a function of maintenance personnel availability and skill, spare parts

availability, equipment availability, and other factors; and 4) operations and support costs – a function of operations tempo, elements of the other three sustainment metrics, and other factors.²²⁹

Determining Best Value for Contractors and Organic Support Providers

Measuring Cost Performance of Contractor and Organic Sources

Cost performance can only be measured when costs are collected at the discrete task level, or when detailed information relating to accomplishing a task is available to enable applying high confidence estimating methodologies. Some higher-level costs can be derived, such as cost per flying hour or cost per operating month, but attributing and allocating detailed costs at the task level requires high fidelity task and cost tracking and reporting. Tracking real military labor costs for organizational level support would require use a time reporting system to track actual direct labor hours spent on each task, similar to a timecard systems used by defense contractors.²³⁰ Current poor cost reporting for S4 is the result of no standard O&S Cost Element Structure (CES) prior to 2012, and current non-compliance with DoDI 5000.02 mandated use of DI-FNCL-81831 in SMC (SAF/AQD is adding direction to use DI-FNCL-81831 into the AFI 63-101/20-101 revision being published March 2017).

Cost performance can only be tracked when a program office defines and annotates the “should costs”, collects the actual costs, and then compares the two via delta analysis.²³¹ Failure to collect actual costs using common cost elements for both contractor and organic provided services and supplies has left the government with little more than anecdotal examples and opinion on which of the two types of providers is a better value.²³² Organic depot metrics for cost of each repair action, on-time delivery rates, and defect / deficiency rates are not made available

to SMC program office program managers in order to assess these metrics as part of a PS-BCA best value assessment.²³³

Tracking costs and performance of organic supply chain managers (SCM) is also not being done; again, making a quantitative-data-based best-value assessment in the PS-BCA unachievable. This coupled with high add-on costs for organic SCM and antiquated SCM data systems in the Air Force and DLA, as well as restriction on paying incentives and using other positive or negative motivator for organic SCMs, result in many program offices opting for contractor SCM unless forced into using organic SCM support.²³⁴

Requirements Definition, Management, and Responsiveness

Moving on to requirements definition, the typical broad requirements included in contract work statements are not sufficient to define the details of a requirement sufficient to cost out each task. WBS and WBS Dictionary must be applied to determine resource allocation and costing. Developing WBS Dictionaries for SMC S4 acquisitions, before the PWS is developed, will enable better requirements definition and management, cost estimating, work and cost tracking, and overall better government management of awarded contracts.²³⁵ Lack of the WBS and WBS Dictionary use with organic providers give contractors an inherent advantage. Other qualitative advantages of a contractor vice an organic support providers are the contractor can hire personnel and contract for needs without the inherent government approval constraints.²³⁶

Contractors can also often realize economies of scale from supporting both military and commercial customers, and sharing spare parts across repair and production lines.²³⁷ Further, the contractor is more likely to own the design and have superior design knowledge, making reliability upgrades easier than an organic source who is not motivated or expert enough to seek out reliability improvements. Contractors take more ownership of *obsolescence management* for

the items they support compared to many organic supply chain managers who can push off problems to the SPO if initial alternate sourcing or suitable substitute efforts are not successful – this multi-step activity in the organic supply chain can cause a loss of precious time resulting in bigger problems emerging than would be caused by a more proactive response.²³⁸

For space system sustainment efforts, often requiring a higher degree of system knowledge and skill than organic agencies possess, contractors' contiguous workforce of space system experts pays dividends. Continuity of the workforce, especially for highly complex systems, results in significant labor saving for support provided, lower overall risks, and less technician caused failures.²³⁹ Additionally, having a technically proactive and highly capable contractor reduces the government management burden significantly. Oversight is still required with a contractor source, but extra help and guidance from the program office is generally less with a contractor than with an organic source, and incentives and other motivators are more available to influence contractor behavior than with an organic support provider.²⁴⁰

Contractor Support Provider Synergies Vice Organic Sources

Another factor in favor of contracted sustainment support for space systems is both organizational and depot level support for space systems is most often contracted. Including both levels of support on a single contract facilitates synergies, lower overhead costs, and overall fewer resources for both the contractor and government management teams. Since space command and control (C2) segments consist of developed software riding on commercial off the shelf (COTS) hardware and software, then contractor support has an advantage, given the organic depot have not developed a business model for managing COTS support agreements and technical refresh requirements, even though an enterprise strategic supplier solution is sorely needed. In summary, the organic depots have not proven to be the most cost effective,

accountable, responsive, and innovative solution provider for space system maintenance, SCM, and sustaining engineering needs.²⁴¹

Security Clearances, Technical Cycles, and Additional Funding Considerations

Many space system sustainment efforts require personnel with a Top-Secret security clearance and facilities designed for Top-Secret work. Maintaining a workforce and work area for highly classified work is something many contractors are accustomed to doing, vice organic depot personnel and facilities usually operating at the Secret or below level.²⁴² As new technology threats come at a faster rate, technology refresh rates turn faster, and quantities bought of each new system shrinks, organic depot retooling and retraining will fail to keep up and fail to support a return on investment (ROI) business case. The organic depots business model was originally formed on a paradigm of slower evolving technology cycles, and stable, large, and repeatable workloads, both of which are decreasing in today's dynamic national security environment.²⁴³

While both the contractor and the program office strive for stable funding, locking in tasks via fixed priced CLINs can result in loss of flexibility for the program office to respond to changing priorities, and thus contrary to beliefs, often results in higher technical and cost risk for the government. Fixed-price contracts across the Air Force results in loss of flexibility at the corporate Air Force level to shift funding in response to changing threats and needs.²⁴⁴

“Contractors often overstate the difficulty of cost reporting and try to negotiate as high a price as possible for such reporting so the government will be less likely to pay for it”,²⁴⁵ even though, the contractor is already managing work packets and loading priced resources to each task. Reporting known cost to the government is less a cost issue for contractors than a tactic to avoid government insight into costs and profits, which can be used by the government in future

contract negotiations.²⁴⁶ In addition to contractor efforts to avoid sharing cost data, contractors resist providing data rights unless motivated to do so via a request for proposal (RFP) during the competition stages of an acquisition. Data rights are needed for future competition and better cost reporting leads to higher quality should-cost estimates; both of these issues significantly impact contractor market share and profit, resulting in increased cost of services and products delivered to the government.²⁴⁷ As of the writing of this paper, OSD/CAPE is pursuing tools to translate contractor formatted cost data into government standard formats, in order to simplify and improve contract cost reporting and improve cost insight for the government.²⁴⁸

SECTION 6 - TEN ENABLERS FOR ACHIEVING OPTIMIZED SPACE SYSTEM SUSTAINMENT CONTRACTING OUTCOMES

The ten enablers described below were derived from insights gained during the governance assessment conducted during research for this paper, as well as the author's extensive experience providing product support for space and other DoD systems. The mitigating processes (enablers) addressed below include three enablers relating to better requirements definition, two relating to improving data management, one relating to improving workforce management, one relating to sustainment cost reporting compliance, one relating to better design and use of CPAF contracts, one relating to improving reliability and affordability of fielded systems, and one recommending repeal of or exemption from outdated depot maintenance laws.

This paper represents a comprehensive assessment of relevant doctrine and the resultant insights for which no equal scholarly paper or commissioned study exists. The 2009 RAND Study entitled "Contractor Logistics Support (CLS) in the United States Air Force" (assessed in Section 5B of this paper) was the most comprehensive sustainment contracting study ever conducted, prior to this paper. While the RAND CLS Study provides many insights, it fails to

identify the requisite mitigating enablers needed to optimize space system sustainment services (S4) contracts. Implementing the enablers addressed below will result in optimized space system sustainment services (S4) contracts, supporting the SMC goal of providing maximum space system capability per dollar spent.²⁴⁹

Section 6A - Enabler 1 – Evolve the Statutory Product Support - Business Case Analysis (PS-BCA) into a Product Support Decision Assessment

The FY2010 NDAA Sec. 805 mandate for a Product Support-Business Case Analysis (PS-BCA) is implemented via DoDI 5000.02 and AFI 63-101/20/101, directing the PS-BCA be used to determine the best value for any of the 12 Product Support Elements (PSE) where optional approaches should be assessed. The four PSEs most often having more than one likely option, and thus benefiting from analysis, are 1) depot maintenance, 2) supply chain management (SCM), 3) sustaining engineering, and 4) product support management relating to contracting strategies. In 2016 SAF/AQD developed and published Air Force Pamphlet (AFPAM) 63-123 to guide the development of a PS-BCA. This 132 page AFPAM added value and clarification on the purpose and application of the PS-BCA but is lacking a well-designed standard assessment model to assess product support courses-of-action (COA). Current PS-BCAs recommendations too often contain poorly supported “opinions” from ill-informed voting member, as well as poorly defined and non-standard assessment criteria.²⁵⁰

The loosely defined PS-BCA process should be replaced with a Product Support Decision Assessment (PSDA) containing standard scoring criteria for each PSE being assessed. The criteria should be objectively defined where feasible and otherwise bounded by subjective model for scoring optional approaches or sources for the subject PSE. A well designed and streamlined PSDA model will reduce the current PS-BCA consternation and level of effort, and result in a

high confidence PSDA pointing to the best value option for the PSE under consideration. The new PSDA model outputs will increase confidence and credibility among SMC and AFSPC leaders approving the resources to implement product support requirements.²⁵¹

Section 6B - Enabler 2 – Implement Better Data Rights Management

Public Law 109-364, Section 802 (2006), amending 10 USC 2320 (*Rights in Technical Data*), mandates PMs managing major weapon systems and subsystems assess the long-term technical data needs and acquire technical data rights to sustain assigned systems and subsystems over the entire life cycle. DoDI 5000.02 and AFI 63-101/20-101 emphasize the critical need for data rights, but processes and trained staff needed to meet doctrinal intent are still lacking in SMC. The solution is a simplified and abridged SMC data rights management guide, additional local courseware and training, and establishing positions for Data Management Specialists in the SMC Engineering Directorate (SMC/EN) and each program office Engineering Division.²⁵²

Section 6C - Enabler 3 – Develop Common Sustainment Services WBS Dictionary Elements and Add to MIL-STD-881

DOD should develop Common WBS Dictionary Elements for Sustainment Services, as these are not currently included in MIL-STD-881C. Sustainment services and products are valid life cycle management requirements and as such the WBS Dictionary process should be used to allocate, track, and managing performance work statement (PWS) tasks, both during solicitation activities and contract execution. Mandated WBS Dictionary use for S4 requirements definition and contract execution monitoring will enable real time resource prioritization and accurate cost reporting. Recommend SAF/AQD engage ASD/L&MR to pursue mitigating this critical gap in MIL-STD-881. While waiting for the L&MR solution, SMC/EN and SMC/SL should jointly develop a set of WBS Dictionary Elements to support S4 requirements development. SMC PSMs

must develop a WBS and WBS Dictionary for all S4 requirements in conjunction with developing task statements, performance criteria, and data deliverable requirements in the performance work statement (PWS).²⁵³

Section 6D – Enabler 4 – Develop a Decision Model Toolset for Contract and Incentive Type Determination

A decision model is needed to analyze the technical characteristics and price risk of each S4 requirement, and determine if an incentive for cost reduction or performance enhancement should be applied. The model should assess whether the complexity and quantity required over the typical one year performance period is stable and predictable, and thus able to be priced. The model must include criteria for determining value of applying cost or objective/subjective performance incentives and provide a list of prescribed award-fee criteria and guidance on when to adopt either incentive type, or neither. The final output of the model is determination of the optimal contract and incentive type(s) for the requirements set. The model's outputs will provide decision support for SMC leaders to confidently approve either a cost-reimbursement and fixed price contract type, and the associated incentive strategy.²⁵⁴ SMC should initiate a rapid-improvement-event, facilitated by a Six-Sigma-Black-Belt, and supported by commercial software based data management vender, to analyze and create the needed model and toolset. Significant management, cost, and warfighting capability return-on-investment (ROI) will be realized by mitigating this critical gap.

Section 6E - Enabler 5 – Enforce and Fully Leverage Mandated Sustainment Cost Reporting in S4 Contracts

This enabler is essential to optimize S4 contracts. Application of DI-FNCL-81831 Contractor Sustainment Report resulting in delivery of DD Form 1921-5 is mandated by Office of Secretary of Defense (OSD) - Director of Cost Assessment and Program Evaluation (CAPE) via DoDI 5000.02, Enclosure 1 Table 7.²⁵⁵ Sustainment cost tracking and reporting not only supports the FIAR legal mandate but also complies with USD(AT&L) direction, and congressional intent, to know where each dollar of appropriated DoD money is spent. High fidelity cost estimating, tracking and reporting facilitates sustainment activity prioritization in the execution year, and future Should-Cost analyses for the subject system and analogous systems. Knowing the precise expenditures and investments for each assigned space system is a sound business practice and a foundational responsibility of every SMC PM and PSM.²⁵⁶

Accurate and comprehensive sustainment cost data helps determine the relative value of organic depot maintenance and organic wholesale level supply chain management (SCM) versus contractor provided support. Current threats from asymmetric and near-peer challengers require best value for all SMC efforts, from any source, contractor or organic. Achieving best value first requires a complete sight-picture of each dollar spent, and an analysis of the relative value delivered from each support provider, both organic and contractor. Accurate cost data allows future spending to be reallocated to most essential products and services, and best performing providers.²⁵⁷

Section 6F - Enabler 6 – Develop an SMC Award-Fee Contracting Guide

When Cost-Plus-Award-Fee (CPAF) is determined through analysis to be the best contract type for an S4 requirements set, the award-fee factors, fee allocation schedule, and

performance evaluation processes must be designed and implemented, as documented in the Award-Fee Plan, to achieve key product and service outcomes at the lowest cost, enable efficient government administration, and ensure the PM maintains maximum influence over the contractor. The Fee-Determining-Office (FDO) must be careful to avoid undermining the PM's influence over the contractor. The FDO can accomplish this by minimizing changes to the Award-Fee-Review-Board (AFRB) recommendation on award-fee earned, and when changes to AFRB recommended fee are made, the rationale for the change are analyzed and the rationale for change is documented in a FDO signed memo.

Award-fee criteria must be designed to only reward the contractor for excellent achievement of important outcomes and mission effects related to system / mission performance, schedule and cost. The award-fee evaluation and rating process must be transparent, highly discipline, and strictly follow the processes contained in the Award-Fee Plan. Award-fee should only be paid when all required work meets satisfactory / average performance. Establish an award-fee culture of driving excellent performance for important outcomes worth paying extra fee to achieve. Revise award-fee factors and fee allocation in advance of each new award-fee period to achieve maximum harvest from the award-fee program. Ensure no factor contradicts any other award-fee or incentive factors in the contract. When in doubt, apply fewer factors rather than more, and avoid overly complex and conflicting incentives. An appropriately applied, well-design, and properly administered award-fee program will motivate best value performance from the contractor, deliver maximum military capability for each dollar spent, and streamline contract administration.²⁵⁸ Given the inherent S4 requirements characteristics and the potential for CPAF contracts to add value, an SMC Award-Fee Contracting Guide should be developed

and followed. Refer to Section 4D of this paper for more cost-plus-award-fee (CPAF) contract management insights.

Section 6G - Enabler 7 – Implement a Commercial-Software-Based Space System Sustainment Data Management Toolset

SMC and AFSPC must implement a tailored commercial-software-based data sharing and management solution for space system sustainment support vice continued use of the antiquated data tools provided by the Air Force, or the unique data systems employed by each contractor. A tailorable commercial-software-based space system data management solution will provide a low-cost collaborative common operating picture to track and manage system/component failures, maintenance actions, supply demands, system deficiencies, Air Force Form 1067s submittal / tracking, and other core processes for all stakeholders' visibility, in real time. A commercial-software-based data management toolset can validate data integrity and produce engineering, management, and financial reports to help determine optimal investments for sustaining and improving fielded systems. Benefits of the new toolset will be significantly improved levels of service, improved communication, improved cycle times, and significant improvements in resource allocation, cost avoidance, and increased war-fighting capabilities.²⁵⁹

DoD and AFPEO-Business-Enterprise-Systems (BES) are now realizing tailored commercial-software-based data management systems offer affordable and capable solutions. DoDI 5000.75, newly published 2 February 2017, directs a focus on tailored commercially available data management products vice developing proprietary unique solutions.²⁶⁰ However, SMC and AFSPC cannot afford to wait a decade for AFPEO/BES to deliver the data management systems needed immediately to help optimize space sustainment product support management.²⁶¹

Section 6H - Enabler 8 – Increase Skills and Experience of the SMC Sustainment Management Workforce and Employ Tailored and Streamlined Services Acquisition Review and Approval Processes

Designing, awarding, and managing space sustainment contracts is an inherently government function. As such, government personnel, be they civilian employees or military members, must be highly capable, trained and experienced in creating, awarding and managing optimized sustainment contracts. The government must continue to invest in hiring capable personnel, training those personnel and then assigning those personnel to work and learn sustainment requirements definition, selecting the best offeror, and expertly managing awarded contracts. People matter; sustainment personnel must be inquisitive, create well supported optimal S4 acquisition strategies and challenge the functional staff and leadership to reduce contract award cycle times. There is no silver-bullet and no substitute for great people doing great work, eliciting excellence from all team members, and striving together to improve and streamline processes. As S4 acquisition and contract management processes are improved as recommended in this paper, and SMC leaders gain confidence in SMC personnel's S4 management expertise, then approval delegations and other efficiency measures must be implemented to reduce S4 contract review and approval burdens on SMC leaders, staff, and PMs.²⁶²

Section 6I - Enabler 9 –Apply the Space Modernization Initiative (SMI) Concept to Identify and Implement Cost Saving Investments for Fielded Space System Ground Segments

The Space Modernization Initiative (SMI) concept has significant value for fielded space systems. Return-on-investment (ROI) opportunities, and improved performance, capability, reliability, availability, resiliency, and affordability (reduce sustainment costs) must be more

proactively analyzed, pursued and supported by SMC staffs and senior leaders. SMI goals can be included in S4 and System Engineering and Integration (SE&I) contracts to encourage contractor innovation. SMI efforts adopted for implementation into fielded systems should take no more than 3-years from inception to delivery to ensure current technology is being delivered and operational wing expectations and requirements are being met in a timely manner.²⁶³

Incremental, affordable, and manageable system improvements will result in higher space wing customer satisfaction. SMIs should apply open-system architectures for better incremental technology infusion. AFI 63-10120-101 directs the PM to apply a Modular Open Systems Approach (MOSA) wherever feasible.²⁶⁴ Long-term high cost space system modernization and technical refresh efforts have routinely experienced cost overruns and have often delivered obsolete components and capabilities not well received by the operational space wings.²⁶⁵

Section 6J - Enabler 10 – Repeal Core Logistics and 50/50 Laws or Exempt Space Systems from These Laws

Title 10 - United States Code (USC) Section 2466 requires performing at least 50 percent of Air Force depot maintenance at DOD organic depots. Title 10 USC Section 2464 requires DoD organic depots to develop maintenance capabilities for all “core systems”. Core systems are those with a Chairman of the Joint Chief of Staff (CJCS) wartime tasking – comprising all fielded space system programs of record. Per the “core law”, government personnel, equipment and facilities must be capable of conducting maintenance of each and every configuration item in each core system. The official rationale behind depot maintenance laws is US national security requires in-house ability to maintain and repair weapon systems during peacetime, mobilizations, contingency situations, and other national emergencies, as contractor may strike and be unwilling to deploy if needed. In practice, repair of various system components are assigned to organic

depots but the organic depots do not have capabilities to repair all hardware and software configuration items of each core system. The “core law” is instead used as a forcing function for organic depot workload capacity management rather than pure compliance with the law as written.²⁶⁶

Given 1) significant “core capability” shortfalls already exist, 2) coupled with current budgetary realities, 3) as well as the current use of outdated business management systems and processes by organic depots, and 4) the challenges in hiring, firing and motivating government touch labor, the US Government can no longer afford to show a preference for organic depots and supply support sources when the business case and risk analysis does not support the supposed necessity. Repealing these two laws should be proposed and approved, and associated DoD and Air Force policies updated accordingly. The DoD organic depot maintenance and supply chain management (SCM) organizations should thrive or fail based on their comparative value of products and services provided. The PS-BCA is the prescribed method for assessing product support best value and risks, and should be used to make all weapon space system product support decisions, to include maintenance and supply support, vice the current practice of pressuring SMC PMs, PSMs, and program element monitors (PEM) to subsidize a lower value depot maintenance and SCM provider. Current depot laws must be reassessed objectively and without concern for government jobs in a specific Congressional district, or any other political reason²⁶⁷

Recapitalizing, reengineering, retooling, and retraining the organic depot maintenance and SCM organizations is a poor investment. The relative value of the organic depots should be urgently and objectively studied and assessed via independent commission chartered by the Secretary of Defense (SecDef)) before more sunk-costs are expended.²⁶⁸ The absence of any

significant published studies on the risks and value associated with DoD organic depots vice commercial depot providers indicates a “don’t ask; don’t tell” political paradigm requiring a solution.²⁶⁹ In lieu of repeal of the two depot laws, SMC should seek an Air Force, DoD, or Congressional waiver from depot maintenance “Core” and “50/50” laws for all satellites, command and control (C2), and user/ground-sensor segments with less than 300 fielded end-items. Organic maintenance and SCM providers should only be used when the Product Support Decision Assessment (PSDA) (currently called the PS-BCA) indicates organic support is best value.²⁷⁰

The current legal and policy mandated preference for organic depot maintenance and supply support, not based on best value analysis, are distracting DoD and Air Force senior leaders from a laser focus on gaps in optimizing contracted sustainment support. Best value contracts, improved data sharing and management systems, and assessment and implementation of strategic supplier initiatives can be more robustly pursued without the distraction of satisfying organic depot outdated laws.²⁷¹ The road to better value for DOD, Air Force, and SMC lies in more effective and efficient employment, use, oversight, and management of the commercial support providers, and more use of commercial data management products tailored for use in DoD, vice archaic data management tools still in use.

SECTION 7 - CONCLUSION

Section 7A - Summary of Recommendations Derived from Assessments

Seventeen of the most important and relevant governance documents relating to space system sustainment services (S4) contracting were assessed in this paper. These governance documents include the five most applicable regulations, the ten most relevant guides, and the two

most relevant studies. Assessment of these documents showed a consistent set of mandates, direction, and guidance; however, it also exposed a consistent set of weaknesses, governance gaps, and even unqualified biases negatively impacting SMC S4 contracting outcomes. The key mitigating enablers identified in this paper, needed to realize optimized S4 contracts are: 1) a requirements analysis and definition model to characterize each requirement type for stability, predictability and ability of a contractor to price; 2) a model to apply the defined requirements set to a recommended optimized contract and incentive type(s); 3) improved SMC guidance and staffing for data rights management; 4) compliance with OSD mandated sustainment cost reporting; 5) training for and full exploitation of the Work Breakdown Structure (WBS) and WBS Dictionary process; 6) new relevant S4 training and personnel rotation/assignments to improve skill-craft of sustainment management personnel who plan, execute and manage S4 contracts; 7) a tailored commercial-software-based space system sustainment data management toolset to improve sustainment management data gathering, analyses and reporting; 8) a standard modernization/technical refresh analysis process for assess and identify high return-on-investment (ROI) upgrades to help realize affordable capability improvements to fielded systems; 9) an SMC Cost-Plus-Award Fee (CPAF) Guide to define when CPAF may be used, improve factor development, prescribe how to apply factors to generate results, and define rules of a well administered CPAF evaluation process; and 10) obtain approval of an Air Force, DoD, or Congressional waiver from depot maintenance “Core” and “50/50” laws for space systems.

Section 7B - DoD Senior Leader Statements

In Mr. Franks Kendall’s last interview before departing his position as USD(AT&L) he provided two areas of advice for Congress and the weapon system management community.

First, Mr. Kendall said, while many lawmakers favor fixed-price contracts for weapons system

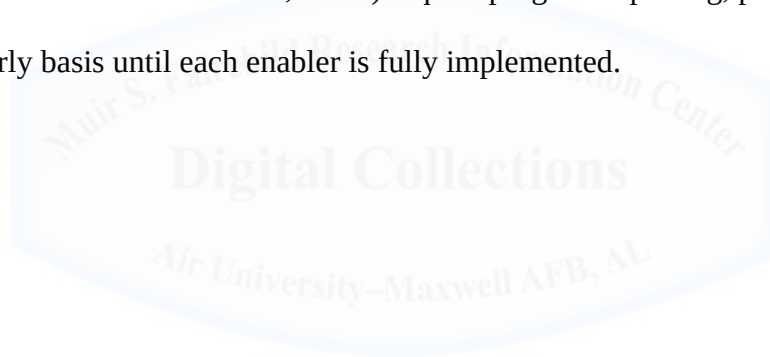
development efforts in an attempt to shift cost risk to industry, data gathered over the past few years shows fixed-price and cost-plus contracts generate the same amount of cost growth. “The idea of fixed price being the solution to our problems was tried and failed. One of my frustrations having been in this business for so long is we don’t seem to learn from the past,”²⁷² Mr. Kendall would advise an analysis process be used to determine the best contract type for a specific set of requirements, followed by appropriate management of the awarded contract. He would further advise, no “silver-bullet” contract type should be blindly applied to all requirements.

Secondly, Mr. Kendall said, new statutes (Congressional help) relating to system acquisition often do more harm than good since they create more bureaucracy, requiring DoD to demonstrate compliance via new regulations, which burdens DoD acquisition organization with low value work, driving up the government administrative burden, as well as adding low value data deliverables in contracts.²⁷³ To mitigate Mr. Kendall concerns, statutes and policy should be reviewed annually to determine which of these mandates requires update and clarification, which policies add value commensurate with cost, and which should be repealed altogether.

In his first message to DoD uniformed and civilian members after being confirmed as the Secretary of Defense on 20 January 2017, the Honorable James Norman “Mad Dog” Mattis conveyed the following message: “Every action we take will be designed to ensure our military is ready to fight today and in the future. We are devoted to gaining full value from every taxpayer dollar spent on defense, thereby earning the trust of Congress and the American people.”²⁷⁴ The S4 contracting enablers identified in this paper support Secretary Mattis’ edict to pursue “full value from every taxpayer dollar spent”.²⁷⁵

Section 7C - A Call to Action

This paper assessed the key population of governance documents pertaining to space system sustainment services (S4) contracts in order to determine if current doctrine is adequate or in need of improvements and refinement. The subject doctrine, especially at the “how-to” guidance and practices level contains critical gaps in need of mitigation. Senior, functional, and materiel leaders know they are charged with seeking out critical operational gaps under their purview and acting as the champion for implementing appropriate countermeasures. The enabling countermeasures needed to optimize S4 contracts are identified in Sections 3-5 of this paper and summarized in Section 6. The actionable way ahead is clear: 1) identify the champion and lead action officer for each enabler, and 2) require progress reporting, per approved action plan, on a quarterly basis until each enabler is fully implemented.



ENDNOTES

Notes

¹ Ian B. Martin, SMC/SLX. Ian Martin, the author of this paper, has been acquiring and sustaining DoD systems since 1982, with three years supporting communications / electronics systems, 12-years in aircraft system program offices, eight years in space system program offices, and the last 12-years in the AFPEO/Space Logistics Plans and Policy Division. Ian Martin is recognized and consulted by SMC, Air Force Materiel Command, and SAF/AQD as a program management (PM) and life cycle logistics (LCL) policy expert. In 2006 Ian wrote the *Performance Based Logistics (PBL) for Space* paper, advocating for vertically integrating contracted space operations support and organizational level maintenance into the system program office contract. The concept prescribed in this paper was approved by AFSPC Commander and significantly contributed a permanently reoccurring savings of \$150 million a year across the AFPEO/Space portfolio.

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