



Tailored Acquisition Timelines for System of Systems Equipment on Rotary-Wing Platforms

John Walden

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Author: John Walden

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Abstract

The purpose of this research paper is to review process timelines for the application of tailored acquisition approaches of the Adaptive Acquisition Framework (AAF), the Modification Work Order (MWO), and ancillary supporting Verification and Validation (V&V) processes for newly acquired System of Systems (SOS) material solutions. Additionally, this research paper is being completed to determine optimization opportunities as associated with the AAF, MWO and supporting processes. The developed analysis and findings, as well as, the change recommendations will frame and support optimization opportunities in the current AAF and MWO timelines that can be applied to future Army Aviation SOS procurement and fielding. Three recommendations for implementation were found to promote optimization opportunities during the research of the AAF, Army MWO, and Ancillary Supporting processes for rotary-wing aircraft. The research conducted highlighted five broad areas for future research.

Chapter 1 – Introduction

“The soldier is the Army. No army is better than its soldiers. The soldier is also a citizen. In fact, the highest obligation and privilege of citizenship is that of bearing arms for one’s country.” – Gen. George S. Patton Jr. (Ammo.com, 2021)

In today’s acquisition environment speed is essential. As the speed of emerging threats and capability generation from our adversaries is increasing, the rate at which the Department of Defense (DOD), must procure, produce and field capabilities is increasing. This increased emphasis is noted by Dr. La Plante, Under Secretary for Acquisition and Sustainment (USD (A&S)). He states, “the Pentagon’s acquisition system has to focus on delivering new capabilities that troops need — not just today, but in the future — to meet the quickly evolving threat from China and other leading adversaries” (Losey, 2022, p. np). The theme of speed within acquisition is also echoed by the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics (ASA) (ATL)), Dr. Will Roper. He states, “Going faster is not just a tag line for us; it’s a dead serious business about keeping the Air Force competitive and dominant” (Christopherson, 2019, p. np) . He also noted, “The “why” is the U.S. competing against peer adversaries who can match its technology. It’s a time of unprecedented technological advancement, so the Air Force must have the fastest acquisition system to keep on winning” (Christopherson, 2019, p. np).

The purpose of this research paper is to look for optimization points in the research area noted below to facilitate capability delivery timeline optimization within Army acquisition. To support this review of acquisition process timelines, this research paper will review and analyze data and documents for the application of tailored acquisition approaches. These approaches will include the Adaptive Acquisition Framework (AAF), the Modification Work Order (MWO), and ancillary supporting Verification and Validation (V&V) processes for newly acquired System of Systems (SOS) material solutions. Additionally, this research paper is being completed to

determine optimization opportunities as associated with the AAF, MWO and supporting processes through analysis and findings and the development of change recommendations. The developed analysis and findings, as well as, the change recommendations will frame and support optimization opportunities in the current AAF and MWO timelines that can be applied to future Army Aviation SOS procurement and fielding.

This first objective of this research paper will look at the AAF as applied to SOS for Army rotary-wing aircraft, from both a Major Capability Acquisition (MCA) and Urgent Capability Acquisition (UCA) aspect. The second objective of this research paper will also complete research with regards to the Routine and Urgent MWO development and application approaches. During the completion of the second objective, several ancillary processes that have been tied to MWO authentication, will also be reviewed at a top level.

The third objective for this research paper is to identify potential adaptation points from the UCA process and apply those optimization opportunities to the MCA acquisition processes contained in the current AAF instructions. The third objective will also review potential optimization points from the Army Urgent MWO process for possible application to the Routine MWO process.

The fourth, and last objective of this paper, will provide analysis and findings on the noted AAF, MWO, and ancillary processes. The developed analysis and findings in objective three will then be used to provide potential optimization points for the first three objectives, which will provide recommended optimization points for the selected pathways of the AAF, MWO, and ancillary process timelines. When applied, these recommendations could result in a positive transformation of the current timelines, resulting in a true reduction in the time to bring needed capabilities to the Army aviation community. Another way to look at the major thrust in objective

four, is to look at ways that will adapt and modify the existing AAF, MWO and ancillary process flows and then apply linear and parallel process optimizations. These linear and parallel process optimizations are really applying Organization Development (OD) processes to both the AAF acquisition and MWO development processes to see how the process blocks can be rearranged to optimize the overall timeline to field needed capabilities.

Background

As a framing exercise, to define and bound the scope of this research paper, the Department of Defense Instruction (DODI) 5000.02(AAF) (Jan 2020) and Army Regulation (AR) 750-10 (Oct 2019) policy evolution must be detailed. Additionally, the SOS paper definition, as well as, the integration definitions of A- and B-Kits must be identified. This cursory review of transformation changes will note the evolutionary process that has implemented greater efficiency in the AAF and MWO arenas. This review will set the stage to the findings and recommendations to exploit timeline reduction opportunities in the overlap areas of the AAF and MWO processes.

First, the current AAF policy is a transformation effort that has been built upon review, findings determination, and recommendation implementation DODI 5000.02, from its inception in 2015 to the current document published in 2020. Initially, DODI 5000.02, from January 2015, described four basic models that served as examples of defense program structures tailored to the type of product being acquired or to the need for accelerated acquisition. DODI 5000.02T, from August 2017, also added two additional hybrid models that combined the features of multiple basic models. Each basic model is tailored to the dominant characteristics of the product being acquired (e.g., hardware intensive products such as most weapons systems). The hybrids are described because many products will require combining models, such as a weapons systems development that includes significant software development. This current version of the DODI 5000.02, from

January 2020, states, “The AAF acquisition pathways provide opportunities for Milestone Decision Authorities (MDAs)/ Decision Authorities (DAs) and Program Managers (PMs) to develop acquisition strategies and employ acquisition processes that match the characteristics of the capability being acquired” (Department of Defense, 2020, p. 3).

The changes to DODI 5000.02 were completed as a major transformation process to help tailor acquisition requirements and push more decision power down to the Material Developer (MATDEV). The new AAF refined the original 4 plus 2 acquisition paths in the DODI 5000.01 and 5000.02T into a 6 pathway acquisition process that recognized software and cybersecurity as a key component of all acquisition paths. In the words of Under Secretary of Defense for Acquisition and Sustainment (USD (AS)), Ellen M. Lord, “By removing procedural bottlenecks and regulatory bureaucracy, programs are pushed to embrace the goal of delivering capabilities with much faster cycle times, in one year or less, while emphasizing and ensuring cybersecurity” (Mayfield, 2020, p. np). As a result of this transformation, DODI 5000.02 (Department of Defense, 2020, p. np) has effectively implemented acquisition policy for Major Acquisition Programs (MAPs), End Items (EI) and systems not requiring A-Kits for integration. This research paper will hone in on the AAF impacts (Objective 1) on SOS application on rotary wing- aircraft, when there is a need for an A-Kit to facilitate integration of the SOS on the host platform.

To facilitate understanding, SOS must be defined and bound. For this research paper, SOS bounding comes from the Defense Acquisition University (DAU) glossary, and is defined as:

A set or arrangement that results when independent and useful systems are integrated into a larger system that delivers unique capabilities. SOS may deliver capabilities by combining multiple collaborative and independent-yet-interacting systems. The mix of

systems may include existing, partially developed and yet-to-be designed independent systems. (DAU, 2022, p. np).

The A-Kit integration brings in the second policy area to be researched, which is the Army Modification Process covered in AR 750-10 (Objective 2). To facilitate the review of Objective 2 of this research paper, the researcher must define the term A-Kit. For most SOS integration efforts there is an additional requirement to develop, build, and test an assembled kit that will physically integrate into or on the intended host system or EI. This is the broad term, in essence, it is the definition of an A-Kit. For most SOS applications the needed A-Kit will generally include an integration kit that includes physical hardware (bolts, brackets, and metal structures), needed wiring interfaces (electrical, computer, and software communication), and display and operation interfaces (McCaney, 2015, p. 1). The B-Kit is broadly referred to as the capability being developed for the systems, which includes their related Line-Replaceable Units (LRUs). (McCaney, 2015, p. np). The overall integration effort of the defined A-Kit above is what is covered in AR 750-10. As a historical basis for context of this research paper, AR 750-10 was updated in 2019 to align to updated Army Directive 2018-07-10, *Prioritizing Efforts-Readiness and Lethality (Update 10)*. As this update occurred prior to the new AAF publication update, released in 2020, certain AAF areas may not have been addressed and is a basis of general review for Objective 2 of this research paper.

Additionally, as the MWO processes requires V&V by both the SOS MATDEV and by the EI MATDEV to meet MWO authentication requirements. This area of the MWO development for both the Routine and Urgent MWO processes will be looked at in Objective 3. The efforts for Objective 3 in this research paper will include reviews, findings development and recommendation formulation which will be found in Chapters 2, 4, and 5 respectively. The previously noted

elements will detect and provide opportunities to streamline the MWO development process and further align the AR 750-10 processes with the relevant process changes included in the current AAF structure.

Statement of Purpose

The purpose of this study is to explore how the AAF and MWO development processes supports timeline optimization opportunities for the United States Army rotary-wing platforms. In an effort to get to the research literature, the findings that require development and any recommendation outflow needed to develop this paper, research questions must be developed to support the overarching research paper theme. The supporting research questions for this paper are outlined below and will be detailed and correlated to the main research paper topic in Chapter 3 of this paper.

Research Questions

Question 1: What are the AAF timeline optimization opportunities?

Question 2: What are the MWO timeline optimization opportunities?

Question 3: What process improvements can be achieved by taking advantage of AAF and MWO timeline optimization opportunities?

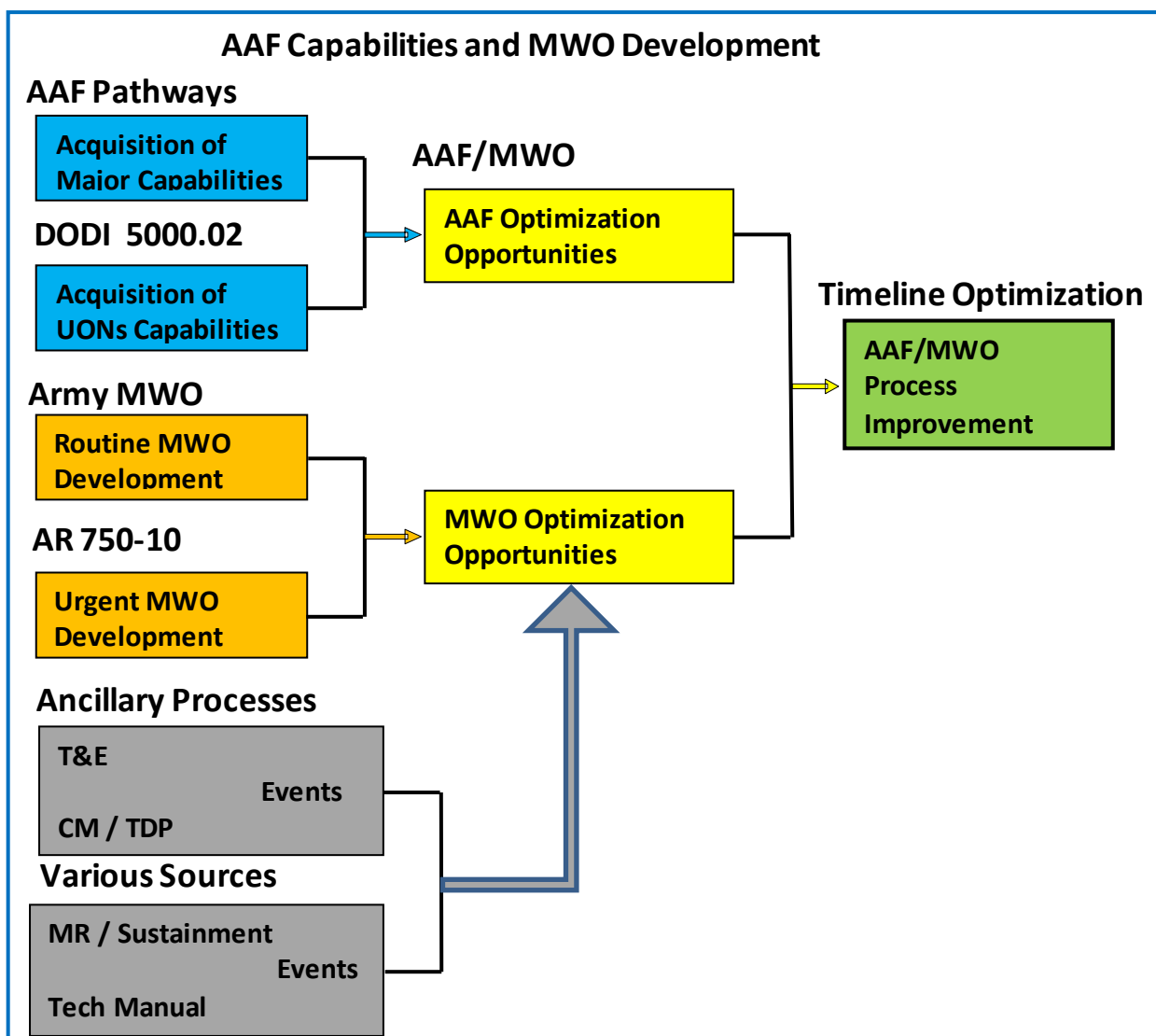
Conceptual Framework

The conceptual framework outlined in Figure 1, provides a graphic depiction of how the four stated objectives will be accomplished to support completion of this research paper. The blue section of the overview chart notes the selected AAF acquisition pathway reviews for the first objective. The orange section of the overview chart depicts the routine and urgent MWO development reviews for the second objective. The yellow section, of the chart, denotes the separate AAF and MWO optimizations opportunity identification that is accomplished as the third

objective of this paper. Finally, the green section shows the culminating recommendations of this research paper that is accomplished by the application of OD change process. This fourth objective will produce recommendations to streamline the overall acquisition timeline, within the intersecting bounds of the selected AAF and MWO processes.

Figure 1

Research Framework Model



Significance of This Research

This research is being completed to identify process differences and produce optimization findings and intersecting AAF and MWO development process transformation recommendations. This supports the continued acceleration of capabilities acquisition, as the DOD and the U.S. Army continues to refine its AAF processes. This optimization and process transformation is then intended to be applied to optimizing the current overarching AAF and MWO intersecting timelines. This is accomplished through decoupling of some linear processes and introducing parallel path execution to reduce the overall fielding timeline for needed capability solutions. As a means to support this effort, this research looks into the differences and potential optimization recommendations to better synchronize the current Army MWO process outlined in AR 750-10 with that of the AAF detailed in Department of Defense Directive (DODD) 5000.01, DODI 5000.02, and 5000.85.

The significance of the research contained in this paper will be used to define recommendations to eliminate process friction and apply optimizing changes to acquisition timelines. These reductions will promote reduced acquisition fielding and deployment timelines for SOS applied to U.S. Army rotary-wing platforms. For bounding of this paper, the comparative research is specially generated for SOS applications on the Utility Helicopter (UH)-60, Attack Helicopter (AH)-64, and Cargo Helicopter (CH)-47 rotary-wing platforms.

Research Methodology

As general background there are three types of research: Quantitative, Qualitative and Mixed Methods that support research paper development. Within those three research types, there are eight supporting approaches that support the development structure and type of data used to

perform a paper's research analysis. More details on the types and methods used for research papers can be found in Chapter 3 (Creswell, 2019, p. 23).

As applied to this research paper, for viewing the AAF, MWO, and ancillary process timelines for optimization points, the qualitative research type, with a Grounded Theory method will be used. The definition used to bound what qualitative research means within the context of this paper is when, visibility is gained on, "different major characteristics at each stage of the research process; exploring a problem and developing a detailed understanding of a central phenomenon; having the literature review play a minor role but justify," (Creswell, 2019, p. 26) the purpose and data used in the research.

This Grounded Theory approach will allow the researcher to collect important fact sets from DOD, U.S. Army, and Defense Technical Information Center (DTIC) technical documents. These facts will then feed a broad picture analysis of the current AAF SOS B-Kit development and acquisition processes relative to current MWO SOS A-Kit development and ancillary supporting integration processes.

Limitations of the Study

The research in this study is limited in several aspects, which will be detailed in this paragraph. Though this limitations list is inclusive to known issues identified by the researcher during the completion of the noted research, it should not be considered an exhaustive list. This assertion is made as there are sure to be unknown, unknowns that the researcher has not contemplated or discovered during the research for this paper.

Limitation – 1

Since surveys were not allowed for this research paper, actual first hand documentation of accounts or research data could not be completed. As such, all information, both qualitative and

quantitative, are limited to data researchable information from open sources and certain DOD databases. These limitations are also restricted by public domain and property right laws for open source data, as well as, property rights and United States (U. S.) Classification applications for the DOD database applications.

Limitation – 2

As this is a time-restrictive research paper, the scope of this effort is a top-level review of both the 1) DOD and Army Acquisition and Integration and 2) MWO development timelines. As recommendations will be a result of this research, the timeline proposed will be topically assessed and further research will need to be completed to validate the recommended timeline adjustments. Additional areas of research focus as aligned to this limitation will be detailed in Chapter 5 of this paper.

Limitation – 3

The scope of this effort is bounded to the cross review of DOD and Army acquisition policy as outlined against Army Regulatory policy for integration and MWO development. This limitation is applied due to the extensive acquisition and development regulations in place supporting the AAF, as such not all regulatory aspects will be researched. Additional areas of research focus as aligned to this limitation include Navy, Air Force, and SOCOM acquisition processes and will be detailed in Chapter 5 of this paper.

Limitation – 4

The scope of this effort is bounded to Army rotary-wing platforms. As there are other Army and DOD systems that may be favorably impacted by the research of this topic, the scope of this paper must be limited to the noted AH-64, CH-47 and UH-60 Army rotary-wing platforms.

Additional areas of research focus as aligned to this limitation will be detailed in Chapter 5 of this paper.

Limitation – 5

The scope of this effort is bounded to the MCA and UCA Acquisition Pathways listed in the AAF. The other four AAF pathways will be topically noted in this research paper, but will not be reviewed to produce findings and recommendations. The other four AAF acquisitions pathways will be noted in Chapter 5 as possible future research areas in relation to the topic covered in this research paper.

Limitation – 6

The scope of this effort is bounded to the Urgent and Routines MWO V&V processes listed in the AAF. The other MWO V&V Process, Emergency, will be topically noted in this research paper, but will not be reviewed to produce findings and recommendations. The Urgent MWO V&V process will be noted in Chapter 5 as possible future research areas in relation to the topic covered in this research paper.

Summary

This chapter contains the basis for development of a research paper to look for optimization points in the AAF and MWO processes. These optimizations are being sought to facilitate capability delivery timeline reductions within Army acquisition. To support this review of acquisition process timelines, this research paper will review and analyze data and documents for the application of tailored acquisition approaches. This paper provides readers with the relative background that promotes the research purpose statement. Additionally, this research paper identifies literature reviewed in support of information gathering, finding development and recommendation presentation.

Also, included in this chapter, is information as bounded by the purpose statement and research questions, describing the conceptual framework, research methodology, and research limitations for this research. As we move to Chapter 2, the research paper will define and bound the literature review completed to support this research paper.

Chapter 2 – Literature Review

“The pessimist complains about the wind; the optimist expects it to change; the realist adjusts the sails.”

William Arthur Ward

Introduction

As we illuminated on in Chapter 1 of this research paper, speed and the requirement to develop, procure and fielded capabilities that match or out-pace our adversaries is needed at an ever increasing pace (Mayfield, 2020). This is the rationale behind the researcher’s effort into reviewing the DOD AAF and Army MWO procedures on SOS equipment for Army rotary-wing platforms. The intent of this research is to ferret out optimization opportunities that can be proffered for the Army to help inset a reduction in the acquisition process timeline.

To place further emphasis on this precept, the following quotes from a recent interview with the Army Principal Military Deputy (MILDEP) for Acquisition stated:

We've been so brain washed in a way, Ostrowski said to a well-attended auditorium, to follow processes and that those processes were more important than product, which has put us in a position where we can no longer keep up with the threat and we no longer can keep up with the advances in technology with the speed at which they are turning (Higgins, 2017, p. np)

LTG Ostrowski further elaborated on the impacts this mindset had on Army acquisition and its work force by noting:

All these events exact a toll on the morale of the acquisition workforce. At some point people, motivated by their desire to serve the country and the men and women defending

it, feel frustrated in their efforts to make a difference and do not feel empowered with respect to work processes. The workforce deserves a better system (Higgins, 2017, p. np).

Based upon the emphasis placed by DOD leadership, as noted in their associated quotes in Chapters 1 and 2, need for a quicker, more cost-efficient acquisition timeline is amplified and drives the purpose of this research paper. The researcher will provide a literature review of the associated documents and processes that impact the DOD AAF and Army MWO efforts. This research will result in a synopsis for all documents for compare and contrast process timelines efforts for the application of tailored acquisition approaches of the AAF and the MWO process for SOS. Additionally, this chapter will help determine process optimization points and develop a list of change recommendations to reduce the overall acquisition timeline. The first two objectives noted in the Chapter 1 introduction will be researched and supporting literature will be provided in this chapter.

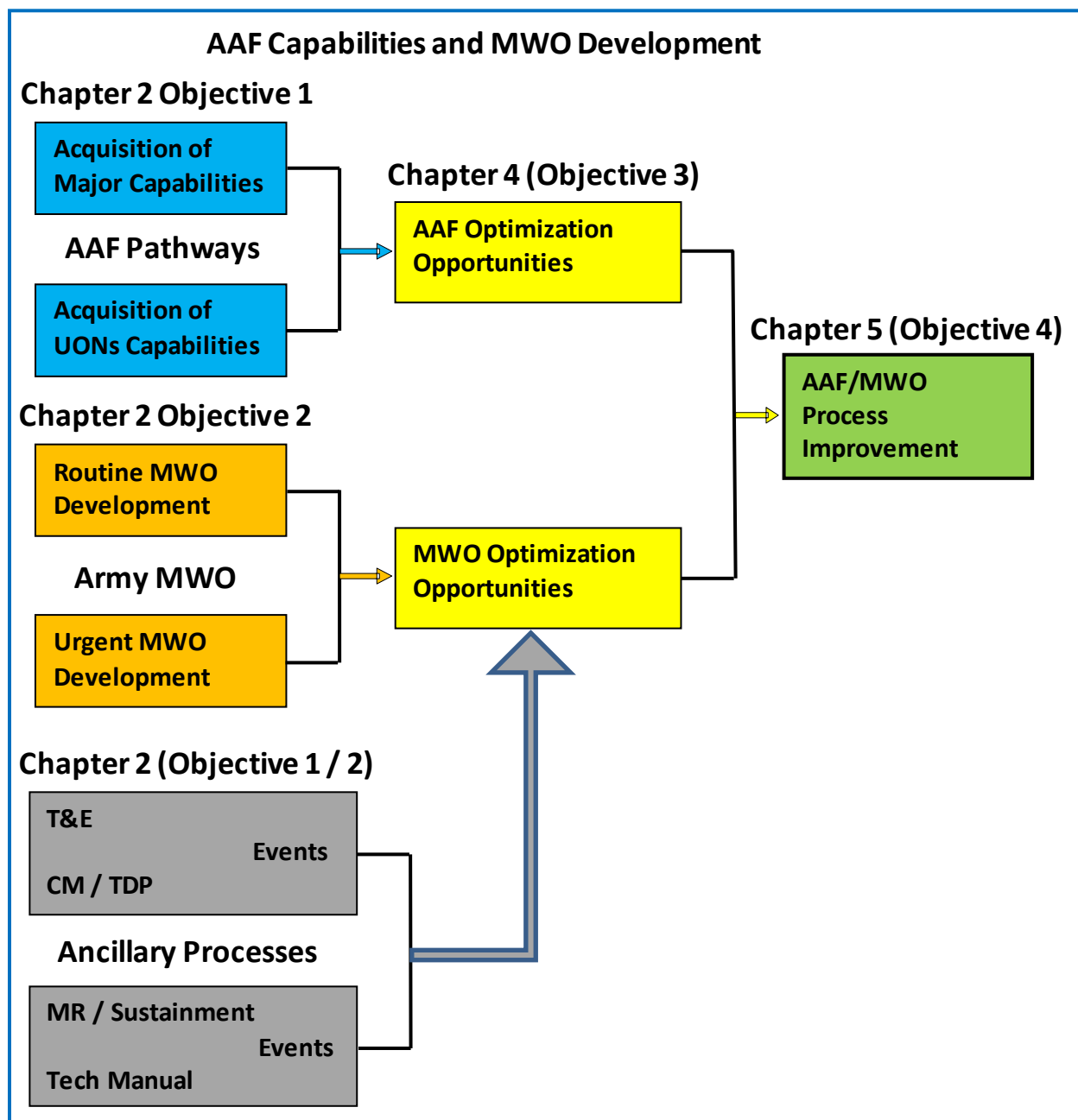
The first objective of this comparative research paper will look into statutory and regulatory requirements of both the AAF and MWO integration processes, as applied to SOS, applications for Army rotary-wing aircraft, both from the MCA and UCA aspects. In this section of Chapter 2, the researcher will detail some of the notable activities that are common to both the MCA and UCA acquisition pathways. This section of the research paper will also denote the MCA steps that are omitted from the UCA pathway. As these commonalities and differences are noted in Chapter 2, a ground work for findings and recommendations will be detailed in Chapters 4 and 5 respectively.

The second objective of this research paper will also complete a comparative research analysis with regards to the Routine MWO and Urgent MWO application approaches in this section of Chapter 2. The research paper will detail notable activities that are common to both the

Routine and Urgent MWO V&V processes. This section of the research paper will denote the Routine MWO V&V process steps that are omitted from the Urgent MWO process.

Figure 2

Research Paper Review, Findings, and Recommendations Framework



Again, as noted for the AAF pathways, the Routine and Urgent MWO process commonalities and differences noted in Chapter 2 lays a ground work for findings and recommendations. The review and literature analysis will be completed by application of the research methodology detailed in Chapter 3. The research paper findings and recommendations will be detailed in Chapters 4 and 5 respectively.

Statement of Purpose

The purpose of this study is to explore how the AAF and MWO development processes supports timeline optimization for the U.S. Army rotary-wing platforms. In an effort to get to the research literature, the findings that require development and any recommendation outflow needed to develop this paper, research questions must be developed to support the overarching research paper theme. The supporting research questions for this paper are outlined below and will be detailed and correlated to the main research paper topic in Chapter 3 of this paper. The research questions below were developed to support the literature review framework contained later in this chapter, as well as the findings and recommendations documented in Chapters 4 and 5 respectively.

Research Questions

Question 1: What are the AAF timeline optimization opportunities?

Question 2: What are the MWO timeline optimization opportunities?

Question 3: What process improvements can be achieved by taking advantage of AAF and MWO timeline optimization opportunities?

Major Topics in the Literature Review

This research paper used 45 relevant, fundamental instructions, regulations, policies, briefings, standards, handbooks, and preferences in the primary literature review. The following

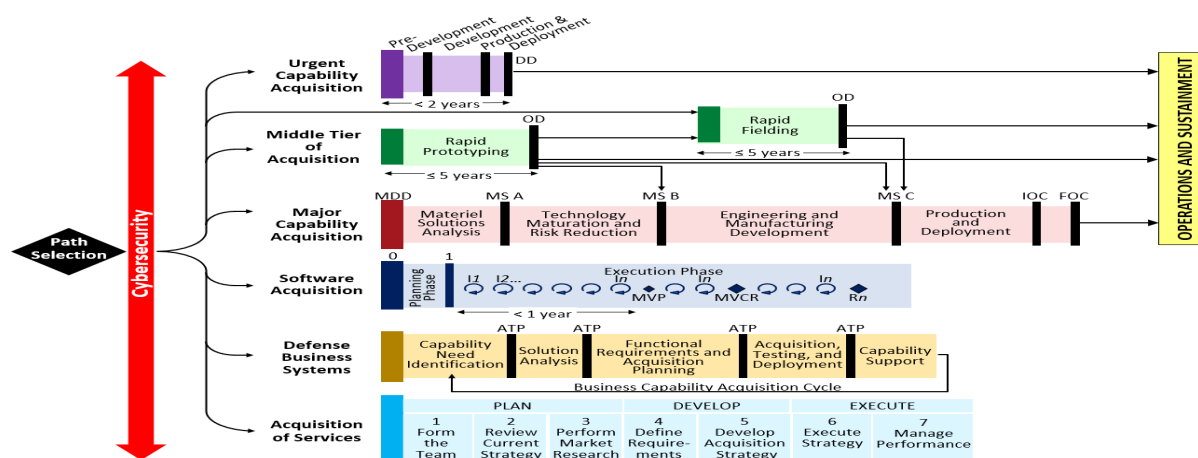
paragraphs provides the essential literature review details as grouped by the DOD AAF, Army MWO, ancillary processes, as well as, optimization opportunities. This paragraph also provides a literature review listing, the listed document purpose, researcher synopsis of the document, and the document focus area that applies to the conducted research within this paper. To support the inquisitive reviewer, experienced practitioner, and the future efforts researchers, the complete list of primary documents reviewed for Chapter 2 is listed in Appendix B. The 525 supporting and related documents may be found in the tables for each primary document in Appendix C.

Adaptive Acquisition Framework Process Review

The literature review supporting the research data compiled for the analysis of the AAF Processes aligned to AAF Pathway One, UCA, and Pathway Three, MCA as illustrated in Figure 3 (Department of Defense, 2020, p. 9) is contained in DODI 5000.81, *Operation of Urgent Capability Acquisition* and DODI 5000.85, *Major Capability Acquisition*, respectively. These newly minted instructions supplement the overarching pathway guidance as established in DODI 5000.02, AAF.

Figure 3

Adaptive Acquisition Framework

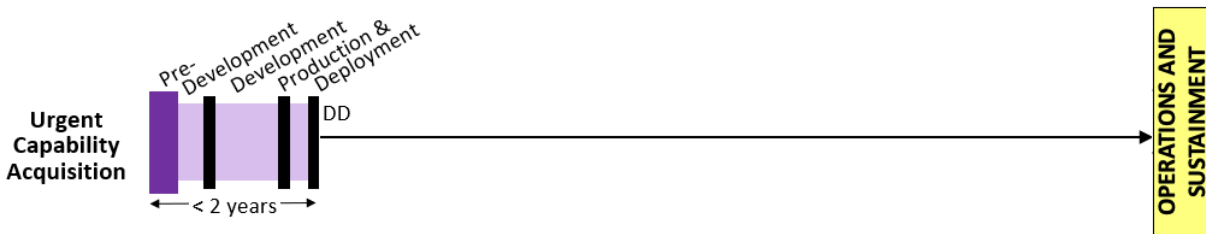


Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 9

This literature review will correlate pathway 1 and 3 timelines, processes, and requirements to execute acquisition within that prescribed pathway. In Chapter 4, the research paper will develop analysis and compare areas of general similarities and contrast areas of difference. The area of focus for this research is within the areas of contrast, as those areas of contrast will produce, if any viable, optimization opportunities that will be outlined to implement in Chapter 5. For an initial look at the high comparison Pathway 1, Figure 4 (Department of Defense, 2020, p. 11), of the DOD AAF outlines the general linear path for UCA and Pathway three, Figure 5 (Department of Defense, 2020, p. 13), for MCA execution. Further analysis and timeline breakdown will be detailed for this area under research question 1 in Chapter 4.

Figure 4

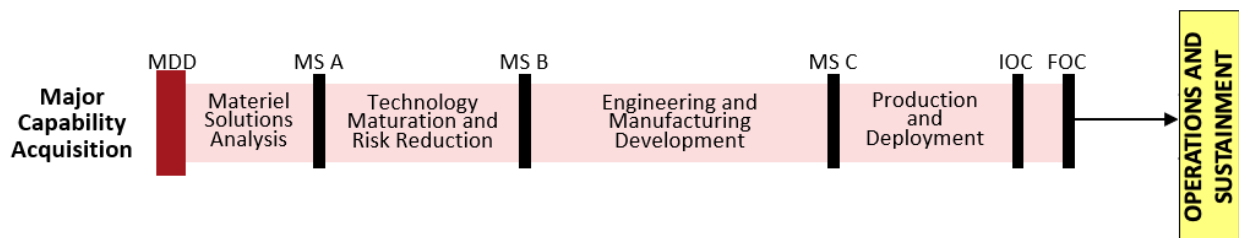
Urgent Capabilities Timeline



Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 11

Figure 5

Major Capability Acquisition Timeline



Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 13

This paragraph's literature review involved the in depth study of 13 primary review documents. The articles are documents 4, 14, 15, 19, 21, 24 - 28, 30, 37, and 45, contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles listed in their associative table in Appendix C. The literature review of the noted documents included influences, processes, and constraints that were applied to or affected the execution of pathways 1 and 3 of the AAF. This section of review and its correlating analysis included the two previous editions of DODI 5000.02 in order to understand the evolutionary events resulting in the current DODI 5000.02 and the AAF architecture. The details of the purpose and primary review areas for the noted documents supporting this area of the research paper are listed in subsequent paragraphs of this chapter. Table 1 (Department of Defense, 2020, p. 4) contains the cross relational changes invoked by DODI 5000.02 AAF as viewed from DODI 5000.02T. In Table 1 (Department of Defense, 2020, p. 4) the transition of old requirements is contained in the left column and the new documents supporting DODI 500.002 AAF is listed in the right. The significance of the table shows how the old requirements in the original DODI 5000.02 and DOD I 5000.02T have migrated and grown into a series of DODIs supporting expansion on the requirements under the AAF. This is important, as the core supporting data has now been dispersed, making it more of a challenge to ensure alignment with requirements for acquisition under the AAF. The newly minted DODI 5000.85 has been developed and released, which supplements DODI 5000.02 for Pathway 3, for MCAs. Summarily for MCAs DODI 5000.02, AAF, and DODI 5000.85 established the timeline for MCA execution. However, the other noted documents apply to this execution as well, through either a primary or secondary means of impact, may affect the overall execution timeline for MCAs. As noted earlier, both similarities and

differences will be noted in more detail in Chapter 4, with the research focus pointed to the contrast portion of the analysis for recommendations in Chapter 5.

Table 1

Relationship of DODI 5000.02 and New Policy

DoDI 5000.02T, Operation of the Defense Acquisition System	Associated New Policy (Issuances with Lettered the Extensions in Development)
Core Acquisition Policy (Paragraph 6, Procedures)	DODI 5000.85, “Major Capability Acquisition”
Enclosure 1. Acquisition Program Categories and Compliance Requirements -- Information Requirements Tables on the AAF website	• DODI 5000.85, “Major Capability Acquisition” • Tables authorized by DoDI 5000.85 will be posted on the AAF website
Enclosure 3. Systems Engineering	DODI 5000.88, “Engineering of Defense Systems”
• Enclosure 4. Developmental Test and Evaluation (DT&E) • Enclosure 5. Operational and Live Fire Test and Evaluation (OT&E and LFT&E)	DODI 5000.89, “Test and Evaluation (T&E)”
Enclosure 6. Life-Cycle Sustainment	DODI 5000.85, “Major Capability Acquisition”
Enclosure 7. Human Systems Integration (HSI)	DODI 5000.XX “Human Systems Integration (HSI) in Defense Acquisition”
Enclosure 8. Affordability Analysis and Investment Constraints	Replaced by direction in Section 807 of Public Law 114-328
Enclosure 9. Analysis of Alternatives (AOA)	Necessary information is in DODD 5105.84 and the Defense Acquisition Guidance. Removal of this enclosure is in progress.
Enclosure 10. Cost Estimating and Reporting	Necessary guidance is available in DODI 5000.73, “Cost Analysis Guidance and Procedures.” Removal of this enclosure is in progress.
Enclosure 11. Requirements Applicable to All Programs Containing Information Technology (IT)	DoDI 5000.82, “Acquisition of Information Technology”
Enclosure 13. Urgent Capability Acquisition DODI	5000.81, “Urgent Capability Acquisition”
Enclosure 14. Cybersecurity in the Defense Acquisition System	• Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) DoDI 5000.CS,

Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 4

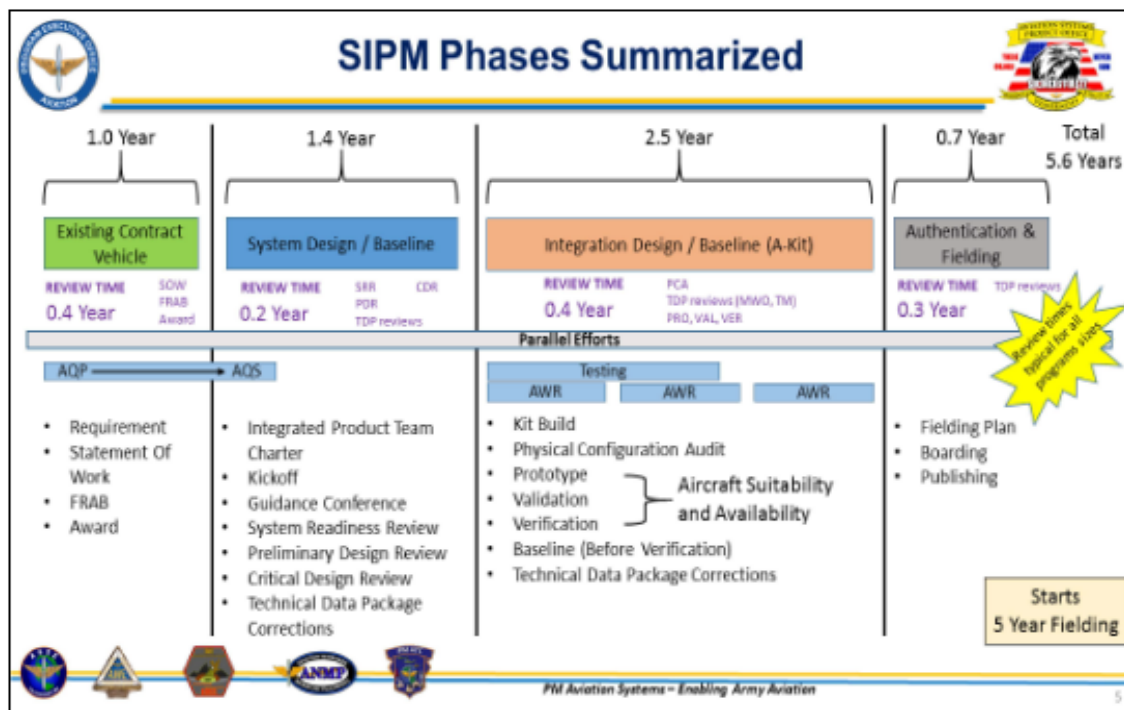
Modification Work Order Process Review

The literature review supporting the research data compiled for the analysis of the Army MWO Development, aligned to the Routine and Urgent development requirements, as well as Full and conditional MWO releases are listed in AR 750-10. This review also looked at MWO development processes for standard and abbreviated MWO development processes in Military Preference (MIL-PRF)-63002M. This literature review will correlate the noted Routine and Urgent

MWO and Full and Conditional Materiel Release (MR) timelines, processes, and requirements to look, from an analytical standpoint, at opportunities for optimization. In Chapter 4, opportunities for implementation of some the streamlined processes in the urgent MWO development and Conditional MWO release processes into the more formal full MWO efforts will be detailed and analyzed. The MWO process checklist is provided in Table 2 (Department of the Army, 2019, p. 23) to show the bounds of the efforts required to authenticate a MWO and ties in the ancillary processes that are covered in the next section of the literature review. In addition, this chapter reviewed the MWO and ancillary supporting activities timelines as noted Figure 7 (AS PO, 2019, p. np) to show the comparative impacts of the entire group of activities required, under AR 750-10 for MWO authentication.

Figure 6

Systems Integration Process Map (SIPM) Summarized



Note: Adapted from "Systems Integrated Process Map Briefing", 2016, p. 5.

The purpose of the review of the documents noted in this area are to execute the same compare and contrast methodology used for Pathway one and three execution under AAF for the routine, urgent, and abbreviated MWO processes listed in AR 750-10. Table 2 (Department of the Army, 2019, p. 23) details the activities that are actioned out of AR 750-10. Many of the areas noted in Table 2 (Department of the Army, 2019, p. 23) are secondary supporting activities that are bound to the MWO process by AR 750-10 and therefore must be considered in the execution of analysis for Question 2 of this research paper. These secondary items will be detailed in the next section of this chapter.

Table 2*MWO Authentication Checklist*

Validation / Verification	
1	Where was the verification site located?
2	Where was the validation site located?
3	Who were the personnel involved in the verification/validation?
4	Has coordination been accomplished with the Life Cycle Management Command (LCMC) materiel release office to determine if the provisions of materiel release apply?
Technical Data Availability Have the following been developed, approved, and are available?	
1	A Maintenance Allocation Chart (MAC)
2	Final MWO
3	Verified Technical Manual (TM)
4	A Depot Maintenance Work Record (DMWR)
5	A Repairs, Parts, and Special Tools List (RPSTL).
6	A Provisioning Master Record (PMR)
7	A Support List Allowance Card (SLAC), or Additional Stock List (ASL), or Shop Stock
8	Software
Support and Test, Measurement, and Diagnostic Equipment (TMDE) Have the following support items been developed, approved, or are otherwise available?	
1	Spares
2	A Test Program Set (TPS)
3	A Test, Measuring, Diagnostic Equipment (TMDE)

Note: From AR 750-10 – “Army Modification Program”, 2019, p. 23

Table 2 (Continued)*MWO Authentication Checklist*

4	Special Tools
5	Kits
6	Management Documents
7	A DA Form 7591
Training and Training Devices Is training required to instruct operators and maintainers on the modified equipment or weapon system? If so, have the following items been identified or scheduled?	
1	Training Required
2	A New Equipment Training (NET) team scheduled
3	Publication Required
4	Equipment and weapon systems available
Safety Has the following been addressed?	
1	Planned or completed corrections of any safety deficiencies
2	Communicating the updated residual risk to the user per DA Pam 385-16
3	Updating the item's Hazard Tracking System (HTS)
4	Providing the required safety documentation per AR 700-142 to support follow-on materiel release actions
5	Updating elements of the demilitarization/disposal plan
Environmental Have environmental issues been analyzed and satisfied (for example, creation of hazardous waste, demilitarization, disposal, and so forth)?	
Test and Evaluation (T&E) Did the MWO successfully pass quality assurance specifications and checks, acceptance test, and interoperability certification?	
Release Statements Are there any actions, concerns, or conditions that would prohibit the full release of the MWO for application? If so, would a conditional release be possible?	
1	Full—no conditions
2	Conditional—list all actions that must be completed before release approval is granted.

Note: From AR 750-10 – “Army Modification Program”, 2019, p. 23

This paragraph's literature review involved the in depth study of 13 primary review documents. The articles are documents 1 - 3, 9, 11 - 14, 19, 37, 39, 44, and 45, contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles

listed in their associative table in Appendix C. The literature review of the noted documents included influences, processes, and constraints that were applied to or affected the execution of MWO development and release efforts. The details of the purpose and primary review areas for the noted documents supporting this area of the research paper are listed in subsequent paragraphs of this chapter. This area will again use the other noted documents that either primarily or secondarily impact the MWO process to detail the contrast aspects of these MWO efforts in Chapter 4. In Chapter 5, this research paper will detail any recommendation that are fruition of the analysis in Chapter 4.

Ancillary Supporting Activities Process Review

The literature review supporting the research data compiled for the analysis for the four ancillary areas of T&E, Configuration Management (CM) and Technical Data Packages (TDP), MR and Sustainment, and TM activities are detailed in the literature review. The review and analysis of the four ancillary areas is justified based upon the significant impact on MWO development and authentication processes, as well as, resultant impacts the timelines included in the AAF. Of note, the four developed supporting bucket areas included in this research paper are developed by the researcher based upon similarity of the eight different ancillary areas in the noted document review, which contain at least 13 separate supporting actions to get an authenticated MWO.

The ancillary areas were divided into the noted four areas to group similar parallel activities to support a reduction in the overall length of this research paper. The four ancillary areas noted below will include a list of applicable documents that literature review was completed for the development of analytical findings that will be detailed in Chapter 4. Again, these areas are considered as they have a secondary impact to the execution of both the MWO and AAF processes.

The area of focus for this research paper is on the contrast areas in order to support optimization opportunities that will be articulated in Chapter 5. For this area, when we note areas of contrast, it also includes areas where linear activities are executed in the AAF acquisition and MWO integration.

Figure 7

Systems Integration Process Map (SIPM) Process Chart

Platform OGP Software (continued) Finalize E3 Test Plan (continued)				VAL Plan (MWO, TM) AR 25-30 Testing, Aircraft (E3, Noise Floor, Source Vitem, etc.)				VER Plan Flight Test (if Required)			
AWR (Test)				ECP				AWR			
CDR	TDP Corrections	Prototype Kit Build	PCA	Prototype (MWO & TM)	TDP Corrections	Validation Document Review	Validation Kit Build	PCA (Delta)	Validation (MWO & TM)	TDP Corrections	Verification Document Review
2	30	90	21	90	180	45	90	14	75	60	45
			21			45		14			45
IEEE 15288.2			AR 70-62					AR 70-62			
CTR / OGA, MATDEV, AED, Platform, NETT, ALC, CM (Platform & PM), CECOM, PM Property team	CTR / OGA	CTR / OGA	GE, CM, CTR / OGA, Platform, AED (POC, Mass Properties, Human Factors), NETT, CECOM Property team	CTR / OGA, MATDEV, ALC, Platform, AED (POC, Mass Properties, Human Factors), NETT, CECOM	CTR / OGA, MATDEV, ALC	MATDEV, ALC, AED, CECOM, Platform	CTR / OGA, MATDEV	CTR / OGA, MATDEV, Packaging, AED	CTR / OGA, MATDEV, ALC, Platform, AED (Mass Properties), 128th AVN, CECOM	CTR / OGA, MATDEV	MATDEV, ALC, AED, CECOM
				Quality Cell Review		Quality Cell Review		Quality Cell Review			Quality Cell Review
* Ensure detailed design is adequate to proceed * Brief slides (Design, ELA, Thermal & Structural Analysis, Weight & Balance, Risk Assessment, Cost, etc.) * Identify long lead items * Initiate purchasing activities	* Complete action items & make changes * Identify long lead items	* Identify & order material * Manufacture parts, paint, prime, heat treat, anodize, conversion coat, etc. * PCA preparation * Identify kit packaging requirements & preferences	* Document processes * Provide a packaged & labeled A & B Kit * Remediate findings * Make certs, dwgs, & processes available for review * Provide test equipment & facilities * On-site processing of non-conformances * Schedule sub vendor audits as applicable	* Install, design, & change design as required * TM development (hands on) * Table-top review of TDP prior to aircraft release * Review / validate test documents * Provide install team * Provide on site corrections * Incorporate TN letter & AWR comments * Calculate WT & BAL * Deliver PROTO report	* Drawing red line into black lines * Write maintenance procedures, RPSTL, & troubleshooting * Finish MWO BOM to match FLIS & drawings * Perform internal QA reviews * Update remaining kits to match TDP * Prepare PPL	* Provide CM stamped data * Deliver completed TDP	* Manufacture parts, paint, prime, heat treat, anodize, conversion coat, etc. * Review purchasing requirements * Package & identify A & B Kits for shipment * Correct findings from Decision Point review	* Document processes * A & B Kit with PCA * Assist USG with PCA * Remediate findings * Make certifications, drawings, & processes available for review * Provide test equipment & facilities * Validate MWO, TMs, ensuring TDP matches * Conduct AAR / identify process improvements	* Support installation with technical writers, engineering * On-site corrections * Incorporate TN letter & AWR comments * Provide install team * Begin drawing baseline (On-site) * Validate MWO, TMs, ensuring TDP matches * Conduct AAR / identify process improvements	* Drawing, MWO, & TM red line into black lines * Update to latest ASME / standards * Update BOM to latest RNCC, nomenclature & CAGE * Deliver CM stamped TDP & ERR * Deliver VAL Report * Baseline drawings at revision A	* All documents reviewed in parallel AED, ALC * Real time changes
* MATDEV initiates preliminary platform ECP * Review exit criteria * Pass / Fail determination * Begin AWR tasker * Review IMS * Evaluate long lead items * Conduct refresher guidance conference * Discuss B-Kit delivery schedule & identify GFE * Discuss program dependencies (software, other PM GFE, etc.)	* Support CTR / OGA as required * Manage action items * Begin AWR tasker * Aircraft coordination with Platform * Identify aircraft tail numbers for PROTO	* Provide GFE * Provide lessons learned from previous events	* Audit GMS processes * Verify conformance to drawings * Provide PCA report upon completion * Apply lessons learned * Packaging approves A & B Kit containers * Evaluate property & packaging * Brief PM	* Witness & support TDP (including TMs) development * Table-top TDP prior to aircraft release * Review comments for Pass / Fail determination * AED (Mass Properties) support for weight & balance * PROTO NETT development * Brief PM	* Provide oversight & assistance * Identify component level of repair for TM * Identify aircraft tail numbers for VAL * AIMS 1102 dry run test & test for record	* Review comments & provide Pass / Fail determination * Identify Kit changes to determine scope of Delta PCA * Brief PM	* Provide GFE * Begin AWR tasker	* Delta PCA to audit new parts or parts of concern * Audit Processes & measure parts for conformance to approved TDP * Final Delta Test if required * Audit A & B Kit final packaging * Brief PM	* Provide fleet representative aircraft * Witness VAL * Request MWO number from ALC (AMCOM PTS) * Request MCN from AFMD * AED (Mass Properties) support weight & balance * Validate NETT * 128th AVN attend if available	* Ensure all CDRs are reviewed * Route TDP & VAL report to all via IPT	* Review & make Pass / Fail determination * 128th AVN review * Remediate comments * Finalize NETT * Submit Validated NETT to TSP * Brief PM * Ensure standards are baselined at the latest revision * Ensure BOM reflects latest RNCC, Nomenclature, & CAGEC * Final ECP * Identify aircraft tail numbers for VER
* Begin VIE for system level training * Must receive box level AIMS certification * Purchase IOT kits if req.	* Select fleet representative aircraft in flyable status	* Time is dependent on work loading & material lead time * Coordinate for test sets & assets	* Audit flat pattern & assemblies * Check items against CPL * Host Pre-PROTO coordination meeting 7-14D prior to event	* Longest event * Line by line review * Verify fleet representative aircraft in flyable status * Verify mounting hardware specified correctly (level of detail) * Coord. Logistics (tables, chairs, power, etc.) with unit	* Provide corrected TDP to Test team	* AED / PM reviews in parallel * Task AED for TDP review	* Time is dependent on work loading & material lead time * Send VAL Plan NLT 45D prior to VAL (ALC Approved)	* PCA items that changed from Pre-Proto PCA or new vendor items * Host Pre-VAL coordination meeting 7-14D prior to event	* Line by line of TM & MWO at aircraft * Plan for XML coding * Coordinate logistics (tables, chairs, power, etc.) with unit	* CTR / OGA can request second VAL if not ready for VER * Graphics files (CGM) delivered	* QE 30D review with 15D table-top comments
			Decision Point		Decision Point					Decision Point	

Note: Systems Integrated Process Map, 2019

Figure 7 (Continued)

Systems Integration Process Map (SIPM) Process Chart

MWO, TM) AR 25-30			PM Fielding Plan (QASM & LCMC coordination)					Risk		
Doc Update			LRIP Kit Build						Months (30 D)	Years
AWR			Fielding AWR (or full qualification)							
Verification Kit Build	PCA (Delta)	Provisioning Conference	Verification (MWO & TM)	TDP Corrections (Full Delivery)	PM Final Document Review	AED / ALC Final Document Review	Board Documentation	Fielding		
90	14	21	60	30	60	60	60		SIPM Total	68.4
									Risk MGMT Total	0.0
	14				60	60			Review	15.2
	AR 70-62						AR 750-10	AR 750-10	Pre Contract	12.4
CTR / OGA, MATDEV, AED	CTR / OGA, MATDEV, Packaging, AED	ALC, CTR / OGA, MATDEV, CECOM	ALC, MATDEV, AED, TRADOC, CECOM, AFMD, CM, Platform, 128th AVN	CTR / OGA, MATDEV	MATDEV, ALC, AED, Platform, TRADOC, CECOM, AFMD	AED, ALC, MATDEV, AFMD, Platform, TRADOC, CECOM	AFMD, AMCOM, ALC, MATDEV, CECOM	MATDEV, Install Team, CTR / OGA, QASM	Post Contract Award	56.0
	Quality Cell Review				Quality Cell Review					4.6
* Correct findings from Decision Point review * Finish drawing baseline (red to black)	* Document processes * A & B Kit * Assist USG with PCA * Remediate findings * Make certifications, drawings, & processes available for review * Provide test equipment & facilities	* Assist ALC * Assist CECOM * On-site corrections	* Support installation with technical writer(s), engineer(s), illustrator(s) * On-site corrections * Incorporate TN letter & AWR comments * Support Line by line review * Convert TDP to XML	* Full Delivery of TDP (MWO, TM, RPSTL, Drawings...) * Complete & deliver ECPs for post baseline changes * Deliver metadata, CGMs, XML, models, etc...	* Document delivery * Correct data if required			* Kit manufacture * Kit QDR / mishap support * Kit shipment		
* Provide GFE * Begin AWR Tasker	* Delta PCA to audit new parts or parts of concern * Audit Processes & measure parts for conformance to approved TDP * Final Delta Test if required * Audit A & B Kit packaging * Brief PM	* Provide direction & assistance for provision changes * Request final frequency authorization	* Provide install team (target audience) * Provide flyable / fleet representative aircraft * Verify TDP & provisioning * Coordinate soldiers for TM Ver * Verify & present NETT to Unit * Conduct AAR / Identify Process Improvements * Line by line review of TDP & XML page breaks	* Route & board ECPs * Ensure all documents are delivered * Ensure delivery of all CDRLs * Begin contract exit strategy / closeout * Deliver TDP to platform MATDEV * Verify file structure for TDP is mapped & identified	* Document reviews * Make Pass / Fail determination * Ensure all drawings & CDRLs are delivered * Remediate comments & corrections * Brief PM	* Document, Safety, & environmental review * Begin AWR tasker * Begin LRIP of kits * Provide AFMD a camera ready MWO	* Boarding documents (7591, 7592, AR 750-10 questionnaire) Field Plan, Safety, Environmental, AMCOM / LCMC letters * TDD submits DA Form 1217 for ALC authentication * Send MWO for signature & publication * Platform PM upload drawings (EDIS)	* Find & fund install teams * Complete in 5 years (AR750-10) * Track Installations * Unit NMIB & NETT * Ensure TMs get published * Track & ship kits * Process QDRs * Transition to sustainment * Follow up on SAQ / terminate AWR * Monitor & support 2028 changes * SME support		
* Follow on Kit SOW * TDP changes will be thru ECP process * Send VER plan NLT 60D prior to VER (Req. TRADOC & ALC approval)	* PCA items that changed from pre-PROTO PCA * PCA items from new suppliers	* Estimated at 30-45 parts per day * Host Pre-VER coordination meeting 7-14D prior to event * Must receive integration level AIMS cert. & freq. authorization	* Line by line review performed at event * Must use new installation team that has not seen MWO * XML Coding * Coordinate logistics (tables, chairs, power, etc.) with unit	* Consider contractor support extension * Submit for "Conditional MWO Release" if fielding must begin prior to authentication		* Follow-on kit production can be original CTR / OGA or second source	* Task AED for admin update to AWR for new revision * FORSCOM approval required for MWO fielding * Task AED to make TMs an AWR enclosure	* Routine MWO fielding shall be complete within 5 years (AR750-10)		

Note: Systems Integrated Process Map, 2019

The contrast areas of this research, with regards to the linear activities, are focused on how some, or all, of the supporting efforts may transition to parallel execution in the overall timeline. The area of contrast noted here supports the overall development of analysis for question three of this research paper.

To better help identify timelines for the MWO and its' ancillary process, Figure 7 (AS PO, 2019, p. np), above, has been provided to illustrate the SIPM timeline for all associated activities. It drives the detail of activities and projected completion times for those component activities as detailed in the four ancillary areas noted below. It also associates the linear and parallel aspects of the ancillary efforts as aligned to the MWO process.

Technical Manuals (TMs) Activities. TMs as the first the four major ancillary areas are tied to the overall AAF and MWO authentication efforts for Army. During the literature review, the researcher will document analysis in Chapter 4 as it pertains to TM V&V activities supporting the AAF and MWO authentication processes. TM V&V activities impact both the AAF and MWO process main lines of effort that support enduring the SOS capability solution meets MR and Sustainment package requirements.

This paragraph's literature review involved the in depth study of 6 primary review documents. Those were articles 3, 8, 38, 41, 42, and 43, contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles listed in their associative table in Appendix C during this research paper analysis and correlating impacts on the AAF and MWO processes will annotated in Chapter 4.

Configuration Management (CM) and Tech Data Package (TDP) Activities. CM and TDP, as the second of the four major ancillary areas is tied to the overall AAF and MWO

authentication efforts for Army. To help bracket the research for these areas, definitions for both CM and TDP would be helpful. First CM, “A management process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design and operational information throughout its life” (DAU, 2022). The TDP definition used for this research was:

The authoritative technical description of an item. This technical description supports the acquisition, production, inspection, engineering, and logistics support of the item. The description defines the required design configuration and/or performance requirements, and procedures required to ensure adequacy of item performance. It consists of applicable technical data such as models, engineering design data, associated lists, specifications, standards, performance requirements, quality assurance provisions, software documentation and packaging details (DAU, 2022).

The researcher will document analysis in Chapter 4 as it pertains to CM and TDP activities supporting the AAF and MWO authentication processes (Department of the Army, 2019, p. 9). CM and TDP activities impact both the AAF and MWO processes because they are the main line of effort that support an enduring SOS capability meeting Technical Data and Document CM requirements (Department of the Army, 2019, p. 9). This paragraph’s literature review involved the in-depth study of 2 primary review documents. Those were articles 36 and 40, contained in Appendix B. It also involved the cursory review of related and supporting documents for the noted articles listed in Appendix B, noted in Appendix C, during the completion research paper. The analysis and correlating impacts on the AAF and MWO processes will annotated in Chapter 4.

The review conducted under this ancillary area demonstrated the detailed process of TDP development and reviews. This cumulative timeline runs intermittently with the overall MWO

process and has 1.2 years of effort to complete the TDP acceptance (Department of Defense, 2009, p. 15). This is attested to in Figure 7 (AS PO, 2019, p. np) SIPM Map for Product Integration. As to CM, it overlays the TDP process to ensure versioning management is adhered to in completion, acceptance, and management of the TDP that supports the SOS integration effort (Department of Defense, 2020, p. 11).

Test and Evaluation (T&E) Activities. T&E, as the third of the four major ancillary areas is tied to the overall AAF and MWO authentication efforts for Army. The researcher will document analysis in Chapter 4 as it pertains to T&E activities supporting the AAF and MWO authentication processes. T&E activities impact both the AAF and MWO process main lines of effort that support enduring the SOS capability solution meets survivability, suitability and sustainability requirements. Additionally, from an Army Aviation perspective, this is critical based upon the catastrophic impacts for failure realization (Department of the Army, 2020, p. 5).

This paragraph's literature review involved the in depth study of 6 primary review documents. The articles are documents 5, 6, 16, 20, 23, and 35, contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles is listed in their correlating table in Appendix C. The research paper analysis and correlating impacts on the AAF and MWO processes will annotated in Chapter 4. The review conducted under this ancillary area demonstrated the detailed process of T&E planning and execution. The T&E area for MWO completion is but a small portion of the overall T&E requirements for DOD system acquisition. As such, the cumulative timeline for T&E runs intermittently with the overall MWO process and requires 0.7 years of effort to complete the T&E activities (Department of the Army, 2018, p. 1) and 0.6 years for Airworthiness Qualification to support the MWO authentication (Department of

the Army, 2016, p. 5). This is attested to in Figure 7 (AS PO, 2019, p. np) SIPM Map for Product Integration.

Materiel Release (MR) and Sustainment Activities. MR and Sustainment as the last of the four major ancillary areas is tied to the overall AAF and MWO authentication efforts for Army. The researcher will document analysis in Chapter 4 as it pertains to MR and Sustainment activities supporting the AAF and MWO authentication processes. MR and Sustainment activities impact both the AAF and MWO process main lines of effort that support enduring the SOS capability solution meets MR (Department of the Army, 2021, p. 6) and Sustainment (Department of the Army, 2018, p. 50) package requirements.

This paragraph's literature review involved the in depth study of 6 primary review documents. The articles are 7, 8, 10, 17, and 18, in Appendix B. It also involved the scan of related and supporting documents for the noted articles listed in their associative table in Appendix C during this research paper analysis and correlating impacts on the AAF and MWO processes will annotated in Chapter 4. The review conducted under this ancillary area demonstrated the detailed process of MR use and Sustainment planning and execution.

The MR area for MWO completion is but a small portion of the overall Sustainment requirements for DOD system acquisition. As such, the cumulative timeline for MR runs intermittently with the overall MWO process and outlines 0.7 years of effort to complete the MR (Department of the Army, 2021, p. 6).

The Sustainment area for MWO completion has large band of activities that impact MWO authentication for DOD system acquisition. "As such, the cumulative timeline for Sustainment activities runs intermittently with the overall MWO process and outlines 1.7 years of effort to

complete the Sustainment package approval” (Department of the Army, 2018, p. 50). This is attested to in Figure 7 (AS PO, 2019, p. np) SIPM Map for Product Integration.

Literature Review Documents

Army Aviation Modification Work Orders (MWOs): Typical Process Required to Efficiently Implement, 24 October 2017. This research paper details the intended MWO processes for normal acquisition of system integration hardware (A-Kit) development onto host Army Aviation platforms. For the purpose of this research paper the focus will be on Mr. Sweeny’s MWO Paper analysis, findings, and recommendations.

Mr. Sweeny defined the focus of his paper as follows:

The intent of this research is to outline an MWO process enabling less experienced personnel to successfully plan, customize, and implement required integration tasks by utilizing a set of recognized procedures typically required to integrate new systems onto existing platforms. Integration processes are currently not a part of the formal acquisition process, nor taught through formal training. Aviation organizations usually rely upon historical knowledge passed amongst transitional personnel to successfully integrate new capabilities on platforms. The absence of a vetted, documented process can cause inefficient variation, with program execution consequences, resulting in protracted delays in getting cutting-edge capabilities fielded to the Warfighter (Sweeny, 2017, p. 16).

Army Equipment Modernization Strategy: Equipping the Total Force to Win in a Complex World, 27 March 2015. Though rather dated, the reality noted in this document remains valid in today’s acquisition and fiscal environments. The word "reality" is used in this document: "Thus, as potential adversaries modernize at a significant rate, our technology development and system designs must accommodate this reality” (DTIC, 2015, p. np). This document is used to

support this research paper by validating the need to optimize AAF and MWO processes to reduce fiscal procurement requirements and accelerate deployment of critical modernizations solutions.

“The Army Equipment Modernization Strategy nests with the Army Strategic Planning Guidance (ASPG) and the U.S. Army Operating Concept by incorporating its framework for building the “future force” (Office of the Deputy Chief of Staff, G-8, Future Force Development (FDF), 2015, p. 6). “This document describes the material capabilities required to retain the U.S. Army’s differential advantage over enemies” (Sweeny, 2017, p. 15). The strategy further acknowledges the Army, “cannot afford to equip and sustain the Total Army with the most modern equipment; therefore, we must acknowledge fiscal realities and we will selectively modernize equipment and formations’ (Office of the Deputy Chief of Staff, G-8, Future Force Development (FDF), 2015, p. 7).

Army Materiel Command (AMC) Pamphlet (PAM) 25-31, Preparation of Plans for Technical Publications, 27 March 2015. This research paper will use the AMC PAM 25-31 source to show the elongated publications process for SOS integration applications. This will help identify analysis and findings that will support recommendations to streamline and optimize the parallel technical publications process as aligned to the overall SOS AAF and MWO processes.

This AMC PAM is now obsolete, however from a procedural stand point provides great insight into Technical Publications development, verification and validation. This insight is used in the research paper as it impacted a heavily referenced, research paper. Also, this document still procedurally impacts the TM V&V operations within the Aviation community.

In 2013, the Army Materiel Command published this guidance to support Army personnel or employees with the verification of technical publications. The pamphlet provides a roadmap to personnel on how to perform a technical publication verification. Verified

publications are a requirement for an authenticated MWO (Department of the Army, 2013, p. 1).

AR 70-1, Army Acquisition Policy, 10 August 2018. AR 70-1 summarily describes the processes by which the U.S. Army will conform to Statutory and Regulatory requirements that are imposed from DODI 5000 series and Title 10 laws (Department of the Army, 2018, p. 1). Chapter 1 (p. 1) lists the introduction and sets the stage for AR 70-1 alignment to higher agency policies and U.S. Statutes. Chapters 2 through 15 (p. 11 – p. 25) detail regulatory structures for support processes for Army acquisition. These structural details span from the overall programmatic management to the supporting technical function requirements. For the purposes of this research, this paper will focus on Chapters 3 (Program Management), 4 (Systems Engineering), 5 (Development T&E (DT&E)), 7 (Life-Cycle Sustainment), 13 (Urgent Capability Acquisition), and 15 (Urgent Conditions Applicable to Army Acquisition) (Department of the Army, 2018, p. np). This AR is procedurally supported by Department of the Army (DA) PAM 70-3, *Army Acquisition Procedures*, which will be detailed in a later review section.

This regulation states the purpose as:

This regulation establishes policy, assigns responsibilities, and reflects the Army's implementation of DODD 5000.01 and DODI 5000.02 for Army-managed acquisition programs. This includes Major Defense Acquisition Programs (MDAPs) that have been identified as Defense Business Systems (DBS) by the Chief Management Officer (CMO) in accordance with DODI 5000.75. If requirements contained in this publication conflict with later issuances or revisions of statutes and mandatory DOD policies, the proponent will direct expeditious development and implementation of interim policy that will be

incorporated in this publication's next revision in accordance with AR 25–30 and DA Pam 25–40 (Department of the Army, 2018, p. 1).

By policy, “Army personnel involved in the acquisition process will apply the overarching management principles and mandatory policies that govern the Defense Acquisition System (DAS) described in DODD 5000.01 and DODI 5000.02 to all Army-managed acquisition programs” (Department of the Army, 2018, p. 5).

AR 70-62, Airworthiness of Aircraft Systems, 11 May 2016. In the context of supporting this paper's research, AR 70-62 provides an introduction to Air Worthiness Release (AWR) qualification in Chapter 1 (p. 1) and expounds on the Air Worthiness (AW) process in Chapter 2 (p. 2). In Chapter 3 (Pg 11) the (AW) documentation requirements are documented. For the purposes of this research paper, the focus is on Chapters 2 (Airworthiness Process) and 3 (Airworthiness Documentation) (Department of the Army, 2016, p. np). The policy requirements detailed in this AR are also supported by execution details in this document, as there is no supporting DA Pam for airworthiness qualification for the U.S. Army.

This regulation states the purpose as:

This regulation prescribes policies, responsibilities, processes, and procedures for life cycle AW (design, production, and continued) of manned and unmanned aircraft systems and subsystems, including the installation of allied equipment and modifications to Army aircraft. This regulation implements DODD 5030.61. Army aircraft as used herein includes all aviation materiel and aircraft that is Army assigned, bailed, borrowed, loaned, leased, owned, or otherwise authorized for operation by Army personnel, or after modification under an Army contract (Department of the Army, 2016, p. 1).

In short this regulation details the U.S. AWR Qualification process. The AWR regulation is applicable to, “Army aviators, unmanned aircraft system operators, other aircrew and passengers, to include contractors performing under an Army contract, will operate or fly aboard aircraft in the performance of official duties only if there is an Army AWR or other Army recognized airworthiness approval” (Department of the Army, 2016, p. 2).

AR 73-1, Test and Evaluation Policy, 08 June 2018. AR 73-1 describes the processes by which the U.S. Army will enact T&E policy to support system acquisition and development. Chapter 1 (p. 1) lists the introduction and sets the stage for AR 73-1 alignment with T&E execution policy and Chapter 2 (p. 6) details responsibilities for T&E execution in support of system acquisition. Chapters 3 through 11 (p. 18 – p. 57) detail regulatory structures for support processes for Army T&E. These structural details span both development and operational T&E requirements. For the purposes of this research paper, the focus on Chapters 3 (T&E Support of Acquisition), 4 (Developmental Testing (DT)), 5 (Operational Test (OT)), 6 (System Evaluation), and 7 (Other Test and Evaluation Considerations) (Department of the Army, 2018, p. np). This AR is procedurally supported by DA PAM 73-1 which will be detailed in a later review section.

This regulation states the purpose as:

This regulation implements the policies and procedures of DODD 5000.01, DODD 3200.11, DODI 5000.02, DODI 5134.17, and Joint Capabilities Integration and Development System (JCIDS) Manual by specifically prescribing implementing policies and assigning responsibilities for T&E activities performed within the Army acquisition system. It applies to all systems developed, evolved, acquired, and managed under the auspices of AR 70-series and DODI 5000.02. This regulation applies to Army participation in Multi-Service Operational Test and Evaluation (MOT&E) and Joint Test and Evaluation

(JT&E). It also provides guidance and establishes procedures governing the Test and Evaluation Managers Committee (TEMAC) and the Test Schedule and Review Committee (TSARC) which are continuing intra-departmental Army committees. Programs with the additional designation of MDAP and Major Automated Information System (MAIS) carry the greatest consequences in terms of T&E reporting requirements, documentation, and analysis to support program acquisition decisions (Department of the Army, 2018, p. 1).

AR 700-18, Provisioning of Army Equipment, 29 August 2020. This regulation states the purpose as:

This regulation prescribes the basic principles, objectives, policies, and responsibilities for provisioning Army systems and EIs. This regulation provides guidance for planning, managing, executing, and evaluating provisioning programs within the framework of the acquisition process and IPS techniques; acquiring and using Provisioning Technical Documentation (PTD) and Engineering Data for Provisioning (EDFP); provisioning actions associated with the provisioning decision process—that is, selecting, coding, computing, cataloging, procuring, and distributing of support items and spare and repair parts” (Department of the Army, 2020, p. 1).

AR 750-10, Army Modification Program, 23 October 2019. AR 750-10 describes the processes by which the U.S. Army modifies its equipment and the support documentation required to authenticate the process. Chapter 1 (p. 1) introduces references, forms, responsibilities, objectives, requirements and exceptions to policy for modifying Army equipment. Chapters 2 through 6 (p. 3 – p. 16) detail regulatory structures for support processes for Army equipment modification. These structural details span standard Army processes, as well as, Multi-Service and Foreign Military Sales (FMS) modification requirements. For the purposes of this research paper

the focus will be on Chapters 2 (Responsibilities), 3 (Modification Program), and 4 (Modification Process) (Department of the Army, 2019, p. np) . The policy requirements detailed in this AR is also supported by execution details in this document, as there is no supporting DA PAM for the Army modification process.

This regulation states the purpose as, “This regulation provides a disciplined approach on how to plan, authorize, implement, track, and control hardware and software modifications made to Army materiel and Army-managed materiel used by other Services” (Department of the Army, 2019, p. 1).

AR 700-127, Integrated Product Support (IPS), 22 October 2018. AR 700-127 describes the processes by which the U.S. Army will enact integrated product support packaging for system acquisition and development. Chapter 1 (p. 1) generalizes references, forms, responsibilities, objectives, requirements and exceptions to policy for provisioning Army equipment. Chapters 2 through 12 (p. 7 – p. 37) detail the framework and execution processes for product support of Army acquisitions. For the purposes of this research paper, the focus is on Chapters 2 (Framework), 3 (IPS and Acquisition Framework), 4 (Product Support Management), and 13 (IPS Program Reviews and Reporting) (Department of the Army, 2018, p. np) . This AR is procedurally supported by DA PAM 700-127 which will be detailed in a later review section.

This regulation states the purpose as:

This regulation prescribes the DA policy for implementing performance-based life cycle product support, including performance-based logistics, through the Army’s IPS Program. The IPS Program includes planning, developing, acquiring, and sustaining well-defined, affordable Performance-Based Product Support Strategies (PBPSSs) that meet the Soldier’s requirements for Army materiel and software throughout their life cycle. Additional guidance for

implementing this policy is provided in DA PAM 700–127 and must be used in conjunction with this regulation. The policy implements PBPSS requirements; defines the process that the MATDEV will use to develop and integrate a PBPSS with the systems engineering process; identifies the framework (twelve IPS elements) that will be used to develop the PBPSS; assigns responsibilities for developing and implementing PBPSSs for Army materiel and software; and requires MATDEVs to implement metrics to measure product support performance. DA Pam 700–127 provides implementing guidance for this regulation. This policy does not apply to business information technology systems developed and supported under the Business Capability Life-Cycle or associated processes (Department of the Army, 2018, p. 1).

AR 770-3, Type Classification and Materiel Release, 16 July 2021. AR 770-3 summarily describes the processes by which the U.S. Army will enact Type Classification (TC) and MR processes for Army capability acquisition and development. Chapter 1 (p. 1) generalizes references, forms, responsibilities, objectives, requirements and exceptions to policy for provisioning Army equipment. Chapters 2 and 3 (p. 5 – p. 10) detail the framework and execution processes for type classification and materiel release activities to support Army acquisition efforts. For the purposes of this research paper, the focus will be on Chapters 2 (Type Classification) and 3 (Materiel Release) (Department of the Army, 2021, p. np). This AR is procedurally supported by DA PAM 770-3 which will be detailed in a later review section. This regulation states the purpose as, “This regulation prescribes responsibilities and policy for TC and MR” (Department of the Army, 2021, p. 1)

Aviation Mission Equipment (AME) SIPM, 09 May 2017. This document was included in the review literature to provide a timeline basis for future optimization opportunities within the standard MWO process as viewed against accelerated MWO efforts and the overall AAF timeline.

It is included in this research paper to document the Program Executive Office (PEO)-Aviation methodology used when executing SOS integration on Army rotary-wing platforms.

This AME Project Office (PO) document was the result of the 2017 Sweeney Senior Service College Fellowship paper on the Typical MWO process. This document:

Provides the framework of the MWO process constructed by experienced personnel tasked with the development, procurement and fielding of modifications. The framework provides the foundation of the overarching process required in establishing an Aviation MWO and lists tasks at key intervals in the process. The SIPM framework also contains time intervals based upon historical averages of MWOs of similar complexity (Sweeney, 2017, p. 12).

AME Briefing: Systems Integration Process Map (SIPM), 21 November 2016. This AME PO briefing was the basis of the 2017 AME SIPM document. It is also included in this research paper to document the PEO Aviation methodology used when executing SOS integration on Army rotary-wing platforms.

Its decision brief nature aligned consensus at the PO and PEO levels for work on the 2017 document listed above.

In 2016, PMO AME assembled an MWO process map in an effort to reduce the need to repeat MWO validations and verifications. The briefing is an executive summary of the process that includes concrete examples of success stories utilizing the model. The SIPM is a tailorable development guide”, that “incorporates stakeholder requirements, process triggers, and estimated completion timelines. The SIPM framework allows for continuous process improvement and strategically places stop gates” in the framework “to ensure critical processes are recognized and executed (Sweeney, 2017, p. 12).

AME Army Aviation Association of America (AAAA) Briefing: Aviation Systems Project Office, 16 November 2017. This document, for the purposes of this research paper, is included to help bound the significant number of platforms used in establishing processes and timelines for the typical MWO process. It also denotes the void of correlation with, at the time, DODI 5000.02 concerns and any adaptability with tailoring based upon the noted DODI 5000.02T processes.

This AME briefing to AAAA was the springboard activity to kick off the SIPM campaign that was detailed in the previous two literature review references. “The briefing provides an overview of Aviation Systems fielding activities” (Sweeny, 2017, p. 13). The AME “Project Office completed 35,070 actions in Fiscal Year (FY) 17 across 14 systems to all three Army components: the Army, Army National Guard, and Army Reserve (AS PO, 2019, p. 4). The briefing also specifies the” PEO Aviation “Quarterly Aviation Synchronization Meeting (QASM) as the mechanism to codify aviation MWO plans with the Operating force (Sweeny, 2017, p. 13).

Best Practices for Using Engineering Standards (ISO/IEC/IEEE 15288, IEEE 15288.1, and IEEE 15288.2) on Contracts for Department of Defense Acquisition Programs, 30 April 2017. For the purposes of this research, this document is reviewed to correlate the MWO and AAF processes to a common Systems Engineering (SE) perspective.

DOD has adopted the voluntary consensus standard International Standards Organization (ISO)/International Electrotechnical Commission (IEC)/Institute of Electrical and Electronics Engineers (IEEE) 15288, “Systems and Software Engineering–System Life Cycle Processes,” for use by acquisition projects. The standard establishes a common process framework for describing the life cycle of man-made systems and defines a set of SE processes and associated terminology typical for the full system life cycle, including conception, development, production, utilization, support, and retirement. DOD has also

adopted the companion standards IEEE 15288.1, “Standard for the Application of Systems Engineering on Defense Programs,” and IEEE 15288.2, “Standard for Technical Reviews and Audits on Defense Programs,” that define requirements for SE processes, technical reviews, and audits for defense projects. Both companion standards, as well as 15288, were all developed to enable direct citation on DOD acquisition contracts. Throughout the remainder of this document, these three standards will be referred to collectively as the 15288 Standards. DOD projects may use the documents collectively or individually to support effective technical performance on DOD contracts

(Office of the Assistant Secretary of Defense for Systems Engineering, 2017, p. 1).

DA PAM 70-3, Army Acquisition Procedures, 17 September 2018. DA PAM 70-3 describes the processes by which the U.S. Army will conform to Statutory and Regulatory requirements that are imposed from DODI 5000 series and Title 10 laws. Chapter 1 (p. 1) lists the introduction and sets the stage for DA PAM 73-1 alignment to AR 70-1. Chapters 2 through 10 (p. 41 – p. 150) detail regulatory structures for support processes for Army acquisition. These structural details span from the overall programmatic management, as well as all supporting technical function requirements. For the purposes of this research paper, the focus will be on Chapters 2 (Program Goals), 3 (Acquisition Strategy), 6 (Program Design), 8 (Program Decisions, Assessment, and Periodic Reporting), and 10 (Army Unique Requirements) (Department of the Army, 2018, p. np). This DA PAM procedurally supports AR 70-1, which was detailed in an earlier review section.

This pamphlet states the purpose as:

This pamphlet provides Army acquisition procedures for all aspects of the materiel acquisition process. In addition to covering Army implementation of the DOD 5000-series

acquisition guidance, the pamphlet provides Army unique procedures used in the materiel acquisition process. DOD and the Army leadership encourage tailoring and streamlining all acquisitions consistent with statutory and federal regulatory requirements. This pamphlet is designed to provide guidance in enough detail to facilitate the exercise of discretion and prudent business judgment; to structure a tailored, responsive, and innovative acquisition; and give the MATDEV the flexibility to manage his program and accept reasonable risks. Tailoring should result from discussions between the MATDEV, the combat developer, and the MDA (Department of the Army, 2018, p. 1).

DA PAM 73-1, Test and Evaluation in Support of Systems Acquisition, 30 May 2003.

DA PAM 73-1 describes the processes by which the U.S. Army will enact T&E policy to support system acquisition and development. Chapter 1 (p. 1) lists the introduction and sets the stage for AR 73-1 alignment with T&E execution policy in support of system acquisition. Chapters 2 through 6 (p. 6 – p. 68) detail processes for support of Army T&E requirements. These structural details span management and documentation process, as well as, development and operational T&E requirements. For the purposes of this research paper, the focus will be on Chapters 3 (T&E Master Plan (TEMP)), 5 (System Evaluation), and 6 (Testing) (Department of the Army, 2018, p. np). This DA PAM procedurally supports AR 73-1, which was detailed in an earlier review section.

This pamphlet states the purpose as:

The primary purpose of T&E is to support system development and acquisition by serving as a feedback mechanism in the iterative systems engineering process. This pamphlet provides guidance and procedures to implement T&E policy for materiel and information systems with regard to planning, executing, and reporting T&E in support of the acquisition process as promulgated by AR 73–1. Developing and deploying Army systems that are

operationally effective, suitable, and survivable represents a significant challenge to all involved in the systems acquisition process (Department of the Army, 2018, p. 1).

DA PAM 700-127, Integrated Product Support Procedures, 29 August 2018. DA PAM 700-127 describes the processes by which the U.S. Army will enact integrated product support packaging for system acquisition and development. Chapter 1 (p. 1) generalizes references, forms, responsibilities, objectives, requirements and exceptions to policy for provisioning Army equipment. Chapters 2 through 12 (p. 1 – p. 96) detail the framework and execution processes for product support of Army acquisitions. For the purposes of this research paper, the focus will be on Chapters 2 (Framework), 3 (IPS and Acquisition Framework), 4 (Product Support Management (PSM)), and 12 (IPS Program Reviews and Reporting) (Department of the Army, 2018, p. np). This DA PAM procedurally supports AR 700-127, which was detailed in an earlier review section.

This pamphlet supports the Army's implementation of PBPSS, including Performance-Based Logistics (PBL), and provides implementing guidance for planning, developing, acquiring and sustaining well defined PBPSS that meet the Soldier's requirements for Army materiel and software throughout its life cycle. AR 700–127 provides policies and requirements for IPS. This pamphlet should be used in conjunction with AR 700–127 to ensure consistent application of Army policy when developing and implementing a PBPSS for materiel and software. This pamphlet guides implementation of PBPSS requirements; describes the process that the MATDEV will use to develop and integrate a PBPSS consistent with the system engineering process; identifies the framework (12 IPS elements) used to develop the PBPSS; describes the Product Support Manager's (PSM) role and relationships with stakeholders in developing and executing the PBPSS; defines metrics to measure the product support system performance; and stresses the importance of ensuring

that contract requirements are accurately identified and included in solicitations and contracts (Department of the Army, 2018, p. 1).

DA PAM 770-3, Type Classification and Materiel Release Procedures, 20 July 2021. DA PAM 770-3 introductorily describes the processes by which the U.S. Army will enact TC and MR processes for Army system acquisition and development. Chapter 1 (p. 1) introduces references, forms, responsibilities, objectives, requirements and exceptions to policy for provisioning Army equipment. Chapters 2 and 3 (p. 5 – p. 14) detail the framework and execution processes for TC and MR activities to support Army acquisition efforts. For the purposes of this research paper, the focus is on Chapters 2 (Type Classification) and 3 (Materiel Release) (Department of the Army, 2021, p. np). This DA PAM procedurally supports AR 770-3, which was detailed in an earlier review section. This pamphlet purpose is, “provides TC and MR procedures.” (Department of the Army, 2021, p. 1)

DOD FY 2022 Budget Estimate, 28 May 2021. This document is here to again relay the criticality of efficient use of fiscal resources. The reviewed DOD FY 22 budget also relates to how optimization of the AAF and MWO may contribute to reduced fiscal resource requirements and accelerated acquisition timelines.

The FY 2022 Defense Budget reflects the President’s national security values and priorities. It is a strategy-based budget aligned with the President’s Interim National Security Strategic Guidance, which emphasizes: A solemn obligation to protect the security of the American people; enduring interest in expanding economic prosperity and opportunity; a commitment to realizing and defending the democratic values at the heart of the American way of life. To meet these goals, the budget request: takes a broader approach to national security to address threats such as climate change, Covid-19, and

extremism; makes smart and disciplined choices regarding our national defense, particularly by aligning our resources to evolving threats; addresses strategic competition with China through calculated defense investments (Department of Defense, 2022, p. 1)

DODD 3200.11, Major Range and Test Facility Base, 15 October 2018. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in AR 73-1 it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODD 3200.11 has been captured in the literature review for AR 73-1 as the implementation instruction that supports DODD 3200.11 for the U.S. Army.

This Directive applies to the OSD, Military Departments, the Chairman of the Joint Chiefs of Staff (CJCS), the Combatant Commands (CC), the DOD Inspector General (IG) , the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DOD (hereafter referred to collectively as the DoD Components (Department of Defense, 2015, p. 1).

DODD 5000.01, The Defense Acquisition System, 09 September 2020. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in AR 70-1, AR 73-1, DODI 5000.02, DODI 5000.02T, and DODI 5000.02AAF it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODD 5000.01 has been captured in the literature review for DODIs 5000.01 and 5000.02 as the implementation instruction that supports DODD 5000.01 for the DOD.

The purpose of this Directive is:

The objective of the DAS is to support the National Defense Strategy (NDS), through the development of a more lethal force based on U.S. technological innovation and a culture of performance that yields a decisive and sustained U.S. military advantage. The acquisition system will be designed to acquire products and services that satisfy user needs with measurable and timely improvements to mission capability, material readiness, and operational support, at a fair and reasonable price (Department of Defense, 2020, p. 4).

DODD 5000.71, Rapid Fulfillment of Combatant Commander Urgent Operational Needs, 24 August 2012. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As DODD 5000.71 is called out in DODI 5000.81, this document was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODD 5000.71 has been captured in the Chapter 4 analysis.

The purpose of this Directive is:

Establishes the Warfighter Senior Integration Group (SIG) as a standing DoD-wide forum to: (1) Lead and facilitate agile and rapid responses to combatant commander UONs, and to recognize, respond to, and mitigate the risk of operational surprise associated with ongoing or anticipated near-term contingency operations. These UONs include Joint Urgent Operational Needs (JUONs), and Joint Emergent Operational Needs (JEONs) identified by Combatant Command (CCMDs). (2) Facilitate the resolution of other urgent warfighter issues as identified by the Co-Chairs of the Warfighter SIG. Establishes policy, assigns responsibilities, and provides direction to facilitate the rapid delivery of capabilities in response to UONs, consistent with all applicable laws and governing regulations (Department of Defense, 2012, p. 1).

DODD 5030.61, DOD Airworthiness Policy, 31 August 2018. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in AR 70-62 it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODD 5030.61 has been captured in the literature review for AR 70-62 as the implementation instruction that supports DODD 5030.61 for the U.S. Army. The purpose of this Directive is, “This directive establishes policy and assigns responsibilities for DOD airworthiness in accordance with the authority vested in the Secretary of Defense (SEC DEF) by section 113 of Title 10, United States Code (USC) (Department of Defense, 2018, p. 1).

DODD 5134.01, Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)), 01 April 2008. This document review was completed to correlate the lower service requirements to initiating DOD requirements. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in DODI 5000.02, DODI 5000.02T, and DODI 5000.02AAF it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODD 5134.01 have been captured in the literature review for DODIs 5000.01 and 5000.02 as the implementation instruction that supports DODD 5134.01 for the DOD.

The purpose of this Directive is:

The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (ATL)) is the Principal Staff Assistant and advisor to the SEC DEF for all matters relating to the DoD Acquisition System; Research and Development (R&D); Modeling and Simulation (M&S); SE; advanced technology; DT&E; production; systems integration;

logistics; installation management; military construction; procurement; environment, safety, and occupational health management; utilities and energy management; business management modernization; document services; and Nuclear, Biological, and Chemical (NBC) defense programs (Department of Defense, 2020, p. 2).

DODI 5000.01, The Defense Acquisition System, 09 September 2020. This document review was completed to correlate the lower service requirements to initiating DOD requirements. The purpose of this Instruction is:

The objective of the DAS is to support the NDS, through the development of a more lethal force based on U.S. technological innovation and a culture of performance that yields a decisive and sustained U.S. military advantage. The acquisition system will be designed to acquire products and services that satisfy user needs with measurable and timely improvements to mission capability, material readiness, and operational support, at a fair and reasonable price (Department of Defense, 2020, p. 4).

DODI 5000.02, Operation of the Defense Acquisition System, Change 3 07 January 2015. This document review was completed to correlate the lower service requirements to initiating DOD requirements. It was also included in this research paper to show the migration towards acquisition tailoring contained in the next two releases of this document. This review also aligns with the optimization details developed in Chapter 4 of this paper.

The purpose of this Instruction is:

This instruction: in accordance with the authority in DODD 5000.01 and DODD 5134.01, reissues the interim DODI 5000.02 to update established policy for the management of all acquisition programs in accordance with, the guidelines of Office of Management and Budget Circular A-11 and other contained references; authorizes MDAs to tailor the

regulatory requirements and acquisition procedures in this instruction to more efficiently achieve program objectives, consistent with statutory requirements; assigns, reinforces, and prescribes procedures for acquisition responsibilities related to cybersecurity in the DAS; and incorporates and cancels Directive-Type Memorandum (DTM) 17-001 (Department of Defense, 2015, p. 1).

DODI 5000.02T, Operation of the Defense Acquisition System, Change 6 10 August 2017. This document review was completed to correlate the lower service requirements to initiating DOD requirements. It was also included in this research paper to show the migration towards acquisition tailoring contained in the next two releases of this document. This review also aligns with the optimization details developed in Chapter 4 of this paper.

The purpose of this instruction is:

This instruction: in accordance with the authority in DODD 5000.01 and DODD 5134.01, reissues the interim DODI 5000.02 to update established policy for the management of all acquisition programs in accordance with, the guidelines of Office of Management and Budget Circular A-11 and other contained references; authorizes MDAs to tailor the regulatory requirements and acquisition procedures in this instruction to more efficiently achieve program objectives, consistent with statutory requirements; assigns, reinforces, and prescribes procedures for acquisition responsibilities related to cybersecurity in the DAS; and incorporates and cancels DTM 17-001 (Department of Defense, 2017, p. 1).

DODI 5000.02, Operation of the Adaptive Acquisition Framework, 23 January 2020. This document review was completed to correlate the lower service requirements to initiating DOD requirements. It was also included in this research paper to show the migration towards acquisition

tailoring contained in the next two releases of this document. This review also aligns with the optimization details developed in Chapter 4 of this paper.

The purpose of this Instruction is:

In accordance with the authority in DODD 5134.01, the July 13, 2018 Deputy Secretary of Defense (DepSecDef) Memorandum, and the December 20, 2019 DepSecDef Memorandum, this issuance: establishes policy and prescribes procedures for managing acquisition programs, pursuant to the relevant sections of Title 10, United States Code; assigns acquisition program management responsibilities in accordance with the authority in a DODDs 5134.01 and 5000.01; describes the responsibilities of principal acquisition officials and the purpose and key characteristics of the acquisition pathways; restructures defense acquisition guidance to improve process effectiveness and implement the AAF. As a result of that restructuring, this issuance has been renamed “Operation of the Adaptive Acquisition Framework,” to better reflect the current content (Department of Defense, 2020, p. 1).

DODI 5000.74, Defense Acquisition of Services, Change 1, 24 June 2021. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in DODI 5000.02 AAF it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5000.74 has been captured in the Chapter 4 analysis.

The purpose of this Instruction is, “In accordance with the authority in DoD Directive 5135.02, this issuance establishes policy, assigns responsibilities, and provides direction for the acquisition of services. Establishes a management structure for the acquisition of services and provides implementation procedures” (Department of Defense, 2021, p. 1).

DODI 5000.75, Business Systems Requirements and Acquisition, 24 January 2020. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in AR 70-1 it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5000.75 have been captured in the literature review for AR 70-1 as the implementation instruction that supports DODI 5000.75 for the U.S. Army.

The purpose of this Instruction is:

In accordance with the authority in DODDs 5134.01, 5144.02, 5105.82, 5105.53, and 5000.01 and the July 11, 2014 and July 13, 2018 Deputy SEC DEF Memorandums, this issuance: implements the statutory requirements of Section 2222(c) “Issuance of Guidance” of Title 10 USC and Section 883(e) “Guidance on Acquisition of Business Systems” of Public Law (PL) 114-92; establishes policy for the use of the Business Capability Acquisition Cycle (BCAC) for business systems requirements and acquisition; implements the statutory requirements of Subtitle III of Title 40, USC and Section 811 of PL 106-398 (referred to in this issuance as the Clinger-Cohen Act (CCA)); supersedes all processes, procedures, and definitions in DODI 5000.02T for all business system acquisition programs, including the definition of MAIS in DoDI 5000.02T’s Table 2 (Department of the Army, 2019, p. 23), which does not apply to business systems (Department of Defense, 2020, p. 1).

DODI 5000.80, Operation of the Middle Tier of Acquisition (MTA), 30 December 2019.

This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in 5000.02 AAF it was included in the substantive,

primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5000.80 have been captured in the analysis in Chapter 4.

The purpose of this Instruction is:

In accordance with the authority in DODD 5134.01 and the July 13, 2018 DepSecDef Memorandum, this issuance establishes policy, assigns responsibilities, and prescribes procedures for the management of the MTA for rapid prototyping and rapid fielding in Section 804 of PL 114-92 (Department of Defense, 2019, p. 1).

DODI 5000.81, Urgent Capability Acquisition, 24 January 2020. This document review was completed to correlate the lower service requirements to initiating DOD requirements. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As DODI 5000.81 document was called out in DODI 5000.02 AAF and derives its' authority from DODD 5000.71, this document was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5000.81 have been captured in the Chapter 4 analysis. The purpose of this Instruction is:

In accordance with the authority in DODD 5134.01 and the July 13, 2018 DepSecDef Memorandum, this issuance establishes policy, assigns responsibilities, and provides procedures for acquisition programs that provide capabilities to fulfill urgent operational needs and other Quick Reaction Capabilities (QRC) that can be fielded in less than 2 years (Department of Defense, 2019, p. 1).

DODI 5000.85, Major Capability Acquisition - Change 1, 04 November 2021. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in DODI 5000.02 AAF it was included in the

substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5000.85 have been captured in the Chapter 4 analysis.

The purpose of this Instruction is:

In accordance with DODD 5135.02, this issuance establishes policy and prescribes procedures that guide the acquisition of major capability acquisition programs, including MDAPs; other programs categorized as Acquisition Category (ACAT) I; major systems, usually categorized as ACAT II; Automated Information Systems (AIS) (not managed by other acquisition pathways); and other capabilities developed via the MCA pathway. Wholly and majority National Intelligence Program-funded acquisition programs will be executed in accordance with Intelligence Community policy (Department of Defense, 2021, p. 1).

DODI 5000.87, Operation of the Software Acquisition Pathway, 02 October 2020. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in DODI 5000.02 AAF it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5000.74 have been captured in the Chapter 4 analysis. The purpose of this Instruction is:

In accordance with the authority in DODD 5135.02, this issuance establishes policy, assigns responsibilities, and prescribes procedures for the establishment of software acquisition pathways to provide for the efficient and effective acquisition, development, integration, and timely delivery of secure software in accordance with the requirements of Section 800 of PL 116-92 (Department of Defense, 2020, p. 1).

DODI 5134.17, Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD (DT&E)), 15 October 2018. This document review was completed to correlate the lower service requirements to initiating DOD requirements. As this document was called out in AR 73-1 it was included in the substantive, primary literature review for potential impact on the AAF and MWO execution timelines. Any impacts from DODI 5134.17 has been captured in the literature review for AR 73-1 as the implementation instruction that supports DODI 5134.17 for the U.S. Army. The purpose of this Instruction is, “This Instruction establishes policy, assigns responsibilities and functions, and prescribes relationships and authorities for the DASD (DT&E) pursuant to Reference (a) and in accordance with the authority in DODD 5134.01” (Department of Defense, 2018, p. 1).

Military Handbook (MIL-HDBK)-61B, Configuration Management Guidance, 07 April 2020. For the purposes of this research paper, MIL-HDBK-61B describes detailed practices by which the U.S. Army will enact CM for Army system acquisition and development. Chapter 1 (p. 1) introduces background, functions and implementation impacts of CM for the Army. Chapters 2 through 10 (p. 4 – p. 51) detail the framework and practice processes for CM activities to support Army acquisition efforts. For the purposes of this research paper, the focus is on Chapters 4 (CM Life Cycle Management and Planning), 5 (Configuration Identification), 6 (Configuration Control), and 8 (Configuration Verification and Audit) (Department of Defense, 2020, p. np). The noted literature review focus was to determine CM impacts on the overall AAF execution timeline.

This military handbook provides guidance and best practices on how Program Managers (PM), systems engineers, logistics managers, and other individual’s assigned responsibility for CM performance and contract for CM. Its purpose is to provide for guidance in planning and implementing effective DOD CM activities and practices during the life cycle of the

defense systems. This handbook is intended to cover the DOD specific management activities related to acquisition and sustainment throughout the system's lifecycle. This handbook is for guidance only and cannot be cited as a requirement (Department of Defense, 2020, p. 1).

MIL-HDBK-245D, Preparation of Statement of Work (SOW), 03 April 1996. For the purposes of this research paper, MIL-HDBK-245D describes detailed practices by which the U.S. Army will enact SOW development for Army system acquisition. Chapter 1 (p. 1) introduces background, functions and implementation impacts of SOW management and development for the Army. Chapters 2 through 6 (p. 2 – p. 31) detail SOW development activities to support Army acquisition efforts. For the purposes of this research paper, the focus is on Chapters 3 (General Description) and 4 (Detail Requirements) (Department of Defense, 1996, p. np). The noted literature review focus supports the research paper review of the program SOW's overall impact on the Army Acquisition development and delivery timeline.

“This handbook provides guidance to enable personnel to create a completed contract SOW applicable to any material acquisition life-cycle phase. It also covers the SOW preparation for non-personal services contracts” (Department of Defense, 1996, p. 1).

MIL-HDBK-1222F, Guide to the General Style and Format of U.S. Army Work Package Technical Manuals, 15 December 2015. MIL-HDBK-1222F describes detailed practices by which the U.S. Army will enact TM's development during the Army's system acquisition and development timeline. Chapter 1 (p. 1) introduces background, functions and implementation impacts of TMs for the Army. Chapters 2 through 10 (p. 1 – p. 49) detail the framework and practice processes for TM activities to support Army acquisition efforts. The research paper focus will be on Chapters 4 (Style and Format), Appendix A (Interactive Electronic Technical Manuals

(IETM) Development)), and Appendix B (Page Based TM Development) (Department of Defense, 2015, p. np). The noted literature review focus supports the research paper review of the IETM and TM development, and V&V activities impact on the AAF timeline.

This handbook provides non-regulatory guidance and information for the preparation of TMs required to operate and to maintain the various types of equipment and weapon systems within the Department of the Army. Appendix A provides development guidance for the preparation of IETMs. Appendix B provides development guidance for the preparation of page-based TMs. This handbook provides guidance only and cannot be cited as a requirement. If it is, the contractor does not have to comply. Any guidance contained herein which is applicable to depot maintenance or DMWRs is also applicable to National Maintenance Work Requirements (NMWRs) (Department of Defense, 2015, p. 1).

MIL-PRF-63002M, Preparation of Modification Work Orders (MWOs), 02 August 2018. MIL-PRF-63002M describes detailed, preferential practices by which the U.S. Army will enact MWOs for Army system acquisition and development. Chapter 1 (p. 1) introduces background, functions and implementation impacts of MWO for the Army. Chapters 2 through 6 (p. 2 – p. 14) detail the framework and practice processes for MWO development activities to support Army acquisition efforts. The research paper focus will be on Chapters 3 (Requirements), 4 (Verification), and 5 (Packaging) (Department of Defense, 2018, p. np). The noted literature review focus supports the research paper review of the MWO development, V&V activities impact on the AAF timeline and Conditional and Abbreviated MWO practices that can be applied to optimized the typical MWO process. “This specification contains the requirements for the

preparation of MWOs. MWOs are to be used as an authenticated and uniform means of providing instructions for modification of materiel” (Department of Defense, 2018, p. 1).

Military Standard (MIL-STD)-31000B, Technical Data Packages (TDPs), 31 October 2018. MIL-STD-31000B describes detailed standards by which the U.S. Army will enact TDPs for Army system acquisition and development. Chapter 1 (p. 1) introduces background, functions and implementation impacts of TDP for the Army. Chapters 2 through 5 (p. 1 – p. 12) detail the framework and practice processes for TDP development activities to support Army acquisition efforts. The research paper focus will be on Chapters 4 (General Requirements) and 5 (Detailed Requirements) (Department of Defense, 2018, p. np) The noted literature review focus supports the research paper review of the TDP development, verification and validation activities impact on the typical MWO process.

This standard defines the requirements for a TDP and its related TDP data management products. The purpose of the TDP is to provide an authoritative technical description of an item which is clear, complete and accurate, and in a form and format adequate for its intended use. A TDP contains elements, is described by a level and type, and may have associated metadata and supplementary technical data. A TDP is a sub-set of product and technical data as shown in the hierarchical breakdown in Figure 1

(Department of Defense, 2018, p. 1).

MIL-STD-38784B, Manuals, Technical: General Style and Format Requirements, 16 November 2020. MIL-STD-38784B describes detailed standards by which the U.S. Army will enact general TM development for Army system acquisition. Chapter 1 (p. 1) introduces background, functions and implementation impacts of general TM development for the Army. Chapters 2 through 5 (p. 1 – p. 37) detail the framework and practice processes for general TM

development activities to support Army acquisition efforts. The research paper focus will be on Chapters 4 (General Requirements) and 5 (Detailed Requirements) (Department of Defense, 2020, p. np). The noted literature review focus supports the research paper review of the General TM development, V&V activities impact on the typical MWO and AAF processes.

This standard covers the general style and format requirements for the preparation of standard TMs and changes thereto. This includes all technical documents assigned a TM identification number and controlled by a TM management information system, or subject to requisition from an inventory control point. This standard provides for Standard Generalized Markup Language (SGML) Document Type Definition (DTD) usage (see appendices B through E) required for electronic data delivery, including Portable Document Format (PDF). This standard supplements the detail specifications used for specific TM types and related publications, but does not deliver any technical data. Unless specified otherwise herein, the examples at the end of this standard are typical and may be adapted to fit the specific equipment or situation being covered. All appendices are intended for compliance when applicable (Department of Defense, 2020, p. 1).

MIL-STD-40051-1C, Preparation of Digital Technical Information for Interactive Electronic Technical Manuals (IETMs), 15 December 2015. MIL-STD-40051-1C describes detailed standards by which the U.S. Army will enact IETM and TM Work Package instructions for Army system acquisition and development. Chapter 1 (p. 1) introduces background, functions and implementation impacts of IETM and TM Work Package instructions for the Army. Chapters 2 through 6 (p. 1 – p. 70) detail the framework and practice processes for IETM and TM Work Package instructions development activities to support Army acquisition efforts. The research paper focus will be on Chapters 4 (General Requirements) and 5 (Detailed Requirements)

(Department of Defense, 2015, p. np). The noted literature review focus supports the research paper review of the IETM and TM development, verification and validation activities impact on the typical MWO and AAF processes.

This standard establishes the technical content, style, format, and functionality requirements for all IETMs for major weapon systems and their related systems, subsystems, equipment, assemblies, components, Shop Replaceable Units (SRU), and LRU. This standard provides requirements for operator and maintenance technical manuals, DMWRs, NWMRs, Preventive Maintenance Daily (PMD), Preventive Maintenance Services (PMS), Phased Maintenance Inspection (PMI), destruction of Army materiel to prevent enemy use manuals, Battle Damage Assessment and Repair (BDAR) manuals, Preventive Maintenance Checklists (PMCs), Lubrication Orders (LOs), ammunition DMWRs, software manuals, and general maintenance manuals. The requirements are applicable for all maintenance levels/classes through overhaul (depot) including DMWRs and NMWRs. The requirements can be used to develop IETMs for interactive frame presentations (Department of Defense, 2015, p. 1).

MIL-STD-40051-2C, Preparation of Digital Technical Information for Interactive Electronic Technical Manuals (IETMs), 15 December 2015. MIL-STD-40051-1C describes detailed standards by which the U.S. Army will enact IETM and TM Work Package instructions for Army system acquisition and development. Chapter 1 (p. 1) introduces background, functions and implementation impacts of IETM and TM Work Package instructions for the Army. Chapters 2 through 6 (p. 1 – p. 70) detail the framework and practice processes for IETM and TM Work Package instructions development activities to support Army acquisition efforts. The research paper focus will be on Chapters 4 (General Requirements) and 5 (Detailed Requirements)

(Department of Defense, 2015, p. np). The noted literature review focus supports the research paper review of the IETM and TM development, verification and validation activities impact on the typical MWO and AAF processes.

This standard establishes the technical content, style, format, and functionality requirements for all IETMs for major weapon systems and their related systems, subsystems, equipment, assemblies, components, SRU, and LRU. This standard provides requirements for operator and maintenance TMs, DMWRs, NWMRs, PMD, PMS, PMI, destruction of Army materiel to prevent enemy use manuals, BDAR manuals, PMCs, LOs, ammunition DMWRs, software manuals, and general maintenance manuals. The requirements are applicable for all maintenance levels/classes through overhaul (depot) including DMWRs and NMWRs. The requirements can be used to develop IETMs for interactive frame presentations (Department of Defense, 2015, p. 1).

PEO AVN, Policy#17-4, Funding System of Systems PM Managed A-Kit and B-Kit Integration on Army Aviation Platforms, 07 March 2017. This document was included in the literature as it impacts both the AAF and MWO processes on PEO AVN platforms. This is primarily due to the fact the noted agreement memorandum has become the common agreed funding and execution interface for all SOS PMs that require integration on PEO AVN controlled Army platforms.

This policy memorandum prescribes the responsibilities of PM AS and aviation platform PMs within PEO Aviation related to funding and labor support for platform integration of PM AS common systems. The memorandum defines A-Kits (cabling, bracketry, etc.) required to integrate the B-Kit (component) onto the platform. The memorandum establishes PM AS as the responsible party to fund, develop, and integrate common

systems onto fielded platforms and existing production lines. The development and funding of platform unique solutions that are not common across the aviation enterprise is the responsibility of the respective platform (Sweeny, 2017, p. 19).

Rules of the Road – A Guide for Leading Successful Integrated Product Teams – Rev 1, 30 November 1999. This document was included in the literature as it impacts both the AAF and MWO processes due to the operating principals executed with Product and Project Offices Army wide still today. As such, at the root-level of AAF and MWO execution, these processes could potentially impact timeline execution for both activities within the responsible MATDEV PMO.

This guide is designed to assist the PM and supporting acquisition community in developing and executing high-performance IPTs. The guide is divided into five chapters. Chapter 2 addresses the mandatory policy and guidance for IPT structures supporting ACAT ID and ACAT IAM programs. Chapter 3 defines fundamental Operating Principles for Effective IPTs at any level within the DOD, and Chapter 4 defines the process of putting IPTs into practice. Chapter 5 provides an operational toolkit to assess and improve the effectiveness of any IPT

(Under Secretary of Defense for Acquisition, Technology, and Logistics, 1999, p. 1).

Additional Supporting Documents List

During review of the 45 primary literature review documents, there were 525 other documents in various reference lists. In support of a thorough research effort and literature review for this paper, those documents were cursorily reviewed and determined not to have a substantive impact on the timelines to be discussed in Chapters 4 and 5. The publications for each primary literature review document can be found in Appendix B and Appendix C of this research paper.

These additional reviews are provided in order to define this research paper contained in this paper and facilitate additional future research recommended in Chapter 5.

Summary

Chapter 2 included an introduction that detailed the intended research activities that would be conveyed in Chapters 3 – 5 of this research paper. This chapter also included a refresher on research Statement of Purpose and the correlating Research Questions to help identify the primary literature review effort. Lastly, the main effort of this chapter was to document and synopsise the primary literature review for this research paper. As an added element, the researcher also included a secondary research sources, in Appendix C, to document the extended roots that germinated as a result of the primary literature review. Next, Chapter 3 will expound upon the Research Methodology synopsized in Chapter 1 of this research paper.

Chapter 3 – Research Methodology

“The time will come when diligent research over long periods will bring to light things which now lie hidden. A single lifetime, even though entirely devoted to the sky, would not be enough for the investigation of so vast a subject... And so this knowledge will be unfolded only through long successive ages. There will come a time when our descendants will be amazed that we did not know things that are so plain to them... Many discoveries are reserved for ages still to come, when memory of us will have been effaced.”

— Seneca, Natural (Goodreads, 2021)

Introduction

This chapter provides details on the research methods available to the researcher and when selected provides the bounds and extent of the research to be documented in the research paper. This chapter will again review the statement of purpose and research questions so that the frame can be set for selecting the research methodologies used for development of Chapters 4 and 5. After selection, the research type structure, will be applied to develop findings in Chapter 4 and offered recommendations contained in Chapter 5 of this research paper. This chapter will also summarize the research method process selection and how that will be applied to the remainder of the research paper.

Statement of Purpose

The purpose of this study is to explore how the AAF and MWO development processes supports timeline optimization for the United States Army rotary-wing platforms. In an effort to get to the research literature, the findings that require development and any recommendation outflow needed to develop this paper, research questions must be developed to support the overarching research paper theme. The supporting research questions for this paper are outlined below and will be detailed and correlated to the main research paper topic in Chapter 1 of this paper. The research questions below were developed to support the literature review framework

contained later in this chapter, as well as the findings and recommendations documented in Chapters 4 and 5 respectively.

Additionally, this research paper identifies literature reviewed in support of information gathering, finding development and recommendation presentation. As a means to get after information gathering, the outlining and pairing of finding points, and recommendation validation, questions must be formed to frame the paper methodology and included information. The questions below denotes the areas to be resolved within this research effort and are as follows.

Research Questions

Question 1: What are the AAF timeline optimization opportunities?

Question 2: What are the MWO timeline optimization opportunities?

Question 3: What process improvements can be achieved by taking advantage of AAF and MWO timeline optimization opportunities?

Research Methodology

As a means to help better understand the research processes, it would be helpful to define the terms as the researcher used them. The application of the use of general research methods can be found in Table 3 (Creswell, 2019), which contains categories, types, and purpose for both quantitative and qualitative data used in research applications. These general bounds lay the groundwork for further descriptive defining of both qualitative and quantitative research.

Table 3*Research Categories, Types, and Purposes*

Category	Type	Purpose
Quantitative Research	Experimental	Explain whether an intervention influences an outcome for one group as opposed to another group
	Correlational	Associate or relate variables in a predictable pattern for one group of individuals
	Survey	Describe trends for a population of people
Qualitative Research	Grounded Theory	Explore common experiences of individuals to develop a theory
	Ethnographic	Explore the shared culture of a group of people
	Narrative	Explore individual stories to describe the lives of people
Mixed Methods	Mixed Methods	Combine quantitative and qualitative data to best understand and explain a research problem
	Action	Use quantitative and qualitative data for individuals to study problems that they face in their settings

Note: From “Research Methods - Definitions, Types, Examples” Creswell, 2019

One definition used to identify what qualitative research means within the context of this paper is when, “the investigator identifies a research problem based on trends in the field or on the need to explain why something occurs” (Creswell, 2019, p. 17). The application of the use of qualitative data can be found in Table 4 (Creswell, 2019), which contains research methods and how to use qualitative data in research applications.

Table 4*Qualitative Research Characteristics*

Research Method	How to Use
Grounded Theory	Researchers collect rich data on a topic of interest and develop theories inductively.
Ethnography	Researchers immerse themselves in groups or organizations to understand their cultures.
Action Research	Researchers and participants collaboratively link theory to practice to drive social change.
Phenomenological Research	Researchers investigate a phenomenon or event by describing and interpreting participants' lived experiences.
Narrative Research	Researchers examine how stories are told to understand how participants perceive and make sense of their experiences.

Note: From “Research Methods - Definitions, Types, Examples” Creswell, 2019

One definition used to bracket what quantitative research means within the context of this paper is when:

The major characteristics are describing a research problem through a description of trends or a need for explanation of the relationship among variables; providing a major role for the literature through suggesting the research questions to be asked and justifying the research problem and a need for direction” (Creswell, 2019, p. 26).

The application of the use of quantitative data can be found in Table 5 (Creswell, 2019, p. np), which contains research methods and how to use quantitative data in research applications.

Table 5*Quantitative Research Characteristics*

Research Method	How to Use	Example
Experiment	Control or manipulate an <u>independent variable</u> to measure its effect on a dependent variable.	To test whether an intervention can reduce procrastination in college students, you give equal-sized groups either a procrastination intervention or a comparable task. You compare self-ratings of procrastination behaviors between the groups after the intervention.
Survey	Ask questions of a group of people in-person, over-the-phone or online.	You distribute <u>questionnaires</u> with rating scales to first-year international college students to investigate their experiences of culture shock.
Systematic Observation	Identify a behavior or occurrence of interest and monitor it in its natural setting.	To study college classroom participation, you sit in on classes to observe them, counting and recording the prevalence of active and passive behaviors by students from different backgrounds.
Secondary Research	Collect data that has been gathered for other purposes e.g., national surveys or historical records.	To assess whether attitudes towards climate change have changed since the 1980s, you collect relevant questionnaire data from widely available <u>longitudinal studies</u> .

Note: From “Research Methods - Definitions, Types, Examples” Creswell, 2019

Based upon the data sets above for defining and contrasting Qualitative and Quantitative data, this research paper, in general, will use a qualitative approach to set the literature review in Chapter 2 of this paper. More narrowly, this research paper will root itself in the narrative research method for the completion of the research topic for this paper.

This narrative research approach will allow the researcher to merge important fact sets from both process constructs contained in the AAF and MWO development and integration processes into a broad picture analysis. This broad analysis will then verify the existence of noted optimizations present in the current SOS B-Kit development and acquisition process within the A-Kit AAF and MWO frameworks. Lastly, this research approach will align itself to see if the noted

commonalities between B-Kit and A-Kit processes can be congealed into actionable recommendations.

Summary

Chapter 3 again reviewed the statement of purpose and research questions so that the frame was set for selecting the research methodology used for development of Chapters 2, 4 and 5. Also, in Chapter 3, this research paper detailed the types of research methods from a general perspective of Quantitative and Qualitative. Next, the paper outlined research approaches that support both qualitative and quantitative research in Tables 3 and 4 respectively. The final action carried out in Chapter 3 was to identify the general type of research to be used for this paper which was qualitative in nature. This chapter also identified the research approach to used, which was the correlated approach to research. Lastly, the research approach selected, was applied to the intended research paper development for findings in Chapter 4 and offered how the correlated research approach would help formulate recommendations contained in Chapter 5. Next we will turn to Chapter 4 that will detail the findings discovered in Chapter 2's literature review as aligned to the research questions framed in Chapter 1 and 3 to support the research paper statement of purpose.

Chapter 4 – Analysis and Findings

“Get in the habit of analysis – analysis will, in time, enable synthesis to become your habit of mind.” – Frank Lloyd Wright (Ammo.com, 2021)

Statement of Purpose

The purpose of this study is to explore how the AAF and MWO development processes support timeline optimization for the United States Army rotary-wing platforms. In an effort to get to the research literature, the findings that require development and any recommendation outflow needed to develop this paper, research questions must be developed to support the overarching research paper theme. The research questions below were developed to support the literature review framework contained later in this chapter, as well as the findings and recommendations documented in Chapters 4 and 5 respectively.

Additionally, this research paper identifies literature reviewed in support of information gathering, finding development and recommendation presentation. As a means to get after information gathering, the outlining and pairing of finding points, and recommendation validation, questions must be formed to frame the paper methodology and included information.

Research Questions

Question 1: What are the AAF timeline optimization opportunities?

Question 2: What are the MWO timeline optimization opportunities?

Question 3: What process improvements can be achieved by taking advantage of AAF and MWO timeline optimization opportunities?

Adaptive Acquisition Framework Process Analysis

In this chapter the research analysis will topically correlate Pathway 1 and 3 timelines, processes, and requirements to execute acquisition of standalone capabilities in general, and for

SOS specifically. Additionally, during the analysis effort the research will denote some areas of commonality, but the area of focus for this research is within the points of contrast. Those points of contrast will produce, if any, viable optimization opportunities that will be recommended in Chapter 5. The AAF literature review in Chapter 2 for research question and research objective 1 included the in depth study of 18 primary review documents. Those were articles 4, 14, 15, 19, 21, 24 – 34, 37, and 45 contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles listed in their associative table in Appendix C.

Normally, a research paper analysis chapter would start with the most significant areas of supporting information first, then trail to the secondary and tertiary items that would be included within the research effort. As the three research questions and four research objectives of this paper are supported by such a vast array of documents, the researcher found that addressing the secondary and tertiary items up front would be beneficial to the reader. By applying this approach, the researcher will help to reduce the amount of documents the reader needs to focus on during the research paper review. The detailed literature review for both the supporting and primary documents listed in this area of the research paper analysis can be found in Chapter 2 and Appendix B.

AAF Secondary and Tertiary Document Analysis

The secondary and tertiary supporting documents for the AAF include: *Best Practices for Using Engineering Standards ISO/IEC/IEEE 15288, IEEE 15288.1, and IEEE 15288.2 on Contracts for DOD Acquisition Programs* and MIL-HDBK-245D, *Preparation of Statement of Work (SOW)*. The documents listed above were noted in the AAF review and analysis as it impacts the development and issuance of contract requirements supporting DOD acquisitions. The noted activities are conducted in the Pre-Development area for UCA and Material Development Decision

(MDD) for MCA activities respectively. The noted document areas are also worked in parallel to reaching subsequent milestones in both the UCA and MCA Acquisition Pathways. In regards to this research, though distinctly contrasting in effort with regards to the amount of documentation required, these will not be analyzed further. This is due to these efforts being executed in parallel with the current area of the acquisition effort and only impact follow-on milestones if completion of the noted contract document areas are not completed according to the acquisition program schedule.

The next area of document analysis for AAF is the *DOD FY 2022 Budget Estimate*, DODD 5000.01, *The Defense Acquisition System (DAS)*, DODD 5134.01, *USD (AT&L)*, DODI 5000.01, *The Defense Acquisition System (DAS)*, and *Rules of the Road – A Guide for Leading Successful Integrated Product Teams publications*. The documents listed above are noted because of either a foundational tie, DODD 5000.01 and DODI 5000.01, an establishment of key infrastructure, DODI 5134.01, or an establishment of a the team operating structure, *Rules of the Road*, which supports DOD acquisition process.

The third area of documentation analysis for AAF deals with supporting documents for the six pathways detailed in DODI 5000.02. The analysis for the third area of AAF research has two distinct components. First, the supporting documentation that covers the four pathways that are not a focus of the research paper, which include DODI 5000.74, *Defense Acquisition of Services*; DODI 5000.75, *Business Systems Requirements and Acquisition*; DODI 5000.80, *Operation of the Middle Tier Acquisition (MTA)*; and DODI 5000.87, *Operation of the Software Acquisition Pathway*. The second component, which is the core of the AAF portion of the research paper, includes DODI 5000.02, *Operation of the Defense Acquisition System - Change 3*; DODI 5000.02T, *Operation of the Defense Acquisition System - Change 6*; DODI 5000.02, *Operation of*

the Adaptive Acquisition Framework; DODI 5000.81, *Urgent Capability Acquisition*; DODI 5000.85, *Major Capability Acquisition*; AR 70-1, *Army Acquisition Policy*; and DA PAM 70-3, *Army Acquisition Procedures*. The documents noted in the second component above, will be further detailed for development of areas of similarity and contrast with regards to AAF Pathway one, UCA, and Pathway three, MCA in the primary document analysis below.

AAF Primary Document Analysis

The AAF primary analysis will detail four key components as primary areas of focus for the AAF review of Pathway one, UCA, and Pathway three, MCA. The four areas noted, will in the analysis, answer research question 1, “What are the AAF timeline optimization opportunities?” which is listed in Chapters 2 – 4. Additionally, it will satisfy Objective 1 contained in Figure 2.

First the research will detail the analysis of transition through the three major issuances of DODI 5000.02, which will document efforts DOD has enacted, to date, to help streamline the overall acquisition timeline. Second, the research will show how the transition, in step 1, has plowed the ground to execute the two noted pathways, under the AAF architecture, for this research paper. The research paper will detail in its third and fourth efforts for the AAF primary analysis the compare and contrast of the UCA and MCA pathways.

DODI 5000.02 Revision Review. As a primer to understanding Pathway one, UCA, and Pathway three, MCA, as defined in the current DODI 5000.02, AAF dated June 04, 2021, the original focus of DODI 5000.02 from January 2015 must be understood. The original Operation of the DAS from January 2015:

Describes four basic models that serve as examples of defense program structures tailored to the type of product being acquired or to the need for accelerated acquisition. Two additional hybrid models combine the features of multiple basic models. Each basic model

is tailored to the dominant characteristics of the product being acquired (e.g., hardware intensive products such as most weapons systems). The hybrids are described because many products will require combining models, such as a weapons systems development that includes significant software development. Acquisition programs should use these models as a starting point in structuring a program to acquire a specific product (Department of Defense, 2015, p. 8).

All six noted models, which were re-termed Pathways in the current AAF, follow a somewhat varied execution based upon the generic acquisition model shown in Figure 8 (DAU, 2022, p. np) below. As detailed in Figure 8 (DAU, 2022, p. np), the developed acquisition model was very extensive and labor intensive to execute. While the four main and two hybrid models were expressed and detailed in the 2015 DODI 5000.02, there was few indications of tailoring or adjusting the acquisition approach based upon the program assigned to the PM.

Additionally, the lack of flexibility was further hampered through a set of mandated checklist requirements and activities as outlined in 14 supporting enclosures. DOD worked to rectify this lack of flexibility through several initiatives executed in the FY 2015 – 2017 time frame. The efforts executed during this period included additional Better Buying Power (BBP), additional documentation templates, and Should-Cost efforts.

Major Capabilities Acquisition (Pre-Tailoring)

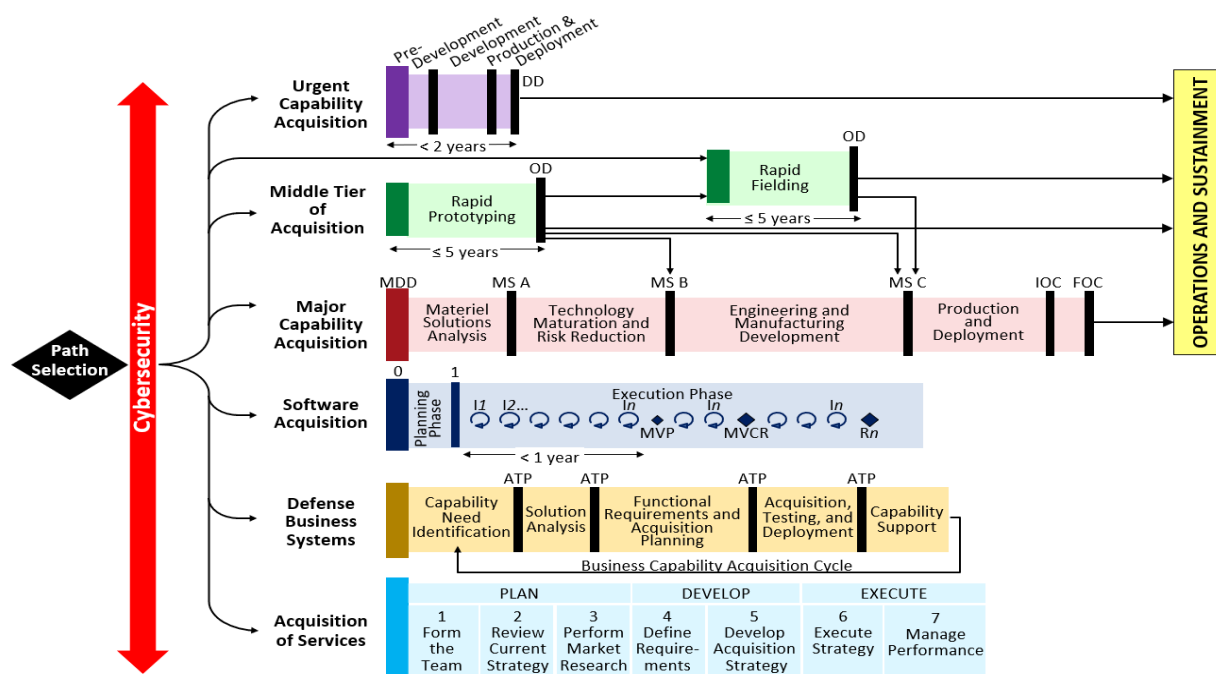


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based upon the Warfighter and Project Manager inputs. This flexibility into the acquisition planning and execution has allowed the timeline to bring capabilities to life to support DOD requirements to be reduced. Figure 9 (Department of Defense, 2020, p. 9) is a duplication of Figure 3 (Department of Defense, 2020, p. 9). This reiteration as a separate figure is executed for the expediency of the reader of this research paper.

FIGURE 9

AAF Acquisition Pathways



Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 9

AAF General Analysis. Next the paper will focus on the current DODI 5000.02 AAF processes as noted in Figure 9 (Department of Defense, 2020, p. 9) above. As a means to demonstrate the flexibility captured in DODI 5000.02 AAF, the following quote is provided. “PMs, with the approval of MDAs/Decision Authorities (DAs), may leverage a combination of acquisition pathways to provide value not otherwise available through use of a single pathway. The use of multiple pathways does not affect the application of statutory thresholds otherwise

applicable to the program as a whole, such as the MDAP or major system (ACAT II) thresholds unless a statute permits.

PMs employing multiple pathways will (1) Define the transition points from one pathway to another pathway. (2) Anticipate, develop, and coordinate the information requirements required at the new pathway entry point. Identifies regulatory and statutory information requirements for major capability acquisition, and the statutory requirements for other pathways. (3) Ensure a smooth transition (Department of the Army, 2018, p. 9).

In addition, PMs will:

(1) “Tailor in” the regulatory information requirements that will be used to describe the management of the program. In this context, “tailoring-in” means that the PM will identify, and recommend for MDA/DA approval, the regulatory information that will be employed to document program plans and how that information will be formatted and provided for review by the decision authority. The PM’s recommendation will be reviewed by the MDA/DA, and the MDA/DA’s decision will be documented in an acquisition decision memorandum. MDAs/DAs will coordinate, when necessary, with other regulatory document approval authorities to facilitate implementation of this approach. Statutory requirements will not be waived unless a statute permits. (2) Design program and business strategies to facilitate the acquisition of appropriate and cost effective technology solutions and achieve mission success while being mutually advantageous to the DOD and its industry partners. Similarly, PMs will consider acquisition strategies that leverage international acquisition and supportability planning to improve economies of scale, strengthen the defense industrial base, and enhance coalition partner capabilities to prepare for joint operations. (3) Recognize that cybersecurity is a critical aspect of program

planning. It must be addressed early and continuously during the program life cycle to ensure cybersecurity operational and technical risks are identified and reduced and that fielded systems are capable, effective, and resilient. (4) Consider the procurement of data deliverables and associated license rights needed to support competitive acquisition and life-cycle sustainment strategies. (5) Prioritize product support and affordability during early program planning to ensure sustained mission effectiveness. (6) Establish a risk management program to ensure program cost, schedule, and performance objectives are achieved, and to communicate the process for managing program uncertainty. In consultation with the user representative, the PM will determine which environment, safety, and occupational health risks must be eliminated or mitigated, and which risks can be accepted. (7) When consistent with pathway requirements, develop engineering plans and processes applicable to the pathways to mature technology, conduct necessary systems engineering tradeoffs, and produce and manage appropriate technical baselines through the use of systems engineering technical reviews (Department of the Army, 2018, p. 9).

From a general AAF standpoint, this quote provides a great foundation from which to review execution of any of the six pathways noted in DODI 5000.02 AAF. However, as noted in the secondary and tertiary area of this chapter, Pathway 2, MTA, Pathway 4, Software, Pathway 5, DBS, and Pathway 6, Services acquisition were not covered in the primary review. As the focus of this research is on comparing and contrasting the UCA and MCA pathways of the AAF, only pathways one and three respectively will be covered.

AAF Pathway One, UCA, Analysis. Pathway one is topically defined, in DODI 5000.02 AAF, as:

To field capabilities to fulfill urgent existing and/or emerging operational needs or quick reactions in less than 2 years. The DOD's highest priority is to provide warfighters with the capabilities urgently needed to overcome unforeseen threats, achieve mission success, and reduce risk of casualties. UONs and other QRC are identified and approved for resolution by designated authorities. The estimated cost of any single solution must not exceed \$525 million in research, development, and test and evaluation; or \$3.065 billion procurement in FY 2020 constant dollars. The acquisition, product support and sustainment processes, reviews, and documents are aggressively streamlined due to operational urgency. The goal is to plan for the capability in a few weeks, with development and production measured in months. The imperative is to quickly deliver useful capability to the warfighter in a timely fashion.

Figure 10 (Department of Defense, 2020, p. 11) illustrates the urgent capability acquisition pathway. DODD 5000.71 and DODI 5000.81 establish policies and provide procedures for urgent operational needs and other QRC acquisition (Department of Defense, 2020, p. 11). Figure 10 (Department of Defense, 2020, p. 11) is a re-image of Figure 4 (Department of Defense, 2020, p. 11) and is inserted here to support ease of review for the reader.

Figure 10

Urgent Capabilities Timeline



Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 11

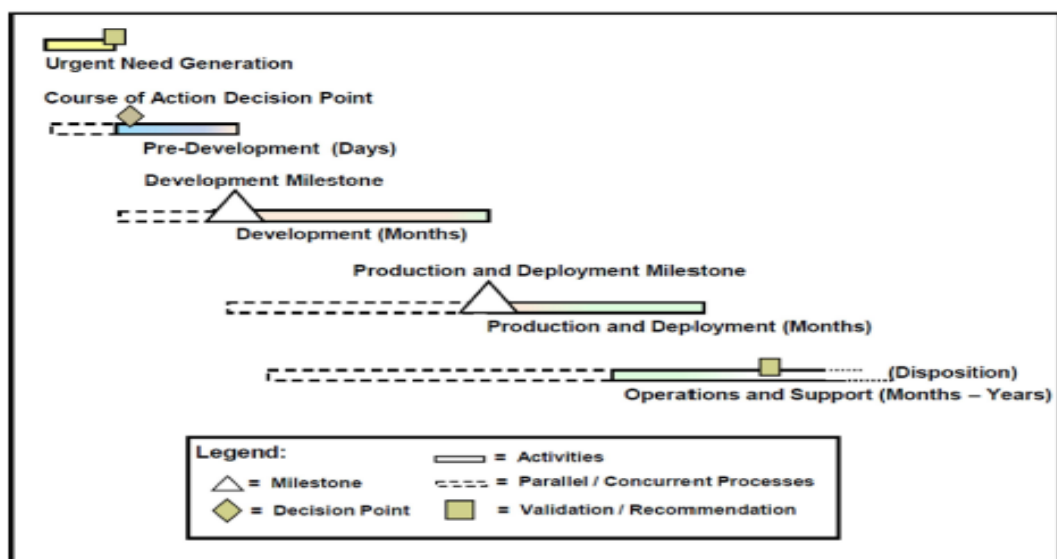
DODI 5000.81 subsequently details the framework for executing a UCA. Within the framework analyzed under Pathway one DODI 5000.81, establishes responsibilities, authorities and procedures for the UCA process. DODI 5000.81 states as such:

This section describes the main activities associated with urgent capability acquisitions – pre-development, development, Production and Deployment (P&D), and Operations and Support (O&S). a. The activities detailed in this issuance are not separate from or in addition to activities performed as part of the acquisition system, but are highly-tailored versions of those activities intended to expedite the fielding of capability by streamlining the documentation and reviews normally required as part of the deliberate acquisition process.

Figure 11 (Department of Defense, 2019, p. 10) depicts representative UCA activities to support fielding of a QRC (Department of Defense, 2019, p. 10).

Figure 11

Urgent Capabilities Acquisition Process



Note: From DODI 5000.81 – “Operation of Urgent Capability Acquisition”, 2019, p. 10

As DODI 5000.02 requirements are flowed down to Army component activities, AR 70-1 is the governing acquisition regulation for capabilities development activities. The responsibilities of AR 70-1 are captured in the following quote from the AR. “This document is intended primarily to identify positions the Army has assigned a responsibility identified in DODI 5000.02 as “Component” or “Service” without specific identification to a person or organization. It also provides a high level summary of Army-assigned responsibilities associated with acquisition that is neither intended to be exhaustive, nor repetitive of responsibilities identified in other current Army administrative publications” (Department of the Army, 2018, p. 1). AR 70-1 requirements are enacted through DA PAM 70-3, supporting “how-to” pamphlet for executing Army acquisition.

As detailed above, the overall UCA timeline is projected to be 2 years or less. As this paper moves forward in this chapter, the main area of contrast in optimization development will focus on the development, production and deployment activities within UCA as opposed to those directed in the MCA pathway.

AAF Pathway Three, MCA, Analysis. Pathway one is topically defined, in DODI 5000.02 AAF, as:

To acquire and modernize military unique programs that provide enduring capability. (2) Characteristics. These acquisitions typically follow a structured analyze, design, develop, integrate, test, evaluate, produce, and support approach. This process is designed to support major defense acquisition programs, major systems, and other complex acquisitions. Acquisition and product support processes, reviews, and documentation will be tailored based on the program size, complexity, risk, urgency, and other factors. Software-intensive

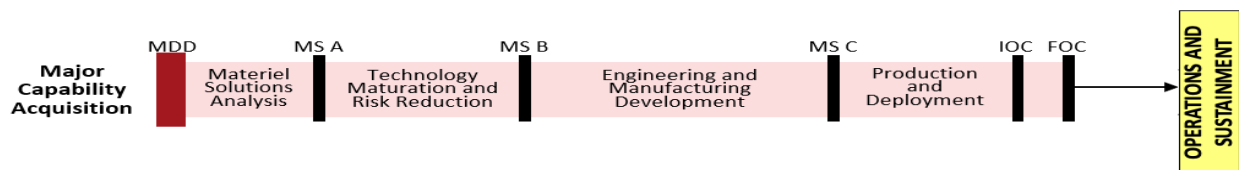
components may be acquired via the software acquisition pathway, with the outputs and dependencies integrated with the overall major capability pathway

(Department of Defense, 2020, p. 12).

Figure 12 (Department of Defense, 2020, p. 13) illustrates the MCA pathway. Figure 12 (Department of Defense, 2020, p. 13) is a re-image of Figure 5 (Department of Defense, 2020, p. 13) and is inserted here to support ease of review for the reader.

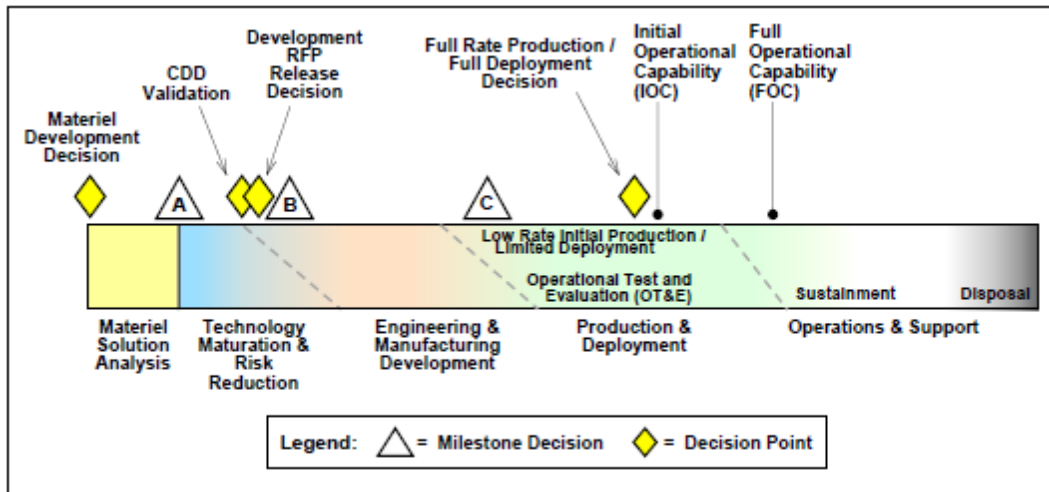
Figure 12

Major Capability Acquisition Timeline



Note: From DODI 5000.02 – “Operation of the Adaptive Acquisition Framework”, 2020, p. 13

DODI 5000.85 subsequently details the framework for executing a MCA. Within the framework analyzed under Pathway three, DODI 5000.85 establishes responsibilities, authorities and procedures for the UCA process. DODI 5000.85 states as such, “Acquisition decisions will be made at the lowest authorized level, commensurate with the ACAT and program risk, to ensure they are timely, and made by those with the greatest knowledge of the program” (Department of Defense, 2021, p. 10). Figure 13 (Department of Defense, 2021, p. 10) depicts the MCA model. The paragraphs that follow describe the decision points and activity phases that apply to almost any acquisition. Appendix 3B of DODI 5000.85 “discusses the information requirements that apply throughout the phases and decision points, subject to PM and MDA decisions and statutory requirements” (Department of Defense, 2021, p. 10). Based upon the timeline depicted in Figure 12 (Department of Defense, 2020, p. 13), the generally accepted timeline for development to deployment is 28 – 36 months, with a deployment time not exceed of 48 months.

Figure 13*Major Capability Acquisition Process*

Note: From DODI 5000.81 – “Major Capability Acquisition”, 2021, p. 10

AAF Analysis Summary. As stated above, the comparison timeline is up to 24 months to field under a UCA and at least 48 months, from a MS A entry point to field a MCA. The main delta in development and fielding points in the UCA and MCA pathways revolve around the testing and sustainment requirements levied against the system. From an AAF area of focus, this research paper will stay at a general level and analyze only the sustainment portion.

The sustainment portion for a UCA is more abbreviated as by its nature, a UCA system capability does not require long term sustainment support. Sustainment for a UCA is as defined in DODI 5000.81:

The PM will execute a supportability strategy that meets materiel readiness and operational support performance requirements, is safe, and sustains the capability in the most cost-effective manner over its anticipated total life cycle. Planning for O&S, including support

funding, will begin during pre-development and will be documented in the acquisition strategy” (Department of Defense, 2019, p. 16).

This approach is generally executed from an Interim Contract Logistics Support (ICLS) construct, where the Original Equipment Manufacturer (OEM) developing and fielding the capability for DOD is paid to maintain the system. This support is required due to the sustainment data that is not purchased with a UCA effort that would allow a DOD depot and LCMC to sustain the system (Department of the Army, 2018, p. np).

The main difference under a MCA pathway effort is that the required Depot and LCMC sustainment data packages would be purchased by the PM. The development period data would then go through V&V to ensure the data products were correct and acceptable for DOD use. DODI 5000.85 validates this as such:

The PM will finalize designs for PS elements and integrate them into a comprehensive support package that is documented in a PS Strategy (PSS). The program will demonstrate PS performance through appropriate verification means that satisfy the sustainment requirements within the MDA-approved program goals established at Milestone A (Department of Defense, 2021, p. 16).

As the paper’s approach, at this point, in the AAF has been generalized, a more detailed compare and contrast of test and sustainment activities will be detailed later in this chapter.

The noted points that follow answer question and objective 1 of this research paper. The first optimization point is the time disparity noted above for UCA and MCA pathways sustainment activities, which are two and five to eight years respectively. However, more optimization opportunities reside in the underlying areas that deal with the overall approach to integrating and deploying SOS capabilities. The additional optimization points include, but are not limited to.

parallel execution of MWO ancillary activities, decoupling of ancillary V&V activities, conditional MWO and MR efforts, tail number AWRs to support fielding until final V&V activities support a fleet-wide AWR, concurrent V&V activities coordinated to A-Kit fielding activities. Lastly, optimization may occur through application of the noted transition and adaptation of flexibility, contained in the changes in DODI 5000.02 and DODD 5000.71, as well as, the efforts laid out in DODI 5000.81 to SOS acquisition. This optimization opportunity will allow DOD to focus a second lens to the completion of the SOS acquisition arena. The rationale for this optimization point research nests itself in the fact that certain key aspects of the SOS acquisition approach is not currently included the Army Acquisition policy in AR 70-1 and DA PAM 70-3. Recommendations for developing and applying that second lens will be discussed in Chapter 5.

MWO Processes Analysis

As a second area of analysis, this chapter contains the research that will topically correlate Urgent/Abbreviated and Routine MWO timelines, processes, and requirements to execute modification and integration of capabilities onto an existing piece of Army equipment. Additionally, during the analysis effort the research will denote some areas of commonality, but the area of focus for this research is within the points of contrast, as those points of contrast will produce, if any, viable optimization opportunities that will be outlined to implement in Chapter 5. The MWO literature reviewed in Chapter 2 for research question and research objective 2 included the in depth study of 13 primary review documents. Those were articles 1, 2, 4, 9, 11 – 14, 19, 37, 39, 44, and 45 contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles listed in their associative table in Appendix C.

MWO Secondary and Tertiary Document Analysis

Again a normal research paper analysis would start with the most significant areas of supporting information first, then trail to the secondary and tertiary items that would be included within the research effort. As the three research questions and four research objectives of this paper are supported by such a vast array of documents, the researcher found that addressing the secondary and tertiary items up front would be beneficial to the reader. By applying this approach, the researcher will help to reduce the amount of documents the reader needs to focus on during the research paper review. The research for the MWO process is documented to answer research question and objective 2. Again, by applying this approach, the researcher will reduce the amount of documents the reader needs to focus on during the research paper review. Also, the detailed literature review for both the supporting and primary documents listed in this area of the research paper analysis can be found in Chapter 2.

The secondary and tertiary supporting documents for the MWO process include: Army Aviation MWO: *Typical Process Required to Efficiently Implement*, 24 October 2017; AEM Strategy: *Equipping the Total Force to Win in a Complex World*, 27 March 2015: MIL-HDBK-245D, *Preparation of Statement of Work (SOW)*; and Program Executive Office (PEO), Aviation (AVN), Policy#17-4, *Funding System of Systems PM Managed A-Kit and B-Kit Integration on Army Aviation Platforms*. The above noted documents are included in the MWO review and analysis as it impacts the methodology for framing the acquisition approach for the integration efforts required for SOS applications on existing systems. The documents cursorily reviewed in this area do not directly dictate integration process timelines, but have an impact on the MWO integration process by either affecting pre-requirements for Army aviation rotary-wing platform integration or the contract approach and contract execution timeline. Due to impacts noted, these

documents germinate quantifiable impacts on the overall MWO integration timeline. Based upon the noted overarching, but a documentable pinpoint impact on the MWO timeline, these documents will not be further reviewed. This rationale is based on the overall impact to the integration timeline for MWO execution being beyond the bounds of this paper. These four documents will be identified as future research opportunities in Chapter 5.

The next area of document analysis for AAF is the AME Systems Integration Process Map (SIPM); AME Briefing: Systems Integration Process Map (SIPM); PO AS AAAA Briefing: *Aviation Systems Project Office*, 16 November 2016; and DOD FY 2022 *Budget Estimate*. The above noted documents are noted because of either a foundational tie to the currently published MWO integration plan now in effect in AR 750-10 or tied to ever present budget constraints that may apply to any DOD acquisition effort. As these are foundational in nature, any timeline similarities or constraints for the Urgent/Abbreviated and Routine MWO integration process will be captured in AR 750-10, which is one of the primary review efforts noted below for research question and objective 2.

The third area of documentation analysis for MWO integration deals with the Army Modification Process and preparation of the resultant MWO documentation. The documents analyzed for this area of research include AR 750-10, *Army Modification Program* and MIL-PRF-63002M, *Preparation of Modification Work Orders (MWOs)*. The documents noted above will be further detailed for development of areas of similarity and contrast with regards to Urgent/Abbreviated and Routine MWO processes in the MWO primary analysis below.

MWO Primary Document Analysis

The MWO primary analysis will detail three key components as primary areas of focus for MWO processes. First the research will detail the analysis of the general requirements for MWO

and the correlation to Mr. Sweeny's previous work in *Army Aviation Modification Work Orders: Typical Process Required to Efficiently Implement*. The paper will look at efforts the Army has enacted for the Routine, Abbreviated/Urgent MWO development to support A-Kit integration for host platforms required to host SOS capability solutions. The research paper will detail in its second and third components for Army MWO processes for the Routine and Abbreviated/Urgent MWO respectively. The analysis captured in this chapter of the research paper will be used to compare and contrast these noted MWO processes to garner optimization opportunities to be presented in Chapter 5.

General MWO Processes. As a descriptor for the basic concept for MWO, AR 75-10 states, Modification is any alteration, conversion, or modernization of an end item or a Component of End Item (COEI), which in any way changes or improves the original purpose or operational capacity in relation to the effectiveness, efficiency, reliability, or safety of that item. This includes, but is not limited to, conversions; field fixes; retrofits; rebuilds; redesigns; upgrades; extended service programs; engineering changes; software revisions; system enhancement programs; service life extension programs; system improvement programs; product improvement programs; preplanned product improvements; modifications developed and applied by contractors as part of prime vendor support or Contractor Logistics Support (CLS) agreements; horizontal technology integration; Continuous Technology Refreshments (CTRs); technology insertions; and all other terms used to describe modifications as defined above. b. Modifications that improve or diminish end item performance against approved Key Performance Parameters (KPPs) and/or Key System Attributes (KSAs) to levels above or below objective performance envelope require an updated functional requirements document be submitted to the Deputy Chief of Staff

(DCS), G-8 for Army Requirements Oversight Council (AROC) approval. Modifications that will not exceed the performance envelope defined by the approved KPP and/or KSA do not require DCS, G-8, or AROC approval (Department of the Army, 2019, p. 9).

Against the general description MWO above from 750-10, the detailed types of MWO are described as Urgent, Routine, and Emergency. For the analysis within this research paper, Urgent and Emergency will be consolidated as both are similar in function and nature.

In the following paragraphs of this section of Chapter 4, the study describes the two areas of MWOs and the areas of difference. This area will also make notation of additional parallel activities that are required to complete MWO authentication, as well as, some brief analysis points for recommendations to be penned in Chapter 5.

Routine MWO Process. The routine MWO process is defined and executed per AR 750-10 as such:

A modification will be classified as “routine” when emergency or urgent priorities are not applicable. (a) Application of all routine MWOs will be completed within the stated timeframe on the MWO, which cannot exceed a maximum period of 5 years from the effective date of the MWO. (b) Routine MWOs published but not applied will not cause equipment to be reported as NMC. Action to apply overdue MWOs will continue and require command emphasis. The proponent and/or MATDEV of each MWO will review the MWO to determine if action to apply the MWO should continue or be discontinued due to lack of current relevance—that is, kits, funding, or other compelling reasons. The proponent/MATDEV will notify the field of the decision made for each MWO reflected as due (Department of the Army, 2019, p. 10).

During this routine MWO application not only does the MWO have to be V&V'd the MWO must also go through a boarding process. During the boarding process, several other document packets must also be formally reviewed, validated, and verified. These document packages include, an A-Kit Drawing Package, platform TM Updates, Physical Configuration Audit (PCA), Build of Material (BOM) List V&V, EDFP V&V, AWR, and MR for the end Platform. According to the SIPM briefing and process, "integration design and baseline and is estimated to consume 2.5 years of the overall development schedule" (Sweeny, 2017, Pg 21) for a particular platform application for a SOS capability. Lastly, *MIL-PRF-63002M, Performance Specification Technical Manuals: Requirements for Preparation of Modification Work Orders (MWOs)* is the document used to authenticate the MWO structure and requisite MWO content. The V&V process ensures the technical aspects of the MWO are met.

Urgent/Emergency MWO Processes. An urgent MWO is defined in AR 750-10 as, Urgent MWOs have the second highest priority and must be applied within 2 years of the MWO effective date. In those cases where the urgent MWO cannot be applied within the 2-year period because of funding, industrial base, or other resource constraints, the PM/MATDEV or system manager will obtain approval from the DCS, G-4 for extending the timeframe for completing the MWO. An urgent priority is assigned to a modification for either of the following reasons: (a) To correct a potentially hazardous condition, which if left uncorrected could result in injury to personnel or damage to equipment. The PM is required to process a System Safety Risk Assessment (SSRA) and update the Hazard Tracking System (HTS) when potentially hazardous conditions are discovered in fielded systems per DA Pam 385-16 and MIL-STD-882E. (b) To cause a change that, if not

accomplished expeditiously, may seriously compromise the mission effectiveness of deployed equipment, software, or forces (Department of the Army, 2019, p. 9).

It also notes the Urgent MWOs may, “Note. The equipment may continue to be operated under restrictions determined by the MATDEV” (Department of the Army, 2019, p. 10).

An Emergency MWO is defined as:

Emergency modification work orders. Emergency MWOs have the highest priority in the modification program and will immediately deadline all equipment affected until the stated deficiencies are corrected or the risk of Communications Security (COMSEC) or cryptographic compromise is reduced to an acceptable level. The MWO coordinator will notify the command channel that an emergency MWO has been issued and necessitates placing affected equipment into a Not Mission Capable (NMC) status. The unit commander will ensure that equipment under their command is immediately placed in a NMC status. A MWO will be classified as “emergency” when the MWO is needed to— (a) Correct a hazardous condition that could result in fatal or serious injury to personnel or in extensive damage or destruction of equipment. The PM is required to process a system safety risk assessment and update the hazard tracking system when hazardous conditions are discovered in fielded systems per DA Pam 385–16 and MIL–STD–882E. (b) Change operational characteristics that, if not accomplished without delay, may seriously compromise national security. (c) Prevent operation of equipment with an unapplied emergency MWO. The MATDEV will proceed with the utmost urgency to apply any emergency MWO (Department of the Army, 2019, p. 9).

As viewed, the noted abbreviated MWO types listed above have very strict conditions for use. However, they also allow a great deal of flexibility in authenticating the support sustainment documentation. It is within these noted areas that the opportunities for optimization reside. MWO Process Summary. In reviewing the two abbreviated MWO execution processes, many of the noted Routine MWO requirements are either waived or truncated for the next types of MWOs detailed below. Of note the same reduction of effort to get Urgent/Emergency MWOs fielded below, revolves around the same reduction of sustainment documentation requirements as noted in the AAF section of this chapter. The documentation reduction is generated on the premise that the Urgent or Emergency MWO may or may not be sustained and has a high enough priority to either waive or delay the authentication of the sustainment support data and documentation. Also, as noted in the AAF process, due to the lack of focus on unique aspects of SOS integration, the Army regulatory process is somewhat limited in regards to integrating an ‘A-Kit’ the same way it does a general system or capability acquisition. The areas of optimization with regards to application of the SOS lens in the AAF section will also impact recommendations for the MWO section of this research paper as detailed in Chapter 5. The noted optimization opportunities listed above satisfy the research requirements listed in research question and objective 2 and can be located in Chapters 2 – 4 and Figure 2, respectively.

Ancillary Processes Analysis

As a third component of this Chapter, the research analysis will topically correlate the ancillary timelines, processes, and requirements to execute modification and integration of capabilities onto an existing piece of Army equipment. Additionally, during the analysis effort the research will denote some areas of commonality. However, the area of focus for this research is within the points of contrast. The points of contrast, if any exist, will produce viable optimization

opportunities that will be outlined to implement. This area of the research paper is necessitated by the number of supporting activity callouts established in AR-750-10 and MIL-PRF-63002M for the V&V of MWOs. The ancillary literature reviewed in Chapter 2 include the in depth study of 18 primary review documents. Those were articles 3, 5 – 8, 10, 16 – 20, 23, 36, 38, 40-43 contained in Appendix B. It also involved the scan of related and supporting documents for the noted articles listed in their associative table in Appendix C.

Ancillary Secondary and Tertiary Document Analysis

The inverted research documentation approach detailed for the AAF material in this chapter will also apply to the ancillary process research analysis. The research for the ancillary process is documented to answer research question 2, contained in this paper, and objective 3, contained Figure 2. Again, by applying this approach, the researcher will help to reduce the amount of documents the reader needs to focus on during the research paper review. Also, the detailed literature review for both the supporting and primary documents listed in this area of the research paper analysis can be found in Chapter 2.

The secondary and tertiary supporting documents for all four of the ancillary process areas include: DOD FY 2022 *Budget Estimate*; DODD 3200.11, *Major Range and Test Facility Base*; DODD 5030.61, *DOD Airworthiness Policy*; and DODI 5134.17, *DASD (DT&E)*. These documents were placed in secondary or tertiary category for ancillary process review due to the application of foundational operating parameters, establishment of supporting agencies, or reference budgeting influences that alter program execution for the entire portfolio of DOD acquisition activities within any given fiscal year. Due to the noted review approach for these supporting documents, as well as the lack of quantifiable impacts on the overall ancillary process timelines, the four noted documents will not be analyzed further. This rationale is based on the

overall impact to the ancillary process timeline for the overarching MWO integration execution being beyond the bounds of this paper. These four documents will be identified as future research opportunities in Chapter 5.

Ancillary Primary Document Analysis

To help dissect the large swath of primary ancillary processes and documents into digestible portions, the researcher established four main functional areas in the Chapter 2 literature review for the ancillary documents. Also, the main focus areas established in Chapter 2 will again be used to align and analyze the research documents that support research question 2, objective 3.

Technical Manual (TM) Activities. For a SOS acquisition, there are actually three different sets of TMs used to support the system integration and deployment. First, on the system side, are the system TMs and DMWRs. The noted manuals impact the daily inspection, maintenance and operation of the acquired system at the field, user level. The second is to support the depot and other depot level entities in sustaining, maintaining, and repairing the acquired system. Secondly, the SOS MATDEV must also produce end platform TMs that will show the fielded unit how to equip/unequip, maintain, inspect, and operate the acquired system on the end, host platform.

To meet the requirements to sustain and operate the SOS in the field the noted TMs have their own V&V process. The V&V review, and confirm the produced TMs meet operational requirements through either a Log Demo or a Limited User Test (LUT). The TMs are also V&V'd against developmental and content requirements based upon review against MIL-HDBK-1222F and MIL-STD-38784B for general style and format. To detail this requirement, MIL-HDBK-1222F states:

This handbook provides non-regulatory guidance and information for the preparation of TMs required to operate and to maintain the various types of equipment and weapon

systems within the Department of the Army. APPENDIX A provides development guidance for the preparation of IETMs. APPENDIX B provides development guidance for the preparation of page-based TMs (Department of Defense, 2015, p. 1).

It is also defined in MIL-STD-38784B as:

This standard provides for SGML DTD usage (see appendices B through E) required for electronic data delivery, including PDF. This standard supplements the detail specifications used for specific TM types and related publications, but does not deliver any technical data (Department of Defense, 2020, p. 1).

Conformance and detailed Work Package (WP) instruction construction for paper TMs and digital IETMs are confirmed via review against MIL-STD-400051-1C and MIL-STD-40051-2C. MIL-STD-40005-1C/2C efforts are defined as:

This standard establishes the technical content, style, format, and functionality requirements for all IETMs for major weapon systems and their related systems, subsystems, equipment, assemblies, components, SRU, and LRU. This standard provides requirements for operator and maintenance TMs, DMWRs, NWMRs, PMD, PMS, PMI, destruction of Army materiel to prevent enemy use manuals, BDAR manuals, PMCs, LOs, ammunition DMWRs, software manuals, and general maintenance manuals

(Department of Defense, 2015, p. 1).

The focus of this research is on the platform and SOS integration. Therefore, the platform TM changes are analyzed to assess their impacts to the overall integration and fielding timeline. From a general standpoint for each end of the V&V events, there is a review, issuance and consolidation of comments and correction, adjudication of correction, and review of final edits to ensure the document is ready for the next step in the review. Each review is 10 – 30 days in length, based

upon the amount of content in the TM, 30 days for adjudication, and 15 days for final comment and correction implementation review.

Based on a minimum one V&V event for the SOS integration effort, that calculates to a minimum of 150 days, or 5 months of effort to V&V platform TMs for MWO authentication. Since these activities require an equipped, operational platform with the SOS installed, the earliest the activities can begin is at the end of the MWO Validation event. This translates into 90 to 120 day, post MWO verification, gap to have a verified TM that is ready to support MWO authentication. This non-parallel driven effort delays the overall deployment and operation of the SOS capability and is an area of optimization that will be detailed in Chapter 5.

Configuration Management (CM) and Technical Data Package (TDP) Activities. The CM and TDP activities are required to produce a controllable, verified Drawing Package, and EDFP. Generically the V&V process for the two products follow the timeline provided for the TMs and has roughly the same start point for V&V in relation to the MWO process. To add some brevity for this research paper, those details will not be recaptured in this section. For informational analytical purposes, the CM and TDP definitions and processes will be quoted from their respective handbook and standard.

For CM, DOD defines it as such in MIL-HDBK-61B:

This military handbook provides guidance and best practices on how PMs, systems engineers, logistics managers, and other individuals assigned responsibility for CM perform and contract for CM. Its purpose is to provide for guidance in planning and implementing effective DOD CM activities and practices during the life cycle of the defense systems (Department of Defense, 2020, p. 1).

For TDPs, DOD defines it as:

This standard defines the requirements for a TDP and its related TDP data management products. The purpose of the TDP is to provide an authoritative technical description of an item which is clear, complete and accurate, and in a form and format adequate for its intended use. A TDP contains elements, is described by a level and type, and may have associated metadata and supplementary technical data. A TDP is a sub-set of product and technical data” (Department of Defense, 2018, p. 1).

Further data can be found in Chapter 2 under AMC PAM 25-31.

Based on a minimum one V&V event for the SOS integration effort, that calculates to a minimum of 150 days, or 5 months of effort to V&V platform TMs for MWO authentication. Since these activities require an equipped, operational platform with the SOS installed, the earliest the activities can begin is at the end of the MWO Validation event. This translates into 90 to 120 day, post MWO verification, gap to have a verified TDP and EDPF that is ready to support MWO authentication. This non-parallel driven effort delays the overall deployment and operation of the SOS capability and is an area of optimization that will be detailed in Chapter 5.

Test and Evaluation (T&E) Activities. T&E activities are required to verify the equipment manufacturer has produced a safe, suitable, supportable, and sustainable capability solution product. Generically the V&V process for this at the platform level is encompassed in the requirements to issue an AWR. The AWR effort runs parallel to the MWO process, with the exception of final AWR which requires verified documents covered under the TM, CM, TDP and sustainment activities. Further data for this area can be found in Chapter 2 under DODD 5030.61, AR 70-62, AR 73-1, and DA Pam 73-1.

Based upon this timeline, a 45 – 60 day gap is realized from the end of MWO verification, until release of the supporting AWR, which impacts MWO authentication (AS PO, 2019, p. np).

Since these activities require an equipped, operational platform with the SOS installed, the earliest the activities can begin is at the end of the MWO Validation event. This translates into 45 – 60 day, post MWO verification, gap to have an AWR that is ready to support MWO authentication (AS PO, 2019, p. np). This non-parallel driven effort delays the overall deployment and operation of the SOS capability and is an area of optimization that will be detailed in Chapter 5.

Materiel Release (MR) and Sustainment Activities. The last ancillary area deals with MR and sustainment documentation activities. For the purposes of this area of the analysis, MR follows the same general timeline and procedural execution as the T&E AWR. For the purposes of sustainment activities which include, Provisioning Parts list (PPL), BOMS, RPSTL and the overall Provisioning Data will roughly follow the TM timeline noted above.

The MR efforts are supported by AR and DA Pam 770-3. The Sustainment efforts are supported by AR and DA PAM 700-127. This section is added to provide realization as to the depth of additional requirements needed to be executed to receive MWO authentication. The MWR and sustainment activities feeds into the analysis review for points of optimization in the overall MWO process activities. These non-parallel driven efforts delay the overall deployment of the SOS capability and is an area of optimization that will be detailed in Chapter 5.

Ancillary Summary. The impacts of all the processes above have been documented and analyzed for points of optimization. However, without a key factor to base the effect and impact of the optimizations, there can be no measurable criteria for future success in implementing any recommendations provided in this research paper. The key fact that surmises optimization for question2, objectives 2 and 3 revolves around the main requirement contained in the Army MWO regulatory language. This requirement states, “No modification is authorized for an application unless it has an approved MWO number” (Department of the Army, 2019, p. 7). The event that

approves an MWO number is the MWO authentication. This point in the process is a singular choke point for fielding and deploying most SOS acquisitions (AS PO, 2019, p. np).

Potential Optimization Points

Potential optimization points for the three major and four supporting areas of analysis in this research paper for the AAF, MWO and ancillary areas are detailed in this chapter and recommendations will be documented in Chapter 5. As numerous significant optimizations points have been discovered in the analysis of the documents researched in Chapter 2, Table 6 below details potential optimization opportunities as aligned to their respective research review area.

Table 6

Potential Optimization Opportunities

Research Activity Area	Potential Optimization Opportunities
AAF	Effective implementation of UCA process requirements reductions into the MCA process
AAF	Target implementation of IOC to full capability acquisition sustainment processes into SOS A-Kit development and integration processes
AAF	Alignment of contract efforts to AAF MCA timeline to reduce administrative delays promulgating into the overall acquisition timeline
MWO Process	Effective implementation of Urgent MWO process requirements reductions into the Routine MWO process
MWO Process	Target implementation of IOC to full capability acquisition sustainment processes into SOS A-Kit development and integration processes
MWO Process	Conversion of 13 major MWO V&V activities from a singular, coupled event into parallel, independent events for final MWO authentication
MWO Process	Decouple of MWO V&V from initial MWO installation approval
MWO Process	Decouple of MWO Drawing Packet V&V from MWO authentication to make a parallel, independent event
MWO Process	Decouple of MWO ECP from MWO authentication to make a parallel, independent event
TM Process	Decouple of Technical Manuals (TMs) V&V from MWO authentication to make a parallel, independent event

Table 6 (Continued)*Potential Optimization Opportunities*

Research Activity Area	Potential Optimization Opportunities
TM Process	Decouple of Maintenance Allocation Chart (MAC) V&V from MWO authentication to make a parallel, independent event
MR Process	Decouple of Full Materiel Release (MR) process from MWO authentication to make a parallel, graduating event from UMR to CMR to FMR
MR Process	Decouple of Full Authority to Operate (ATO) process from MWO authentication to make a parallel, independent event
Sustainment Process	Decouple of Parts Provisioning List (PPL) process from MWO authentication to make a parallel, independent event
Sustainment Process	Decouple of Repair Parts and Special Tools List (RPSTL) process from MWO authentication to make a parallel, independent event
Sustainment Process	Decouple of Provisioning Data Process from MWO authentication to make a parallel, independent event
T&E Process	Decouple of Fleet Airworthiness Release (AWR) process from MWO authentication to make a parallel, independent event
CM/TDP Process	Decouple of Full Technical Data Package (TDP) process from MWO authentication to make a parallel, independent event
CM/TDP Process	Decouple of Engineering Data for Provisioning (EDFP) process from MWO authentication to make a parallel, independent event

Summary

Chapter 4 of this research paper covered the analysis of literature documents noted in Chapter 2. The analysis contained in this chapter included documents and processes for completion of UCA and MCA pathways within the AAF construct. This chapter also contained the documents and processes for the completion of the Urgent/Emergency, and Routine MWO processes. Next, the research paper detailed the process and timeline correlations for numerous ancillary activities tied to the MWO authentication process. Lastly, this chapter summarized how potential optimization points would be captured. Next, Chapter 5 will outline conclusions, recommendations and areas of future research proffered by this research paper.

Chapter 5 – Conclusions and Recommendations

“Be decisive. Right or wrong, make a decision. The Road of Life is paved with flat squirrels who couldn’t make a decision.” – Unknown (Ammo.com, 2021)

Introduction

This chapter will capture the conclusions, recommendations and areas of future research that have evolved from the literature review and analysis conducted in Chapters 2 and 4, of this research paper respectively. The conclusions will tie the completed analysis together to form a foundational data set to pen recommendations that will be contained in this chapter. The conclusion will identify and describe possible optimization points in the noted documentation processes that may help reduce the overall execution of integration requirements for SOS.

Based upon the vast expanse of the topical areas of this research, numerous research efforts will be proffered for future research efforts. The goal of these areas of research is to provide future researchers with multiple areas to positively impact the overall AAF process.

Conclusions

The AAF, MWO, and Ancillary supporting processes require the synchronization of multiple organizations and personnel. In general the stakeholders would involve all functional groups within the SOS and Platform MATDEV PMO. Additional stakeholders would then be included based upon the activity being worked and the overall programs ACAT level. Failure to synchronize activities will prolong the complex process and increase the timeline to modify the platform and field the capability to the Warfighter. Shrinking the noted timelines will require the execution of events in parallel. Resultant process tailoring will be based upon the characteristics of the added AAF focus on SOS capability acquisition focus in development. Again, like the stakeholder engagement, the approval for this tailoring would be the Acquisition decision

authority. A task combination guide crafted by experienced practitioners could enable less experienced personnel to tailor an MWO successfully.

Key to successfully implementing this focus is a review of and updating flow processes for ancillary activities within the MWO process. The updating document process could promote a more parallel execution of ancillary processes for platform A-kit integration. This updated approach will follow the already developed approach that the AAF already deployed for most system acquisition B-Kits. In SOS applications, the A-Kit integration and fielding efforts would mirror those of the system B-Kit.

Lastly, each acquisition program is different and the ability to tailor programs intelligently depends upon experience of those executing the program. In order to effectively baseline optimization, the MWO V&V, as well as the MWO ancillary events in support of MWO authentication could be offset to run in a more parallel manner. Risks associated with this change path would be considered and evaluated by the team assembled to review and implement the researcher's recommendations. This offset approach will facilitate continued application of SOS A-Kits, which will result in a DOD and Army ability to ensure receipt of SOS capabilities by the Warfighter, faster.

Recommendations

Recommendations for implementation of optimization opportunities during the research of the AAF and Army MWO processes for rotary-wing aircraft are captured in this section of Chapter 5. There are three recommendations offered by the researcher, as garnered from the literature reviews and compiled data analysis contained in Chapters 2 and 4 respectively.

Recommendation 1 A-Kit Transition to Sustainment Process

Based upon Statutory and Regulatory guidelines, the PM for the capabilities acquisition program, MATDEV, has the responsibility to include development of supportability sustainment planning and packages to support the developed capability. This mandate (Department of the Army, 2018, p. np) requires the PM to transition from an initial product support structure, normally some type of ICLS for the developed system, to an end Organic Sustainment structure. The timeline for the PM and their supporting Product Support Manager to complete this transition is currently set at Initial Operating Capability (IOC) plus three years. This transition period has been successfully employed for numerous end items that do not require integration on to another platform and for the B-Kit part of the SOS capability solution for items requiring integration onto another platform. The research indicates and offers a recommendation to establish the same kind of transition structure for the SOS A-Kit. This would allow an orderly ramp up of documentation V&V that would not hinder the initiation of fielding. As the complexity and size of the supportability and sustainment packet is simpler and smaller for the B-Kit portion of an SOS system, the entire 36 –month period established for B-Kits transition would not be needed for A-Kit transition. Based upon the analysis in this research paper, a recommended timeframe to execute A-Kit sustainment transition from the SOS MATDEV to the platform MATDEV would be 12 months with either a +/- 90 or 180 day window to establish a threshold and objective window. This timeframe is derived from the review of the overall MWO and ancillary processes in Chapters 2 and 4. It is also correlated to some established times noted in Figure 7 (AS PO, 2019, p. np). The researcher recommends these A-kit sustainment transition concepts be emphasized in DODI 5000.02 AAF, DODI 5000.80 MTA, and MCA DODI 5000.81.

Recommendation 2 Update of Army Regulations

The second recommendation from the researcher is to enact the established A-Kit transition to sustainment postured in the noted DODI 5000.02 and 5000.85 above, into the lower level Army regulatory documents managing Army acquisition and MWO applications.

Recommendation 3 Timeline Reductions from Future Research Areas

The Third recommendation is for Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA (ALT)) to establish a cross functional Working Group (WG) to review the development, integration, and fielding portions of the UCA and MCA pathways as a means to garner efficiencies promulgated in the UCA pathway execution. This effort will be aimed at the current AAF with SOS development as the target to drive change inputs. The AAF inputs will then drive changes in Army acquisition and equipment modification policy with a goal of trimming the overall system acquisition timeline. The fruit of the effort being realization of capability to the field, faster and at a reduced cost. Rather than restate areas covered below in the area for future research, this research paper would simply point to those areas as points of optimization opportunity mining. Exploratory work in these areas may well provide the fruition of cost and time savings for future DOD acquisition efforts.

Areas for Future Research

The research conducted in this paper highlighted several areas for future research. The five noted areas are detailed below.

Area 1 – Contract Requirements Package (CRP) Execution Impacts on Overall Acquisition Timeline

Contracting generally runs parallel to support acquisition development, procurement, and sustainment. Contracts Requirements Package (CRP) approval and execution timelines have

substantially increased in the past five years. As noted in the AAF and MWO analysis sections of the research paper, the administrative delays in contract have continued to impact capability development and integration efforts. Future research could be conducted to help develop a path for better alignment of the CRP process to reduce the time to develop and field capabilities in the future. Research opportunities also exist on application of acquisition tailoring in contracting to help enact faster response time for contracting action.

Area 2 – Transfer of Developmental Test and Evaluation Activities to Operational Test and Evaluation Activities

Areas of additional research can be executed under this general area to help identify DT&E tasks that can be moved to an OT&E environment. This area of research could also spawn opportunities to look at procurement of advanced prototypes and early Low-Rate Initial Production (LRIP) to use in extended LUT, early demonstration fielding initiatives, and other OT&E activities. This approach will garner field performance data for the Capabilities Set (CAPSET) solution and provide the requisite data needed for KPP and KSA assessment. Further research may also drive timeline reductions in actualizing certain system KPPs and KSAs.

Area 3 – Materiel Release (MR) and Sustainment Activities

Areas of additional research can be executed to ascertain the feasibility of using early validation test, safety, logistics, and system design data to posture early issuance of MR for the CAPSET to support early OT&E activities listed above. As noted in the T&E and MR and Sustainment sections of this paper, early transition of test requirements from DT&E to OT&E drive the data that is actually needed to calculate achievement of some key, mandatory KPPs and KSAs. Research can also be accomplished to help posture early fielding of capabilities to mature

sustainment data. This would help research development of reduced timelines to meet 10 USC 23664, 2366, and 2474 requirements for DOD acquisitions.

Area 4 – Configuration Management (CM) and Technical Data Packet (TDP) V&V Activities

The same research general opportunities noted in areas 2 and 3 are present in CM and TDP V&V processes. These are general areas for future research.

Pertaining to these areas there are two areas of research that are exposed from the research within this paper. The first area of focus lies in the baselining of the TDP and supporting documentation jointly with the SOS and Platform MATDEV teams. The hours lost in non-parallel, repetitive TDP reviews artificially bloats the overall integration schedule and permeates into inflation of the overall acquisition program schedule. Better alignment of current TDP review and CM processes and formatting of the TDP will present optimization opportunities to help reduce the overall AAF and MW timelines. The management, distribution and shared access to associated MWO and CM documentation will help ensure the TDP is jointly supportive of requirements to sustain the A-Kit after incorporation into the host platform. Again, non-parallel, repetitive CM reviews of the TDP cause inflated completion times for integration activities. This future research could result in possible acquisition timeline reductions.

Area 5 – Technical Manual V&V Activities

The same research opportunities for TM acceptance V&V that are noted in areas 2 and 3 can be applied to this area. Current TM V&V event for the SOS integration effort, that calculates to a minimum of 150 day, or 5 months of effort to V&V platform TMs for MWO authentication, if each event is a first time go. The future research into the V&V efforts for TMs could result in acquisition timeline reductions.

Summary

This chapter provides the researcher's conclusions from analysis on AAF, MWO and ancillary process timelines for SOS integration on Army rotary-wing aircraft. This chapter also included recommendations for potential timeline reductions in the overall AAF timeline, as well as, within functional areas of the MWO and ancillary processes. Lastly, this chapter provides variety of areas for future research full spectrum of functions contained within Army acquisition. The noted analysis, conclusion, and recommendations are a result of a thorough review and correlation of requirements from 45 primary and 525 of secondary DOD and Army policies procedures, and documents completing this research paper.

The results of this research are at the heart of DOD's ever evolving acquisition reform initiatives of better, faster, cheaper. At the core of all the DODI 5000.02 reform initiatives captured in this document from 2010 to present, is the push to reduce the cycle at which we develop, deploy and equip our Warfighter with needed capabilities to meet their mission in defense of the United States. Based upon current World events, the need to reduce acquisition timelines is more critical than ever. The conclusions and analysis provided in this paper will advance this effort and eliminate inefficiencies in acquisition efforts. In the words of Dr. La Plante, Under Secretary for Acquisition and Sustainment (USD (A&S)), "The Pentagon's acquisition system has to focus on delivering new capabilities that troops need — not just today, but in the future — to meet the quickly evolving threat from China and other leading adversaries" (Losey, 2022, p. np).

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Appendix A – OPSEC and Public Affairs Certification

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Appendix B – Primary Literature Lists

The 45 primary documents used in the completion of this research are provided in the list below for use by the practitioners and future researchers reviewing this paper. These document also contained 525 related and referenced documents. The list for those documents can be found in Appendix C.

Table B1

Primary Research Literature List

Article Number	Title Number	Title	Date	Research Area Supported
1	N/A	<i>Army Aviation MWO: Typical Process Required to Efficiently Implement</i>	24 Oct 2017	MWO
2	N/A	<i>AEM Strategy: Equipping the Total Force to Win in a Complex World</i>	27 Mar 2015	MWO
3	AMC PAM 25-31	<i>Preparation of Plans for Technical Publications</i>	27 Mar 2015	ANC
4	AR 70-1	<i>Army Acquisition Policy</i>	10 Aug 2018	AAF, MWO
5	AR 70-62	<i>Airworthiness of Aircraft Systems</i>	11 May 2016	ANC
6	AR 73-1	<i>Test and Evaluation Policy</i>	08 Jun 2018	ANC
7	AR 700-18	<i>Provisioning of Army Equipment</i>	29 Aug 2020	ANC
8	AR 700-127	<i>Integrated Product Support</i>	22 Oct 2018	ANC
9	AR 750-10	<i>Army Modification Program</i>	23 Oct 2019	MWO
10	AR 770-3	<i>Type Classification and Materiel Release</i>	16 Jul 2021	ANC
11	N/A	<i>AME Systems Integration Process Map</i>	09 May 2017	MWO
12	N/A	<i>AME Briefing: Systems Integration Process Map (SIPM)</i>	21 Nov 2016	MWO
13	N/A	<i>PO AS AAAA Briefing: Aviation Systems Project Office</i>	16 Nov 2016	MWO
14	N/A	<i>Best Practices for Using Engineering Standards (ISO/IEC/IEEE 15288) on Contracts for Department of Defense Acquisition Programs</i>	30 Apr 2017	AAF, MWO

Note: AAF=Adaptive Acquisition Framework; MWO=Modification Work Order; ANC=Ancillary

Table B1 (Continued)*Primary Research Literature List*

Article Number	Title Number	Title	Date	Research Area Supported
15	DA PAM 70-3	<i>Army Acquisition Procedures</i>	17 Sep 2018	AAF
16	DA PAM 73-1	<i>Test and Evaluation in Support of Systems Acquisition</i>	30 May 2003	ANC
17	DA PAM 700-127	<i>Integrated Product Support Procedures</i>	29 Aug 2019	ANC
18	DA PAM 770-3	<i>Type Classification and Materiel Release Procedures</i>	20 Jul 21	ANC
19	N/A	<i>Department of Defense FY 2022 Budget Estimate</i>	28 May 21	AAF, MWO, ANC
20	DODD 3200.11	<i>Major Range and Test Facility Base</i>	15 Oct 2015	ANC
21	DODD 5000.01	<i>The Defense Acquisition System</i>	09 Sep 2020	AAF
22	DODD 5000.71	<i>Rapid Fulfillment of Combatant Commander Urgent Operational Needs</i>	24 Aug 2012	AAF
23	DODD 5030.61	<i>DOD Airworthiness Policy</i>	31 Aug 2018	ANC
24	DODD 5134.01	<i>USD (AT&L) Appointment</i>	01 Apr 2008	AAF
25	DODI 5000.01	<i>The Defense Acquisition System</i>	09 Sep 2020	AAF
26	DODI 5000.02	<i>Operation of the Defense Acquisition System</i>	07 Jan 2015	AAF
27	DODI 5000.02T	<i>Operation of the Defense Acquisition System, Chg 6</i>	10 Aug 2017	AAF
28	DODI 5000.02	<i>Operation of the Adaptive Acquisition Framework</i>	23 Jan 2020	AAF
29	DODI 5000.74	<i>Acquisition of Services</i>	24 Jun 2021	AAF
30	DODI 5000.75	<i>Business Systems Requirements and Acquisition</i>	24 Jan 2020	AAF
31	DODI 5000.80	<i>Operation of Middle-Tier Acquisition</i>	30 Dec 2019	AAF
32	DODI 5000.81	<i>Urgent Capability Acquisition</i>	31 Dec 2019	AAF
33	DODI 5000.85	<i>Major Capability Acquisition</i>	04 Dec 2021	AAF

Note: AAF=Adaptive Acquisition Framework; MWO=Modification Work Order; ANC=Ancillary

Table B1 (Continued)*Primary Research Literature List*

Article Number	Title Number	Title	Date	Research Area Supported
34	DODI 5000.87	<i>Operation of the Software Acquisition Pathway</i>	02 Oct 2020	AAF
35	DODI 5134.17	<i>DASD (DT&E) Appointment</i>	15 Oct 2018	AAF, MWO
36	MIL-HDBK-61B	<i>Configuration Management Guidance</i>	07 Apr 2020	ANC
37	MIL-HDBK-245D	<i>Preparation of Statement of Work (SOW)</i>	03 Apr 1996	AAF, MWO, ANC
38	MIL-HDBK-1222F	<i>Guide to the General Style and Format of U.S. Army Work Package Technical Manuals</i>	15 Dec 2015	ANC
39	MIL-PRF-63002M	<i>Preparation of Modification Work Orders (MWOs)</i>	02 Aug 2018	MWO
40	MIL-STD-31000B	<i>Technical Data Packages (TDPs)</i>	31 Oct 2018	ANC
41	MIL-STD-38784B	<i>Manuals, Technical: General Style and Format Requirements</i>	16 Nov 2020	ANC
42	MIL-STD-40051-1C	<i>Preparation of Digital Technical Information for IETMs</i>	15 Dec 2015	ANC
43	MIL-STD-40051-2C	<i>Preparation of Digital Technical Information for IETMs</i>	15 Dec 2015	ANC
44	N/A	<i>Program Executive Office (PEO), Aviation (AVN), Policy#17-4, Funding System of Systems PM Managed A-Kit and B-Kit Integration on Army Aviation Platforms</i>	07 Mar 2017	MWO
45	N/A	<i>Rules of the Road – A Guide for Leading Successful Integrated Product Teams – Rev 1</i>	30 Nov 1999	AAF, MWO

Note: AAF=Adaptive Acquisition Framework; MWO=Modification Work Order; ANC=Ancillary

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Appendix C – Secondary Literature Lists

Army Aviation Modification Work Orders: Typical Process Required to Efficiently Implement, 24 October 2017

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

Army Equipment Modernization Strategy: Equipping the Total Force to Win in a Complex Word, 27 March 2015

The required documents reviewed under the secondary literature review for this document are as listed in Table C1. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C1

AEM Strategy Secondary Documents

Required Documents	Required Documents
2014 Quadrennial Defense Review	Sustaining U.S. Global Leadership: Priorities for 21st Century Defense
Army Strategic Planning Guidance	The U.S. Army Operating Concept: Win in a Complex World
Force 2025 and Beyond Integration and Synchronization Plan	U.S. Army Science and Technology Strategic Implementation Plan
National Security Strategy	

Army Materiel Command (AMC) Pamphlet (PAM) 25-31, Preparation of Plans for Technical Publications, 27 March 2015

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

Army Regulation (AR) 70-1, Army Acquisition Policy, 10 August 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C2. Related documents were not included based upon the

exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C2

AR 70-1 Secondary Documents

Required Documents	Required Documents
AR 5–12 Army Management of the Electromagnetic Spectrum	AR 71–9 Warfighting Capabilities Determination
AR 10–87 Army Commands, Army Service Component Commands, and Direct Reporting Units	AR 385–10 The Army Safety Program
AR 25–1 Army Information Technology	CJCSI 3170.01I Joint Capabilities Integration and Development System (JCIDS)
AR 25–2 Information Assurance	DA Pam 385–16 System Safety Management Guide
AR 70–77 Program Protection	DODI 5000.69 DOD Joint Services Weapon and Laser System Safety Review Processes

AR 70-62, Airworthiness of Aircraft Systems, 11 May 2016

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C3. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C3

AR 70-62 Secondary Documents

Required Documents	Required Documents
AR 95–1 Flight Regulations	AR 750–6 Army Equipment Safety and Maintenance Notification System
AR 95–20 Contractor's Flight and Ground Operations	DA Pam 95–9 Management of Aviation Critical Safety Items
AR 95–23 Unmanned Aircraft System Flight Regulations	DA Pam 385–16 System Safety Management Guide
AR 385–10 The Army Safety Program	DA Pam 738–751 Functional User's Manual for the Army Maintenance Management System-Av
AR 750–1 Army Materiel Maintenance Policy	

AR 73-1, Test and Evaluation Policy, 08 June 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C4. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C4*AR 73-1 Secondary Documents*

Required Documents	Required Documents
AR 5–13 Total Army Munitions Requirements and Prioritization Policy	DOD Integrated Product and Process Development (IPPD) Handbook
AR 25–2 Information Assurance	DODI 3200.18 Management and Operation of the Major Range and Test Facility Base
AR 40–7 Use of U.S. Food and Drug Administration–Regulated Investigational Products in Humans	DODI 3216.02 Protection of Human Subjects and Adherence to Ethical Standards in DOD-Supported Research
AR 70–41 International Cooperative Research, Development, and Acquisition	DODI 8330.01 Interoperability of Information Technology (IT) including NSS
AR 200–1 Environmental Protection and Enhancement	DODI 8500.01 Cybersecurity
AR 525–29 Army Force Generation	DODI 8510.01 Risk Management Framework (RMF) for DOD Information Technology (IT)
AR 702–19 Reliability, Availability, and Maintainability	DODI O–3600.03 TAS for CNA Capabilities
Chapter A0–2040 (RDT&E–A) of the Army Management Structure	10 USC 139 Director of Operational Test and Evaluation
DOD 7000.14–R Department of Defense Financial Management Regulation	10 USC 1706 Government performance of certain acquisition function

AR 700-18, Provisioning of Army Equipment, 29 August 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C5. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C5*AR 700-18 Secondary Documents*

Required Documents	Related Documents
AR 12-1 Security Assistance, Training, and Export Policy	AR 750-43 Army Test, Measurement, and Diagnostic Equipment
AR 25-30 Army Publishing Program	CTA 8-100 Army Medical Department Expendable/Durable Items
AR 40-60 Army Medical Materiel Acquisition Policy	CTA 50-970 Expendable/Durable Items
AR 40-61 Medical Logistics Policies	DA Pam 25-40 Army Publishing Program Procedures
AR 700-82 Joint Regulation Governing the Use and Application of Uniform Source, Maintenance, and Recoverability Codes	DA Pam 710-2-1 Using Unit Supply System
AR 700-141 Hazardous Materials Information Resource System	DOD 4140.26-M, Volume 1 DoD IMM for Consumable Items: Operating Procedures For Item Management Coding (IMC)
AR 702-19 Reliability, Availability, and Maintainability	DODM 4100.39 Federal Logistics Information System (FLIS) Procedures
AR 710-1 Centralized Inventory Management of the Army Supply System	DODM 4120.24 Defense Standardization Program (DSP) Procedures
AR 750-1 Army Materiel Maintenance Policy	SB 708-6 Federal Item Name Directory for Supply Cataloging

AR 700-127, Integrated Product Support, 22 October 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C6. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C6*AR 700-127 Secondary Documents*

Required Documents	Related Documents
AR 602-2 Human Systems Integration in the System Acquisition Process	DA Pam 700-28 Independent Logistics Assessment
AR 715-9 Operational Contract Support Planning and Management	Office of Management and Budget Circular A-94 Discount Rates for BCA of Fed Programs
AR 750-1 Army Materiel Maintenance Policy	

AR 750-10, Army Modification Program, 23 October 2019

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C7. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C7*AR 750-10 Secondary Documents*

Required Documents	Related Documents
AR 220–1 Army Unit Status Reporting and Force Registration—Consolidated Policies	AR 725–50 Requisitioning, Receipt, and Issue System
AR 700–138 Army Logistics Readiness and Sustainability	DA Pam 738–751 User's Manual for the Army Maintenance Management System–Av
AR 710–1 Centralized Inventory Management of the Army Supply System	DA Pam 750–8 The Army Maintenance Management System (TAMMS) User's Manual

AR 770-3, Type Classification and Materiel Release, 16 July 2021

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C8. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C8*AR 770-3 Secondary Documents*

Required Documents	Related Documents
AR 40–10 Health Hazard Assessment Program in Support of the Army Acquisition Process	AR 602–2 Human Systems Integration in the System Acquisition Process
AR 115–11 Geospatial Information and Services	DA Pam 385–16 System Safety Management Guide
AR 385–10 The Army Safety Program	

Aviation Mission Equipment (AME) Systems Integration Process Map (SIPM), 09 May 2017

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

AME Briefing: Systems Integration Process Map (SIPM), 21 November 2016

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

Aviation Systems Project Office (PO AS) Army Aviation Association of America (AAAA)

Briefing: Aviation Systems Project Office, 16 November 2017

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

Best Practices for Using Engineering Standards (ISO/IEC/IEEE 15288) on Contracts for Department of Defense Acquisition Programs, 30 April 2017

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C9. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C9

Best Practices for Using Engineering Standards Secondary Documents

Required Documents	Related Documents
Defense Acquisition Guidebook (DAG)	IEEE 15288.1-2014 "IEEE Standard for Application of SE on Defense Programs
DODM 4120.24 Defense Standardization Program (DSP) Procedures	IEEE 15288.2-2014 "IEEE Standard for Tech Reviews and Audits on Defense Programs
ISO/IEC/IEEE 15288:2015 "Systems and SW Engineering—System Life Cycle Processes	Public Law 114-328 National Defense Authorization Act of Fiscal Year 2017
SD-9 DoD Guidance on Participation in the Development and	Public Law 104-113 National Technology Transfer and Advancement Act of 1995

Department of the Army Pamphlet (DA PAM) 70-3, Army Acquisition Procedures, 17**September 2018**

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C10. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C10*DA PAM 70-3 Secondary Documents*

Required Documents	Related Documents
Defense Acquisition Guidebook (DAG)	

DA PAM 73-1, Test and Evaluation in Support of Systems Acquisition, 30 May 2003

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

DA PAM 700-127, Integrated Product Support Procedures, 29 August 2018

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

DA Pam 770-3, Type Classification and Materiel Release Procedures, 20 July 2021

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C11. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C11*DA PAM 770-3 Secondary Documents*

Required Documents	Related Documents
AOP–7 Revision 2 Manual of Data Requirements and Tests for the Qualification of Explosives Materials for Military Use	CTA 50–900 Clothing and Individual Equipment
AR 5–12 Army use of the Electromagnetic Spectrum	CTA 50–909 Field and Garrison Furnishings and Equipment
AR 25–1 Army Information Technology	DA Pam 385–64 Ammunition and Explosives Safety Standards
AR 25–30 Army Publishing Program	DA Pam 708–2 Cataloging and Supply Management Data Procedures for the Army Enterprise Material Master
AR 40–10 Health Hazard Assessment Program in Support of the Army Acquisition Process	DA Pam 708–3 Cataloging of Supplies and Equipment, Army Adopted Items of Materiel, and List of Reportable Items
AR 70–47 Engineering for Transportability Program	DA Pam 742–1 Ammunition Surveillance Procedures
AR 71–32 Force Development and Documentation Consolidated Policies	MIL–STD–882E System Safety
AR 75–15 Policy for Explosive Ordnance Disposal	MIL–STD–1901 Munition Rocket and Missile Motor Ignition System Design, Safety Criteria
AR 350–1 Army Training and Leader Development	SB 700–20 Army Adopted/Other Items Selected for Authorization/List of Reportable Items
AR 385–10 The Army Safety Program	TB 700–2 Department of Defense Ammunition and Explosives Hazard Classification Procedures
AR 385–63 Range Safety	10 CFR chap 1 Nuclear Regulatory Commission
AR 602–2 Human Systems Integration in the System Acquisition Process	49 CFR 173 Shippers—General Requirements for Shipments and Packaging
AR 750–43 Army Test, Measurement, and Diagnostic Equipment	10 USC 139 Director of Operational Test and Evaluation

Department of Defense FY 2022 Budget Estimate, 28 May 2021

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

DODD 3200.11, Major Range and Test Facility Base, 15 October 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C12. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C12*DODD 3200.11 Secondary Documents*

Required Documents	Related Documents
DODD 5105.71 Department of Defense Test Resource Management Center (TRMC)	DODR 7000.14 Volume 1-15 DoD Financial Management Regulation
DODD 5142.02 Director of Operational Test and Evaluation (DOT&E)	10 USC 196 Department of Defense Test Resource Management Center
DODI 3200.18 Management and Operation of the Major Range and Test Facility Base (MRTFB)	Deputy Secretary of Defense Memorandum Establishment of the Office of the USD for R&E and the Office of the USD for A&S
DODM 8910.1 DoD Information Collections Manual: Procedures for DoD Internal Information Collections	

DODD 5000.01, The Defense Acquisition System, 09 September 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C13. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C13*DODD 5000.01 Secondary Documents*

Required Documents	Related Documents
DODD 1322.18 Military Training	DODD 5143.01 Under Secretary of Defense for Intelligence and Security (USD(I&S))
DODD 2060.01 Implementation of, and Compliance with, Arms Control Agreements	DODD 5144.02 DoD Chief Information Officer (DoD CIO)
DODD 5105.82 Deputy Chief Management Officer (DCMO) of the Department of Defense	DODI 5015.02 DoD Records Management Program
DODD 5105.84 Director of Cost Assessment and Program Evaluation	DODI 8500.01 Cybersecurity
DODD 5124.02 "Under Secretary of Defense for Personnel and Readiness (USD(P&R))	MIL-STD-882E DoD Standard Practice for System Safety
DODD 5135.02 Under Secretary of Defense for Acquisition and Sustainment (USD(A&S))	Title 10 USC Armed Forces
DODD 5137.02 Under Secretary of Defense for Research and Engineering (USD(R&E))	Title 44 USC Public Printing and Documents
DODD 5141.02 Director of Operational Test and Evaluation (DOT&E)	

**DODD 5000.71, Rapid Fulfillment of Combatant Commander Urgent Operational Needs,
24 August 2012**

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C14. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C14

DODD 5000.71 Secondary Documents

Required Documents	Related Documents
PL 107-314 2003 NDAA	CJCSI 3170.01H Joint Capabilities Integration and Development System
Title 10 USC	USD (ATL) Memo Acquisition Actions for JUONS

DODD 5030.61, DOD Airworthiness Policy, 31 August 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C15. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C15

DODD 5030.61 Secondary Documents

Required Documents	Related Documents
DODI 4500.53 DoD Commercial Air Trans Quality and Safety Review Program	Title 10 USC Armed Forces
DODI 4540.01 Use of International Airspace by U.S. Military Acft and for Missile/Projectile Firings	Title 14 USC US Coast Guard
DODI 5030.19 DoD Responsibilities on Federal Aviation	Federal Aviation Regulation (FAR)
MIL-HDBK-516C Airworthiness Certification Criteria	USD for ATL Memo Flight in Foreign-Owned Aircraft Implementation Guidance
MIL-STD-882E DoD Standard Practice for System Safety	DSD Memo Establishment of the Office of the USD R&E Under USD A&S

**DODD 5134.01, Under Secretary of Defense for Acquisition, Technology, and Logistics
(USD (AT&L)), 01 April 2008**

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C16. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C16

DODD 5134.01 Secondary Documents

Required Documents	Related Documents
DODD 2060.01 Implementation of, and Compliance with, Arms Control Agreements	Title 22 USC Foreign Relations and Intercourse
DODD 5000.59 DoD Modeling and Simulation (M&S) Management	Title 29 USC Labor
DODD 5101.01 DoD Executive Agent	Title 41 USC Public Contracts and Property Management
DODD 5530.03 International Agreements	Public Law 95-452 IG Act of 1978
DODD 8910.01 Management and Control of Information Requirements	Public Law 101-510 The Defense Base Closure and Realignment Act of 1990
DODI 5230.28 Low Observable (LO) and Counter Low Observable (CLO) Programs	Public Law 102-484 The National Defense Authorization Act for Fiscal Year 1993
DODM 5025.01 DoD Directives System Procedures	EO 12196 Occupational Safety and Health Programs for Federal Employees
DODM 5101.01 DoD Executive Agent	EO 12626 National Defense Stockpile Manager
OMB 109A Major System Acquisitions	EO 12931 Federal Procurement Reform
Title 10 USC Armed Forces	National Disclosure Policy-1 NPP for the Disclosure of Classified Military Information to Foreign Govs and International Orgs
Title 14 USC US Coast Guard	SecDef Memo Actions to Improve Logistics and Global Supply Chain Management
Title 15 USC Commerce and Trade	

**Department of Defense Instruction (DODI) 5000.01, The Defense Acquisition System, 09
September 2020**

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C17. Related documents were not included based upon the

exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C17

DODI 5000.01 Secondary Documents

Required Documents	Related Documents
DODD 1322.18 Military Training	DODD 5143.01 Under Secretary of Defense for Intelligence and Security (USD(I&S))
DODD 2060.01 Implementation of, and Compliance with, Arms Control Agreements	DODD 5144.02 DoD Chief Information Officer (DoD CIO)
DODD 5105.82 Deputy Chief Management Officer (DCMO) of the Department of Defense	DODI 5015.02 DoD Records Management Program
DODD 5105.84 Director of Cost Assessment and Program Evaluation	DODI 8500.01 Cybersecurity
DODD 5124.02 “Under Secretary of Defense for Personnel and Readiness (USD(P&R))	Title 10 USC Armed Forces
DODD 5135.02 Under Secretary of Defense for Acquisition and Sustainment (USD(A&S))	Title 44 USC Public Printing and Documents
DODD 5137.02 Under Secretary of Defense for Research and Engineering (USD(R&E))	MIL-STD-882E DoD Standard Practice for System Safety
DODD 5141.02 Director of Operational Test and Evaluation (DOT&E)	

DODI 5000.02, Operation of the Defense Acquisition System, Change 3 07 January 2015

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C18. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C18

DODI 5000.02 Secondary Documents

Required Documents	Related Documents
DIAD 5000.200 Intelligence Threat Support for Major Defense Acquisition Programs	DODI O-5240.24 Counterintelligence (CI) Activities Supporting RDA
DIAI 5000.002 Intelligence Threat Support for Major Defense Acquisition Programs	DODI 5400.16 DoD Privacy Impact Assessment (PIA) Guidance
DODD 1322.18 Military Training	DODI 7041.03 Economic Analysis for Decision Making
DODD 5000.71 Rapid Fulfillment of Combatant Commander Urgent Operational Needs	DODI 7041.04 Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support

Table C18 (Continued)*DODI 5000.02 Secondary Documents*

Required Documents	Related Documents
DODD 5105.84 Director of Cost Assessment and Program Evaluation (DCAPE)	DODI O-5240.24 Counterintelligence (CI) Activities Supporting Research, Development, and Acquisition (RDA)
DODD 5205.02E DoD Operations Security (OPSEC) Program	DODI 5400.16 DoD Privacy Impact Assessment (PIA) Guidance
DODD 5250.01 Management of Intelligence Mission Data (IMD) in DoD Acquisition	DODI 7041.03 Economic Analysis for Decision Making
DODD 5400.11 DoD Privacy Program	DODI 7041.04 Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support
DODD 5400.11 DoD Privacy Program	DODI 7041.04 Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support
DODI 1100.22 Policy and Procedures for Determining Workforce Mix	DODI 8320.02 Sharing Data, Information, and Information Technology (IT) Services in the Department of Defense
DODI 2010.06 Materiel Interoperability and Standardization with Allies and Coalition Partners	DODI 8320.04 Item Unique Identification (IUID) Standards for Tangible Personal Property
DODI 3200.12 DoD Scientific and Technical Information Program (STIP)	DODI 8330.01 Interoperability of Information Technology (IT), Including National Security Systems (NSS)
DODI 4140.67 DoD Counterfeit Prevention Policy	DODI 8410.03 Network Management (NM)
DODI 4151.22 Condition Based Maintenance Plus (CBM+) for Materiel Maintenance	DODI 8500.01 Cybersecurity
DODI 4630.09 Wireless Communications Waveform Development and Management	DODI 8510.01 Risk Management Framework (RMF) for DoD Information Technology (IT)
DODI 4650.01 Policy and Procedures for Management and Use of the Electromagnetic Spectrum	DODI 8530.01 Cybersecurity Activities Support to DoD Information Network Operations
DODI 5000.61 DoD Modeling and Simulation (M&S) Verification, Validation, and Accreditation (VV&A)	DODM 4160.28 Volume 1 Defense Demilitarization: Program Administration
DODI 5000.66 Operation of the Defense Acquisition, Technology, and Logistics Workforce Education, Training, and Career Development	DODM 5000.04-M-1 Cost and Software Data Reporting (CSDR) Manual
DODI 5000.67 Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure	DODS 5015.02 Electronic Records Management Software Applications Design Criteria Standard
DODI 5000.73 Cost Analysis Guidance and Procedures	OMB A-11 Preparing, Submitting, and Executing the Budget," current edition
OMB Memorandum M-04-08 Maximizing Use of Smart Buy and Avoiding Duplication of Agency Activities with the President's 24 E-Gov Initiatives	Public Law 111-383 Ike Skelton National Defense Authorization Act for Fiscal Year 2011
OMB Memorandum M-04-16 Software Acquisition	Public Law 113-66 National Defense Authorization Act for Fiscal Year 2014
OMB Memorandum M-05-25 Smart Buy Agreement with Oracle	Public Law 112-81 National Defense Authorization Act for Fiscal Year 2012

Table C18 (Continued)*DODI 5000.02 Secondary Documents*

Required Documents	Related Documents
CJCSI 3170.01I Joint Capabilities Integration and Development System	Public Law 112-239 National Defense Authorization Act for Fiscal Year 2013
CJCSI 5123.01G Charter for Joint Requirements Oversight Council	Public Law 114-92 National Defense Authorization Act for Fiscal Year 2016
CJCSI 6510.01F Information Assurance (IA) and Support to Computer Network Defense (CND)	EO 12114 Environmental Effects Abroad of Major Federal Actions
Title 10 USC Armed Forces	EO 13691 Promoting Private Sector Cybersecurity Information Sharing
Title 15 USC Commerce and Trade	DFARS
Title 29 USC Labor	Federal Acquisition Regulation
Title 32 USC National Guard	SFFAS No. 23 Eliminating the Category National Defense Property, Plant, and Equip
Title 40 USC Protection of the Environment	JCIDS Manual Operation of the JCIDS
Title 42 USC Public Health and Welfare	ANSI/EIA 748 Earned Value Management Systems
Title 44 USC Public Printing and Documents	Security Assistance Management Manual (SAMM)
Title 47 USC Telecommunication	Integrated Program Management Report Implementation Guide
Title 44 USC Public Printing and Documents	Global Information Grid (GIG) Technical Guidance Federation (GTGF)
Title 47 USC Telecommunication	OSD (DT& E) Department of Defense Cybersecurity Test and Evaluation Guidebook
Public Law 95-452 Inspector General Act of 1978	OSD (SE) Guidance to Stakeholders for Implementing Defense Federal Acquisition Supplement Clause 252.204-7012
Public Law 101-510 The Defense Base Closure and Realignment Act of 1990	OSD (SE) Department of Defense Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs
Public Law 101-576 Chief Financial Officers Act of 1990	OSD (CAPE) Operating and Support Cost-Estimating Guide
Public Law 102-484 The National Defense Authorization Act for Fiscal Year 1993	DOTe Procedures for OT&E of Cybersecurity in Acquisition Programs
Public Law 102-538 The National Telecommunications and Information Organization Act	ASD R&E Guide Technology Readiness Assessment (TRA) Guidance
Public Law 106-398 Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001	Directive Type Memo 17-001 Cybersecurity in the Defense Acquisition System
Public Law 107-314 Bob Stump National Defense Authorization Act for Fiscal Year 2003	USD (ATL) Policy Memorandum Key Leadership Positions and Qualification Criteria
Public Law 109-364 John Warner National Defense Authorization Act for Fiscal Year 2007	USD (ATL) Memo Change to Major Defense Acquisition Program Milestone A Requirements
Public Law 110-417 The Duncan Hunter National Defense Authorization Act for Fiscal Year 2009	MIL-STD-882E DoD Standard Practice for System Safety

DODI 5000.02T, Operation of the Defense Acquisition System, Change 6 10 August 2017

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C19. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C19*DODI 5000.02T Secondary Documents*

Required Documents	Related Documents
DIAD 5000.200 Intelligence Threat Support for Major Defense Acquisition Programs	DODI O-5240.24 Counterintelligence (CI) Activities Supporting RDA
DIAD 5000.002 Intelligence Threat Support for Major Defense Acquisition Programs	DODI 5400.16 DoD Privacy Impact Assessment (PIA) Guidance
DODD 1322.18 Military Training	DODI 7041.03 Economic Analysis for Decision Making
DODD 5000.71 Rapid Fulfillment of Combatant Commander Urgent Operational Needs	DODI 7041.04 Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support
DODD 5105.84 Director of Cost Assessment and Program Evaluation (DCAPE)	DODI O-5240.24 Counterintelligence (CI) Activities Supporting Research, Development, and Acquisition (RDA)
DODD 5205.02E DoD Operations Security (OPSEC) Program	DODI 5400.16 DoD Privacy Impact Assessment (PIA) Guidance
DODD 5250.01 Management of Intelligence Mission Data (IMD) in DoD Acquisition	DODI 7041.03 Economic Analysis for Decision Making
DODD 5400.11 DoD Privacy Program	DODI 7041.04 Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support
DODI 1100.22 Policy and Procedures for Determining Workforce Mix	DODI 8320.02 Sharing Data, Information, and Information Technology (IT) Services in the Department of Defense
DODI 2010.06 Materiel Interoperability and Standardization with Allies and Coalition Partners	DODI 8320.04 Item Unique Identification (IUID) Standards for Tangible Personal Property
DODI 3200.12 DoD Scientific and Technical Information Program (STIP)	DODI 8330.01 Interoperability of Information Technology (IT), Including NSS
DODI 4140.67 DoD Counterfeit Prevention Policy	DODI 8410.03 Network Management (NM)
DODI 4151.22 Condition Based Maintenance Plus (CBM+) for Materiel Maintenance	DODI 8500.01 Cybersecurity
DODI 4630.09 Wireless Communications Waveform Development and Management	DODI 8510.01 Risk Management Framework (RMF) for DoD Information Technology (IT)
DODI 4650.01 Policy and Procedures for Management and Use of the EM Spectrum	DODI 8530.01 Cybersecurity Activities Support to DoD Information Network Operations
OMB A-11 Preparing, Submitting, and Executing the Budget, current edition	DODI 8530.01 Cybersecurity Activities Support to DoD Information Network Operations
DODI 5000.61 DoD Modeling and Simulation (M&S) VV&A	DODM 4160.28 Volume 1 Defense Demilitarization: Program Administration

Table C19 (Continued)*DODI 5000.02T Secondary Documents*

Required Documents	Related Documents
DODI 5000.66 Operation of the Defense Acquisition, Technology, and Logistics Workforce Education, Training, and Career Development	DODM 5000.04-M-1 Cost and Software Data Reporting (CSDR) Manual
DODI 5000.67 Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure	DODS 5015.02 Electronic Records Management Software Applications Design Criteria Standard
DODI 5000.73 Cost Analysis Guidance and Procedures	OSD (CAPE) Operating and Support Cost-Estimating Guide
OMB Memorandum M-04-08 Maximizing Use of Smart Buy and Avoiding Duplication of Agency Activities with the President's 24 E-Gov Initiatives	Public Law 111-383 Ike Skelton National Defense Authorization Act for Fiscal Year 2011
OMB Memorandum M-04-16 Software Acquisition	Public Law 112-81 National Defense Authorization Act for Fiscal Year 2012
OMB Memorandum M-05-25 Smart Buy Agreement with Oracle	Public Law 112-239 National Defense Authorization Act for Fiscal Year 2013
CJCSI 3170.01I Joint Capabilities Integration and Development System	Public Law 114-92 National Defense Authorization Act for Fiscal Year 2016
CJCSI 5123.01G Charter for Joint Requirements Oversight Council	EO 12114 Environmental Effects Abroad of Major Federal Actions
CJCSI 6510.01F Information Assurance (IA) and Support to Computer Network Defense (CND)	EO 13691 Promoting Private Sector Cybersecurity Information Sharing
Title 10 USC Armed Forces	DFARS
Title 15 USC Commerce and Trade	Federal Acquisition Regulation
Title 29 USC Labor	SFFAS No. 23 Eliminating the Category National Defense Property, Plant, and Equip
Title 32 USC National Guard	JCIDS Manual Operation of the JCIDS
Title 40 USC Protection of the Environment	ANSI/EIA 748 Earned Value Management Systems
Title 42 USC Public Health and Welfare	Security Assistance Management Manual (SAMM)
Title 44 USC Public Printing and Documents	Integrated Program Management Report Implementation Guide
Title 47 USC Telecommunication	Global Information Grid (GIG) Technical Guidance Federation (GTGF)
Public Law 95-452 Inspector General Act of 1978	OSD (DT& E) Department of Defense Cybersecurity Test and Evaluation Guidebook
Public Law 101-510 The Defense Base Closure and Realignment Act of 1990	OSD (SE) Guidance to Stakeholders for Implementing DFAS Clause 252.204-7012
Public Law 101-576 Chief Financial Officers Act of 1990	OSD (SE) Department of Defense Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs
Public Law 102-484 The National Defense Authorization Act for Fiscal Year 1993	Public Law 102-484 The National Defense Authorization Act for Fiscal Year 1993
Public Law 102-538 The National Telecomm and Information Organization Act	Public Law 102-538 The National Telecomm and Information Organization Act
Public Law 113-66 National Defense Authorization Act for Fiscal Year 2014	Public Law 106-398 Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001

Table C19 (Continued)*DODI 5000.02T Secondary Documents*

Required Documents	Related Documents
Public Law 107-314 Bob Stump National Defense Authorization Act for Fiscal Year 2003	OSD (CAPE) Operating and Support Cost-Estimating Guide
Public Law 109-364 John Warner National Defense Authorization Act for Fiscal Year 2007	DOTe Procedures for Operational Test and Evaluation of Cybersecurity in Acquisition
Public Law 110-417 The Duncan Hunter National Defense Authorization Act for Fiscal Year 2009	ASD R&E Guide Technology Readiness Assessment (TRA) Guidance
USD (ATL) Memorandum Change to Major Defense Acquisition Program Milestone A Requirements	Directive Type Memo 17-001 Cybersecurity in the Defense Acquisition System
USD (ATL) Memorandum Change to Major Defense Acquisition Program Milestone B Requirements	USD (ATL) Policy Memorandum Key Leadership Positions and Qualification Criteria
OSD (SE) Department of Defense Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs	USD (ATL) Policy Memorandum Key Leadership Positions and Qualification Criteria

DODI 5000.02, Operation of the Adaptive Acquisition Framework, 23 January 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C20. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C20*DODI 5000.02 Secondary Documents*

Required Documents	Related Documents
DODD 5000.71 Rapid Fulfillment of Combatant Commander Urgent Operational Needs	Public Law 114-328 National Defense Authorization Act for Fiscal Year 2017
DODI 5000.74 Defense Acquisition of Services	Public Law 114-92 National Defense Authorization Act for Fiscal Year 2016
DODI 5000.80 Operation of the Middle Tier of Acquisition (MTA)	DSD Memorandum Acquisition Roles and Responsibilities
DODI 5000.81 Urgent Capability Acquisition	DSD Memorandum Procedures for the Establishment of Program Cost, Fielding, and Performance Goals for MDAPs
DODI 5010.44 Intellectual Property (IP) Acquisition and Licensing	DSD Memorandum Establishment of the Office of the USD for R&E and the Office of the USD for A&S
DODI 5025.01 DoD Issuances Program	Milestone Documentation Identification Tool
Title 10 USC Armed Forces	

DODI 5000.74, Acquisition of Services, 24 June 2021

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C21. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C21*DODI 5000.74 Secondary Documents*

Required Documents	Related Documents
DODD 1100.04 Guidance for Manpower Management	Title 31 USC Economy Act of 1933
DODD 5135.02 Under Secretary of Defense for Acquisition and Sustainment (USD(A&S))	Public Law 111-84 National Defense Authorization Act for Fiscal Year 2010
DODI 1100.22 Policy and Procedures for Determining Workforce Mix	Public Law 115-141 Consolidated Appropriations Act, 2018
DODI 5000.77 DOD Federally Funded Research and Development Centers	OMB Circular 76 Performance of Commercial Activities
DODI 5000.82 Acquisition of information Technology	OFPP Letter 11-01 Performance of Inherently Governmental and Critical Functions
DODI 7041.04 Estimating the Full Civilian, AD, and Contractor Support	DOD Cost Estimating Guide
FAR	Handbook of Contract Function Checklists for Services Acquisition
Title 10 USC Armed Forces	(UARC) Management Plan

DODI 5000.75, Business Systems Requirements and Acquisition, 24 January 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C22. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C22*DODI 5000.75 Secondary Documents*

Required Documents	Related Documents
DODD 5105.53 Director of Administration and Management (DA&M)	Public Law 112-239 National Defense Authorization Act for Fiscal Year 2013
DODD 5144.02 DoD Chief Information Officer (DoD CIO)	DSD Memorandum Reorganization of the Office of the Deputy Chief Management Officer,
DODD 5105.82 Deputy Chief Management Officer (DCMO) of the Department of Defense	DCMO Policy Memorandum Defense Business Systems Investment Management Process Guidance
DODI 7041.03 Economic Analysis for Decision-making	DOT&E Policy Memorandum Cyber Economic Vulnerability Assessments (CEVA)
DODI 8330.01 Interoperability of Information Technology (IT), Including National Security Systems (NSS)	DOT&E Policy Memorandum Guidelines for Operational Test and Evaluation of Information and Business Systems
Title 10 USC Armed Forces	

DODI 5000.80, Mid-Tier Acquisition, 30 December 2019

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C23. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C23*DODI 5000.80 Secondary Documents*

Required Documents	Related Documents
DODI 5025.01 DOD Issuance Programs	CJCSI 5123.01H Charter of the JROC and Implementation of JCIDS
Title 10 USC Armed Forces	DSD Memorandum Reorganization of the Office of the Deputy Chief Management Officer
Public Law 114-92 National Defense Authorization Act for Fiscal Year 2016	

DODI 5000.81, Urgent Capability Acquisition, 31 December 2019

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C24. Related documents were not included based upon the

exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C24

DODI 5000.81 Secondary Documents

Required Documents	Related Documents
DODI 8510.01 Risk Management Framework	PL 107-314 FY 2003 NDAA
DODM 5000.78 Rapid Acquisition Authority	Sec Def Pub – 2018 NDS
DODM 8910.01 DOD Information's Collection Manual	CJCSI 5123.01H Charter of the JROC and Implementation of JCIDS
Title 10 USC Armed Forces	DSD Memorandum Reorganization of the Office of the Deputy Chief Management Officer
Title 40 USC Environmental	

DODI 5000.85, Major Capability Acquisition, 04 December 2021

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C25. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C25

DODI 5000.85 Secondary Documents

Required Documents	Related Documents
DODD 5000.71 Rapid Fulfillment of Combatant Commander Urgent Operational Needs	Public Law 114-328 National Defense Authorization Act for Fiscal Year 2017
DODI 5000.74 Defense Acquisition of Services	Public Law 114-92 National Defense Authorization Act for Fiscal Year 2016
DODI 5000.80 Operation of the Middle Tier of Acquisition (MTA)	DSD Memorandum Acquisition Roles and Responsibilities
DODI 5000.81 Urgent Capability Acquisition	DSD Memo Procedures for the Establishment of Program Cost, Fielding, and Performance Goals for Major Defense Acquisition Programs
DODI 5010.44 Intellectual Property (IP) Acquisition and Licensing	DSD Memo Establishment of the Office of the USD for R&E and the Office of the USD for A&S
DODI 5025.01 DoD Issuances Program	Milestone Documentation Identification Tool
Title 10 USC Armed Forces	

DODI 5000.87, Operation of the Software Acquisition Pathway, 02 October 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C26. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C26*DODI 5000.87 Secondary Documents*

Required Documents	Related Documents
DODD 5135.02 USD(A&S)	PL 104-106 CCA Act
DODI 5000.73 Cost Analysis Guidance and Procedures	PL 115-91 FY 2018 NDAA
DODI 5010.44 Intellectual Property (IP) Acquisition and Licensing	PL 116-92 FY 2020 NDAA
Title 10 USC Armed Forces	

DODI 5134.17, Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD (DT&E)), 15 October 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C27. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C27*DODI 5134.17 Secondary Documents*

Required Documents	Related Documents
DODI 5000.66 Operation of the Defense Acquisition, Technology, and Logistics Workforce	Public Law 112-239 National Defense Authorization Act for Fiscal Year 2013
Title 10 USC Armed Forces	DSD Memo Establishment of the Office of the USD for R&E and the Office of the USD for A&S

Military Handbook (MIL-HDBK)-61B, Configuration Management Guidance, 07 April 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C28. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C28

MIL-HDBK-61B Secondary Documents

Required Documents	Related Documents
Public Law 104-113 National Technology Transfer and Advancement Act	SAE-EIA-649-1A Configuration Management Requirements for Defense
SAE-EIA-649C Configuration Management Standards	GEIA-HB-649A Configuration Management Standard Implementation Guide

MIL-HDBK-245D, Preparation of Statement of Work (SOW), 03 April 1996

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C29. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C29

MIL-HDBK-245D Secondary Documents

Required Documents	Related Documents
DODL 5010.12 Acquisition Management System and Data Requirements Control List (AMSDL)	DFARS 227.71 Rights in Technical Data
DODM 5010.12 Procedures for the Acquisition and Management of Technical Data	DFARS 252.211-7000 Acquisition Streamlining
FAR 52.215-33 Order of Precedence	MIL-STD-881 Work Breakdown Structures for Defense Material Items
DFARS 211 Describing Agency Needs	MIL-STD-961 Department of Defense Standard Practice for Defense Specifications
DFARS 212 Acquisition of Commercial Items - General	MIL-HDBK-248 Acquisition Streamlining
FAR 52.215-33 Order of Precedence	MIL-STD-881 Work Breakdown Structures for Defense Material Items

Table C29 (Continued)
MIL-HDBK-245D Secondary Documents

Required Documents	Related Documents
DFARS 211 Describing Agency Needs	MIL-STD-961 Department of Defense Standard Practice for Defense Specifications
DFARS 212 Acquisition of Commercial Items - General	MIL-HDBK-248 Acquisition Streamlining

MIL-HDBK-1222F, Guide to the General Style and Format of U.S. Army Work Package

Technical Manuals, 15 December 2015

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C30. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C30

MIL-HDBK-1222F Secondary Documents

Required Documents	Related Documents
AR 25–30 Army Publishing Program	DODM 5200.01 Volume 2 Information Security Program: Marking of Classified Information
DA PAM 25-40 Army Publishing: Action Officers Guide	DODM 5200.01 Volume 3 Information Security Program: Protection of Classified Information
DA PAM 738- 751 User's Manual for The Army Maintenance Management System-Av (TAMMS-A)	DODM 5200.01 Volume 4 Information Security Program: CUI
DODI 5230.24 Distribution Statements on Technical Documents	FM 4-25.11 First Aid
DODM 5200.01 Volume 1 ISP: Overview, Classification, and Declassification	TB 750-93-1 FGC, Combat, Tactical and Support Vehicles and SPE

Military Preference (MIL-PRF)-63002M, Preparation of Modification Work Orders

(MWOs), 02 August 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C31. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C31*MIL-PRF-63002M Secondary Documents*

Required Documents	Related Documents
DODD 5230.25 Withholding of Unclassified Technical Data from Public Disclosure	AR 95-1 Flight Regulations
DODI 5230.24 Distribution Statements on Technical Documents	DA PAM 25-40 Army Publishing: Action Officers Guide
DODM 5200.01 Volume 1 Information Security Program: Overview, Classification, and Declassification	DA PAM 738- 751 User's Manual for The Army Maintenance Management System-Av (TAMMS-A)
DODM 5200.01 Volume 2 Information Security Program: Marking of Classified Information	DA PAM 750-8 The Army Maintenance Management System (TAMMS) User's Manual
DODM 5200.01 Volume 3 Information Security Program: Protection of Classified Information	TM 55-1500-342-23 Joint Service Technical Manual for Aircraft Weight and Balance
DODM 5200.01 Volume 4 Information Security Program: CUI	TM 750-245-4 Direct Support and General Support for QC Inspector's Inspection Criteria
AR 25-30 Army Publishing Program	

Military Standard (MIL-STD)-31000B, Technical Data Packages (TDPs), 31 October 2018

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C32. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C32*MIL-STD-31000B Secondary Documents*

Required Documents	Related Documents
DODD 5230.25 Withholding of Unclassified Technical Data from Public Disclosure	DFARS 252.227-7014 Rights in Noncommercial Computer SW and Documentation
DODI 5230.24 Distribution Statements on Technical Documents	DOD-STD-2101 Classification of Characteristics
DODM 4100.39 Federal Logistics Information System (FLIS) Procedures	MIL-STD-961 Defense and Program-unique Specifications Format and Content
DODM 5220.22 DoD Industrial Security Manual for Safeguarding Classified Information	MIL-STD-963 Data Item Descriptions (DIDs)
DFARS Part 252 DFAR Supplement for Solicitations, Provisions and Contract Clauses	MIL-STD-2073-1 Standard Practice for Military Packaging

MIL-STD-38784B, Manuals, Technical: General Style and Format Requirements, 16 November 2020

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C33. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C33

MIL-STD-38784B Secondary Documents

Required Documents	Related Documents
DODI 5200.48 Controlled Unclassified Information (CUI)	TO 00-5-1 AF Technical Order System
DODI 5230.24 Distribution Statements on Technical Documents	TO 00-5-3 AF Technical Order Life Cycle Management
DODM 5200.01 Volume 1 Information Security Program: Overview, Classification, and Declassification	TO 00-25-234 General Shop Practice Requirements for the Repair, Maintenance, and Test of Electrical Equipment
DODM 5200.01 Volume 2 Information Security Program: Marking of Classified Information	AFI 16-201 AF Foreign Disclosure and Technology Transfer Program
DODM 5220.22 DoD Industrial Security Manual for Safeguarding Classified Information	AFI 21-101 Aircraft and Equipment Maintenance Management
DFARS 252.227-7013 Rights in Technical Data--Noncommercial Items	SECNAV M-5510.1 Foreign Disclosure Manual
AR 25-30 Army Publishing Program	

Military Standard (MIL-STD)-40051-1C, Preparation of Digital Technical Information for Interactive Electronic Technical Manuals (IETMs), 15 December 2015

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C34. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C34*MIL-STD-40051-1C Secondary Documents*

Required Documents	Related Documents
AR 25–30 Army Publishing Program	DODM 5200.01 Volume 3 Information Security Program: Protection of Classified Information
AR 25-52 Authorized Abbreviations, Brevity Code, and Acronyms	DODM 5200.01 Volume 4 Information Security Program: Controlled Unclassified Information (CUI)
AR 95-1 Flight Regulations	DODM 5220.22 DoD Industrial Security Manual for Safeguarding Classified Information
AR 385–10 The Army Safety Program	Public Law 91-956 OSHA Act of 1970
AR 700-82 — Joint Regulation Governing the Use and Application of Uniform Source, Maintenance, and Recoverability Codes	EO 12196 Occupational Safety and Health Programs for Federal Employees
AR 750-1 Army Materiel Maintenance Policy	EO 13423 Strengthening Federal Environmental, Energy, and Trans Management
AR 750-59 Corrosion Prevention and Control for Army Materiel	EO 13526 Classified National Security Information
DA PAM 25-30 Consolidated Index of Army Publications and Blank Forms	MIL-PRF-2104 Lubricating Oil, Internal Combustion Engine, Combat Tactical Service
DA PAM 25-40 Army Publishing: Action Officers Guide	MIL-PRF-63049 Manuals, Technical: List of Applicable Publications (LOAP)
DA PAM 95-9 Management of Aviation Critical Safety Items	MIL-STD-882 System Safety
DA PAM 385-63 Range Safety	MIL-STD-1309 Definitions of Terms for Testing, Measurement, and Diagnostics
DA PAM 385-64 Ammunition and Explosives Safety Standards	MIL-STD-1686 Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assy, and Equip (Excluding Electrically Initiated Explosive Devices)
DA PAM 738- 751 User's Manual for The Army Maintenance Management System-Av (TAMMS-A)	MIL-STD-3003 Vehicles, Wheeled: Preparation for Shipment and Storage
DA PAM 750-8 The Army Maintenance Management System (TAMMS) User's Manual	MIL-STD-3008 Interactive Electronic Technical Manual (IETM) Technical Data Requirements to Support the GCSS-A
DODI 4140.01 DOD Supply Chain Materiel Management Policy	MIL-HDBK-113 Guide for the Selection of Lubricants, Functional Fluids, Preservatives and Specialty Products for use in Ground Equipment Systems
DODI 5230.24 Distribution Statements on Technical Documents	MIL-HDBK-263 Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric)
DODM 5200.01 Volume 1 ISP: Overview, Classification, and Declassification	MIL-HDBK-275 Guide for Selection of Lubricants, Fluids, and Compounds for Use in Flight Vehicles and Components
DODM 5200.01 Volume 2 Information Security Program: Marking of Classified Information	H6 Federal Item Name Directory

Table C34 (Continued)*MIL-STD-40051-1C Secondary Documents*

Required Documents	Related Documents
FM 4-25.11 First Aid	TM 1-1500-204-23 Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) Manual for General Aircraft Maintenance
FM 4-30.31 Recovery and Battle Damage Assessment and Repair	TM 1-1500-335-23 Nondestructive Inspection Methods, Basic Theory
Joint Pub 1-02 DOD Dictionary of Military and Associated Terms	TM 1-1500-344-23 Cleaning and Corrosion Control (4 volumes)
SB 742-1 Inspection of Supplies and Equipment Ammunition Surveillance Procedures	TM 4-33.31 Operations and Maintenance of Ordnance Materiel in Cold Weather
TB 43-0118 Field Instructions for Painting and Preserving Communications - Electronics Equip	TM 43-0139 Painting Instructions for Army Materiel
TB 43-0213 Corrosion Prevention and Control (CPC) for Tactical Vehicles	TM 55-1500-342-23 Joint Service Technical Manual for Aircraft Weight and Balance
TB 750-93-1 Functional Grouping Codes; Combat, Tactical, and Support Vehicles and SP	TM 55-1500-345-23 Painting and Marking of Army Aircraft
TC 3-04.7 Army Aviation Maintenance	

Military Standard (MIL-STD)-40051-2C, Preparation of Digital Technical Information for Interactive Electronic Technical Manuals (IETMs), 15 December 2015

The required and related documents reviewed under the secondary literature review for this document are as listed in Table C35. Related documents were not included based upon the exhaustive list of noted documents that are common across the span of primary literature review documents.

Table C35*MIL-STD-40051-2C Secondary Documents*

Required Documents	Related Documents
AR 25-30 Army Publishing Program	AR 385-10 The Army Safety Program
AR 25-52 Authorized Abbreviations, Brevity Code, and Acronyms	AR 700-82 — Joint Regulation Governing the Use and Application of Uniform Source, Maintenance, and Recoverability Codes
AR 95-1 Flight Regulations	AR 750-1 Army Materiel Maintenance Policy
AR 750-59 Corrosion Prevention and Control for Army Materiel	EO 13423 Strengthening Federal Environmental, Energy, and Trans Management

Table C35 (Continued)*MIL-STD-40051-2C Secondary Documents*

Required Documents	Related Documents
DA PAM 25-30 Consolidated Index of Army Publications and Blank Forms	FM 4-30.31 Recovery and Battle Damage Assessment and Repair
DA PAM 25-40 Army Publishing: Action Officers Guide	Joint Pub 1-02 DOD Dictionary of Military and Associated Terms
DA PAM 95-9 Management of Aviation Critical Safety Items	EO 13526 Classified National Security Information
DA PAM 385-63 Range Safety	MIL-PRF-2104 Lubricating Oil, Internal Combustion Engine, Combat Tactical Service
DA PAM 385-64 Ammunition and Explosives Safety Standards	MIL-PRF-63049 Manuals, Technical: List of Applicable Publications (LOAP)
DA PAM 738- 751 User's Manual for The Army Maintenance Management System-Av (TAMMS-A)	MIL-STD-882 System Safety
DODI 4140.01 DOD Supply Chain Materiel Management Policy	MIL-STD-1686 Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices)
DODI 5230.24 Distribution Statements on Technical Documents	MIL-STD-3003 Vehicles, Wheeled: Preparation for Shipment and Storage
DODM 5200.01 Volume 1 Information Security Program: Overview, Classification, and Declassification	MIL-STD-3008 Interactive Electronic Technical Manual (IETM) Technical Data Requirements to Support the GCSS-A
DODM 5200.01 Volume 2 Information Security Program: Marking of Classified Information	MIL-HDBK-113 Guide for the Selection of Lubricants, Functional Fluids, Preservatives and Specialty Products for use in Ground Equipment Systems
DODM 5200.01 Volume 3 Information Security Program: Protection of Classified Information	MIL-HDBK-263 Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric)
DODM 5200.01 Volume 4 Information Security Program: Controlled Unclassified Information (CUI)	SB 742-1 Inspection of Supplies and Equipment Ammunition Surveillance Procedures
DODM 5220.22 DoD Industrial Security Manual for Safeguarding Classified Information	MIL-HDBK-275 Guide for Selection of Lubricants, Fluids, and Compounds for Use in Flight Vehicles and Components
Public Law 91-956 OSHA Act of 1970	H6 Federal Item Name Directory
EO 12196 Occupational Safety and Health Programs for Federal Employees	FM 4-25.11 First Aid
FM 4-30.31 Recovery and Battle Damage Assessment and Repair	TM 1-1500-204-23 Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) Manual for General Aircraft Maintenance (General Maintenance and Practices), Volumes 1-11

Table C35 (Continued)*MIL-STD-40051-2C Secondary Documents*

Required Documents	Related Documents
Joint Pub 1-02 DOD Dictionary of Military and Associated Terms	TM 1-1500-335-23 Nondestructive Inspection Methods, Basic Theory
SB 742-1 Inspection of Supplies and Equipment Ammunition Surveillance Procedures	TM 1-1500-344-23 Cleaning and Corrosion Control (4 volumes)
TB 43-0118 Field Instructions for Painting and Preserving Communications - Electronics Equipment	TM 4-33.31 Operations and Maintenance of Ordnance Materiel in Cold Weather
TB 43-0213 Corrosion Prevention and Control (CPC) for Tactical Vehicles	TM 43-0139 Painting Instructions for Army Materiel
TB 750-93-1 Functional Grouping Codes; Combat, Tactical, and Support Vehicles and SP	TM 55-1500-342-23 Joint Service Technical Manual for Aircraft Weight and Balance
TC 3-04.7 Army Aviation Maintenance	TM 55-1500-345-23 Painting and Marking of Army Aircraft

Program Executive Office (PEO), Aviation (AVN), Policy#17-4, Funding System of Systems

PM Managed A-Kit and B-Kit Integration on Army Aviation Platforms, 07 March 2017

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

Rules of the Road – A Guide for Leading Successful Integrated Product Teams – Rev 1, 30

November 1999

This document had no additional required or related publications listed that were outside of those covered in the primary literature review.

Appendix D – Glossary of Acronyms

A _m	Material Availability
A _o	Operational Availability
ACAT	Acquisition Category
AAF	Adaptive Acquisition Framework
ASL	Additional Stock List
AW	Air Worthiness
AWR	Air Worthiness Release
AOA	Analysis of Alternatives
AAAA	Army Aviation Association of America
AEM	Army Equipment Modernization
AMC	Army Materiel Command
AR	Army Regulation
AROC	Army Requirements Oversight Council
ASPG	Army Strategic Planning Guidance
ASA (ALT)	Assistant Secretary of the Army for Acquisition, Logistics, and Technology
AH	Attack Helicopter
AVN	Aviation
AS PO	Aviation Systems Project Office
AME	Aviation Mission Equipment
AIS	Automated Information Systems
BDAR	Battle Damage Assessment and Repair
BBP	Better Buying Power

BOM	Build of Material
BCAC	Business Capability Acquisition Cycle
CAPSET	Capabilities Set
CH	Cargo Helicopter
CJCS	Chairman of the Joint Chiefs of Staff
CMO	Chief Management Officer
CCA	Clinger-Cohen Act
CC	Combatant Command
CCMD	Combatant Command
COEI	Component of End Item
COMSEC	Communications Security
CM	Configuration Management
CTR	Continuous Technology Refreshment
CRP	Contract Requirements Package
CLS	Contractor Logistics Support
DA	Decision Authority
DAS	Defense Acquisition System
DAU	Defense Acquisition University
DBS	Defense Business Systems
DTIC	Defense Technical Information Center
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction

DA	Department of the Army
DA PAM	Department of the Army Pamphlet
DMWR	Depot Maintenance Work Record
DASD DT&E	Deputy Assistant Secretary of Defense for Developmental Test and Evaluation
DCS	Deputy Chief of Staff
DepSecDef	Deputy Secretary of Defense
DT	Developmental Testing
DT&E	Developmental Test and Evaluation
DTM	Directive-Type Memorandum
DTD	Document Type Definition
EI	End Items
EDFP	Engineering Data for Provisioning
FY	Fiscal Year
FMS	Foreign Military Sale
FDF	Future Force Division
HTS	Hazard Tracking System
HSI	Human Systems Integration
IT	Information Technology
IG	Inspector General
IPS	Integrated Product Support
IPT	Integrated Product Team
IETM	Interactive Electronic Technical Manual
ICLS	Interim Contract Logistics Support

IEC	International Electrotechnical Commission
IEEE	Institution of Electrical and Electronics Engineers
IOC	Initial Operating Capability
ISO	International Organization for Standardization
JCIDS	Joint Capabilities Integration and Development System
JEON	Joint Emergent Operational Need
JT&E	Joint Test and Evaluation
JUON	Joint Urgent Operational Need
KPP	Key Performance Parameter
KSA	Key System Attribute
LCMC	Life Cycle Management Command
LUT	Limited User Test
LRU	Line Replaceable Units
LFT&E	Live Fire Test and Evaluation
LRIP	Low-Rate Initial Production
LO	Lubrication Order
MAC	Maintenance Allocation Chart
MAP	Major Acquisition Program
(MCA)	Major Capability Acquisition
MDAP	Major Defense Acquisition Program
(MAIS)	Major Automated Information System
MATDEV	Material Developer
MDD	Material Development Decision

MR	Materiel Release
MTBF	Mean Time Between Failure
MTA	Middle Tier Acquisition
MILDEP	Military Deputy
MIL-HDBK	Military Handbook
MIL-PRF	Military Preference
MIL-STD	Military Standard
MS	Milestone
MDA	Milestone Decision Authority
M&S	Modeling and Simulation
MWO	Modification Work Order
MOT&E	Multi-Service Operational Test and Evaluation
NDS	National Defense Strategy
NMWR	National Maintenance Work Requirement
NEW	New Equipment Training
NMC	Not Mission Capable
NBC	Nuclear, Biological, and Chemical
OT	Operational Test
OT&E	Operational Test and Evaluation
O&S	Operations and Support
OD	Organization Development
OEM	Original Equipment Manufacturer
PAM	Pamphlet

PBL	Performance-Based Logistics
PBPSS	Performance-Based Product Support Strategy
PMI	Phased Maintenance Inspection
PCA	Physical Configuration Audit
PDF	Portable Document Format
PMC	Preventive Maintenance Checklist
PMD	Preventive Maintenance Daily
PMS	Preventive Maintenance Services
PS	Product Support
PSS	Product Support Strategy
PEO	Program Executive Office
PM	Program Manager
PO	Project Office
PTD	Provisioning Technical Documentation
PSM	Product Support Manager
PSM	Product Support Management
P&D	Production and Deployment
PPL	Provisioning Parts List
PL	Public Law
PMR	Provisioning Master Record
QASM	Quarterly Aviation Synchronization Meeting
QRC	Quick Reaction Capability
RPSTL	Repairs, Parts, and Special Tools List

R&D	Research and Development
SEC DEF	Secretary of Defense
SIG	Senior Integration Group
SRU	Shop Replaceable Unit
SGML	Standard Generalized Markup Language
SOW	Statement of Work
SLAC	Support List Allowance Card
SE	Systems Engineering
SIPM	Systems Integration Process Map
SSRA	System Safety Risk Assessment
SOS	System of Systems
TDP	Technical Data Packages
TM	Technical Manual
T&E	Test and Evaluation
TEMAC	Test and Evaluation Managers Committee
TEMP	Test and Evaluation Master Plan
TMDE	Test, Measuring, Diagnostic Equipment
TPS	Test Program Set
TSARC	Test Schedule and Review Committee
TC	Type Classification
USD (AS)	Under Secretary of Defense for Acquisition and Sustainment
USD (ATL)	Under Secretary of Defense for Acquisition, Technology, and Logistics
US	United States

USC	United States Code
UCA	Urgent Capabilities Acquisition
UON	Urgent Operational Needs
UH	Utility Helicopter
V&V	Validation and Verification
WP	Work Package
WG	Working Group

Appendix E – Author Biography



SENIOR SERVICE COLLEGE FELLOWSHIP HUNTSVILLE, ALABAMA

John W. Walden

Mr. John Walden assumed his current duties as Product Support Manager and Chief of Logistics in the Product Manager Office for Infrared Countermeasures in July 2015. Mr. Walden is responsible for identifying, developing, implementing, incentivizing, and measuring quantifiable best value outcome-based product support solutions to support readiness during development, fielding and sustainment of a portfolio of ACAT I and Quick Reaction Capability systems. In this capacity, Mr. Walden served as an integral part of the 2020 team selected by Army for Acquisition, Logistics and Technology (ASA (ALT)) as Project Management/Project Director Office Team of the Year.



Prior to his current appointment, he served for ten years as a Contractor Program Manager/Chief Operating Officer, providing Systems Engineering and Technical Assistance (SETA) services for the Utility, Cargo, and Kiowa Warrior Project Management Offices within the Aviation and Missile Command organization. Mr. Walden began his career enlisting in the U.S. Army and served for 21 years. He retired as a Senior Non-Commissioned Officer in 2004. During this service, Mr. Walden had the unique operational opportunity to be assigned to the First Unit Equipped for the Common Missile Warning System (CMWS) and other Desert Modifications in support of OEF/OIF Aviation operations.

Mr. Walden attended Embry-Riddle Aeronautical University, graduated Cum Laude, in 2010 with a Bachelor of Science degree in Professional Aeronautics. In 2015, Mr. Walden became a member of the Army Acquisition Core and is certified level III in the Life-Cycle Logistics and Program Management career fields. Mr. Walden is currently enrolled at Liberty University and is projected to graduate in Oct 2022 with a Master's in Business Administration.

A few of Mr. Walden's career accomplishments include two selections as a finalist for the Army Acquisition Logistician of the Year, and a finalist for the Department of Defense Product Support Manager of the Year. He was selected to serve as the Subject Matter Expert on the Common Infrared Countermeasure Source Selection Board. Mr. Walden's DA Civilian Awards include the Commander's Award for Civilian Service in 2015, 2017, and 2018. His U.S. Army awards include Meritorious Service award with two oak leaf

clusters, Army Commendation Medal with three oak leaf clusters, the Army Achievement Medal with 8 oak leaf clusters, and numerous Campaign and Service medals.

Mr. Walden is active in his local community and works with Habitat for Humanity and Veterans support organizations. He currently resides in Elkton, TN with his wife Melissa, three children (Hannah, Elizabeth, and Oliver) and six Grandchildren.