NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

EVALUATION OF NAVY DEPOT MAINTENANCE INTER-SERVICE SUPPORT AGREEMENT (DMISA) TECHNICAL DATA COMPLIANCE AND QUALITY CONTROL

by

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September 2021

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REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704-0188*

1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** September 2021	**3. REPORT TYPE AND DATES COVERED** Master's thesis

4. TITLE AND SUBTITLE
EVALUATION OF NAVY DEPOT MAINTENANCE INTER-SERVICE SUPPORT AGREEMENT (DMISA) TECHNICAL DATA COMPLIANCE AND QUALITY CONTROL

5. FUNDING NUMBERS

6. AUTHOR(S) Jamaries Kilgore

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
N/A

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release. Distribution is unlimited.

12b. DISTRIBUTION CODE
A

13. ABSTRACT (maximum 200 words)

This thesis evaluated Depot Maintenance Inter-Service Agreements (DMISAs) and processes between the Navy and the other services from a program manager and systems engineering perspective. The intent was to determine whether the DMISAs support technical data compliance and quality control. The research developed a structured method to evaluate 15 DMISAs, conducted semi-structured interviews with domain experts and logisticians, and developed a prototype data analytics tool. The evaluation determined that the 15 DMISAs conform to the recommended DMISA standard format, according to the *DMISA Desktop Reference*. The semi-structured interviews revealed a knowledge gap between domain experts (with minimum to no knowledge) and logisticians (high knowledge) of DMISAs, the DMISA process, and depot maintenance inter-service activities. The prototype tool applies data analytics to target the inspection, cleaning, transformation, and modeling of the data with the goal of visualizing the data to discover useful information, inform conclusions, and support decision-making at an individual and enterprise level. The thesis informs program managers and systems engineers on how to accurately evaluate, analyze, and manage DMISAs, and provides a general understanding for depot-level maintenance and repair.

14. SUBJECT TERMS
Depot Maintenance Inter-Service Support Agreement, DMISA, inter-service, support agreement, technical data compliance, quality control, depot-level maintenance and repair, maintenance, repair, and overhaul, MRO, technical data compliance, quality control

15. NUMBER OF PAGES
169

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	**18. SECURITY CLASSIFICATION OF THIS PAGE**	**19. SECURITY CLASSIFICATION OF ABSTRACT**	**20. LIMITATION OF ABSTRACT**
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

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EVALUATION OF NAVY DEPOT MAINTENANCE INTER-SERVICE SUPPORT AGREEMENT (DMISA) TECHNICAL DATA COMPLIANCE AND QUALITY CONTROL

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Submitted in partial fulfillment of the
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MASTER OF SCIENCE IN SYSTEMS ENGINEERING MANAGEMENT

from the

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ABSTRACT

This thesis evaluated Depot Maintenance Inter-Service Agreements (DMISAs) and processes between the Navy and the other services from a program manager and systems engineering perspective. The intent was to determine whether the DMISAs support technical data compliance and quality control. The research developed a structured method to evaluate 15 DMISAs, conducted semi-structured interviews with domain experts and logisticians, and developed a prototype data analytics tool. The evaluation determined that the 15 DMISAs conform to the recommended DMISA standard format, according to the *DMISA Desktop Reference*. The semi-structured interviews revealed a knowledge gap between domain experts (with minimum to no knowledge) and logisticians (high knowledge) of DMISAs, the DMISA process, and depot maintenance inter-service activities. The prototype tool applies data analytics to target the inspection, cleaning, transformation, and modeling of the data with the goal of visualizing the data to discover useful information, inform conclusions, and support decision-making at an individual and enterprise level. The thesis informs program managers and systems engineers on how to accurately evaluate, analyze, and manage DMISAs, and provides a general understanding for depot-level maintenance and repair.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACAT	acquisition category
AFI	Air Force instruction
AFJI	Air Force joint instruction
AFR	Air Force Reserve
AFTO	Air Force technical order
ANSI	American National Standards Institute
AR	Army
AIDR	acceptance inspection deficiency reports
AS	aerospace standard
ASD(S)	Assistant Secretary of Defense for Sustainment
ASQC	American Society for Quality Control
ASME	American Society of Mechanical Engineers
ATTN	attention
BOM	bill of materials
CAC	common access card
CD	compact disk
CFMI	CFM international
CJCS	Chairman of the Joint Chiefs of Staff
CM	configuration manager
COA	course of action
COI	commercial, original equipment manufacturer, interservice
COMFRC	Commander, Fleet Readiness Centers
COPQ	cost of poor quality
CPI	continuous process improvement
CRM	customer relations manager
DASD(MR)	Deputy Assistant Secretary of Defense for Materiel Readiness
DAU	Defense Acquisition University
DAPML	Deputy, Assistant Program Manager for Logistics
DDD	defense distribution depot

DIRs	disassembly inspection reports
DLA	Defense Logistics Agency
DLAD	Defense Logistics Agency directive
DLAR	Defense Logistics Agency regulation
DMA	DMISA management application
DMI	depot maintenance inter-service
DMISA	depot maintenance inter-Service support agreements
DOD	Department of Defense
DODM	Department of Defense manual
DSOR	depot source of repair
EI	engineering investigation
FAR	Federal Acquisition Regulation
FARs	failure analysis reports
FS	Fiscal Service
FST	fleet support team
GMTS	guided missile test set
GSA	General Service Administration
G/FO	general or flag officer
GT&C	general terms and conditions
IAW	in accordance with
ISO	International Organization for Standardization
JAB	joint advisory board
JDM	joint depot maintenance
JDMAG	joint depot maintenance analysis group
JDRS	joint deficiency reporting system
JG-DM	joint group on depot maintenance
LCSP	life cycle sustainment plan
LOG	logistics
MARCORLOGCOM	Marine Corps Logistics Command
MARFORRES	Marine Forces Reserve
MCO	Marine Corps order
MDS	mission, design, and series

MICO	maintenance inter-service coordinating office
MIPR	military interdepartmental purchase request
MISMO	maintenance inter-service support management office
MISO	maintenance inter-service support office
MOA	memorandum of agreement
MOAT	missile on aircraft test
MOU	memorandum of understanding
MRO	maintenance, repair, and overhaul
NAMP	naval aviation maintenance program
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NAWCAD	Naval Air Warfare Center Aircraft Division
NDAA	National Defense Authorization Act
NIMSC	non-consumable item material support code
NIP	non-consumable item program
NSN	national stock number
OASIS	online aerospace supplier information system
OIB	organic industrial base
OPNAV	Office of the Chief of Naval Operations
OPNAVINS	Chief of Naval Operations instructions
OSD	Office of the Secretary of Defense
PBL	performance-based logistics
PDF	portable document file
PDMSS	programmed depot maintenance scheduling system
PEO	Program Executive Office
PEO(A)	Program Executive Office for Air Anti-submarine Warfare, Assault and Special Mission Programs
PEO(CS)	Program Executive Office for Aviation Common Systems and Commercial Services
PEO(JSF)	Program Executive Office for Joint Strike Fighter

PEO(T)	Program Executive Office for Tactical Aircraft Programs
PEO(U&W)	Program Executive Office for Unmanned Aviation and Strike Weapons
PICA	primary inventory control activity
PID	procurement initiation document
PIEE	procurement integrated enterprise environment
PM	program manager
PMA	program management, air
PMI	planned maintenance interval
PMT	procurement management tool
PQDR	product quality deficiency report
POS	product-oriented survey
PPP	public-private partnership
QA	quality assurance
QASAS	quality assurance specialist ammunition surveillance
QC	quality control
QMS	quality management system
QSE	quality support engineer
RFI	ready for issue
RQD	required
SAE	society of automotive engineers
SDR	supply deficiency report
SE	system engineer
SES	senior executive service
SICA	secondary inventory control activity
SORA	source of repair analysis
SOW	statement of work
SYSCOM	systems command
T/M/S	type, model, and/or series
TAT	turn-around-time
TD	technical data
TDCD	technical data compact disk

TDRs	teardown deficiency reports
TO	technical order
TPDR	technical publication deficiency report
US	United States
USD(A&S)	Under Secretary of Defense for Acquisition and Sustainment
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
WAWF	wide area workflow
WCD	work control document
WSS	weapon systems support

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EXECUTIVE SUMMARY

This thesis describes the evaluation of 15 Navy depot maintenance interservice agreements (DMISAs) with special emphasis to technical data compliance and quality control, explores the depot-level maintenance and repair process with a thorough literature review, includes process remarks from semi-structure interviews, and creates a prototype tool to analyze DMISAs at an individual and enterprise level. The research question, "How shall we evaluate DMISAs from a program manager (PM) or systems engineer (SE) perspective when one military department supports another?" emphasizes three major sections, depot-level maintenance and repair, Joint Depot Maintenance (JDM) program, and DMISA to provide an answer.

Depot-level maintenance performs the most complex test, repair, and overhaul tasks on end items, parts, assemblies, and subassemblies that include complete rebuilding of weapons systems, parts manufacturing, and technical assistance. DMISAs result from a DSOR assignment for one service "to provide depot maintenance support to another service" (Navy Interservice Support Management Office [MISMO] 2013, enclosure 2–2). DMISAs are an "execution tool by which depot maintenance support is provided for weapons systems across DOD" (Defense Acquisition University [DAU] 2020, lesson 1 DMISA). PMs and SEs have specific roles and responsibilities in the DMISA process.

The PMs are involved in the DMISA process since the DSOR assignment. After the DSOR assignment, the PM is responsible of document the DSOR assignment in the life cycle sustainment plan (LCSP), finalize requirements, incorporate program and budget planning, and coordinate to establish the maintenance capability. The SEs are involved during the DMISA through the PM and service maintenance inter-service support management office (MISMO) to make sure quality, technical data, and other systems requirements are addressed. The PM and SEs evaluate and manage DMISAs through the principal and agent. The JDM program has eight relevant roles related to DMISA management and evaluation that include agent, principal, depot, maintenance inter-service support office (MISO), maintenance inter-service coordinating office (MICO), MISMO, program office or DMISA PM, and SE or assigned system expert. No overall (or holistic)

management and evaluation is done across services or programs for DMISAs or depot-level maintenance and repair activities. Each DMISA is managed under the PM and JDM program following the DMISA desktop reference format (boilerplate) provided by the Navy MISMO office wish include a recommended standard DMISA format and language.

After the DSOR assignment the PM has the responsibility of kicking off the DMISA negotiations through the JDM program. The eight relevant roles related to DMISA management are identified and a DMISA is implemented after successful principal and agent negotiations. Both (principal and agent) must agree, sign, and have funding for the DMISA to be active. Under the JDM program, each DMISA is maintained, managed, and evaluated at least annually. A standard DMISA format (tittle and administration, terms of agreement [section I], material support [section II], and exhibits) is used as the boilerplate for the development of all DMISAs across services, as shown in Figure 1. The Navy MISMO office provides and updates the standard DMISA format and the boilerplate recommended language with format rules for each section.

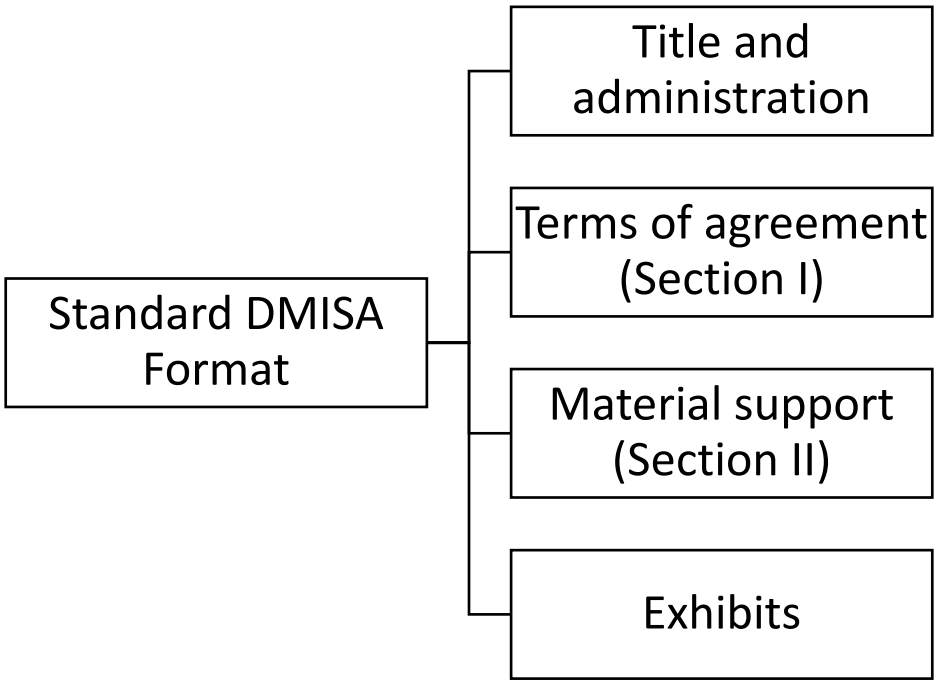

Figure 1. Standard DMISA format.

Technical data is specifically addressed in section I paragraph d in the standard DMISA desktop reference boilerplate. Only 10 out of 15 DMISAs followed the prescribed technical data standard DMISA format language; all other DMISAs had some type of deviation from the boilerplate recommended language. Quality assurance is specifically addressed in section I paragraph 10.e in the standard DMISA desktop reference boilerplate. Only 4 out of 15 DMISAs followed the prescribed quality assurance standard DMISA language; all other DMISAs had some type of deviation from the boilerplate recommended language. In summary, the 15 evaluated DMISAs conformed to the recommended DMISA standard format according to the DMISA desktop reference but deviated in some instances from the prescribed boilerplate recommended language. For the exhibit evaluation section, all 15 agreements included exhibit VII-A, statement of work, but all others differ in what is applicable or not depending on the needs and negotiations between the principal and agent. There are six exhibits (VI [bill of material/material requirement list], VII-A [statement of work], VII-B [technical data list and line-item cross reference], VII-C [quality assurance requirements], VIII [product-oriented survey parameters], and IX [joint operating procedure for configuration management]) that play an integral role in assuring technical data and quality control is consistent. Special consideration should be given to the applicability to the exhibits. Exhibits play an integral role making sure that the appropriate changes, expectations, and needs are kept up to date over time. This is important because DMISAs remain active over long periods of time unless otherwise terminated and the exhibits provide the most efficient way to maintain the requirements updated on an annual basis.

The semi-structure interviews reveal a knowledge gap between domain experts (with minimum to no knowledge) and logisticians (high knowledge) of DMISAs, DMISA process, or depot maintenance interservice activities. Domain experts (also known as subject matter experts or fleet support teams) include for example system engineers, quality engineers, technical system experts among others. Given that SEs and domain experts carry the responsibility of maintaining quality, technical data, and airworthiness in the DMISAs it is imperative making sure they understand the role they play in depot-level maintenance and repair activities or DMISAs.

The purpose of the prototype tool is to apply data analytics to target the inspection, cleaning, transformation, and modeling of the data with the goal of visualizing the data to discover useful information, inform conclusions, and support decision-making. The prototype tool basic design has a single application named depot-level maintenance and repair created using Qlik. Inside the application it is divided in three main sections prepare (data manager), analyze (sheet), and narrate (storytelling). The tool performs as expected connecting the data and query the information as designed. The tool accommodates changes in views and allows targeting visualizations based on stakeholders needs. Based on interviewee feedback, the tool can offer valuable data to stakeholders to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria for program managers and systems engineers. Overall, interviewees had positive feedback and agreed the tool offers valuable insight, access, and analysis to understand, evaluate, and support decision making related to depot-level maintenance and repair or DMISAs.

The thesis successfully collects DMISA process information, evaluates 15 Navy DMISAs, and collects the feedback related to a prototype tool that provides a holistic view of DMISA evaluation. One key objective of the thesis is to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria for PMs and SEs. The objective is accomplished by gathering all the DMISA reference material in one place for PMs and SEs while creating process views for them to understand their roles and responsibilities. In addition, by providing a prototype tool with the purpose to evaluate DMISAs and depot-level maintenance and repair activities at an individual and enterprise level.

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ACKNOWLEDGMENTS

A great amount of support and assistance went into the two years I dedicated to pursuing my second master's degree with the sole purpose of documenting this thesis topic. I was assigned to a special project at work, and I saw the need to document my discoveries somewhere. Closing the gap on depot-level maintenance and repair between the engineering and logistician communities is the first step to analyze all the data we already collect and create a smart feedback loop from sustainment to the acquisition community.

While the proposed approach here is not a fit-in-solves-all-type of deal, it touches on the fundamentals that the program managers and systems engineers need to understand for what is happening and what their role is in depot-level maintenance and repair. It was a great endeavor, met with a lot of challenges, from planning the content of this thesis to descoping my special project at work, so I could publish this through the Naval Postgraduate School and make it available not just to my command but to all DOD services.

First, I would like to thank and acknowledge my direct supervisor, Mr. David Gallardo, and my division head, Mr. Clint Osborne. Both were instrumental in keeping my thesis topic alive. They helped me to descope the work so I could publish the discoveries, took the time to provide feedback for chapters or the prototype tool to better represent the need, and shared invaluable insight from their points of view.

Second, I would like to thank my advisors, Dr. Ronald Giachetti and COL Joyce Stewart, whose expertise, feedback, and guidance were instrumental to maintaining my goals, formulating the correct research questions, and producing a clear methodology to make it happen.

Third, to my Naval Postgraduate School family of cohort 20: each of us kept in contact, made sure we helped each other, and supported each other every step of the way. Even in the last quarter, we strived to stay updated and helped each other through the thesis process. Great friendships and professional ties were created because of it.

Finally, but no less important, I would like to thank my husband, Max W Kilgore, for his invaluable patience throughout the process. His support kept me sane during the full ordeal.

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I. INTRODUCTION

This study provides the basis of how to evaluate Depot Maintenance Inter-Service Support Agreements (DMISAs) from a program manager's or systems engineer's perspective when one military department supports a program in another military department. Proper evaluation and understanding of depot-level maintenance and repair agreements forms the foundation of technical data compliance and quality control. The agreement serves to maintain product integrity, airworthiness, and safety overtime. It starts with a fiduciary (principal-agent) relationship in which crucial information is exchanged via a quasi-contract agreement between the principal and the agent (e.g., between the Navy and Army). The agreement between the organizations is vital to ensuring technical data compliance and understanding of quality control expectations.

This thesis evaluates the DMISAs technical data compliance and quality control, and evaluates a prototype tool intended to analyze DMISAs at an individual and enterprise level. The study is divided into three parts, and it aims to provide program managers and systems engineers the information and tools to accurately evaluate DMISAs. First, the thesis includes the evaluation by the author of 15 Navy-owned agreements (Navy as the principal) to analyze cross-program DMISAs. Second, the discussion of a semi-structured interview where the author collected and documented the information related to the DMISA process from various subject matter experts. Third, documents the evaluation of a prototype tool created by the author to analyze DMISAs at an individual and enterprise level that documents the most relevant information for analyzing DMISAs from a technical data compliance and quality control point of view. The study aims to collect the process information, evaluate a sample of DMISAs, and collect the feedback related to the prototype tool to provide a holistic view of DMISA evaluation. One key objective of the thesis is to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria for program managers and systems engineers.

A. BACKGROUND

According to the Department of Defense 2020 *Report on Requirements for Military Department Inter-Service Depot*, all "DOD major organic (government-owned, government operated) depot-level maintenance facilities provide specialized capabilities to support specific weapons systems often referred as the organic industrial base (OIB)" (Department of Defense [DOD] 2020b, 2). The report states that "approximately $20 billion is spent annually throughout the OIB" by carefully managing the specialized capabilities across the 17 DOD major maintenance depots to leverage and "get the most out of each maintenance dollar" (2). The report points out that "several mechanisms, such as public-private partnerships (PPPs), performance-based logistics (PBLs), and inter-service repair strategies are employed to ensure depot-level maintenance is performed as effectively and efficiently as possible" (2). The report reveals that "Depot Maintenance Inter-service (DMI)" represents "three percent of DOD's $20 billion annual organic depot-level maintenance" expenditure (2).

Maintenance, repair, and overhaul (MRO) activities, also known as depot-level maintenance and repair, are integral in maintaining product integrity, airworthiness, and safety over time. The DMISA defines the requirements for depot-level maintenance and repair activities between DOD agencies. DMISAs are managed via a principal and agent relationship (e.g., between the Navy and Army). In the DMISA, it is imperative to have the program manager and systems engineer review, evaluate, and maintain technical compliance and quality assurance over the life of the agreement. With that statement in mind, recommendations from a "Command investigation into the class A aviation mishap within Marine aerial refueler transport squadron 452 on 10 July 2017" advised to improve DMISAs "by specifically defining each party's obligations and responsibilities" (United States Marine Corps Forces Reserve [MARFORRES] 2018, 63). The recommendation includes technical expertise integration into the quality process at the depot-level maintenance facility (MARFORRES 2018). Furthermore, according to the National Defense Authorization Act (NDAA) for Fiscal Year 2020 section 358 titled "Requirement for military department inter-service depot maintenance," there is a concern of whether current policy and procedures "ensure technical" data "compliance and quality control for

the work performed" when a "depot or maintenance activity of one military department supports another" (House of Representatives 2019, 128).

Accurate term definitions are imperative in the understanding of the process and for data evaluation. There are two important definitions. First, technical data is defined using the aerospace standard for quality management systems (QMS) - requirements for aviation maintenance organizations AS9110C definition:

> Data that is necessary to ensure that the article or product can be maintained in a condition such that continuing airworthiness of the aircraft and related operational and emergency equipment is assured. Technical data shall be acceptable to the competent authority or approved by the authority, if applicable. (SAE International 2016, 12)

Second, quality control is defined according to the international standard for QMS ISO9000-2015 as the "part of quality management focused on fulfilling quality requirements" (International Organization for Standardization [ISO] 2015, 14). The DMISA is a key document for inter-service support by being the quasi-contractual agreement between the principal (service that needs [receives] the maintenance support) and agent (service that provides [performs] the depot maintenance action) between military departments concerning the maintenance of technical data and quality control. It is important to understand that DIMISAs are used only to administer assigned depot maintenance workload for military materiel. DMISAs do not transfer the "responsibility for a function or mission from one military service or DOD agency to another" (OPNAV 2013, enclosure 2 page 1). The DMISA establishes a fiduciary (principal-agent) relationship between a depot maintenance activity providing depot maintenance support (the agent), and the entity receiving the support (the principal). Additional terms and definitions are covered to avoid any confusion or misinterpretation of the thesis scope and intent latter in this chapter under Section E.

The research question narrows down the NDAA FY20 section 358 targeted to Navy inter-service activities as: How shall we evaluate DMISAs from a program manager or systems engineer perspective when one military department supports another? This approach allowed the DMISA process to be studied from a narrower perspective and expand on how to help program managers or systems engineers evaluate DMISAs. The

study opens the possibility to support the NDAA FY20 section 358 research by evaluating policy, procedures, and approach to inter-service management in a smaller sample size. This study documents the DMISA process, evaluates a sample of current DMISAs where the Navy is the principal, and creates an evaluation criterion that program managers or system engineers can use to manage and evaluate DMISAs at an individual or enterprise level. One key purpose is to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria.

The DOD benefits from this study by documenting current DMISA processes and creating an approach that can be used among sister commands to evaluate DMISAs. The study provides additional information to supplement or aid the NDAA FY20 section 358 requirement. Additionally, the prototype tool created for DMISA management is based on current active Navy DMISAs, which directly benefits the command by being able to adopt the proposed approach. Also, the research benefits the systems engineering and program manager communities by providing essential information needed to understand, evaluate, and manage a DMISA for depot-level maintenance and repair activities.

B. RESEARCH QUESTION

How shall we evaluate Depot Maintenance Inter-Service Support Agreements (DMISAs) from a program manager or systems engineer perspective when one military department supports another?

1. How are the program manager or systems engineer involved, and how do they evaluate and manage DMISAs?
2. What is the DMISA process after the depot source of repair (DSOR) assignment?
3. How is the DMISA maintained, managed, and evaluated over time?
4. How is technical data compliance addressed?
5. How is quality control ensured?

C. GOAL AND OBJECTIVES

The thesis goal is to develop an evaluation system to identify, document, and manage inter-service depot-level maintenance and repair activities for program managers and systems engineers to allow cross-program and individual DMISA evaluation. The objectives are to:

- answer the main and subsidiary research questions
- document the DMISA process
- evaluate 15 Navy DMISAs with the Navy as the principal
- collect (factual) information from program managers, engineers, key maintenance depot, principal, and agents using a semi-structured interview
- create and publish a prototype tool to analyze DMISAs.

D. SCOPE

This study focuses on the DMISA process after the final depot source of repair (DSOR) decision. The study evaluates 15 active Navy DMISAs (Navy as the principal). It includes the documentation of factual process information via semi-structured interviews. The study presents a prototype tool to evaluate DMISAs from an individual and an enterprise level. The tool key purpose is to shorten the cycle time from data gathering to decision-making in support of DMISA management and evaluation criteria for program managers and systems engineers.

E. TERMS AND DEFINITIONS

Agent. The "military service responsible for providing depot maintenance support to the principal" (JDMAG 2004, 5).

Airworthy. The "state of an article or product conforming to its type design and being in a condition for safe operation" (SAE International 2016, 10).

Component. "An integral constituent of a complete (end) item. A component may consist of a part, assembly, or subassembly" (DOD 2017, 12). "In logistics, a part or

combination of parts having a specific function, which can be installed or replaced only as an entity" (Office of the Chairman of the Joint Chiefs of Staff [CJCS] 2021, 44).

Consumable. "An item of supply or an individual item (except explosive ordnance and major end items of equipment) that is normally expended or used up beyond recovery in the use for which it is designed or intended" (DOD 2020a, 63).

Contract maintenance. "Controlled by a commercial organization at a government or private facility" (Defense Acquisition University [DAU] 2020, lesson 1 workload options).

Defense Distribution Depot (DDD). "Functions may include receipt, storage, stock maintenance, preservation, packing, packaging, marking, and shipment of materiel." (MISMO 2013).

Depot. "The authorized activity or facility that performs or will perform depot level repair of an item" (JDMAG 2004, 5). "An activity for the receipt, classification, storage, accounting, issue, maintenance, procurement, manufacture, assembly, research, salvage, or disposal of material" (CJCS 2021, 62).

Depot-level maintenance and repair. Refers to "material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies, and the testing and reclamation of equipment as necessary" according to Tittle 10 U.S.C. § 2460 (2021).

Depot-level reparable component. "An item of supply that is designated for repair at the depot level, or that is designated for repair below the depot level for which condemnation authority must be exercised by the responsible depot level repair activity using the procedures in Volume 1 of DODM 4160.21" (DOD 2020a, 64).

Depot maintenance. According to DOD Instruction 4151.20:

> The processes of materiel maintenance or repair involving the overhaul, upgrading, rebuilding, testing, inspection, and reclamation (as necessary) of weapons systems, equipment end-items, parts, components, assemblies, and subassemblies. Depot maintenance also includes all aspects of software maintenance; the installation of parts or components for modifications; and

> technical assistance to intermediate maintenance organizations, operational units, and other activities. (DOD 2018, 13)

Depot Maintenance Inter-Service Support Agreements (DMISAs). According to DOD Manual 4140.68:

> A formalized agreement like a contract whereby one Military Department, the agent, obligates itself to provide depot maintenance support to another Military Department, the principal. DMISAs may also be used when a Military Department is the agent, and another Federal Government department or agency, or element thereof, is the principal. (DOD 2020a, 64)

DSOR. "The authorized organic, contract, or combination of organic and contract activity(s) or facility(s) that performs or is planned to perform depot-level maintenance on an item" (DOD 2017, 13). "The authorized activity or facility assigned to perform depot level repair on an item" (DOD 2020a, 64).

DSOR determination process. "An iterative process that ensures management control over the determination and assignment of depot-level sources of repair and allows for incremental planning and investment in organic industrial capabilities as system configuration stabilizes and matures" (DOD 2017, 13).

End item. "A final combination of systems, subsystems, components, parts, and other materiel that is ready for its intended use" (DOD 2017, 13). "A final combination of end products, component parts, or materiel that is ready for its intended use, e.g., ship, tank, mobile machine shop, or aircraft" (DOD 2020a, 64).

Fiduciary relationship. According to the *Merriam-Webster Dictionary*:

> Legal definition of fiduciary relationship**:** a relationship in which one party places special trust, confidence, and reliance in and is influenced by another who has a fiduciary duty to act for the benefit of the party (called also confidential relationship, fiduciary relation). NOTE: A fiduciary relationship may be created by express agreement of the parties, or it may be imposed by law where established by the conduct of the parties. Typical fiduciary relationships exist between **agents and principals**, attorneys and clients, executors or administrators and legatees or heirs, trustees and beneficiaries, corporate directors or officers and stockholders, receivers or trustees in bankruptcy and creditors, guardians and wards, and confidential advisors and those advised. (Merriam-Webster n.d.)

Flow Time. "The total number of calendar days from the day an item is inducted by the Agent's designated repair point until the time the item is completed and ready for issue (RFI) by the designated repair point" (Navy Interservice Support Management Office [MISMO] 2013, enclosure 2 page 2).

Maintenance. The "performance of a task required to ensure the continuing airworthiness of a product or article, including any one or combination of overhaul, disassembly, cleaning, inspection, testing, replacement, defect rectification, and the embodiment of a modification or repair" (SAE International 2016, 11).

Maintenance Interservice Support Management Office (MISMO). "The office within each Service responsible for implementing depot maintenance interservice policy and procedures" (JDMAG 2004, 5). "The MISMO also assists with resolving disputes between Services involving DMISA issues" (5). "The office within a Military Department responsible for formulating policy, guidance, and procedures for the implementation, management, and operation of the inter-Service Depot Maintenance Program" (DOD 2020a, 67).

Maintenance Interservice Support Office (MISO). "The office responsible for developing, negotiating, managing, and terminating DMISAs for a command, center, or agency" (JDMAG 2004, 5).

Management. Defined as "coordinated activities to direct and control an organization" (ISO 2015, 13).

Major end item. "A final combination of end products that is ready for its intended use, e.g., missiles, tanks, mobile machine shop, industrial material, weapons, vehicles, and aircraft engines" (DOD 2020a, 66).

Materiel. According to DOD Manual 4140.68:

> All items necessary to equip, operate, maintain, and support military activities without distinction as to their application for administrative or combat purposes, excluding real property, installations, and utilities. Materiel is either serviceable, i.e., in an issuable condition, or unserviceable, i.e., in need of repair to make it serviceable. (DOD 2020a, 66)

Materiel management. According to DOD Manual 4140.68:

> Continuing actions relating to planning, organizing, directing, coordinating, controlling, and evaluating the application of resources to ensure the effective and economical support of military forces. That phase of military logistics that includes managing, cataloging, requirements determinations, demand and supply planning, procurement, distribution, overhaul, and disposal of materiel. (DOD 2020a, 66)

Non-consumable item material support code (NIMSC). "Alphanumeric codes assigned to non-consumable items, which indicate the degree of materiel support (numeric) or repair responsibility (alphabetic); NIMSCs for PICA actions are always alphabetic and NIMSCs for SICA actions are always numeric" (DOD 2020a, 68).

Non-consumable item. "Item of supply that is a major end item, depot-level reparable component, or special management item" (DOD 2020a, 68).

Organic maintenance. According to the Defense Acquisition University:

> Performed by a Military Service in Government owned installations, by Government personnel on Government equipment. This maintenance can be done in the Services own depots or by another Military Service in their own depot, or what is termed as 'inter-service'. In inter-service maintenance, partnerships can also exist between the Government and Industry (commercial) which can be a mix of Government and commercial practices and facilities. Inter-service maintenance under a DMISA is organic maintenance. (DAU 2020, lesson 1 workload options)

Principal. "The military service, federal department, or agency receiving depot maintenance support from the agent" (JDMAG 2004, 5).

Product integrity. According to Kim H. Pries and Jon M. Quigley book: "a more general concept of integrity: a oneness, an entity with no discontinuities, a form of honesty" (Pries and Quigley 2009, 31).

Product safety. The "state in which a product is able to perform to its designated or intended purpose without causing unacceptable risk of harm to persons or damage to property" (SAE International 2016, 11).

Quality. According to ISO 9000:2015 fundamental concepts:

> An organization focused on quality promotes a culture that results in the behavior, attitudes, activities, and processes that deliver value through fulfilling the needs and expectations of customers and other relevant

> interested parties. The quality of an organization's products and services is determined by the ability to satisfy customers and the intended and unintended impact on relevant interested parties. The quality of products and services includes not only their intended function and performance, but also their perceived value and benefit to the customer. (ISO 2015, 2)

> A degree to which a set of inherent characteristics of an object fulfils requirements. Note 1 to entry: The term "quality" can be used with adjectives such as poor, good, or excellent. Note 2 to entry: "Inherent," as opposed to "assigned," means existing in the object. (ISO 2015, 18)

Quality assurance. Defined as "part of quality management focused on providing confidence that quality requirements will be fulfilled" (ISO 2015, 14).

Quality control. Defined as "part of quality management focused on fulfilling quality requirements" (ISO 2015, 14)

Quality management. Defined as "management with regards to quality" (ISO 2015, 14)

Quality management system (QMS). According to the International Organization for Standardization ISO 9000:

> A QMS comprises activities by which the organization identifies its objectives and determines the processes and resources required to achieve desired results. The QMS manages the interacting processes and resources required to provide value and realize results for relevant interested parties. The QMS enables top management to optimize the use of resources considering the long- and short-term consequences of their decision. A QMS provides the means to identify actions to address intended and unintended consequences in providing products and services. (ISO 2015, 2)

Quasi-contract. According to Cornell Law School:

> An obligation imposed by law to prevent unjust enrichment. Also called a contract implied in law or a constructive contract, a quasi-contract may be presumed by a court in the absence of a true contract, but not where a contract—either express or implied in fact—covering the same subject matter already exists. Because a quasi-contract is not a true contract, mutual assent is not necessary, and a court may impose an obligation without regard to the intent of the parties. When a party sues for damages under a quasi-contract, the remedy is typically restitution or recovery under a theory of quantum meruit. Liability is determined on a case-by-case basis. (Cornell Law School n.d.)

Reparable. An "item of supply subject to economical repair and for which the repair (at either depot or field level) is considered in satisfying computed requirements at any inventory level" (DOD 2020a, 69).

Subsystem. A "combination of equipment, groups, etc., that performs an operational function within a system. Subsystems form the major subdivisions within a system" (DOD 2017, 13).

Technical data. According to AS9110C:

> Data that is necessary to ensure that the article or product can be maintained in a condition such that continuing airworthiness of the aircraft and related operational and emergency equipment is assured. Technical data shall be acceptable to the component authority or approved by the authority, if applicable. (SAE International 2016, 12)

F. SUMMARY

Depot-level maintenance and repair (or maintenance, repair, and overhaul [MRO]) activities are integral in maintaining product integrity, airworthiness, and safety over time. The DMISA defines the requirements for depot-level maintenance and repair activities between DOD agencies. DMISAs are managed via a principal and agent relationship, but it is imperative to have the program manager and systems engineer review, evaluate, and maintain technical compliance and quality assurance over the life of the agreement. This study focuses on the DMISA process after the final DSOR decision and answers the research question of how we shall evaluate DMISAs from a program manager or systems engineer perspective when one military department supports another. The study evaluates 15 active DMISAs with the Navy as the principal (service that needs [receives] the maintenance support), includes the documentation of factual process information via semi-structured interviews, and presents a prototype tool to evaluate DMISAs from an individual and enterprise level. Additionally, specific terms and definitions were discussed to maintain accurate understanding of the thesis scope and intent.

G. THESIS CONTENT OUTLINE

This thesis is organized into five chapters and three appendixes. Chapter I provides a quick introduction to the reader emphasizing the background, research questions, goal

and objectives, scope, terms and definitions, and a quick summary. Chapter II presents a review of literature that covers depot-level maintenance and repair, the joint depot maintenance program, the DMISA (including relevant roles, implementation, standard format, creation and management process, technical data, and quality control) along with a quick summary. Chapter III discusses the thesis methodology for the research questions, DMISA evaluation, semi-structure interviews, and the prototype tool along with a chapter summary. Chapter IV focuses on the analysis and results that include the DMISA evaluations, the summary for the semi-structure interview feedback, the prototype tool presentation, and a chapter summary. Chapter V discuss the conclusion, areas further studies, and a chapter summary.

Appendix A describe the semi-structure interview and the direct feedback collected by the author for each question per interviewee. Appendix B shows the prototype tool Qlik story presentation. Appendix C includes an example of an agreement between federal program agencies for intragovernmental reimbursable, buy and sell activities. The agreement is identified as form (FS Form 7600A) from the U.S. Department of Treasury titled U.S. Government general terms & conditions (GT&C) used for intragovernmental reimbursable, buy and sell activities. The form mentions additional agreement information, an annex A to D for statement of work (SOW) and an annex E for standard legal clauses. The annex A through E were included for information purposes to give a clear picture of the entire form requirements for the intragovernmental reimbursable, buy and sell activities.

II. LITERATURE REVIEW

The literature review defines the depot-level maintenance and repair functions and provides a general overview of the joint depot maintenance program. The DMISA relevant roles, implementation, standard format, creation and management processes, technical data, and quality are explained in more detail. According to the Department of Defense 2020 *Report on Requirements for Military Department Inter-Service Depot*, "DOD major organic (government-owned, government-operated) depot-level maintenance facilities provide specialized capabilities to support specific weapons systems often referred as OIB" (DOD 2020b, 2). The report states that "approximately, $20 billion dollars is spent annually throughout the OIB" managing the specialized capabilities across the 17 DOD major maintenance depots aiming to leverage and "get the most out of each maintenance dollar" (2). The report points out that "several mechanisms, such as PPPs, PBLs, and inter-service repair strategies are employed to ensure depot-level maintenance is performed as effectively and efficient as possible" (2). Revealing that DMI represents three percent or $600M of "DOD's $20 billion annual organic depot-level maintenance" expenditure (2).

A. DEPOT-LEVEL MAINTENANCE AND REPAIR

Tittle 10 U.S.C. § 2460 (2021), contains the laws in effect defining depot-level maintenance and repair (or MRO) activities as follows:

> (a) In General. - In this chapter, the term "depot-level maintenance and repair" means (except as provided in subsection (b)) material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies, and the testing and reclamation of equipment as necessary, regardless of the source of funds for the maintenance or repair or the location at which the maintenance or repair is performed. The term includes (1) all aspects of software maintenance classified by the Department of Defense as of July 1, 1995, as depot-level maintenance and repair, and (2) interim contractor support or contractor logistics support (or any similar contractor support), to the extent that such support is for the performance of services described in the preceding sentence. (b) Exceptions. - (1) The term does not include the procurement of major modifications or upgrades of weapon systems that are designed to improve program performance or the nuclear refueling or defueling of an aircraft carrier and any concurrent complex overhaul. A major upgrade program

> covered by this exception could continue to be performed by private or public sector activities. (2) The term also does not include the procurement of parts for safety modifications. However, the term does include the installation of parts for that purpose.

The DOD 2017 instruction *Depot Source of Repair (DSOR) Determination Process* establishes: the contract, private sector versus organic (own-service, inter-service, or public sector); source selection for any "weapons systems; and items of military equipment that require depot-level maintenance" (DOD 2017, 1). The instruction explains that programs under the "DSOR determination process" include "weapon systems and items of military equipment, end items, systems, subsystems, equipment, or components that require depot-level maintenance" (8). The instruction mentions the exemptions from this process that include the "hull, mechanical, and electrical related systems for ships and submarines" (9). According to the DOD instruction, "funds will not be obligated to establish a depot-level maintenance capability or expand capacity of an existing capability" without an approved DSOR assignment (3).

The program manager and related DOD components document the DSOR assignment in the Life Cycle Sustainment Plan (LCSP) (DOD 2017). Military departments are responsible for maintaining "a record of DSOR assignments that supports the weapons systems and military equipment in their force structure;" the record includes "the DSOR decision letter signed by the appropriate authority, along with the supporting rationale and coordination" (DOD 2007, 5). "Depot activation planning" is initiated "during program inception" following "DOD directive 4151.18" for maintenance of military materiel for organic and contract sources of repair (DOD 2007, 7). Core logistics capabilities are identified in accordance with DOD instruction 4151.20 where depot maintenance core capability requirements and workloads are determined along with the depot maintenance interservice work (DOD 2018). "Depot-level maintenance programs that transition" (e.g., "commercial to organic, organic to commercial," or organic to organic) "regardless of the investment needed or annual value of the program are subject to the DSOR determination process" (DOD 2017, 9).

DSOR assignments are governed by service-level regulations providing consideration of all possible DSORs, including own-service organic, inter-service organic,

and contract (commercial) maintenance (DAU 2020). A DMISA results from a DSOR (organic) assignment for one service "to provide depot maintenance support to another service" (MISMO 2013, enclosure 2–2). The policies and responsibilities of DOD materiel maintenance for both organic and contract sources of repairs is established by DOD directive 4151.18 titled "Maintenance of Military Materiel" (DOD 2004). The directive recommends evaluating the best value to the government by considering maintenance workloads using public sector (organic) or private sector (contract or commercial) sources. It encourages programs to, "employ the full spectrum of maintenance support structures available to sustain military materiel, including organic or unique military capabilities, PBL arrangements, commercial sector support, partnering, and competition, as applicable," including PPP and any other collaborative agreements when feasible (DOD 2004, 2).

Figure 1 shows the organic and contract sources available for depot-level maintenance and repair activities. Organic maintenance sources subdivide in inter-service (e.g., Navy and Army) or intra-service (e.g., Navy and Navy). Depending on the length of the agreement, the maintenance service will be performed by a DMISA or a support agreement. DMISAs represent a maintenance commitment of two years or more. Support agreements represent a maintenance commitment of less than two years and are accomplished via form 1144, Memorandum of Agreement (MOA), or Memorandum of Understanding (MOU) for inter-agency or intra-agency maintenance work (DOD 2004). In contrast, contract maintenance is accomplished via commercial (private party), PPP (public-private party), or PBL (private party) contractual arrangements. For this thesis, only the inter- and intra-service DMISAs will be evaluated.

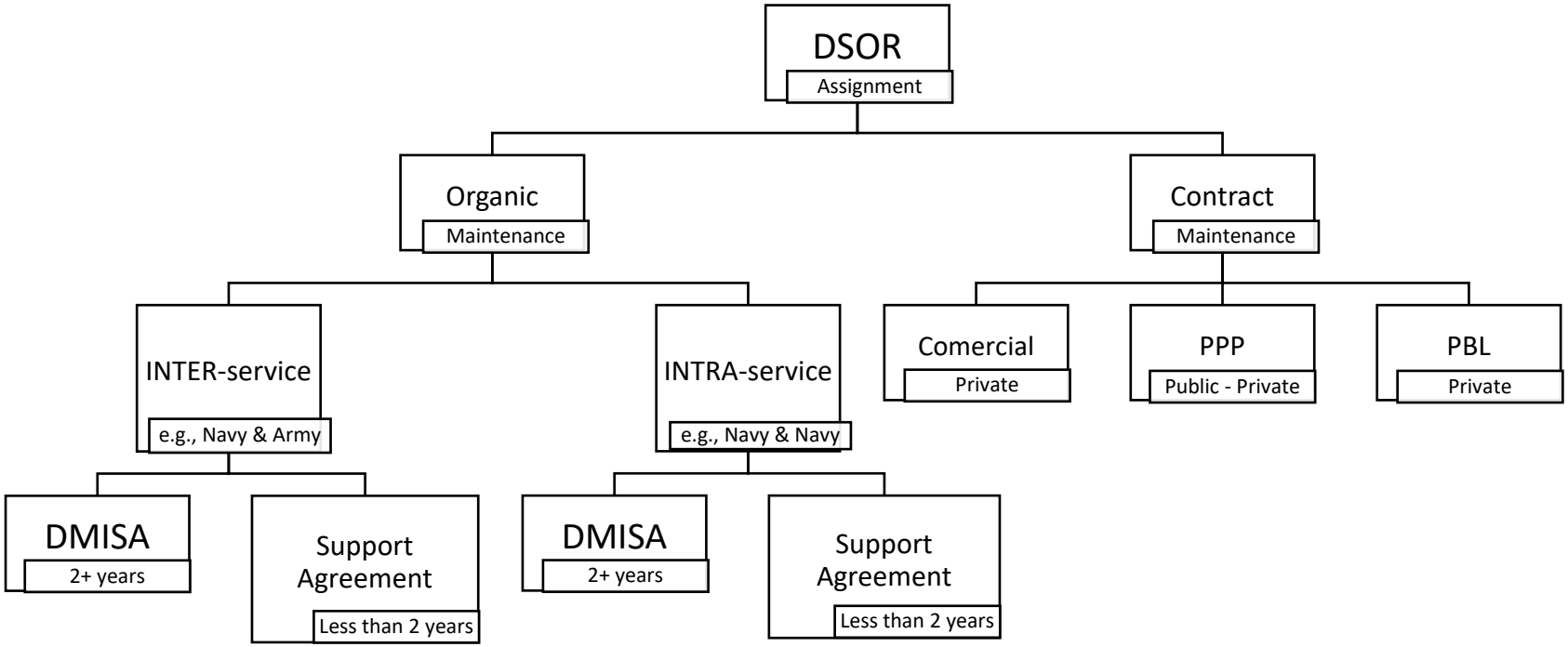

Figure 1. Sources of depot-level maintenance and repair activities.

According to the Office of the Chief of Naval Operations 2013 instruction *Joint Depot Maintenance Program*, the two authorized methods of inter- or intra-service workloads are accomplished by DMISAs or credit exchange. The instruction mentions that other methods are used "for interim periods of recurring workloads of less than one year or a finite workload requirement of less than two years" (enclosure 1–1). The instruction points out that any reassignment of workload from a terminated DMISAs is subject to the DSOR process.

After receiving a DSOR decision, the program manager is responsible for four key actions (DOD 2017, 10) described as follows:

1. "Document the decision and resulting DSOR assignment in the LCSP."
2. "Finalize applicable personnel, facility, equipment, and technical data requirements."
3. Incorporate the "program and budget" submittals for "planning, programming, budgeting, and execution in the LCSP."
4. Coordinate "with the appropriate military department to establish organic-depot level maintenance capability."

Figure 2 shows the DSOR determination process from start to finish (DOD 2017). In this thesis, only the organic depot-level maintenance of two or more years (DMISAs) will be evaluated.

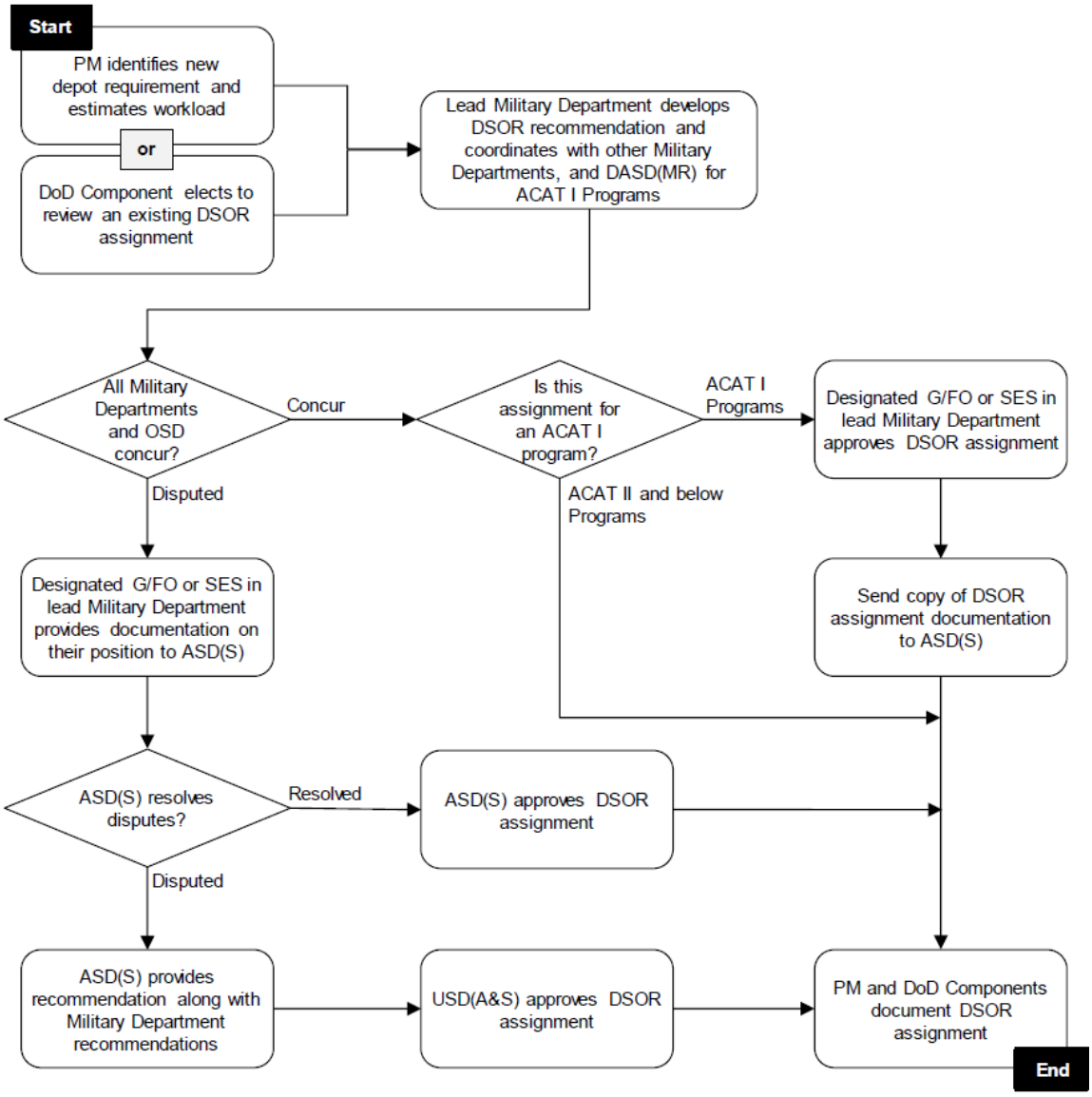

Figure 2. DSOR Determination Process Flow Chart. Source: DOD (2017).

B. JOINT DEPOT MAINTENANCE PROGRAM

The Joint Depot Maintenance (JDM) program focuses on the organic depot-level maintenance activities that are executed using DMISAs. The program establishes policy and provides procedures for implementing the JDM and the Depot Maintenance Inter-service (DMI) process (Office of the Chief of Naval Operation [OPNAV] 2013). It establishes the responsibility of maintaining the Navy's inter-service network.

> This network consists of the Maintenance Inter-Service Support Management Office (MISMO), personnel within each naval systems command (SYSCOM), depot maintenance activities, and acquisition and logistics managers who acquire, modify, support, or procure depot support services for weapons systems, end items, systems, subsystems, equipment, and components, to include software maintenance. It also includes Naval Supply Systems Command Weapon Systems Support (NAVSUP WSS) personnel who manage and procure reparable material. (OPNAV 2013)

The Joint Group on Depot Maintenance (JG-DM), "provides guidance to establish, direct, and control the JDM program," and provides direction to ensure, "consistent emphasis and interpretation of joint and inter-service depot maintenance policy," for service MISMOs (OPNAV 2013, 2).

> The Navy MISMO is the focal point for implementing joint and inter-Service depot maintenance policies within the Navy. The Navy MISMO has the responsibility to manage the JDM program, implement joint policy, achieve joint Service objectives, and provide arbitration in resolving conflicts and disputes with other Services or between the Navy and other agencies. (OPNAV 2013)

Under the MISMO resides the Maintenance Inter-Service Support Office (MISO) and Maintenance Inter-Service Coordinating Office (MICO). According to the Office of the Chief of Naval Operations 2013 instruction *Joint Depot Maintenance Program* the "MISO serves as the focal point for implementation of joint and inter-service depot maintenance support requirements within each SYSCOM" (4). According to the instruction, the SYSCOMs are the ones responsible to establish a MISO within their command headquarters and at the NAVSUP WSS. The instruction describes that some of the responsibilities for the MISO include the implementation of DSOR decisions in addition to preparing and negotiating DMISAs. The instruction emphasizes, a MICO is "the coordinating office located at a Navy depot maintenance activity that supports inter-service initiatives on behalf of the SYSCOM MISO as the service agent representative making it the central point of contact for coordinating DMI support at the depot repair activity" (5).

Figure 3 depicts the JDM program responsibility structure as defined in the instruction (OPNAV 2013). It starts with the JG-DM, which is responsible for the JDM program and depot maintenance policy. A joint advisory board (JAB) member is assigned

by the Navy MISMO to act as the focal point between the JG-DM and MISMOs. The MISMO acts as a focal point for JDM policies along with other responsibilities. Each SYSCOM is responsible to establish a MISO to request depot maintenance support. The MISO has the responsibility to implement the DSOR decision, prepare and negotiate DMISAs along with other responsibilities. The MICO is the coordinating office located at the depot maintenance activity (or depot repair activity) serving as the service agent representative. The program manager (PM) is responsible for identifying the DMI information to be sent to their SYSCOM MISO among other responsibilities as outlined in the instruction (OPNAV 2013).

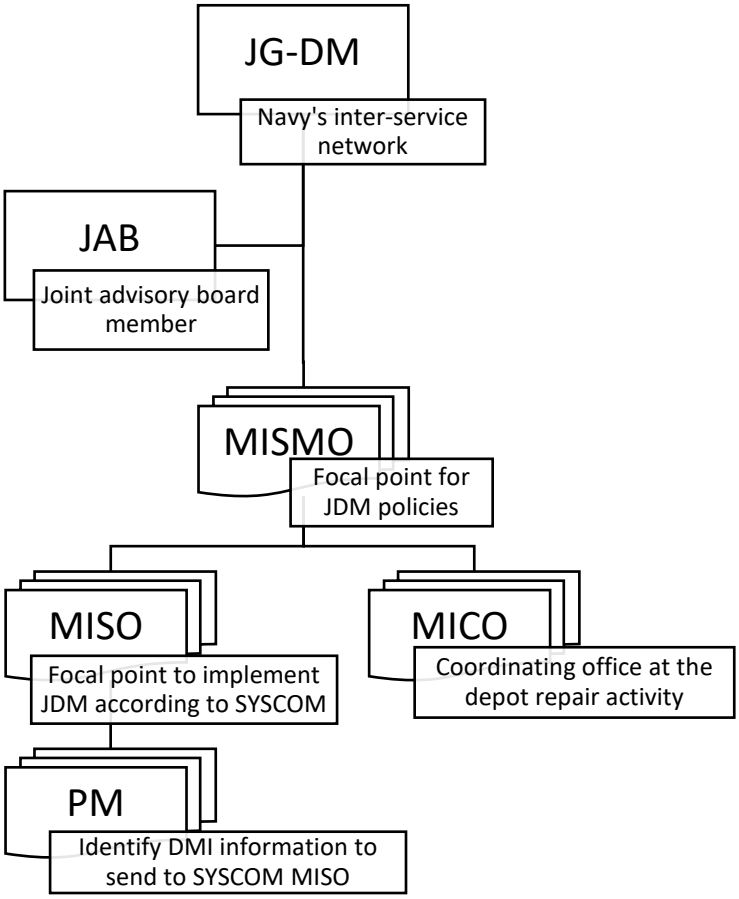

Figure 3. Joint depot maintenance program responsibility structure.

According to McGarry and Owens (1992), *An Analysis of Depot Maintenance Interservicing Source of Repair Selection and Acquisition Program Incompatibilities* reveals "that the Depot Maintenance Inter-service (DMI) has the potential for considerable savings" through the DSOR process but various incompatibilities between the DMI and DSOR prevent a timely decision (vii). According to McGarry and Owens, "the Joint Depot Maintenance Analysis Group (JDMAG) was created to facilitate the DMI" process, but it revealed challenges "in the transfer of information between organizations" (2). McGarry and Owens reveals, "very little written documentation addressing depot maintenance inter-servicing," and that it is still a concern today (17). McGarry and Owens emphasizes that most program offices interviewed stated, "the hardest information to obtain was technical data, manuals, test requirement documents, and level three drawings" (34). Some of the observations and recommendations from McGarry and Owens indicated the process is not evaluated at an enterprise level, some key personnel are not involved until the final DSOR decision, and familiarization of the process through education of personnel involved is key for success but not being emphasized. Finally, McGarry and Owens found that with the JG-DM:

> MISMOs do not appear to be actively involved in the process, until it is time to make the final DSOR decision, MISOs only render assistance to the program office when the logistics managers request it, and the MISMO and the MISO remove themselves from the communication loop by allowing the program offices to work directly. (McGarry and Owens 1992, 52)

Figure 4 shows the DMI review process. The process starts with the submission of a Source of Repair Analysis (SORA) from the candidate depot to the Navy MISMO (OPNAV 2013). Then the process flow has two decision points with a either a 'Yes' or 'No'. If 'No', then it expands into two more decisions points with 'Yes New DSOR'; 'Yes Original DSOR'; or 'No'. After following all the steps, the process ends with two actions. First, the introducing service MISMO is responsible to "publish the joint decision letter and" second, they "ensure the assigned DSOR for specific repairable items is recorded in the DSOR database" (OPNAV 2013, enclosure 3–7). The DMI process has five "types of reviews: a directed DSOR, a service workload competition, a MISMO review, a comparative merit based DSOR study, and a comparative DSOR study for non-core sustaining workloads" (OPNAV 2013, enclosure 3–3). The five types follow the DMI review process, as depicted in Figure 4.

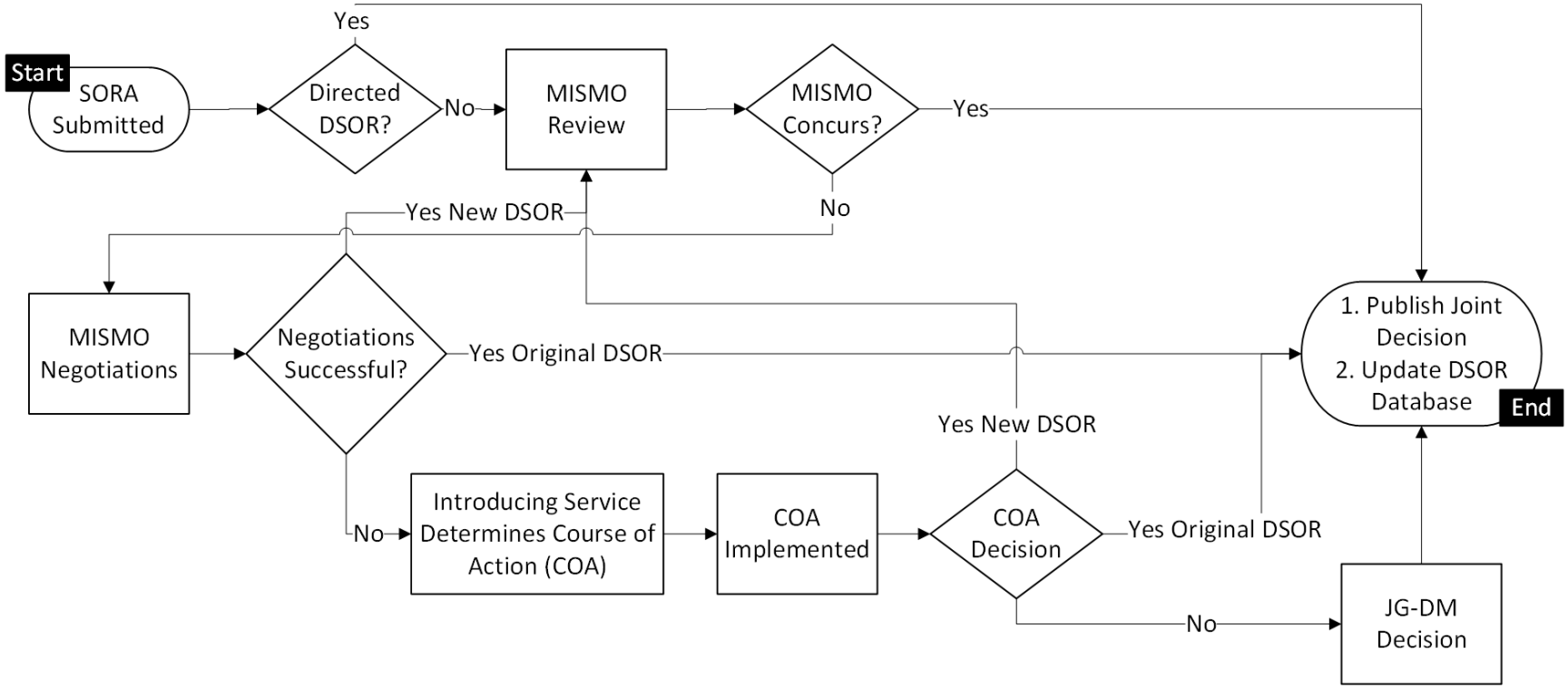

Figure 4. DMI Review Process. Adapted from OPNAV (2013).

> Inter-service depot-level maintenance as a support solution is undertaken in situations where some aspect of required depot maintenance capability does not exist within the military service that procured (and owns) a given weapon system, or when a determination has been made to optimize existing capabilities within the DOD before expending funds to establish duplicate capabilities. In instances where it is determined to be cost-effective to leverage another military service depot as the source of repair, a DMI arrangement may be established. DMI arrangements are effective because they optimize existing capabilities and potentially lower cost (non-recurring and recurring) to customers' materiel maintenance requirements. The military services make use of a well-established joint depot maintenance construct to provide DMI support for weapons systems, end items, and components. These DMI arrangements leverage depot maintenance capabilities and resources across the department and have been responsible for increasing effectiveness and reducing redundant capabilities while sustaining essential support needs. Additionally, DMI arrangements assist the military services in maintaining the core logistics requirements as directed by title 10 U.S. Code § 2464. (DOD 2020b)

C. DEPOT MAINTENACE INTER-SERVICE SUPPORT AGREEMENT

After an organic DSOR assignment has established an organic depot-level maintenance capability, the program manager is responsible to initiate the coordination with the appropriate military department through their service MISMO. Figure 5 shows the sequence of events to start the DMISA negotiations. The general sequence of events starts with the DSOR assignment, then the program manager reaches out to the MISMO office, via the JDM program requirements, to trigger the DMISA negotiations.

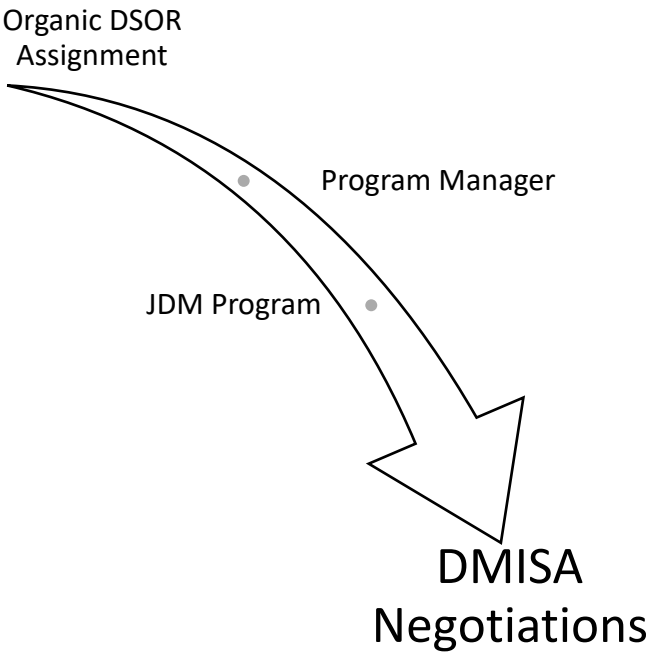

Figure 5. Sequence of events for DMISA negotiations.

The DMISA is a quasi-contractual agreement that exchanges crucial information via a fiduciary (principal-agent) relationship. “One military service (the agent) agrees to provide depot-level maintenance support for another service (the principal)” (JDMAG 2004, 4. DMISA’s are used to assign workload of two or more-years commitment with mandatory annual reviews to establish workload projections and exhibit updates (OPNAV 2013).

The DMISA defines the requirements for depot-level maintenance and repair activities between DOD agencies. DMISAs are managed via a principal and agent relationship, but it is imperative to have the program manager and systems engineer review, evaluate, and maintain technical compliance and quality assurance over the life of the agreement. The DMISA process is governed by the JDM program by providing “uniform guidance for developing, negotiating, managing, and terminating DMISAs” (OPNAV 2013, enclosure 2 page 1)

> The DMISA shall be used for all multi-year inter-service depot maintenance workload assignments unless it meets the criteria for an MOA or MOU… or the credit exchange method is selected. (OPNAV 2013, enclosure 1)

> MISOs are responsible for developing, negotiating, managing, and terminating DMISAs. DMISAs shall only be used to assign workload and shall not be used to document transfer of responsibility for a function or mission from one Military Service or DOD agency to another. The standard DMISA format should be used (obtained from the Navy MISMO office) but may be tailored to fit the needs of the principal and agent. (OPNAV 2013, enclosure 2)

The DMISA desktop reference can be obtained from the Navy MISMO office for detailed procedures regarding development, negotiation, management, and termination (MISMO 2013).

1. DMISA Relevant Roles

There are eight relevant roles for DMISAs. First, "the military service providing the maintenance support" at one of its depots for another service, federal department, or agency is known as the agent (JDMAG 2004, 5). Second, "the military service, federal department, or agency receiving depot maintenance support from the agent" is known as the principal (JDMAG 2004, 5). Third, "the authorized activity or facility that performs or will perform repair of an item" is known as the depot (JDMAG 2004, 5). Fourth, "the office responsible for preparing, negotiating, managing, and terminating DMISAs for a command, center, or agency" is known as MISOs (JDMAG 2004, 5). Fifth, "the office located at a depot maintenance activity that supports the inter-service initiatives on behalf of the SYSCOM MISO as the Military Service or SYSCOM agent representative" is known as the MICO (DAU 2020, lesson 1 DMISA Roles and Responsibilities: Three Key Locations). Sixth, "the office within each Service that is responsible for implementing depot maintenance inter-service policy and procedures, validating service reviews and depot plans for the DSOR process, notifying the service of DSORs and ensuring the implementation of joint service DSOR decisions, giving service approval on DSOR recommendations, and resolving disputes between services involving DMISA issues" is known as MISMO (DAU 2020, lesson 1 DMISA Roles and Responsibilities: Three Key Locations). Seventh, the office "responsible for programming, budgeting, and funding to support the DMISA" is known as the program office or DMISA program manager (OPNAV 2013, enclosure 1–2). Eight, the principal subject matter experts under the

program office or DMISA program manager responsible of system requirements, technical data specifications for the performance of the work, and quality standards for the acceptance of finished work is known as the system engineer or assigned system expert.

Figure 6 provides a representation of the DMISA relevant roles. The top three (agent, principal, and depot) work very close to develop, create, and maintain the DMISA. They act as the focal point for the DMISA management. The middle three (MISO, MICO, and MISMO) work very close to maintain the DMISA process, procedures, and policies. The bottom two (program office or DMISA program manager and systems engineer or assigned system expert) work very closely with the principal to maintain the DMISA information (e.g., technical data and quality) and funding up to date. The bottom two provide the subject matter expertise related to the system that include but are not limited to requirements for the depot-level maintenance, repair needs, and updates to maintain the airworthiness of the system.

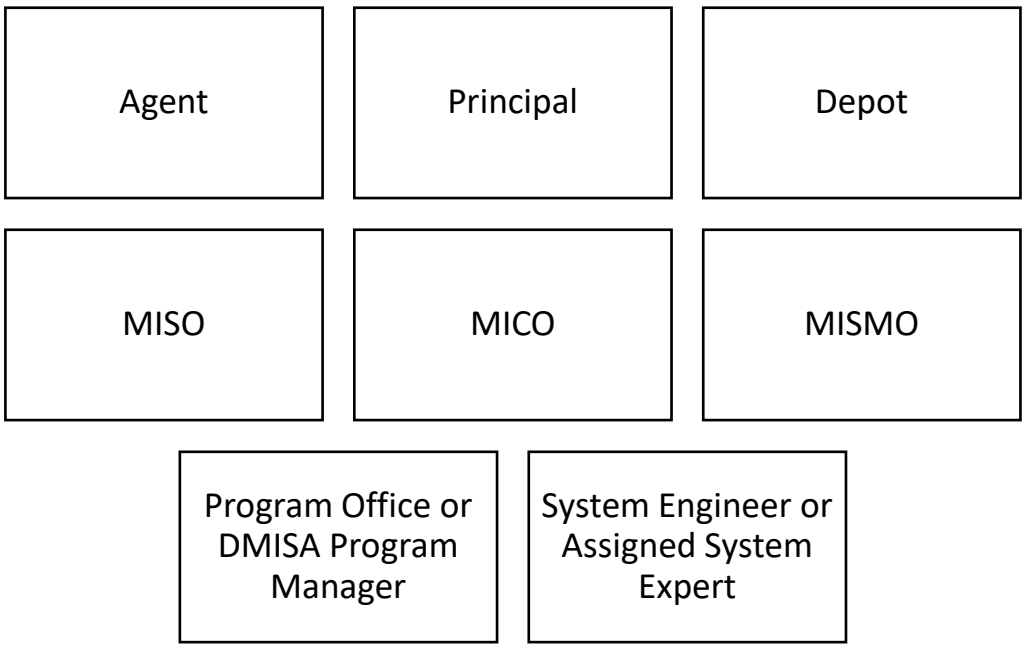

Figure 6. DMISA relevant roles.

2. DMISA Implementation

DMISAs are implemented upon an issuance of a DSOR assignment. The principal MISO is the party that requires the depot-level maintenance support and is responsible for developing the plan in direct coordination with the agent MISO. The agent MISO is the party who will provide the support or who is responsible for workload planning for the assigned depot location. The agent MISO may have a MICO at the depot that acts on their behalf in coordinating depot functions. The plan is submitted by the principal MISO to their MISMO office after the DSOR decision. The MISOs for the principal and agent share responsibility for DMISA implementation and are the key points of contact for review, negotiations, and approval.

There are two methods of implementation for inter- or intra-service depot assignments to manage materiel classified as non-consumable items between organizations. A non-consumable item is an item of supply used by one or more military services as not consumable at the wholesale level (DOD 2020a). For example, major end items and depot repairable components are considered non-consumable items. The non-consumable item material support code (NIMSC) identifies the level of material support furnished to the Secondary Inventory Control Activity (SICA) by the Primary Inventory Control Activity (PICA) and the service or federal agency providing depot repair. Table 1 provides the NIMSC 3, 4, 5, and 8 descriptions.

Table 1. NIMSC description. Adapted from DAU (2020) and DOD (2020a).

NIMSC	Item	Support (DAU 2020)	Description of the Level of Integrated Materiel Management Support (DOD 2020a)
3	End Item PICA	DMISA (DAU 2020, lesson 2 Numeric NIMSC)	SICA managed depot-level reparable end items or equipment assigned to another DOD Component PICA that is responsible for the wholesale logistics support functions of single submitter of cataloging data, acquisition, and disposal authority and depot maintenance, if required, to be provided pursuant to a DMISA. (DOD 2020a, 8)

NIMSC	Item	Support (DAU 2020)	Description of the Level of Integrated Materiel Management Support (DOD 2020a)
4	Depot-level Reparable Component (temporary)	DMISA (temporary) (DAU 2020, lesson 2 Numeric NIMSC)	SICA managed depot-level reparable components, assigned to another PICA that is responsible for the logistics functions of single submitter of cataloging data, acquisition, disposal authority, and depot maintenance to be provided by DMISA. NIMSC 4 is temporarily assigned to items that are reviewed for NIMSC logistics reassignment to NIMSC 5 every 2 years. (DOD 2020a, 8)
5	Depot-level Reparable Component	Credit Exchange (DAU 2020, lesson 2 Numeric NIMSC)	SICA managed depot-level reparable components, assigned to another DOD Component that is responsible for the logistics functions of single submitter cataloger, acquisition and disposal authority, depot maintenance, and that performs the wholesale stock, store, and issue functions and establishes, budgets, and funds the wholesale stock level requirement. (DOD 2020a, 9)
8	Depot-level Reparable Component	DMISA (Permanent) (DAU 2020, lesson 2 Numeric NIMSC)	SICA managed depot-level reparable components that have been reviewed for migration to NIMSC 5. (DOD 2020a, 9)

According to the DOD 2020 manual *Integrated Materiel Management of Non-consumable Items,* the first method of implementation is the credit exchange method identified as NIMSC 5 or depot-level reparable component. The manual states that the second method, the DMISA, is identified by three numeric NIMSC: 3 end item PICA, 4 depot-level reparable component -temporary, or 8 depot-level reparable component (DOD 2020a). The manual points out that NIMSC are assigned to non-consumable items under a joint service program called the non-consumable item program (NIP) governed by the DOD manual 4140.68 titled Integrated Materiel Management of Non-consumable Items.

Any level of support agreed between the SICA and the PICA is documented by the numeric NIMSC (DAU 2020).

The NIMSC 5 is preferred when the SICA's item is identical to the item the PICA uses, a single procurement specification meets PICA and SICA requirements, or there are no unique depot maintenance and technical support requirements required by the SICA (DAU 2020). Under NIMSC 3, 4, or 8, the PICA provides depot maintenance support to the SICA under a DMISA.

The NIMSC codes indicate the level of wholesale logistics support the PICA will provide the SICA and the service that is performing depot repair. While the DSOR code indicates the specific organic activity (or commercial contract) that is repairing or will repair the item. The DSOR code is identified by two alpha numeric characters that are identified for each item in the DSOR assignment process.

3. DMISA Standard Format

The standard DMISA format is the basis for drafting a DMISA (DAU 2020). "Detailed procedures are contained in the DMISA desktop reference" and can be "obtained from the Navy MISMO" (OPNAV 2013, enclosure 2–2). "The standard format contains almost every conceivable support option that can be negotiated between the principal and the agent" (DAU 2020, lesson 3 The DMISA). In general, the standard DMISA format has four basic parts, as depicted in Figure 7.

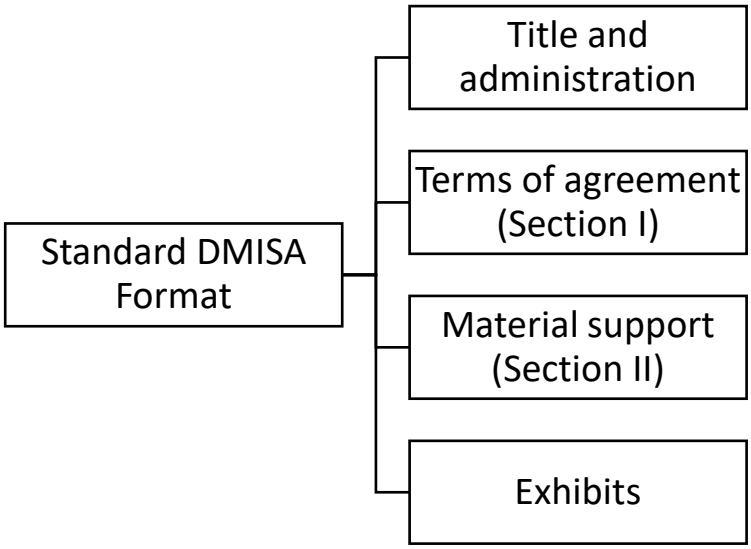

Figure 7. Standard DMISA format.

First, the title and administration portion, which includes provisions for authorization, distribution, and number of copies; notations of deviations made to the standard format; notations of changes made to the agreement as a result of periodic reviews; and periodic review certification sheets. Figure 8 shows the DMISA desktop reference for the tittle and administration portion. The tittle and administration portion are updated at least annually during minor reviews.

Title Page
Table of Contents
Deviation Page
Periodic Review (if applicable)
Change Page
Distribution List

Figure 8. Tittle and administration portion. Source: MISMO (2013).

Second, the terms of agreement (section I) portion, which addresses the purpose and authority for the agreement, effective dates, conditions for terminations and reviews, names of the coordination representatives, guidelines for liaison visits and contract administration, and provisions for negotiation and management of the agreement. Figure 9

shows the DMISA desktop reference for section I terms of agreements portion. Section I is created after the DSOR decision, and it is only changed if a major review is triggered by the principal or agent.

SECTION I - TERMS OF AGREEMENT:

1. Purpose
2. Authority
3. Effective Dates
4. Termination
5. Periodic Review
6. Coordination Representatives and Responsibilities
   a. Agent
   b. Principal
7. Liaison Representatives
8. Contacts with Agent's Repair Facility
9. Contract Administration
10. Specific Provisions
    a. Support Required
    b. Program Data
       (1) Immediate Year Requirements
       (2) Projected Requirements
       (3) National Emergency Requirements
       (4) Special Engineering Support
       (5) Failure Analysis Reports (FARs), Teardown Deficiency Reports (TDRs), and Disassembly Inspection Reports (DIRs)
    c. Man-Hour/Flow Time/Cost Estimating
    d. Work Specifications
       (1) Statement of Work
       (2) Technical Data
       (3) Bill of Material/Material Requirements List
       (4) Configuration Management
    e. Quality Assurance
    f. Economic Repair Limitations
    g. Reusable Containers
    h. Costing
    i. Funding
    j. Billing
    k. Reports
    l. Personnel Spaces
    m. Security
    n. Safety
    o. Other Support

Figure 9. Section I: Terms of Agreement. Source: MISMO (2013).

Third, the material support (section II) portion, which outlines procedures for shipment of assets, emergency repair provisions, item accountability, depot material

support, support equipment procurement, maintenance material source changes, disposition of assets at termination, and recovery of precious metals. Figure 10 shows the DMISA desktop reference for section II material support portion. Section II is created after the DSOR decision and it is only changed if a major review is triggered by the principal or agent.

SECTION II - MATERIAL SUPPORT:

1. Procedures for Shipment
   a. To Agent
      (1) Agent's Repair Activity
      (2) Packaging
      (3) Markings
   b. To Principal
      (1) Location/Consignee
      (2) Shipping Authority
      (3) Packaging Instructions
      (4) Special Markings
      (5) Method of Transportation
      (6) Transportation Fund Citation
2. Production Support
3. Emergency Repair Provisions
4. Item Accountability
5. Depot Material Support
   a. Jointly Used/Jointly Managed Items
      (1) Initial Pipeline
      (2) Follow-on
   b. Joint Support Items
   c. Peculiar Items
   d. Repairable Items
   e. DLA, GSA, and Other Material
   f. Modification Kits
   g. Material Support Procedures
   h. Items Missing on Inventory
6. Support Equipment
7. Material Source Changes
8. Termination Assets Disposition
9. Critical Alloy and/or Precious Metals Recovery
10. Use of Exhibits

Figure 10. Section II: Material Support. Source: MISMO (2013).

Fourth, the exhibits portion, which may contain up to 17 exhibits that apply to program data, work specifications, reporting requirements, safety procedures, depot material support, tools and equipment, and non-engineering requirements. Some exhibits have standard formats; others do not. Figure 11 shows the DMISA desktop reference for the 17 exhibits that may apply to the DMISA; note that there are 26 options in total, but some exhibits are further identified with a capital letter after the exhibit roman numeral. The exhibits are revised or updated at least annually during the minor reviews unless specified otherwise in the DMISA.

EXHIBIT	
I	SCHEDULE & COSTS - Major Programs
II	SCHEDULE & COSTS - Minor Programs
III-A	PROJECTED REQUIREMENTS - Major Programs
III-B	PROJECTED REQUIREMENTS - Minor Programs
III-C	PROJECTED REQUIREMENTS - Pending Capability
IV	NATIONAL EMERGENCY REQUIREMENTS
V	SPECIAL ENGINEERING SUPPORT
VI	BILL OF MATERIAL/MATERIAL REQUIREMENTS LIST
VII-A	STATEMENT OF WORK
VII-B	TECHNICAL DATA LIST AND LINE ITEM CROSS REFERENCE
VII-C	QUALITY ASSURANCE REQUIREMENTS
VIII	PRODUCT ORIENTED SURVEY PARAMETERS
IX	JOINT OPERATING PROCEDURE FOR CONFIGURATION MANAGEMENT
X-A	LIST OF REPORTS
X-B	MONTHLY PRODUCTION REPORT
XI	SAFETY
XII	SPECIAL MARKINGS
XIII-I	SPECIAL SHIPPING INSTRUCTIONS PART I
XIII-II	SPECIAL SHIPPING INSTRUCTIONS PART II
XIII-III	SPECIAL SHIPPING INSTRUCTIONS PART III
XIV	SPECIAL PRESERVATION, PACKAGING AND PACKING INSTRUCTIONS
XV-A	ROTATABLE POOL REQUIREMENTS
XV-B	MODIFICATION KITS
XV-C	OTHER MATERIAL SUPPORT PROCEDURES
XVI	TOOLS AND EQUIPMENT
XVII	OTHER SUPPORT (NON-ENGINEERING)

Figure 11. Exhibits. Source: MISMO (2013).

The standard DMISA format is considered a "fill in the blank" type of guidance (or boilerplate) that is accepted by all services and becomes the focal point for the subsequent negotiations and changes (DAU 2020). If any paragraphs in the standard DMISA format do not apply, they are not deleted. Instead, "N/A" is entered in the adjacent margin. If any sentence does not apply, it is placed in parentheses, and (N/A) is entered in the adjacent margin. In accordance with the DMISA desktop reference, the "modifications to the standard DMISA format to meet the needs of both parties may be accomplished by" (MISMO 2013, 5):

1. Changing the boiler plate to reflect those changes on the "Deviations" page,
2. Removing the wording from any paragraph that does not apply and replacing with N/A (this keeps paragraph numbers for each DMISA consistent) or
3. Expanding information required in the DMISA by using attachments. (MISMO 2013)

DMISAs may be edited by the principal and agent MISOs. Any changes to the standard format are notated on the changes page noting that the standard language was changed to reflect the needs of the program or depot. The uniqueness of some repair programs or of the equipment itself may require changes from the standard DMISA format. Any changes are noted on the changes page that appears at the beginning of the DMISA. Unused exhibits have the exhibit number on the page and left as blank as a placeholder with N/A.

4. DMISA Creation and Management Process

The principal MISO determines support, workload, and technical requirements. The principal MISO also coordinates with the agent MISO and MICO (if a MICO exists) on availability of depot maintenance resources. The principal and the agent will work together to develop requirements, a schedule, and priorities that will enable successful execution. Once the principal MISO has been tasked to implement the DSOR decision, the MISO requests an agent's acceptance number, or DMISA number, from the agent MISO and MICO. The DMISA number consists of 15 characters (including blank spaces) that identify the agent, fiscal year, DMISA sequence number, amendment, principal service,

and principal activity (MISMO 2013). Figure 12 shows the agent's acceptance number columns definition and some sample formats. Figure 13 shows the principal command identification codes and location.

AGENT'S ACCEPTANCE NUMBER

COLUMN 1-6	Agent Identification. Use six alpha characters, spaces or dashes.
COLUMN 7-8	Fiscal Year (FY) of Initial Negotiation. Use last two digits of the FY.
COLUMN 9	Leave blank (mandatory space).
COLUMN 10-11	Serial Number. Use two numeric characters assigned by Agent, sequential within FY.
COLUMN 12	Amendment. Use one alpha character: A for basic, B for first amendment of DMISA, C for second, etc.
COLUMN 13	Principal Service/agency Identification. Use one alpha character: A - Army; N - Navy; F - Air Force; M - Marine Corps; C - Coast Guard; L - Defense Logistics Agency; D - Defense Mapping Agency; G - General Services Administration; T - Customs Service; R - Federal Aviation Administration; W - National Oceanic and Atmospheric Administration/National Weather Service); J - Immigration and Naturalization Service; X - all others.
COLUMN 14-15	Principal Command Identification. Use two alpha characters. See "Codes for the Principal" for list.

SAMPLE FORMATS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Basic DMISA	C	E	C	O	M	_	9	3	_	3	0	A	N	H	A
Army (CECOM) Agent															
Navy (NAVSEASYSCOM) Principal															
DMISA with 1 Amendment	A	I	R	C	P	T	8	9	_	0	3	B	F	S	X
Navy (NADEP Cherry Point) Agent															
Air Force (OC-ALC) Principal															
DMISA with 2 Amendments	O	O	-	A	L	C	9	0	_	0	1	C	M	P	A
Air Force (OO-ALC) Agent															
Marine Corps (MCLB Albany) Principal															
DMISA with 3 Amendments	U	S	M	C	_	_	9	0	_	0	2	D	A	A	Z
Marine Corps (MCLB Albany) Agent															
Army (TACOM) Principal															

Note: The use of the underscore symbol "_" in the examples denotes a space.

Figure 12. Construction of the DMISA number. Source: MISMO (2013).

Service/ Agency	Principal Activity and Location		Code
Army	US Army Soldier's Biological and Chemical Command Natick MA 01760		AJ
	US Army Tank-automotive and Armaments Command Warren MI 48397-5000		AZ
	US Army Communications- Electronics Command Fort Monmouth NJ 07703-5000		CL
	US Army CECOM Communications Security Logistics Activity Fort Huachuca AZ 85613-7090		CM
	US Army Aviation and Missile Command Redstone Arsenal AL 35898-5000	(Missile) (Aviation)	BD EJ
	Armament and Chemical Acquisition and Logistics Activity Rock Island IL 61299-7630		BF
Navy	Naval Air Systems Command Patuxent River MD 20670-1626		KA
	Naval Sea Systems Command Washington Navy Yard DC 20376-1010		HA, HB
	Space and Naval Warfare Systems Command San Diego CA 92152-5002		HC
	NAVSUP Weapons System Support Philadelphia PA 19111-5098		KE
	NAVSUP Weapons System Support Mechanicsburg PA 17055-0788		HD HX, JF
	Naval Construction Battalion Center Port Hueneme CA 93043-5000		JN
Air Force	Ogden Air Logistics Center Hill AFB UT 84056-5838		SU
	Oklahoma City Air Logistics Center Tinker AFB OK 73145-5989		SX
	Warner Robins Air Logistics Center Robins AFB GA 31098-3058		TG
	Aeronautical Systems Center Wright-Patterson AFB OH 45433-6503		AS
	Electronic Systems Center Hanscom AFB NM 01731-1620		ES
	Space and Missile Systems Center Los Angeles AFB CA 90245-4683		SD
	Air Armament Center Eglin AFB FL 32542-5000		AD
	Cryptologic Systems Group Kelly AFB TX 78243-7056		SJ
Marine Corps	Marine Corps Logistics Base Albany GA 31704-1128		PA
Coast Guard	US Coast Guard Aircraft Repair and Supply Center Elizabeth City NC 27909-5001		XH
	US Coast Guard Yard Curtis Bay MD 21226		XF
	US Coast Engineering Center Baltimore MD 21226-5000		SF, XG
Defense Logistics Agency	Defense Supply Center Richmond Richmond VA 23297		CX

Figure 13. Codes for the principal activity and location. Source: MISMO (2013).

Once an agent's acceptance number has being assigned, the principal drafts the DMISA from the standard format (boilerplate) and works directly with the program or commodity to get the technical information for the depot-level maintenance required for the system. While the principal and agent are the owners of the process for a DMISA, the program or commodity is the owner of the system (responsible for the airworthiness) and the depot location is responsible for the depot-level maintenance actions to be performed to the system according to the DMISA negotiations. Once the principal has the standard format finalized and appropriate inputs from the program or commodity for the system, then the DMISA is sent to the agent MISO. The agent MISO will review and seek depot feedback for the DMISA until an agreement between the parties is reached. Drafting the DMISA is an essential part of the process and involves several key players that include, but are not limited to, program (or commodity) domain experts, principal domain experts, agent domain experts, depot domain experts, Defense Logistics Agency (DLA) feedback, and supply chain feedback. Domain experts (also known as subject matter experts or fleet support teams) provide feedback to section I, section II, and exhibits ensuring technical data, quality, system requirements, schedule, price, specifications, and other system related information is accurate and reflects the appropriate depot-level maintenance required for the system.

Figure 14 shows how the "repair procedures, technical specifications, and quality assurance requirements are coordinated and documented in the DMISA development process" (DOD 2020b, 5). The DMISA creation process starts with a DSOR decision that needs a DMISA (new DMISA) to be created. That action triggers the principal MISO to get notified of the DMISA. The principal contacts the agent to acquire the acceptance number for the DMISA. Then the principal MISO creates the DMISA from the standard format (boilerplate) and works hand in hand with the program (or commodity) to fill out the DMISA draft with all the requirements. The requirements come from the program domain experts. Once the work specifications and schedule, along with other information, is acquired, then the draft DMISA is sent to the agent MISO. The agent MISO then coordinates with the depot to review the draft DMISA and adjusts the draft accordingly by adding cost data and flow time. The principal receives the agent draft DMISA with the

updates and confirms final cost, schedule, and technical information with the principal and program domain experts by doing a detail review of the DMISA. Then the agent reviews, approves, and signs the DMISA (the agent and depot domain experts provide feedback; once they agree with all terms, the agent signs the agreement). Once the agent signed the DMISA the principal signs the final DMISA and is distributed to all parties. Figure 14 identifies the main process flow with a solid line, the sub-process flow with a dashed line, and the inputs to the sub-process flow with a red dotted line. The main process flow is managed only by the principal and agent. The sub-process flow identifies the feedback to and from the principal or agent to their respective domain experts to acquire the necessary information for creating and finalizing the DMISA. The inputs to the sub-process flow is the expected information the domain experts will provide to their principal or agent to finalize the DMISA. The flowchart has five rows (swim lanes) that identify: the DMISA process, the principal responsibilities, the agent responsibilities, the depot financial responsibilities, and the program (or commodity) requirements.

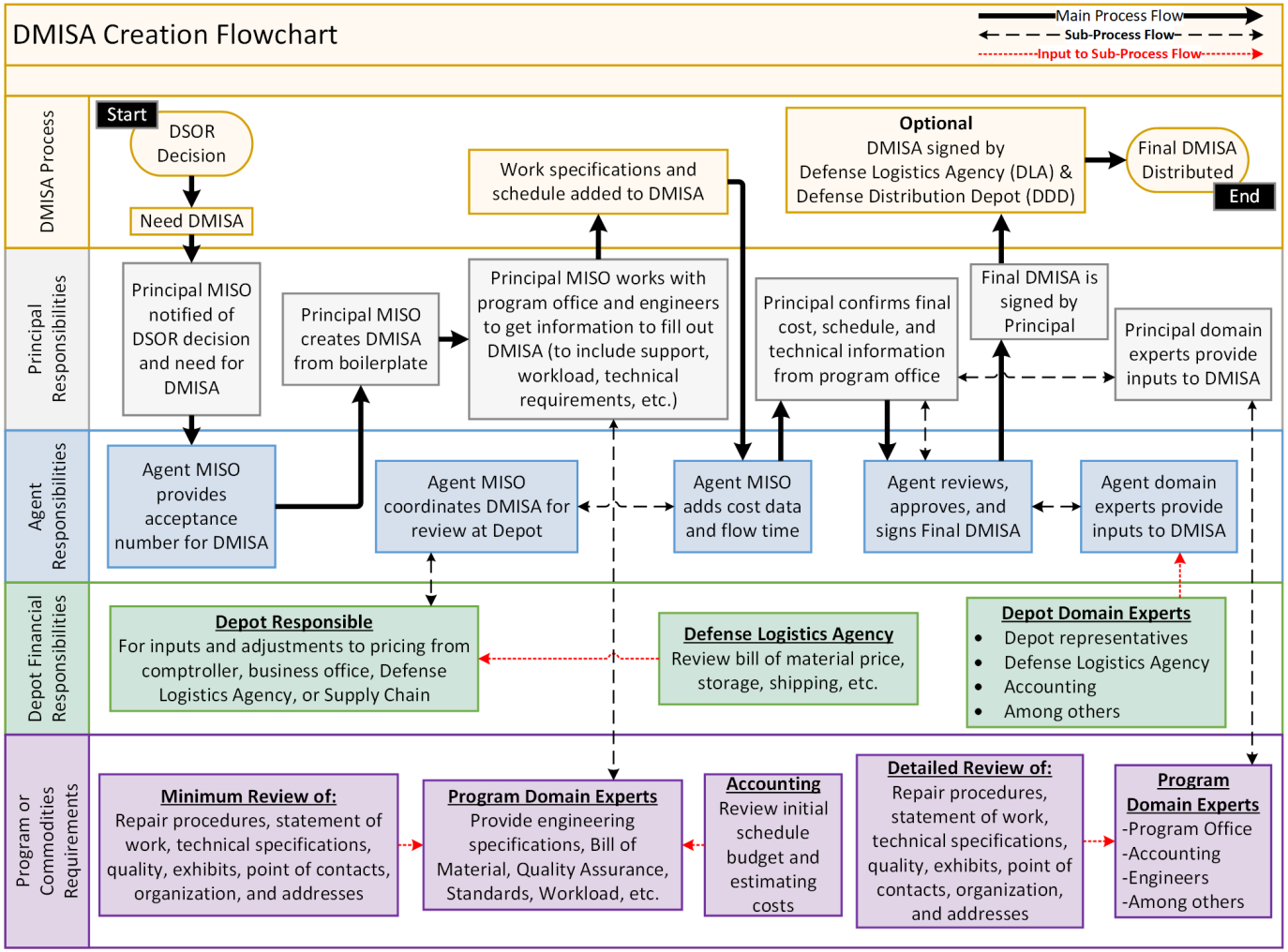

Figure 14. DMISA creation flowchart. Adapted from DOD (2020b).

Figure 15 shows how "the repair procedures, technical specifications, and quality assurance requirements are" reviewed and negotiated in the DMISA management process (DOD 2020b, 6). The management process in Figure 15 assumes that a DMISA already exists; if a new DMISA is needed, then Figure 14 is the appropriate process flow. The DMISA management process starts with an existing DMISA that it is evaluated annually (each fiscal year). The principal ensures the DMISA exhibits are current and out year schedules are accurate by coordinating with the program (or commodity); the program domain experts provide inputs to update the DMISA according to the program needs. Then the principal evaluates the type of review that is required (minor or major). If a minor review is selected, then the changes are sent to the agent for review. The agent coordinates with the depot financial official to corroborate changes and make adjustment as appropriate. According to the depot's feedback, the agent evaluates what type of review (minor or major) as necessary. If a minor review is required, then all exhibits and information is updated and negotiated. If negotiations are not successful, then it goes back in the process. If negotiations are successful, then the DMISA is signed by the principal and agent with the option for signature, if applicable, from the DLA and Defense Distribution Depot (DDD) then the final DMISA is distributed.

A minor review means section I and section II are the same and only exhibits and appropriate title and administration pages are updated. If the principal or agent decides a major review is required, the principal coordinates with the program domain experts; the agent coordinates with the depot domain experts to update section I, section II, the exhibits, and the title and administration pages as required. If negotiations for a major review are not successful, then the MISMO offices are called in to review and assist in negotiations. Once negotiations are successful, the DMISA is signed by the principal and agent and the final DMISA is distributed. Figure 15 identifies the main process flow with a solid line, the sub-process flow with a dash line, and the inputs to the sub-process flow with a red dotted line. The main process flow is managed only by the principal and agent. The sub-process flow identifies the feedback to and from the principal or agent to their respective domain experts to acquire the necessary information for managing and finalizing the DMISA for a minor or major review according to the negotiations. The inputs to the sub-

process flow is the expected information the domain experts will provide to their principal or agent to finalize the DMISA review. The flowchart has five rows (swim lanes) that identify: the DMISA process, the principal responsibilities, the agent responsibilities, the depot financial responsibilities, and the program (or commodity) requirements.

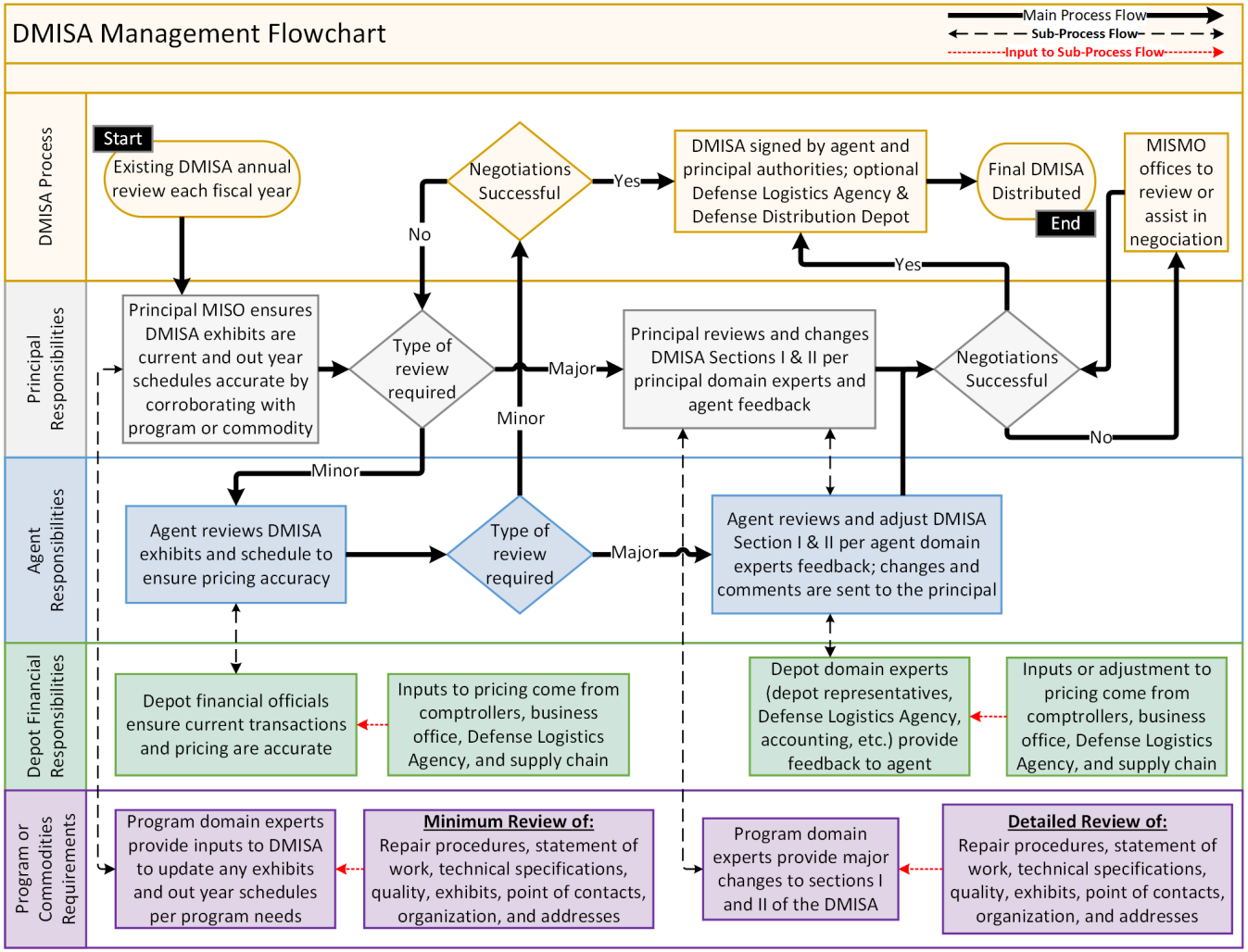

Figure 15. DMISA management flowchart. Adapted from DOD (2020b).

The creation and management flowcharts can be summarized in 12 points that highlight tasks and expectations for the DMISA creation, management, and termination. These points are described in OPNAV (2013) and DOD (2020b) as follows:

1. The "principal is responsible for determining support, workload, and technical requirements" (DOD 2020b, 6).
2. The principal coordinates "with the agent to ensure availability of adequate depot maintenance resources" (DOD 2020b, 6).
3. "The principal and agent establish a mutually agreeable work specifications" using the DMISA desktop reference (boilerplate) (OPNAV 2013, enclosure 2–2).
4. The agent "adds cost data and flow time information" for the principal's requirements "to the workload," to be reflected in the applicable "exhibits" to the DMISA being established, "and then return the completed draft DMISA to the principal" (OPNAV 2013, enclosure 2–3).
5. "The principal will review the agent's input and, if acceptable, prepare the formal agreement" (DOD 2020b, 6).
6. The principal sends the formal agreement to the agent for signature. The "depot commander or designated representative will sign the DMISA as the agent when DMISA workload is planned to be accomplished at" the depot commander "organic maintenance facility" (DOD 2020b, 7). "If desired by either the principal or agent, the agent will request" the DLA or the DDD to "sign the DMISA cover page acknowledging DLA's" or DDD's "support commitment" (7).
7. "Signatures on the cover page of the DMISA by the principal, agent, and other involved parties constitutes approval and acceptance of the DMISA's terms and conditions" (DOD 2020b, 7).
8. "A formal negotiation meeting may be held to resolve outstanding issues before the DMISA is executed" (DOD 2020b, 7). If needed, the MISMO

offices get involved if any outstanding issues cannot be negotiated at the principal and agent level.

9. "The principal's and agent's MISOs facilitate an annual joint review" of each DMISA "with the principal's program office and the agent's depot command" to ensure schedules accuracy, update applicable exhibits, and verify if a minor or major review is needed (DOD 2020b, 7).

10. "Amendments are incorporated at the annual reviews prior to the next fiscal year, but if either the agent or principal determines a required change is significant, amendments can be made at any time and the DMISA will require at a minimum new signatures by the service representative authorized to approve the DMISA and the principal's and agent's MISO to formally accept the change" (DOD 2020b, 7).

11. The "principal may request a DMISA be terminated if the agent's product cost, product quality, or schedule does not meet the requirements identified in the DMISA" (DOD 2020b, 7).

12. "An agent may request a DMISA be terminated because of the principal' s inadequate funding, lack of piece part support, or lack of sufficient assets to support the agreed upon workload schedule" (DOD 2020b, 7).

Figure 14 and Figure 15 were adapted from the report to the congressional Defense Committee regarding NDAA FY20 section 358 "requirement for military department inter-service depot maintenance" (House of Representatives 2019, 128). According to the Department of Defense 2020 *Report on Requirements for Military Department Inter-Service Depot*, the DOD has "sufficient existing policies, process, procedures, and controls," and that "technical specifications, requirements, and standards for depot-level maintenance inter-service work are clearly set forth by the principal requiring the work and understood by the agent performing the work" (7). The report also identified one gap in the policy that, "if addressed, may improve the overall effectiveness and efficiency of the depot-level maintenance organic workloads" with an estimated completion date of January 2022 (7).

The identified policy gap is related to DMISA management policy that is not documented at the OSD-level. The Department of Defense 2020 *Report on Requirements for Military Department Inter-Service Depot* states that "service-level policies address processes and procedures to implement DMISAs and execute inter-service workloads" (7). The report points out that "this policy framework" based on service-level is effective, but it is predominantly based upon legacy service-specific regulations; "however, it is not documented in OSD-level policy" (7). The report identifies that the "policy gap, lack of overarching OSD-level policy for DMI arrangements," will be addressed by issuing new policy through an "issuance, thus improving the performance of inter-service depot maintenance" (8). According to the report, the "military services will continue to manage and update the DMISA desktop reference and exhibits in alignment with OSD direction" (8).

5. DMISA Technical Data and Quality Control

According to the aerospace standard for QMS - requirements for aviation maintenance organizations AS9110C definition, technical data is defined as:

> Data that is necessary to ensure that the article or product can be maintained in a condition such that continuing airworthiness of the aircraft and related operational and emergency equipment is assured. Technical data shall be acceptable to the competent authority or approved by the authority, if applicable. (SAE International 2016)

The definition provides the foundation for how technical data is evaluated in terms of requirements for aviation maintenance organizations. On the other hand, quality control is defined according to the international standard for QMS fundamental and vocabulary ISO9000-2015 as "part of quality management focused on fulfilling quality requirements." (ISO 2015, 14). Given these two definitions, the DMISA is the key document for inter-service support by being the quasi-contractual agreement between the principal (service that needs [receives] the maintenance support) and agent (service that provides [performs] the depot maintenance action) between military departments. It is important to understand that DIMISAs are only used to administer assigned depot maintenance workload for military materiel. DMISAs do not transfer the "responsibility for a function or mission from one military service or DOD agency to another" (MISMO 2013, 3). In terms of the

DMISA desktop reference, section I provides guidance for technical data and quality assurance under specific provisions (specifically under section I paragraph 10.d.(2) technical data and section I paragraph 10.e quality assurance). For section II, only certain exhibits (VI, VIIA, VIIB, VIIC, VIII, and IX) will be related to technical data and quality assurance depending on section I agreements and negotiations. Section I paragraph 10.d work specifications from the DMISA desktop reference boilerplate states:

> d. Work Specifications. The Principal and Agent will negotiate the work specifications. Once the work specification has been agreed to, the Agent will notify the Principal before changing the work specification. Where conditions exist that are peculiar to the Principal (environmental, special equipment, procedures, etc.) and require a change or addition to the work specification, such change(s) will be defined in Exhibit VIIA and identified in Exhibit VIIB. The contents of these special sections will be agreed upon by negotiation and mutual consent before being incorporated into the Agent's work specifications as an added section. When weapon systems or major assemblies, such as aircraft or engines, are involved, and a common work specification cannot be developed, the Principal's work specification will be made an addendum to the Agent's work specification. Work specification addenda of this nature will be modified only by the Principal. Implementation of work specifications will be the sole responsibility of the Agent. Deviations from work specifications, such as waivers, engineering change proposals, material substitutions or alternate repair methods, not specifically authorized by the work specification or elsewhere in the DMISA, shall only be permitted after obtaining approval of the Principal. (MISMO 2013)
>
> 1. Statement of Work. When the Agent's current work specification does not satisfy the Principal's requirements, a separate section will be mutually developed documenting the Principal's needs and included as Exhibit VIIA.
> 2. Technical Data. The initial supply of the Principal's engineering directives, forms, and/or publications will be listed in Exhibit VIIB and will be furnished by the Principal prior to the beginning of work. Subsequent requirements will be obtained by the Agent by submitting requisitions to the appropriate source in accordance with Army (AR) 25–36, Air Force Reserve (AFR) 66–19, OPNAVINST 5215.16A, MCO P5215.17C, Defense Logistics Agency regulation (DLAR) 4151.9, inter-servicing of Technical Manuals and Related Technology. Direct liaison is authorized for the exchange of information relative to alterations and engineering change proposals as they occur; however, exchange of all approved engineering modifications and product improvement information between the Agent and

Principal is the responsibility of the coordination representatives, as specified in section I, paragraphs 6a and b.

3. Bill of Materials/Material Requirements List. The list of materials required to support work specifications is shown as Exhibit VI.

4. Configuration Management. When configuration management across Service lines applies, an agreement will be negotiated between the Principal and the Agent and furnished as Exhibit IX. The Agent will not make any configuration changes to the Principal's equipment without prior approval of the Principal. The Principal and Agent will negotiate desired configuration change costs.

(MISMO 2013)

The previous block quote included the boilerplate guidance for the Navy standard DMISA desktop reference material under each applicable section. Section I paragraph 10.e quality assurance from the DMISA desktop reference boilerplate states:

e. Quality Assurance

1. For work accomplished in a government-owned and government-operated facility, the Agent will be responsible for maintaining an adequate quality assurance program. The Agent's established methods and procedures, ISO 9002/3, or American Society for Quality Control (ASQC) 9002/3, or those specified in Exhibit VIIC will be used.

2. For work accomplished under contract, the Agent will ensure the contractor maintains a quality assurance system in accordance with the provisions of ISO 9002/3 or ASQC 9002/3 and delivers material of acceptable quality in accordance with the terms of the applicable contracts and specifications. The Principal will deal with the Agent in all quality and contract management matters.

3. For organic or contractual work, the Agent or the Principal may require negotiated special examinations of the quality system by a team of quality assurance personnel. The need for special examination will be determined by agreement between the Agent and Principal. For organic work, unless otherwise agreed to, the Agent will conduct the examination and invite the Principal to participate. For contractual work, the contract shall specify that the Principal may request a Product-Oriented Survey (POS) in accordance with Federal Acquisition Regulation (FAR), and the Agent will participate. Exhibit VIII may be used to reflect the parameters for the POS. Normally, a POS is chaired by the requesting activity.

(MISMO 2013)

The two previous block quotes provide the guidance for the principal and agent as the starting point to negotiate the work specifications that include technical data and quality assurance. It is important to point out that these negotiations and work specifications are

not and should not be done in a vacuum. The principal, agent, program, and depot domain experts are expected to be involved in the negotiations to populate and assure the work specifications are properly addressed to comply with the technical data and quality assurance expectations. In summary, Figure 16 shows the applicable DMISA desktop reference section I to evaluate technical data and quality assurance for Navy DMISAs.

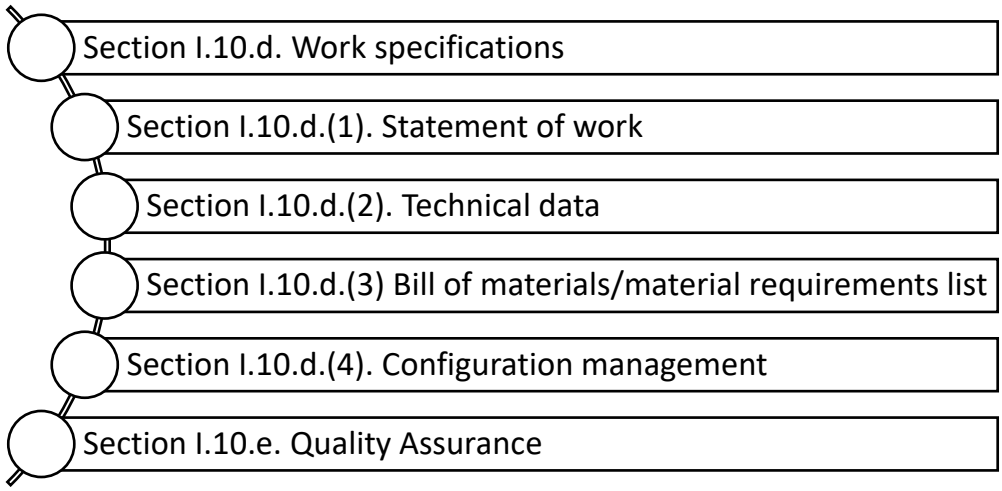

Figure 16. Applicable DMISA desktop reference section I paragraph 10 segments for technical data and quality assurance. Adapted from MISMO (2013).

As mentioned previously, there are certain exhibits related to technical data and quality assurance. The exhibits need to be marked as applicable or not applicable under section II paragraph 10. use of exhibits. There are 26 exhibits in total that need to be classified as applicable or not applicable (for the complete exhibit list see Figure 11, previously discussed). All exhibits are added as an enclosure per the standard DMISA format reference guide and marked “N/A” if they do not apply per section II. Figure 17 shows the DMISA desktop reference exhibits that are related to technical data and quality assurance.

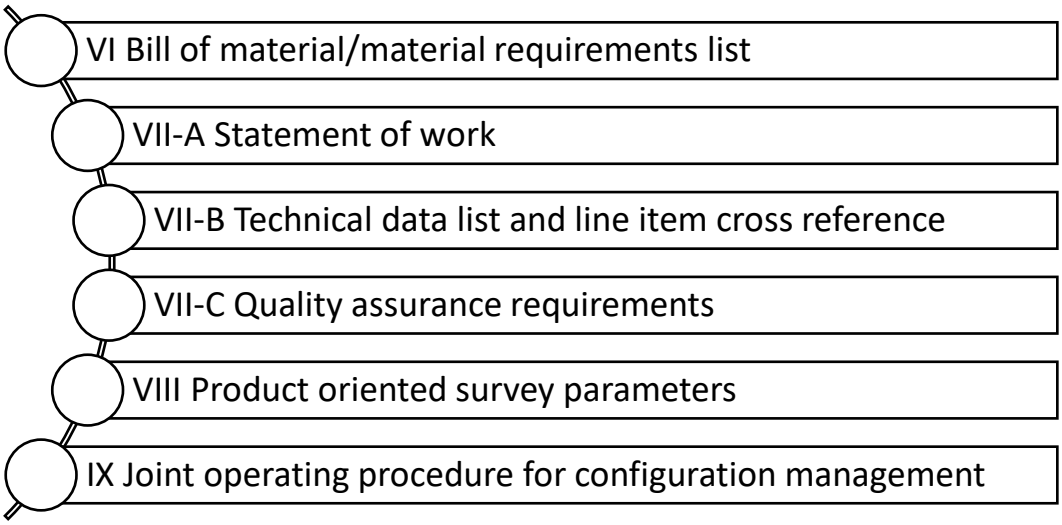

Figure 17. DMISA desktop reference exhibits related to technical data and quality assurance. Adapted from MISMO (2013).

> Exhibit VI is used to list, by usage rates, all material required for depot maintenance of the negotiated end item. The format for the data and the decision for the use of exhibit VI will be agreed during the DMISA negotiations according to paragraph 10d(3). When used, it must contain at least the negotiated end items, mission, design, and series (MDS) or be reflected in exhibits I and II with a breakdown of supporting parts by national stock number (NSN), quantity per assembly, overhaul replacement factor, and source of supply. Exhibit VII-A, -B, and -C include applicable information cited in section I, paragraphs 10d and 10e and agreed to during negotiations. The statement of work is identified as Exhibit VII-A, technical data list and line item cross-reference is identified as Exhibit VII-B, and quality assurance requirements is identified as Exhibit VII-C. Exhibit VIII include applicable information cited in section I, paragraph 10e(3). Exhibit IX, when applicable, as specified in section I, paragraph 10d(4), negotiates a joint agreement on configuration management that is attached. (MISMO 2013)

D. SUMMARY

Depot-level maintenance performs the most complex test, repair, and overhaul tasks on end items, parts, assemblies, and subassemblies that includes complete rebuilding of weapons systems, parts manufacturing, and technical assistance. DMISAs result from a DSOR assignment for one service "to provide depot maintenance support to another service" (MISMO 2013, enclosure 2–2). DMISAs are the required method to implement

multi-year inter-service DSOR decisions between DOD entities and applies to all DOD inter-service workloads; unless a NIMSC 5 item, credit exchange process, is used. All DSOR assignments are coordinated with all services. DSOR assignments provides consideration to all possible DSORs (organic: intra service, inter-service, and support agreements; and contract: commercial, PPP, and PBL).

DMISAs are an "execution tool by which depot maintenance support is provided for weapons systems across DOD" (DAU 2020, lesson 1 DMISA). They are a quasi-contractual agreement between the principal and agent in which the agent agrees to provide depot-level maintenance support for the principal. DMISAs are only used to administer depot-level maintenance workload for military materiel and do not document transfer of responsibility for a function or mission. The standard DMISA format has four basic parts: title and administration, terms of agreement (section I), material support (section II), and exhibits (with 26 exhibits in total that need to be classified as applicable or not applicable). The front portion of the DMISA, title and administration, covers the administration of the document. Its components include title page, table of contents, periodic review, change page, and distribution list. Section I, terms of agreement, addresses the specific support conditions agreed to by the principal and agent. It includes elements related to the purpose, authority, effective dates, termination, periodic reviews, coordination representatives, liaison representatives, contract administration, and various specific support provisions of the DMISA that include, but are not limited to, work specifications, technical data, and quality assurance. In terms of general work specifications (technical data included), the following six key points are important:

1. "The principal and agent negotiate mutually agreeable work specifications" (OPNAV 2013, enclosure 2–2).
2. "The agent's current work specifications should be used when possible" (DAU 2020, lesson 6 Scope and Specifications: Key Points).
3. "Any principal's unique repair requirements are defined by the principal in Exhibit VII-A and listed in Exhibit VII-B" (DAU 2020, lesson 6 Scope and Specifications: Key Points).

4. "Any changes to the negotiated work specification by the agent (whether it is the principal's unique specification or the agent's current specification) must be approved by the principal before they are implemented" (DAU 2020, lesson 6 Scope and Specifications: Key Points).

5. "If the work specification requires a material listing, it is provided by the principal in Exhibit VI" (DAU 2020, lesson 6 Scope and Specifications: Key Points).

6. "The final element of the work scope to be considered is the necessity for configuration management. If configuration management across service lines applies, a joint operating agreement (documented in Exhibit IX) must be negotiated by the principal and agent" (DAU 2020, lesson 6 Scope and Specifications: Key Points).

The quality assurance provisions apply whether the agent is accomplishing the work organically or contractually. For organic workloads, the agent maintains an adequate quality assurance program based on the agent's own established methods and procedures. If the agent's quality assurance program is inadequate or the principal requires additional quality provisions, such provisions are mutually negotiated and set forth in Exhibit VII-C.

> When work for the principal is accomplished by the agent through contract support, the agent must ensure that the contractor maintains a quality assurance system. The principal must contact the agent in all quality and contract matters. Whether the work is accomplished organically or contractually, the agent or principal may require mutually negotiated special quality assurance provisions. For organic work, the agent normally conducts the examination and invites the principal to participate. With participation by the agent, the principal may request a product-oriented survey in accordance with the Federal Acquisition Regulation (FAR). If the work is accomplished contractually, this survey must be specified in the agent's repair contract. When product-oriented surveys are required, they are normally chaired by the principal. Exhibit VIII is used to reflect the nature for the survey and has no default format. Its format is agreed upon by the principal and agent under FAR provisions. (DAU 2020, lesson 6 Contract Support: Principal and Agent Responsibilities)

Section II, material support, includes elements related to shipment of material from the principal to the agent, return of that material from the agent to the principal, among

other sections related to emergency repair, item accountability, depot material support; and support equipment use, disposition of assets upon termination, and considerations to critical alloys and precious metals recovery. The exhibits section includes 17 main exhibits with some having up to three sub-exhibits accounting for 26 exhibits in total that need to be classified as applicable or not applicable in section II paragraph 10. Each exhibit is marked according to its use. Numbering must be maintained even if an exhibit is not required in a specific program. Figure 18 provides a summary of the applicable sections and paragraphs to evaluate technical data and quality assurance in a DMISA.

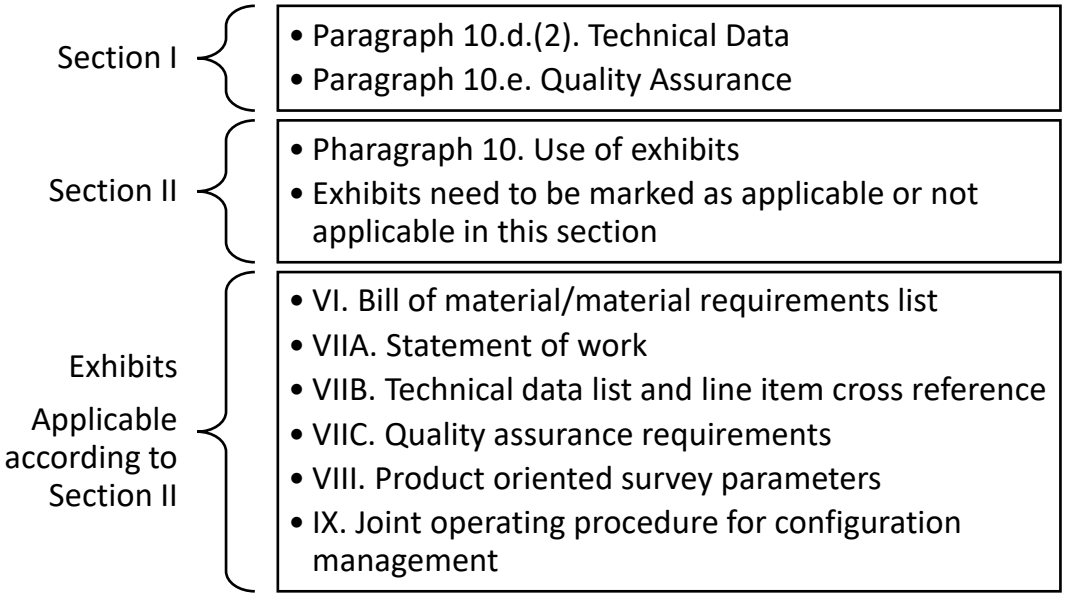

Figure 18. Applicable sections and paragraphs to evaluate technical data and quality assurance in a DMISA. Adapted from MISMO (2013).

III. METHODOLOGY

Guided by the main and subsidiary research questions the methodology was divided in three distinct parts. First, it includes the evaluation of 15 agreements owned by the Navy as the principal (work going out as intra- or inter-service) to analyze cross-program DMISA evaluation against the process, structure, technical data, and quality assurance. Second, the thesis conducted semi-structured interviews to collect and document information related to the DMISA process. Third, the evaluation of a prototype visualization tool to analyze DMISAs at a holistic level from a technical data compliance and quality control point of view. The study aimed to collect the process information, evaluate a sample of DMISAs, and collect the feedback related to the process and the prototype visualization tool to provide a complete view of DMISA evaluation.

A. REASEARCH QUESTION

The methodology was guided primarily by the research question and five subsidiary questions that aim to specify the depth and intent of the topic. The main and subsidiary questions investigate:

How shall we evaluate DMISAs from a program manager or systems engineer perspective when one military department supports another?

1. How are the program manager or systems engineer involved, and how do they evaluate, and manage DMISAs?
2. What is the DMISA process after the DSOR assignment?
3. How is the DMISA maintained, managed, and evaluated over time?
4. How is technical data compliance addressed?
5. How is quality control ensured?

B. DMISA EVALUATION

DMISAs were collected to be evaluated against the creation and management process, recommended structure, technical data, and quality assurance. The Navy MISMO

office provided a list of active DMISAs. From the active DMISAs list as of July 2020, the DMISA evaluation was focused on work going out (including intra-service e.g., Navy-Navy) with 37 total records for the Navy SYSCOMs (NAVAIR, NAVSUP, NAVSEA, and NAVFAC). Fifteen out of the 37 identified records were evaluated against the process and standard format. Special attention was given to the work specifications (technical data), quality assurance, and related exhibits (VIIA, VIIB, VIIC, VIII, VI, and IX), if applicable.

C. SEMI-STRUCTURED INTERVIEWS

The semi-structured interviews aim to understand how the process is being applied and focuses on gathering factual process information rather than personal opinions from the interviewees. APPENDIX A. SEMI-STRUCTURED INTERVIEW, shows the content provided to the participants, in addition to the written feedback collected by the author per interviewee. The content aimed to gather information about the DMISA process, structure, evaluation, technical data, quality assurance, and prototype feedback. The semi-structured interviews targeted program managers, engineers, MISMO, MISO, MICO, principals, agents, or domain experts. The semi-structured interview included a quick introduction to set up the expectations and six main questions (B to G) with subsidiary questions to guide the intent of the main question during the interview. The six main questions included:

1. What information, systems, and people are needed to evaluate a DMISA?
2. What are the key characteristics of the DMISA structure?
3. What triggers a DMISA and an evaluation?
4. How is technical data compliance addressed?
5. How is quality control ensured?
6. Prototype feedback

D. PROTOTYPE TOOL

A prototype tool was developed and presented during the semi-structured interviews to provide a starting point in the evaluation of DMISAs from a holistic view. The prototype aimed to open the conversation on how DMISAs are evaluated today and

how the enterprise could expand the evaluation to a holistic view to improve management and maintain special emphasis in work specifications (technical data) and quality expectations for DMISAs and depot-level maintenance overtime.

The prototype tool was developed using Qlik, a query-based technology, focused on self-service visualization. While the tool does not need to be based in a specific technology (e.g., Qlik or Tableau), it must be capable of visualizing the data in a way that allows the user to further analyze it. In today's environment the DOD is collecting a lot of data but not necessarily analyzing it in the most effective way to aid in the decision-making process and maintaining traceability from top to bottom. Having an interactive dashboard and visualizations provide a powerful and rapid way to share, evaluate, and manage information with different stakeholders. The prototype DMISA tool serves as a starting point to show what can be done and how it can be useful to manage DMISAs and even to be considered for depot-level maintenance work.

E. SUMMARY

The methodology was guided by the main research question and divided in a three-way approach. First, the evaluation of 15 Navy-owned agreements as the principal (work going out as intra- or inter-service) to analyze cross-program DMISA evaluation against the process, structure, technical data, and quality assurance. Second, a semi-structured interview to collect and document information related to the DMISA process. Third, the evaluation of a prototype tool developed in Qlik to analyze DMISAs and depot-level maintenance at a holistic level from a technical data compliance and quality control point of view.

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IV. ANALYSIS AND RESULTS

This chapter is divided in four sections. First, the DMISA evaluation analysis and results are tabulated for easy comparison against the DMISA standard format (boilerplate). Second, the semi-structure interview feedback was summarized per question. Third, the prototype tool is presented using various view as examples to show the functionality, intent, and results using dummy data. Fourth, a quick summary discusses the highlights of the chapter.

A. DMISA EVALUATION

The Navy MISMO maintains a master DMISA matrix list to track active, inactive, and terminated DMISAs. Active DMISAs represent the agreements that have current funding and work for the fiscal year. Inactive DMISAs represent the agreements that are in place but do not have funding and work planned for the fiscal year. Terminated DMISAs represent the agreements where "depot support is no longer needed" (representing the most common reason for termination), the principal requested termination because of requirements issues, or the agent requested termination because of lack of sufficient finding or assets (DAU 2020, lesson 12 Cause for Termination). Figure 19 shows the Navy DMISAs quantity and percentage. The Navy has 73 active, 10 inactive, and five terminated DMISAs as of July 2020.

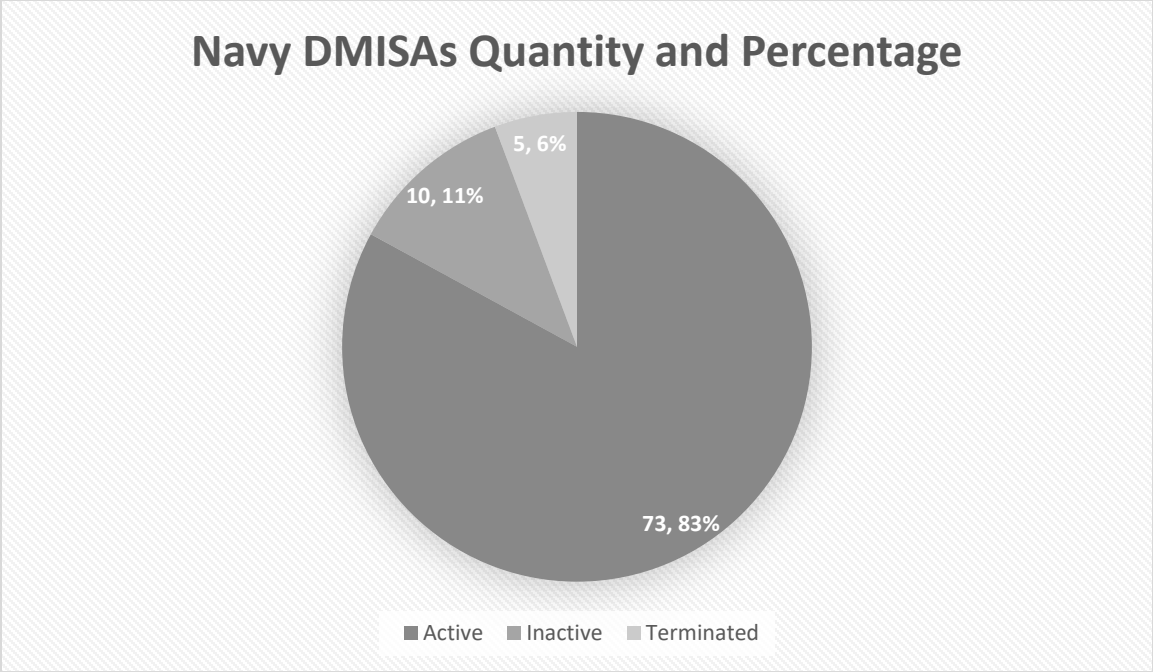

Figure 19. Navy DMISAs quantity and percentage.

Work assignments for Navy DMISAs can be divided into three categories: work going "OUT" of the Navy (e.g., Navy to Army), "INTRA" work (e.g., Navy to Navy), or work coming "IN" to the Navy (e.g., Army to Navy). Figure 20 shows the quantity and percentage for the active Navy DMISAs work assignments as of July 2020. There are 30 work assignments going out, seven intra work assignments, and 36 work assignments going into the Navy.

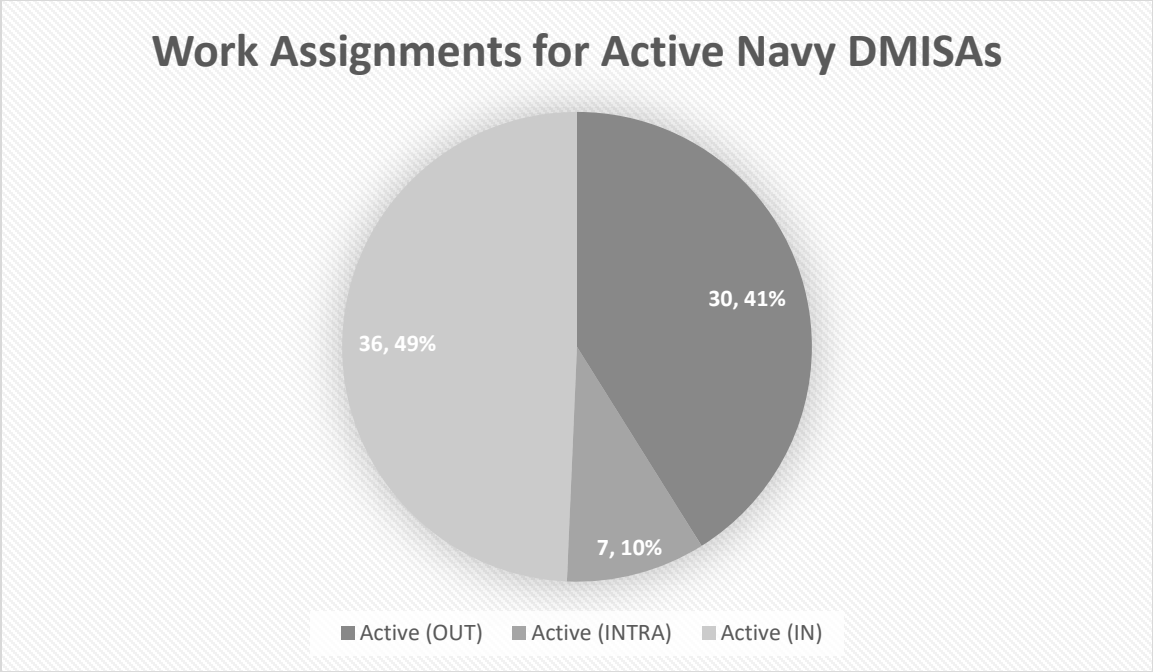

Figure 20. Work assignments for active Navy DMISAs.

In this thesis only work assignments categorized as out or intra were considered for evaluation. Work assignments going out and intra represents a total of 37 DMISAs (or 51 percent work assignments for active Navy DMISAs) as of July 2020. Table 2 shows the total number of DMISAs acquired for evaluation and total number of work assignments going out and intra for the different Navy SYSCOMs.

Table 2. Navy SYSCOM DMISAs (out and intra).

Navy SYSCOMs	Acquired for Evaluation	Total Number in the Navy (Out and Intra)
NAVAIR	6	7
NAVSUP	6	26
NAVSEA	2	2
NAVFAC	1	1

Navy SYSCOMs	Acquired for Evaluation	Total Number in the Navy (Out and Intra)
MARCORLOGCOM	0	1
Total DMISAs	15	37

1. DMISA Title and Administration Evaluation

The 15 acquired DMISAs were evaluated against the DMISA standard format according to the DMISA desktop reference (MISMO 2013). Special emphasis was given to the DMISA technical data and quality control. Table 3 shows the evaluation of the title and administration requirements. The criteria used for the evaluation of each requirement according to the desktop reference was included, incomplete, and not included. Two DMISAs (number 5 and 14) did not include specific required sections. Three DMISAs (number 10, 11, and 12) had an incomplete table of contents. Table 3 also describes other sections included but are not required according to the DMISA desktop reference. Six DMISAs (number 1, 2, 3, 4, 6, and 7) included a glossary of terms and a definition of terms sections, all others DMISAs did not include any additional material in the tittle and administration section. Of the DMISAs evaluated all had the required title and administration format expected per the DMISA desktop reference guidance.

Table 3. DMISA title and administration evaluation.

DMISA	Tittle page	Table of content	Deviation page	Periodic review; if applicable	Change page	Distribution list	Added sections but not required per the DMISA desktop reference
1	●	●	●	●	●	●	Glossary of terms, definition of terms
2	●	●	●	●	●	●	Glossary of terms, definition of terms
3	●	●	●	●	●	●	Glossary of terms, definition of terms
4	●	●	●	●	●	●	Glossary of terms, definition of terms
5	●	-	●	●	●	●	Not applicable

DMISA	Tittle page	Table of content	Deviation page	Periodic review; if applicable	Change page	Distribution list	Added sections but not required per the DMISA desktop reference
6	●	●	●	●	●	●	Glossary of terms, definition of terms
7	●	●	●	●	●	●	Glossary of terms, definition of terms
8	●	●	●	●	●	●	Not applicable
9	●	●	●	●	●	●	Not applicable
10	●	○	●	●	●	●	Not applicable
11	●	○	●	●	●	●	Not applicable
12	●	○	●	●	●	●	Not applicable
13	●	●	●	●	●	●	Not applicable
14	●	●	-	●	-	-	Not applicable
15	●	●	●	●	●	●	Not applicable
Legend ● – included ○ – incomplete (missing page numbers) - – not included							

2. DMISA Section I and II Evaluation

Table 4 shows the evaluation of section I paragraph d, paragraph e, and section II paragraph 10 with the number of applicable exhibits out of 26 options. Note that not all paragraphs of section I and II were evaluated against the DMISA desktop reference. As previously discussed, special emphasis was given to the sections related to technical data (section I paragraph d) and quality control (section I paragraph e). Seven DMISAs (number 1, 5, 6, 8, 9, 11, and 15) included the specified paragraphs per the desktop reference boilerplate format language but they were marked as not applicable per the DMISA desktop reference guidance instructions. Of the DMISAs evaluated all 15 agreements had the required section I and section II format expected per the DMISA desktop reference guidance.

Table 4. Applicable section I and II DMISA evaluation.

DMISA	I.10.d.	I.10.d.(1)	I.10.d.(2)	I.10.d.(3)	I.10.d.(4)	I.10.e.(1)	I.10.e.(2)	I.10.e.(3)	II.10.	Number of applicable exhibits out of 26 options
1	●	●	●	○	●	●	●	●	●	13
2	●	●	●	●	●	●	●	●	●	14
3	●	●	●	●	●	●	●	●	●	17
4	●	●	●	●	●	●	●	●	●	12
5	●	●	●	○	●	●	●	●	●	19
6	●	●	●	○	●	●	●	●	●	14
7	●	●	●	●	●	●	●	●	●	11
8	●	●	○	●	○	●	●	○	●	8
9	●	●	○	●	○	●	●	○	●	18
10	●	●	●	●	●	●	●	●	●	12
11	●	●	●	○	●	●	●	●	●	13
12	●	●	●	●	●	●	●	●	●	14
13	●	●	●	●	●	●	●	●	●	10
14	●	●	●	●	●	●	●	●	●	5
15	●	●	●	●	●	●	○	●	●	10

Legend
● – paragraph included and applicable
○ – paragraph included but marked not applicable
I.10.d. Work specifications
I.10.d.(1) Statement of work
I.10.d.(2) Technical data
I.10.d.(3) Bill of material/material requirement list
I.10.d.(4) Configuration management
I.10.e. Quality assurance paragraph (1), (2), and (3)
II.10. Use of Exhibits

Table 5 shows the technical data (section I paragraph 10.d.(4)) and quality assurance (section I paragraph 10.e.(1), (2), and (3)) deviations from the standard DMISA format. Four DMISAs (number 1, 2, 8, and 9) do not have any changes to the standard DMISA format. All other DMISAs have some type of deviation explained in Table 5 or in the numbered notes (1 through 9) after the table. Specifically, for technical data only 10 out of 15 DMISAs and for quality assurance only 4 out of 15 DMISAs followed the prescribed standard DMISA suggested boilerplate recommended language.

Table 5. Technical data and quality assurance deviations from standard DMISA format.

DMISA	I.10.d.(2)	I.10.e.(1)	I.10.e.(2)	I.10.e.(3)	Deviations from standard format
1	●	●	●	●	No
2	●	●	●	●	No
3	●	●-	●-	●	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "ISO 9001:2015 or ASQC 9001:2015"
4	●	●-	●-	●	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "ISO 9001:2008/AS9100 Rev C"
5	●	●-	●-	●	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "ISO 9001:2015 or AS9110C"
6	●	●-	●-	●	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "Aerospace Standard (AS) 9100/9110"
7	●	●-	●-	●	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "Aerospace Standard (AS) 9100/9110:2015"
8	○	●	●	○	No
9	○	●	●	○	No
10 Note:	●-1	●-2	●-3	●-4	Yes, added a sentence in I.10.d.(2) see Note 1. Replaced "ISO 9002/3 or ASQC 9002/3" with Note 2 and Note 3. Added extra paragraphs under I.10.e. (4-12) see Note 4.
11 Note:	●-5	●-	●-	●	Yes, I.10.d.(4) see Note 5. Replaced "ISO 9002/3 or ASQC 9002/3" with "ISO 9001:2015 or AS9110C".
12 Note:	●	●-	●-	●-6	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "AS9100-9110." Added extra paragraphs under I.10.e. (4-5) see Note 6.
13 Note:	●-7	●-8	●-8	●-9	Yes, added a sentence in I.10.d.(4) see Note 7. Replaced "ISO 9002/3 or ASQC 9002/3" with Note 8. Added extra paragraphs under I.10.e. (4-7) see Note 9.
14 Note:	●	●-10	●-10	●-10	Yes, paragraph deviation from standard format and added extra paragraphs under I.10.e. (4-5) see Note 10.
15	●	●-	○-	●	Yes, replaced "ISO 9002/3 or ASQC 9002/3" with "ISO 9110"

Legend
● – paragraph included and applicable
○ – paragraph included but marked not applicable
- – paragraph deviation from standard format
I.10.d.(2) Technical data
I.10.e. Quality assurance paragraph (1), (2), and (3)

Note 1: “The principal shall ensure that any technical data format, viewer version, or software changes are approved through the Air Force Network Integration center 60 days prior to release/implementation and loaded to appropriate devices” (DMISA number 10).

Note 2: “ISO 9001:2015 or AS9100D/9110C” (DMISA number 10).

Note 3: “ISO 9001:2015 or American National Standards Institute (ANSI)/ASQC Q9001:2015” (DMISA number 10).

Note 4: The following block quote includes the deviations from the standard DMISA format for section I paragraph 10.e.(4-12) of DMISA number 10.

> 4) The Principal will designate a qualified person to support quality engineering for Navy Aircraft. This support will be referred to herein as the Quality Support Engineer (QSE). The functions performed will be continuous surveillance of the rework process to ensure conformance with the Navy’s Quality Management System (QMS). Four key areas of involvement will include: Work Control Document (WCD) integrity, proper technician certification and qualifications, technical data accuracy, and correct application of support equipment and tooling.
>
> 5) The Agent will include the QSE on its yearly AS9100D/9110C review with its certifying body.
>
> a. The Agent will notify the QSE 30 days prior to the certifying body’s assessment to allow for travel planning.
>
> 6) The Agent will provide the QSE the following information relative to all Navy and USMC workload (source data will be provided if requested):
>
> a. Organic/Internal reject/rework information, to include:
>
> i. incident reports for quality issues (on occurrence for critical and majors and monthly for minors)
>
> ii. internal non-conformance reports
>
> b. Status of all ongoing Root Cause/Corrective Action initiatives and the option to participate in formal events dealing with quality issues or process improvements that will affect Navy and Marine Corps workload.
>
> c. Cost of Poor Quality (COPQ) for aircraft in flow, monthly and total upon PMI completion.

7) The Agent will also provide the QSE access to the following USAF information upon request:

a. Technician training records

b. WCD's

c. Air Force technical data

d. Delivered quality: Product Quality Deficiency Report (PQDR), Acceptance Inspection Deficiency Report (AIDR) via Joint Deficiency Reporting System (JDRS)

e. Results of 2nd and 3rd party AS9100D/9110C audits via Online Aerospace Supplier Information System (OASIS)

f. Data from Programmed Depot Maintenance Scheduling System (PDMSS)e.g., IMPRESSA

8) The Agent will use the Principal's Product Quality Deficiency Report (PQDR), AIDR, and Engineering Investigation (EI) process. The Agent will coordinate all PQDR's, AIDR's, and EI's with the QSE.

9) The Agent will submit, review and track Supply Deficiency Reports (SDR's) for problems with items being sent and received and notify the QSE and Fleet Liaison.

10) The Agent and the QSE will establish the following communication process for reporting incoming defects, major rework, process execution concerns and quality escapes to PMA. Prompt advisement of such issues is critical to PMA to assure stakeholder awareness and action when required. The communication plan is to provide the timely and accurate dissemination of information related to critical or major incidents that occur at the Agent's facility which affect Navy and USMC assets. Critical, major, and minor categories are defined in Exhibit VII C, paragraph 4.

a. Communication procedures:

i. Upon the discovery of any critical or major incident, the Agent will notify the QSE within two business days with the facts known at the time. The QSE will follow up for root cause analysis with the Agent.

ii. Minor incidents need not be reported unless there is, in the judgment of the QSE, a possible quality trend that could lead to Critical or Major Impact.

11) The Agent will provide major procedural changes to documentation, which affects Navy workload to the cognizant engineering group (i.e.,

Structures, Subsystems, Avionics, Support Equipment, etc.) while notifying the QSE. Desired changes to Navy publications will be routed through the TPDR process.

12) The QSE will:

a. Travel to the Agent and be onsite a minimum of 1 week (Monday-Friday) every four to six weeks or more frequently as dictated by events.

b. Interface directly with the Agent's Quality Assurance department to identify, correct, and/or mitigate any quality issue that may arise during the rework process.

c. Work directly with the Agent's production functions to address any nonconformance or defects to product processes.

d. Establish feedback loop with the Agent, PMA, and FST to elevate quality risks and identify mitigation as required.

e. Maintain awareness of continuous process improvement (CPI) initiatives executed by the Agent to increase quality across the program.

f. As required, participate in Pre-Production Planning Teams or Production Planning Teams (PPPTs or PPTs) dealing with major changes to Navy and USMC Work Control Documents.

g. Notify the Agent of any non-conformances as needed. All non-conformances submitted to the Agent will be answered within five business days.

h. Participate in reviewing and updating this DMISA annually or as required. (DMISA number 10)

Note 5: The following block quote includes the deviations from the standard DMISA format for section I paragraph 10.d.(2) of DMISA number 11.

2) Technical Data.

a) Paper: The initial supply of the Principal's engineering directives, forms, and/or publications will be listed in Exhibit VII-A Para 1.3 and will be furnished by the Principal prior to the beginning of work. Subsequent requirements will be obtained by the Agent by submitting requisitions to the appropriate source in accordance with AR 25-36, Air Force Joint Instruction (AFJI) 21- 301, OPNAVINST 5600.22, and MCO 5215.16A. Additionally, Agent required CFM international (CFMI) Technical Data Changes/Updates will be forwarded by CFMI to the following Agent's

Office for distribution; Technical Order distribution Office, attention (ATTN): address. Inter-servicing of Technical Manuals and Related Technology. Direct liaison is authorized for the exchange of information relative to alterations and engineering change proposals as they occur; however, exchange of all approved engineering modifications and product improvement information between the Agent and Principal is the responsibility of the coordination representatives, as specified in section I, paragraphs 6a and b process.

b) Electronic: Name is responsible for the below

(1) CFM sends compact disk (CD) to Tech Order Distribution.

(2) Technical Data Compact Disc (TDCD) and correctly completed Load Request sheet is delivered to the Customer Relations Manager (CRM) from requestor. If incomplete, it is returned to requestor.

(3) CRM assigns Tech Data Number (TD#) to the request.

(4) CRM hand delivers TD Package to Configuration Manager (CM).

(5) CM coordinates with Navy Equipment Specialist, System Administrators and Database Administrators as needed to load tech data to test environment.

(6) Navy Equipment Specialist is notified that it is ready to test.

(7) When testing is complete, Navy Equipment Specialist notifies CRM it is ready to move to production and provides date/time to move.

(8) CM team coordinates the Application POC's, SA's, and DBA's as appropriate to move data to production on cut over date/time.

(9) CM sends e-mail notification to Navy Equipment Specialist and TDCD CRM.

(10) Navy Equipment Specialist revalidates data on known valid operation computer.

(11) Navy Equipment Specialist signs off on release.

(12) CM returns TDCD package to CRM.

(13) CRM returns TDCD package to Technical Order Distribution to confirm completion and updates spreadsheet.

(14) To gain access to the electronic publications, AF Form 2875 is to be submitted to Name.

c) Electronic Technical Data Issues

(1) Contact Name (phone or email) when an initial issue(s) is identified.

(2) If the issue is not resolved within 5 working days, contact Name (phone or email).

(3) If the issue is not resolved within 10 working days, contact Name (phone or email). (DMISA number 11)

Note 6: The following block quote includes the deviations from the standard DMISA format for section I paragraph 10.e.(4-5) of DMISA number 12.

4) Warranty Program. All items repaired, overhauled, or fabricated by the Agent's Repair Activity are warrantied. Items lose warranty coverage when there is evidence of unauthorized customer repair or tampering, obvious physical damage or misuse which could cause a defect. The warranty coverage will continue until the first successful completion of either the test set or the missile-on-aircraft test. Reoccurring defects and those discovered after prolonged inactive storage will be investigated for systemic depot process deficiencies and warranty eligibility. The only other exception to the coverage would be when a customer waives a requirement in a SOW, MOA or other document which effects the claim. Warranty eligibility is determined using the technical reference order or drawing package as the specification. Exhibits which must be returned to Agent's Repair Activity to be investigated and/or repaired will be shipped with copies of the ELTY Form 2600, Aug 2013 Standard Form 368, and/or other applicable documents attached, to Agent's Repair Activity at the following address: X ATTN: X. Field users will mark the outside of the shipping container with PQDR/Warranty Exhibit. The 14-digit document number is required for pick-up to record of Exhibits and for shipment back to the customer. This document number must be annotated on the documentation included with the shipment.

5) For the missile programs the Quality Assurance Specialist Ammunition Surveillance (QASAS) is: Name, DSN: X, Comm: X, e-mail: X. (DMISA number 12)

Note 7: The following block quote represents the added sentence in I.10.d.(4) for DMISA number 13:

Technical Order deficiencies will be reported utilizing Air Force technical order (AFTO) Form 22 IAW TO 00–5-7 for USAF assets, and by direction

of U.S. Navy assets. This form is located on the Web at http://www.epublishing.af.mil upon completion, forward the AFTO form 22 to: X Attn: Name DSN: X Comm: X Email: X. (DMISA number 13)

Note 8: Replaced "ISO 9002/3 or ASQC 9002/3" with "AS9100-9110, ISO9001-2008 or ANSI/ASQC Q9001:2008" (DMISA umber 13).

Note 9: The following block quote includes section I added paragraphs 10.e.(4-7) for DMISA number 13.

4) For the missile programs the Quality Assurance Specialist Ammunition Surveillance (QASAS) is: Name, DSN: X, Comm: X, e-mail.

5) Suspected assets will be processed, handled, stored, documented, and shipped in accordance with Defense Logistics Agency directive (DLAD) 4155.24/AR 702-7/ SECNAVINST4855.5B/Air Force Instruction (AFI) 21–115, Product Quality Deficiency Report Program. Upon receipt of the shipping instructions from the Principal, the PQDR or Supply Deficiency Report (SDR) candidate shall be shipped to: X Attn: X. The Principal will ensure the shipping containers are clearly marked for PQDR or SDR. The Principal will follow on with a phone call to the Agent's Repair Activity Quality Assurance (QA) Control Officer at DSN X or Commercial X. The agent will process the PQDR or SDR request and ensure the exhibits are properly received, stored, and accounted for per the applicable regulatory guidance.

6) Warranty Program. All items repaired, overhauled, or fabricated by Agent's Repair Activity are warranted under normal and reasonable circumstances. Items lose warranty coverage when there is evidence of unauthorized customer repair or tampering, obvious physical damage, or misuse, which could cause the defect. The warranty coverage will continue until the first successful completion of either an intermediate level field tester, such as the Guided Missile Test Set (GMTS) or the Missile on Aircraft Test (MOAT). Reoccurring defects and those discovered after prolonged inactive storage, will be investigated for systemic depot process deficiencies and warranty eligibility. The only other exception to the coverage would be when a customer waives a requirement in a SOW, MOA, or other document which affects the claim. Warranty eligibility is determined using the Technical Reference Order or drawing package as the specification.

7) If an item delivered by the Agent fails testing at the field level or at the all-up-round depot, the field unit or the all-up-round depot will submit a PQDR in accordance with OPNAV M-8000.16 Volume 1, Chapter 4.6, paragraph 4.6.2.1 to PMA and Lead Equipment Specialist for the Air Force,

> by phone and/or e-mail for Navy, that a PQDR has been submitted. Assets will be tracked using serial numbers. Upon receipt of the asset, the Agent will reevaluate the asset in accordance with the information provided in the PQDR. If the failure is associated with workmanship, the agent will correct the problem and will fund the repair, to include the cost of shipment to and from the Agent's Facility. If there is no failure indicated, based off the test analysis and data, the Principal will fund any further investigation to determine the root cause of the problem. Reference document X. (DMISA number 13)

Note 10: The following block quote includes section I paragraph deviation from standard format and the added paragraphs 10.e.(4-7) for DMISA number 14.

> 10.e (1) For work accomplished in a government-owned and government-operated facility, the Agent will be responsible for maintaining an adequate quality assurance program. The Agent's established methods and procedures, (for example ASQC 9001:2015), or those specified in Exhibit VII-C will be used.
>
> 10.e (2) For work accomplished under contract, the Agent will ensure the contractor maintains a quality assurance system. in accordance with the quality provisions (for example ASQC 9001:2015) and delivers material of acceptable quality in accordance with the terms of the applicable contracts and specifications. The Principal will deal with the Agent in all quality and contract management matters.
>
> 10.e (3) For organic or contractual work, the Agent or the Principal may require negotiated special examinations of the quality system by a team of quality assurance personnel, see Exhibit VII-C.
>
> 10.e (4) The Agent will use the Principal's Product Quality Deficiency Report (PQDR)/Engineering Investigation (EI) process.
>
> 10.e (5) The Agent will submit/review/track Supply Deficiency Reports (SDR's) for problems with items being sent/received either damaged, misidentified, or incomplete (to include missing reusable container non-compliant, or missing documentation – traceable back to source). (DMISA number 14)

3. DMISA Exhibit Evaluation

Table 6 shows the list of applicable exhibits related to technical data and quality control and include other applicable exhibits according to each active DMISA. All the DMISAs include exhibit VII-A, statement of work, but all others differ in what is

applicable or not depending on the needs and negotiations between the principal and agent. The six exhibits (VI, VII-A, VII-B, VII-C, VIII, and IX) play an integral role in assuring technical data and quality control is consistent. Special consideration should be given to the applicability to the exhibits. Exhibits play an integral role making sure that the appropriate changes, expectations, and needs are kept up to date over time. As a reminder, DMISAs remain active over long periods of time and the exhibits provide the most efficient way to maintain the requirements updated on an annual basis.

Table 6. List of applicable exhibits related to technical data and quality control according to each active DMISA.

DMISA	VI	VII-A	VII-B	VII-C	VIII	IX	Other applicable exhibits; not directly related to technical data or quality
1	○	●	●	●	○	●	II, III-B, V, X-A, X-B, XIII-I, XIII-II, XIV, and XVII
2	●	●	●	●	○	○	II, III-B, V, X-A, X-B, XII, XIII-I, XIII-II, XIV, and XVI
3	○	●	●	●	○	●	I, II, III-A, III-B, V, X-A, X-B, XII, XIII-III, XIV, XV-C, XVI, and XVII
4	○	●	●	●	○	●	II, III-B, X-A, X-B, XIII-I, XIII-II, XIII-III, and XIV
5	●	●	●	●	●	●	I, II, III-A, III-B, IV, V, X, XII, XIII-III, XIV, XV-B, XV-C, and XVII
6	○	●	●	●	○	●	II, III-B, V, X-A, X-B, XII, XIII-I, XIII-II, XIV, and XVII
7	○	●	●	○	○	○	II, III-B, V, X-A, X-B, XIII-I, XIII-II, XIV, and XVII
8	○	●	○	●	○	●	I, III-A, V, X-A, and XII
9	●	●	○	●	○	●	I, II, III-A, III-B, V, X-A, XII, XVI, XV-A, XV-B, XV-C, XV-D, XV-E, and XVI
10	●	●	○	●	○	○	I, III-A, IV, V, X, XI, XIV, XVI, and XVII
11	●	●	○	●	○	●	I, III-A, IV, V, X, XI, XV-A, XVI, and XVII
12	○	●	○	●	○	●	I, III-A, IV, V, X, XI, XII, XIII-I, XIII-II, XIII-III, and XVII
13	○	●	○	●	○	○	I, III-A, IV, V, X, XI, XIV, and XVII
14	○	●	○	○	○	○	I, III-A, X-A, and X-B
15	●	●	○	●	○	○	I, III-A, IV, V, X, XI, and XVI

DMISA	VI	VII-A	VII-B	VII-C	VIII	IX	Other applicable exhibits; not directly related to technical data or quality
Legend ● – applicable ○ – not applicable VI Bill of material/material requirement list VII-A Statement of work VII-B Technical data list and line-item cross reference VII-C Quality assurance requirements VIII Product oriented survey parameters IX Joint operating procedure for configuration management							

4. Evaluation Summary

The Navy MISMO maintains a master DMISA matrix list to track active, inactive, and terminated DMISAs. Work assignments for Navy DMISAs can be divided into three categories: work going "OUT" of the Navy (e.g., Navy to Army), "INTRA" work (e.g., Navy to Navy), or work coming "IN" to the Navy (e.g., Army to Navy). A total of 15 DMISAs of work going "OUT" or "INTRA" were evaluated against the DMISA standard format according to the DMISA desktop reference. The standard DMISA format (tittle and administration, terms of agreement [section I], material support [section II], and exhibits) is used as the boilerplate for the development of all DMISAs across services. The Navy MISMO office provides and updates the standard DMISA format, and the boilerplate recommended language or format rules for each section. Special emphasis was given to the DMISA technical data and quality control related sections within the DMISAs.

In summary, the 15 evaluated DMISAs conformed to the recommended DMISA standard format according to the DMISA desktop reference. Of the DMISAs evaluated all 15 agreements had the required title and administration format expected per the DMISA desktop reference guidance and only three had an incomplete table of contents. Technical data is specifically addressed in section I paragraph d in the standard DMISA desktop reference boilerplate. Only 10 out of 15 DMISAs followed the prescribed technical data standard DMISA format language; all other DMISAs had some type of deviation from the boilerplate recommended language. Quality assurance is specifically addressed in section

I paragraph 10.e in the standard DMISA desktop reference boilerplate. Only 4 out of 15 DMISAs followed the prescribed quality assurance standard DMISA language; all other DMISAs had some type of deviation from the boilerplate recommended language.

For the exhibit evaluation all 15 agreements included exhibit VII-A, statement of work, but all others differ in what is applicable or not depending on the needs and negotiations between the principal and agent. The six exhibits (VI, VII-A, VII-B, VII-C, VIII, and IX) play an integral role in assuring technical data and quality control is consistent. Special consideration should be given to the applicability to the exhibits. Exhibits play an integral role making sure that the appropriate changes, expectations, and needs are kept up to date over time. As a reminder, DMISAs remain active over long periods of time and the exhibits provide the most efficient way to maintain the requirements updated on an annual basis. Changes, additions, and omissions to the DMISA desktop reference or standard DMISA format language were included in the analysis and summarized in Table 3, Table 4, Table 5, and Table 6.

B. SEMI-STRUCTURED INTERVIEWS

In addition to evaluate a sample of Navy DMISAs against the DMISA desktop reference, semi-structure interviews (see Appendix A for questions content and collected feedback for each question per interviewee) were conducted to understand how the process is being applied. During the interviews a prototype tool (see Appendix B for prototype tool Qlik story presentation) for holistic evaluation of DMISAs was presented to the participants to gather feedback. A total of nine interviewees participated in the semi-structure interviews that lasted approximately one hour and 30 minutes and an additional participant (interviewee number 10) opted to share process experience examples for depot-level maintenance. Table 7 list the interviewee identification number, field of expertise, and title.

Table 7. Interviewee identification, field of expertise, and title.

Interviewee	Field of Expertise	Title
1	Joint deficiency reporting system (JDRS) and quality	NAVAIR Discrepancy Reporting Manager
2	Logistics	Air Force Maintenance Interservice Support Officer (MISO)
3	Logistics	Navy Joint Industrial Program Lead for the Navy Maintenance Interservice Management Office (MISMO)
4	Quality, manufacturing, and engineering	NAWCAD Manufacturing and Quality Lead
5	Logistics	NAVAIR Maintenance Interservice Support Officer (MISO)
6	Industrial Engineering	Integrated Quality Team Lead
7	Manufacturing and quality engineering	NAWCAD Product Integrity, Manufacturing and Quality Branch Supervisor
8	Quality, manufacturing, and engineering	Commander, Fleet Readiness Centers (COMFRC) Quality Group Head
9	Systems Engineering	NAWCAD Chief Engineer
10	Logistics	COMFRC Supply Group Policy, Compliance, and Training Department

Interviewee number 10, a logistician from COMFRC Supply Group Policy Compliance, and Training Department, in discussion with the author on April 05, 2021, expressed being away from the DMISA business for many years and opted to share some information of interest from his point of view included in Appendix C (a form with the applicable enclosures used for intragovernmental reimbursable, buy and sell activities) along with some experience examples. In the discussion, it was shared that organic depots use DLA in some way for the parts to do the repairs. Interviewee number 10 points out that, part of the reason to have a DIMSA is to define the financial requirements; Treasury requires inter agency agreements (see Appendix C) so that services can exchange funds and pay for services provided. The interviewee went on to explain to the author that differences in the

way services do depot-level maintenance business are another big part. From the interviewee experience, when doing business with Tobyhanna (Army for component repairs); NAVSUP sends funds and the parts for the repair, instead of Tobyhanna ordering the parts needed for the repair. Another experience from the interviewee was that the Air Force's depot that does C-130 propeller repairs had differences in the work scope between the services (Navy versus Air Force) at one point in time, and a failure to keep the product lines separate for the different services lead to some catastrophic failures; this can be corroborated per the first recommendation under MARFORRES 2018:

> The USN and USAF create one set of standardized joint publications defining all requirements for the propeller blade overhaul process to be executed by every depot: level maintenance facility. This includes the standardization of QC/QA audits and investigations for all processes and procedures dealing with detection and removal of corrosion. (MARFORRES 2018, 63)

1. Data Points Summary

Across all the interviewees, the following DAU training data was collected and summarized in Table 8. The first question asked the interviewees if the LOG 0250 DMISA training was required (RQD) for their position. The second question asked the interviewees if they have taken the LOG 0250 DMISA training. In summary, only two had the training as a requirement for their position and three had completed the training.

Table 8. Interviewees DAU LOG 0250 training data points.

Interviewee	Training LOG 0250 DMISA required for the position	Completed the training LOG 0250 DMISA
1	No	No
2	Yes	Yes
3	No	Yes
4	No	No
5	Yes	Yes
6	No	No
7	No	No
8	No	No
9	No	No
10	Not applicable	Not applicable

2. What Information, Systems, and People are Needed to Evaluate a DMISA?

Five interviewees (interviewees 1, 4, 6, 7, and 8) emphasize minimal to no knowledge related to information, systems, and people needed to evaluate a DMISA. It was implied that some of the interviewees were involved in a reactive approach into the DMISA process. Interviewees 2, 3, 5, and 9 describe their knowledge related to information, systems, and people needed to evaluate a DMISA. The knowledge related to information, systems, and people discussed were in par with the authors literature review and documented process for DMISA evaluation.

3. What Are the Key Characteristics of the DMISA Structure?

Four interviewees (interviewees 1, 4, 7, and 8) emphasize having no knowledge of the key characteristics of the DMISA structure. Interviewees 2, 3, 5, 6, and 9 described the key characteristics of the DMISA structure in in par with the authors literature review and documented process. The most common response for the key characteristics for the DMISA structure was the description of section I, section II, and the exhibits. When asked about knowledge in regards any assessment tools currently available to manage, evaluate, or compare DMISAs all interviews had no knowledge of any existing tool with those purposes. Two interviewees (interviewee 3 and 5) mention a DMISA management application (DMA) prototype developed under a joint DMISA integrated product team in the USAF to address DMISA document control and process execution issues. The USAF developed the DMA to manage the DMISAs process, all supporting documentation, and exhibits. The DMA serves as a DMISA oversight, management, and execution tool and repository. It was shared during the interviews that the Navy requested access and it is in the process of uploading and populate the tool with the DMISAs.

4. What Triggers a DMISA and an Evaluation?

Three interviewees (interviewees 1, 4, and 7) emphasize having no knowledge of what triggers a DMISA and an evaluation. The most common response between all other interviewees was the need for a depot-level repair activity to perform some work between services it is what triggers an evaluation. In summary, interviewees 2, 3, 5, 6, 8, and 9

understood what triggers a DMISA and an evaluation. They agreed at least an annual review needs to take place and the principal, agent, domain experts, or depot could trigger an evaluation at any time.

5. How Is Technical Data Compliance Addressed?

Three interviewees (interviewees 1, 4, and 7) emphasize having no knowledge of how technical data compliance is addressed in a DMISA. The most common response from all other interviewees was that technical data compliance is addressed in a specific section of the DMISA; some were able to recall the specific section and others just generalized but they were in agreement that it was addressed in some form.

6. How Is Quality Control Ensured?

One interviewee (interviewee 1) emphasizes having no knowledge of how quality control is ensured under a DMISA. The most common response from all other interviewees was that quality control is addressed in a specific section of the DMISA and in an exhibit; some were able to recall the section and exhibit number others just generalized. In summary, the response was described as quality control being ensured via the depot local QMS and any added requirements in the DMISA under the quality section or the exhibit.

7. Prototype Feedback

All interviewees had a positive response to the prototype. Feedback included additions or information to be added to the prototype to analyze DMISA and depot-level maintenance more targeted to their subject matter expertise. Some concerns included the management and maintenance responsibility of the tool to maintain it relevant and up to date, others expressed the possibility to make the changes in other tools they had access, to be able to access similar data, but all agreed that currently there in no tool with the presented capability to evaluate depot-level maintenance and DMISAs from a top to bottom level while maintaining traceability and connections of the data. Some expressed the usefulness of pulling the data from different databases into one place and create the connections and filter accordingly without losing the traceability and granularity of the information allowing a deeper understanding and analysis of the information in one place.

8. Interviews Summary

Based on the data points collected and interviewee responses there are a couple correlations that stand out. First, the interviewees can be divided in two sub-groups, domain experts and logisticians. Second, all domain experts (interviewees 1, 4, 6, 7, 8, and 9) have some to little knowledge about DMISAs, DMISA process, or DMI activities, and appear to be involved in a reactive approach in the DMISA process for reviews of their domain expertise. Third, all logisticians (interviewees 2, 3, 5, and 10) have a good understanding and knowledge about DMISAs, DMISA process, or DMI activities. While no PMs were interviewed in this sample size, it can be assumed that PMs have some knowledge of their responsibilities given that the domain experts and logisticians interviewees mentioned their involvement. It can be assumed that there is a training gap between logisticians and the domain expert's knowledge to understand DMISAs, DMISA process, or DMI activities. While domain experts are expected to support DMISAs, DMISA process, or DMI activities their knowledge in regards these three topics is low. Given that systems engineers and domain experts carry the responsibility of maintaining quality, technical data, and airworthiness in the DMISAs it is imperative making sure they understand the role they play in DMI activities and DMISAs. In the logistics side of the house, there is a thorough understanding for DMISAs, DMISA process, or DMI activities but they are the process owners along with the PMs but not the owners nor experts for maintaining quality, technical data, and airworthiness.

C. PROTOTYPE TOOL

The prototype tool was developed using Qlik, a query-based technology, focused on self-service visualization. The tool can visualize the data in a way that allows the user to further analyze it. The purpose of the prototype tool is to apply data analytics to target the inspection, cleaning, transformation, and modeling of the data with the goal of visualizing the data to discover useful information, inform conclusions, and support decision-making. Applying the process of data analytics to the depot-level maintenance and DMISAs creates a unique access to discover trends, make inform decisions, and evaluate the process. In conjunction with JDRS the data can be further analyzed to

understand connections between deficiencies and locations for multiple depot-level maintenance work. Allowing an enterprise view of wholeness and wellness evaluation while having traceability by PEO, PMA, T/M/S, component, and location maintaining the granularity and connections.

The prototype tool basic design has a single application named depot-level maintenance and repair. Inside the application it is divided in three main sections prepare (data manager), analyze (sheet), and narrate (storytelling). Figure 21 shows the Qlik application overview for depot-level maintenance and repair prototype tool. In the top the name of the application is shared along with the three main sections. In the gray area the application information is displayed giving more details of when was the last date it was updated and a short description. Lastly, under my sheets there are nine views (depot-level maintenance, contract, organic, DMISA matrix, active DMISA Navy (principal), DMISA cost comparison, DMI locations, depot specialty, and JDRS deficiency reports). Sheets can be created to target any stakeholder needs and tailored specifically to the data they want to analyze and visualize. Sheets can be created for a PEO, PMA, T/M/S, components, or even targeting a domain expertise e.g., technical data or quality.

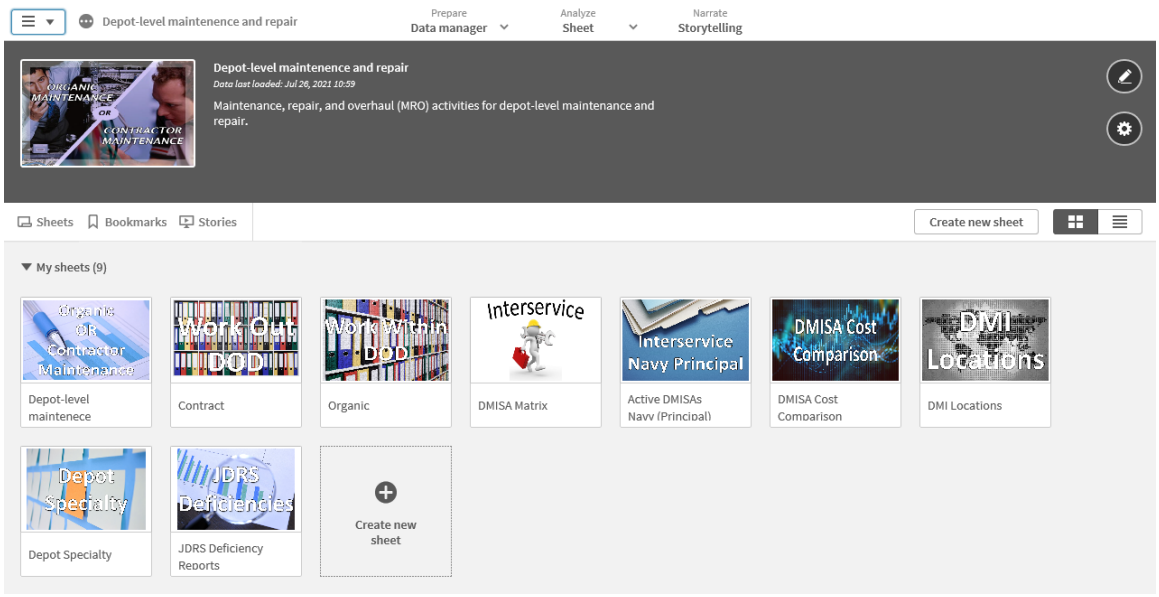

Figure 21. Qlik application overview.

1. Prepare (Data Manager)

The prepare (data manager) section allows to manage and prepare the data for analysis and visualization. Figure 22 shows the data manager with seven tables along with the table's associations (or connections). It is as simple as dropping off an attached file, doing a manual entry, add a file location, or connect to a new data source. Once the information is added or connected to the application then you can concatenate or join different sources (table columns). The association between tables are identified by the smaller dotted circles in Figure 22. Under the prepare section a data model viewer allows to see and verify the associations between tables. Figure 23 shows the Qlik data model viewer with a couple examples of the table associations. To associate the data the columns title needs to be the same along with the row data associated with the columns in each table for an accurate association. Associations allow filtering of multiple sources while keeping that connection between tables and being able to analyze the data from different point of view (e.g., by filtering the DMISA listing 20180423 it can correlate and identify PQDR data related to the specific filter used in the DMISA listing 20180423 table using the shipping TAT).

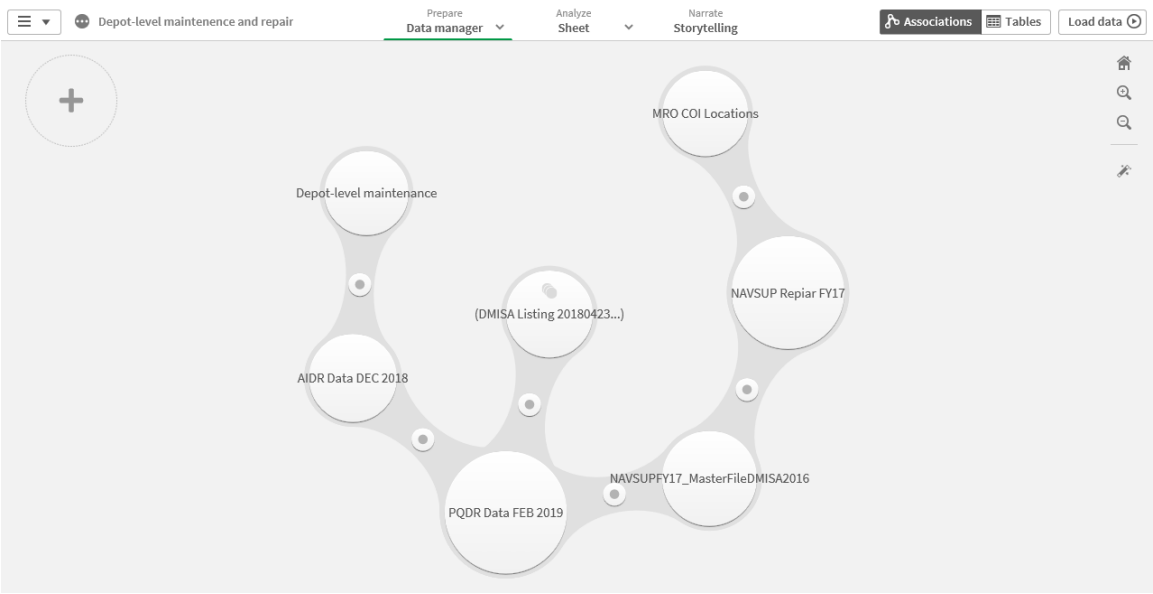

Figure 22. Qlik data manager.

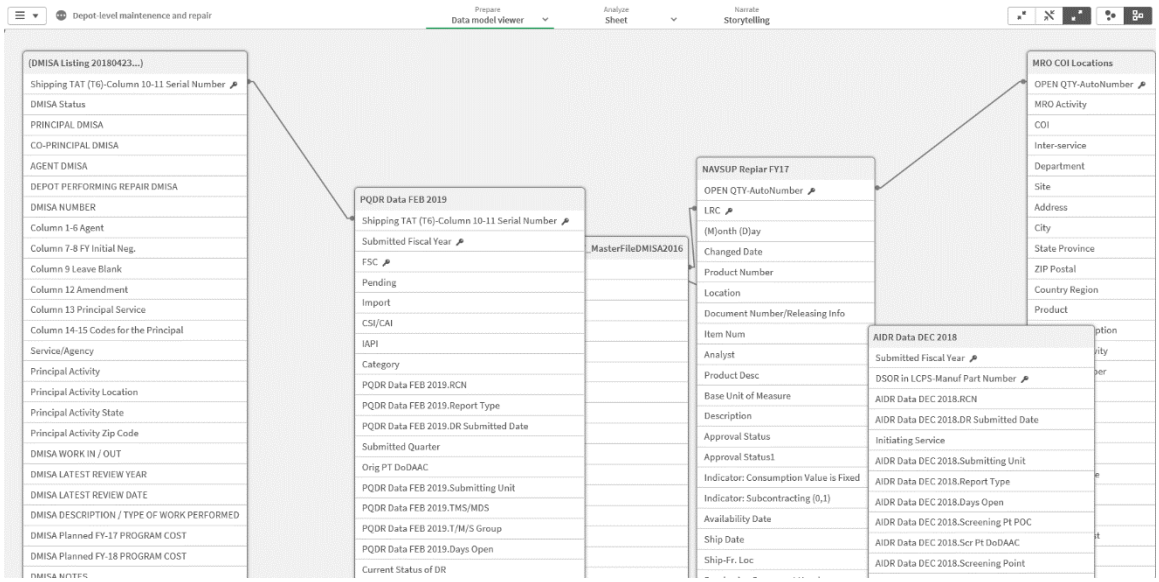

Figure 23. Qlik data model viewer.

2. Analyze (Sheet)

The analyze (sheet) section is where the stakeholders will have access to the data sheet views. The views can be created and tailored for the needs of each stakeholder using the uploaded data manager with associations as the source of the content for the sheets. Figure 24 shows an example view of how the commercial, original equipment manufacturer, interservice (COI) MRO maps data can be used to depict the information. In this instance, the sheet provides access to filter by MRO activity (top left column chart), location (top right map), and commercial or interservice (in the bottom tree map) options. The stakeholder can click at any portion of the data inside the sheet and the tool will filter all the views based on the selections.

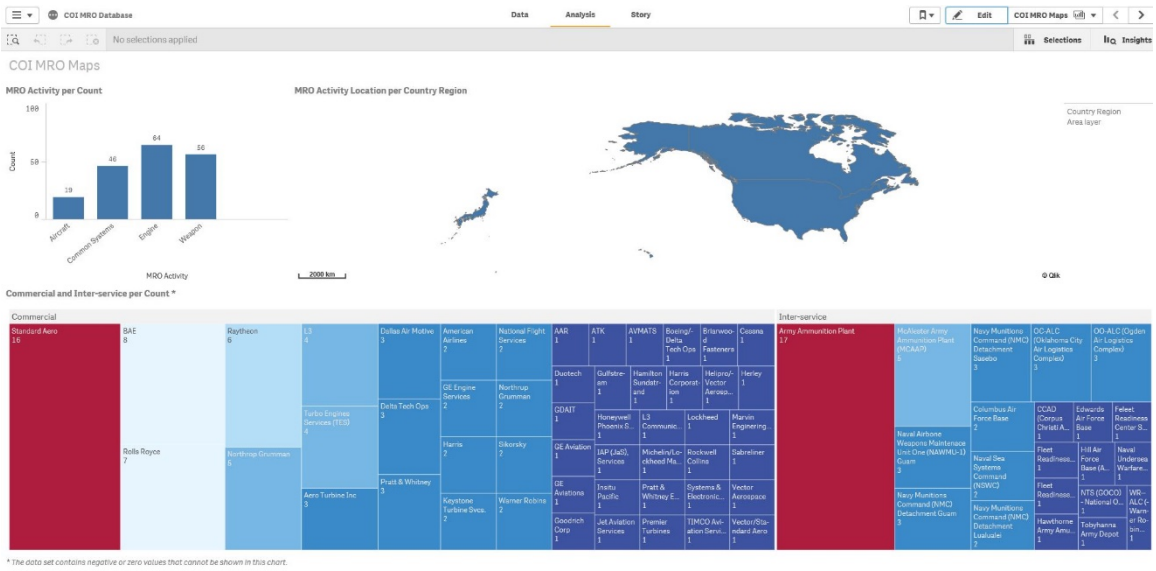

Figure 24. Qlik analysis sheet view for COI MRO maps.

Figure 25 shows another example for the analyze (sheet) view for depot-level maintenance. In this instance it shows the PEO distinct count (top left bar chart), DSOR in LCSP (top middle bar chart), contract type (top right bar chart), and type of organic activity by system (bottom tree map). Figure 26 shows an example filtering the top left bar chart by PEO(T) and the effect the selection has in all other bar charts and the tree map. With that selection applied the LCSP (top middle bar chart), contract type (top right bar chart), and type of organic activity by system (bottom tree map) filter themselves automatically and now show all related selections for PEO(T) only.

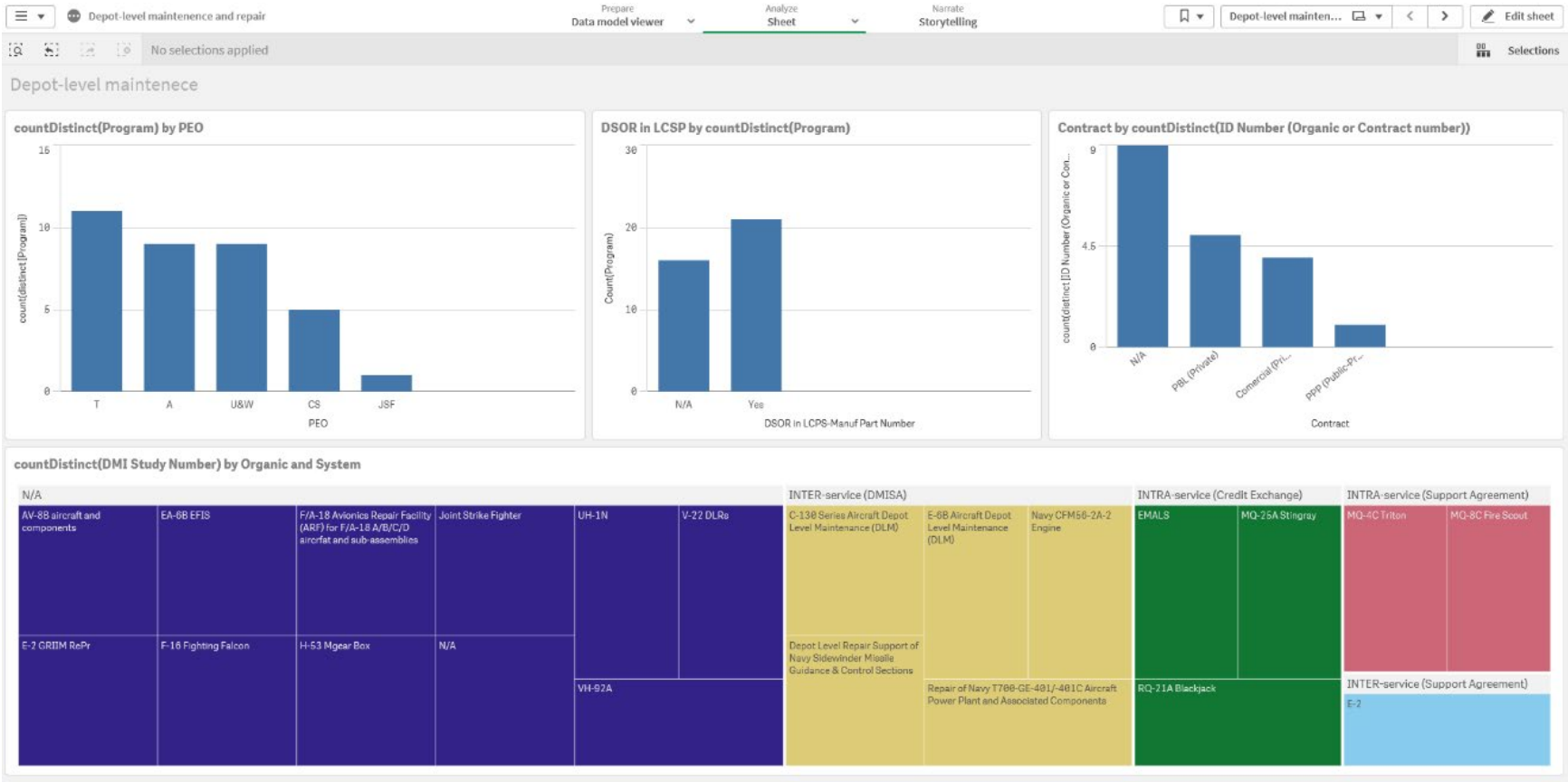

Figure 25. Qlik analysis sheet view for depot-level maintenance.

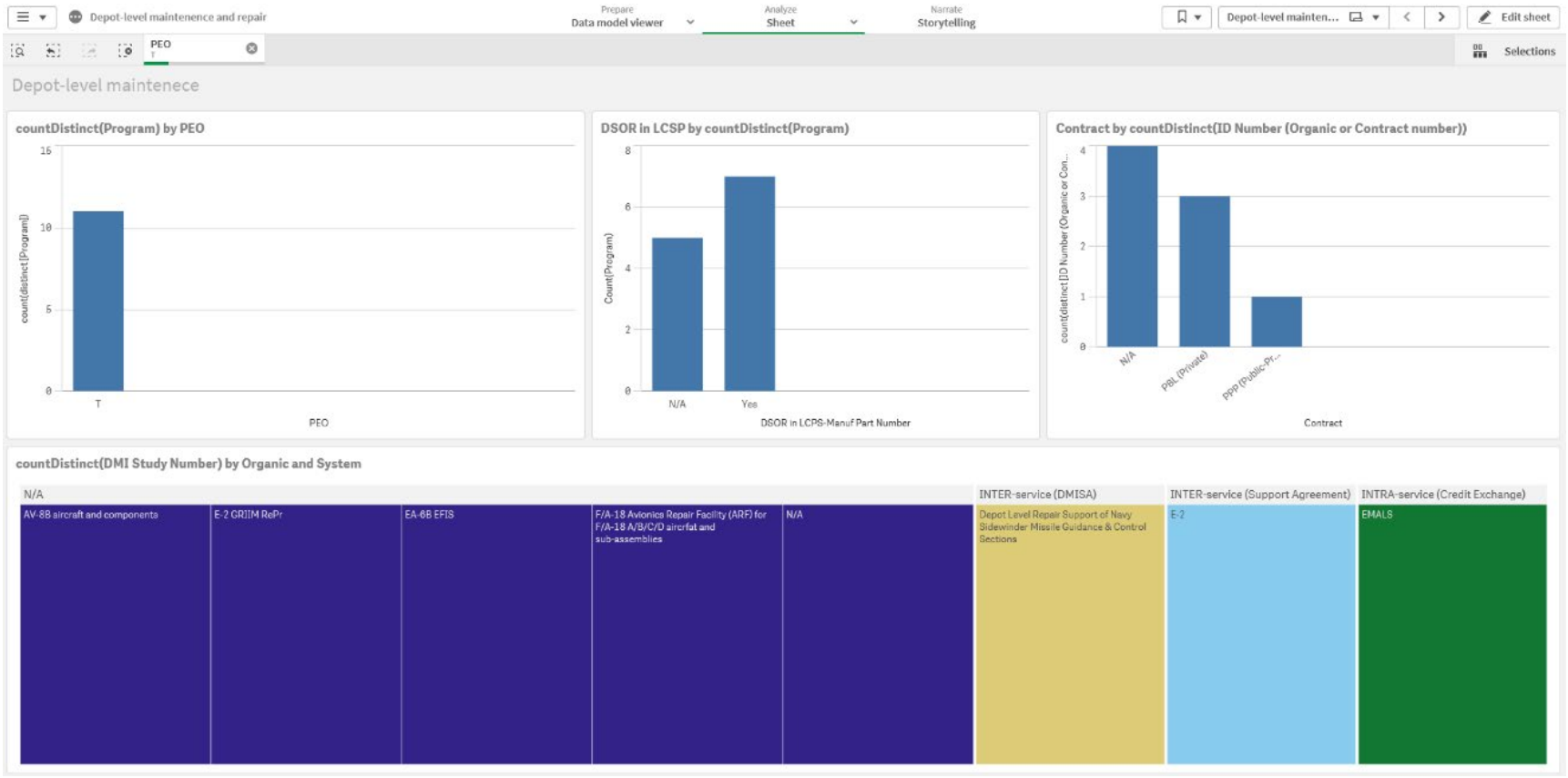

Figure 26. Qlik analysis sheet view for depot-level maintenance with PEO(T) selection.

3. Narrate (Storytelling)

In the narrate (storytelling) section is where the stakeholders will have access to a created story. This section allows the creation of presentation type views targeted to the needs of the stakeholders. Figure 27 shows the "my sheets" menu where an unlimited number of stories can be created (e.g., depot-level maintenance, PEO(T), or DMISA). This allows each stakeholder to have their own set of views to analyze, visualize, evaluate, and filter the data. In addition, the tool allows the story to be exported to PowerPoint or PDF format in case connectivity issues or access to the tool is limited. If presenting directly form the tool using the narrate (storytelling) feature the created slides can have a live data sheet (active sheet). An active sheet allows live filtering while presenting the data. That means that during a presentation if a question is asked e.g., about the detail behind PEO(T) data, the presenter can click on PEO(T) and all other views will filter accordingly. Figure 28 shows the view of a live data sheet (active sheet is depot-level maintenance). Active sheets automatically update if new data is uploaded in the tool.

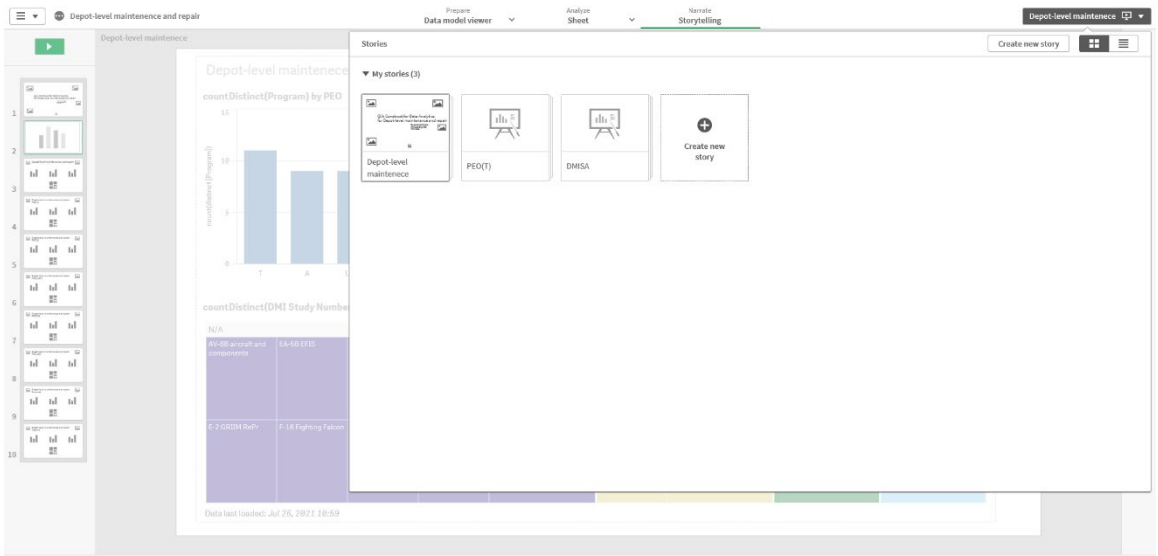

Figure 27. Qlik narrate (storytelling) created stories example.

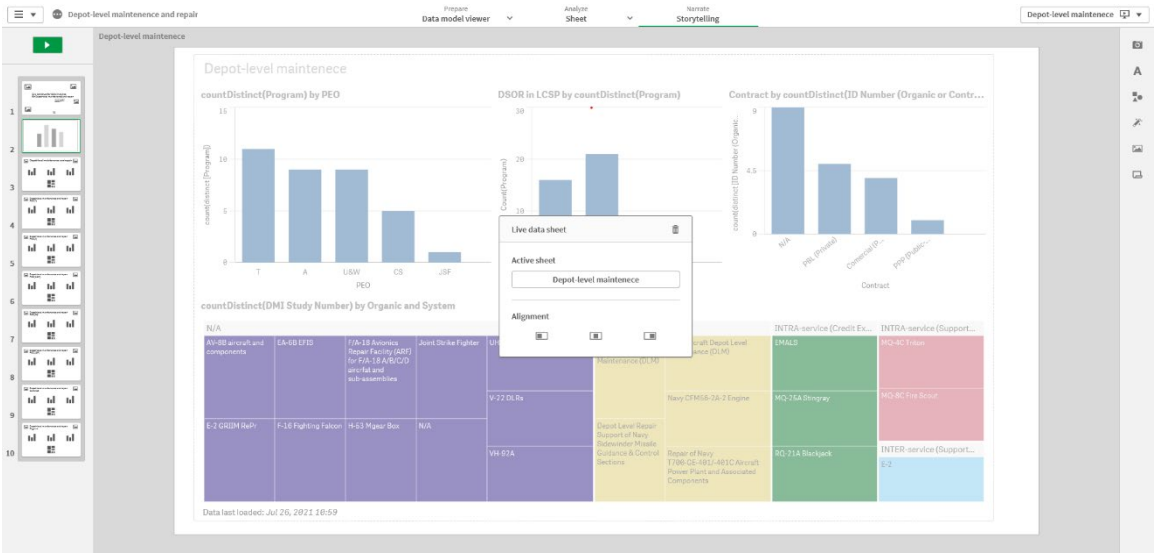

Figure 28. Qlik narrate (storytelling) depot-level maintenance example for live data sheet view.

Lastly, the stakeholders can create a slide deck using snapshots of the analyze (sheet) section to capture a particular view in time of the data. The snapshoots do not update automatically but once the view is created replacing the snapshoots when the data is updated does not take more than three clicks per view. Each view has a replace snapshot, edit, and lock the snapshot options to quickly update the views in the narrate (storytelling) slides section. Figure 29 shows the replace snapshot (camera), edit (pen), and lock the snapshot (lock) options with the replace snapshoot menu open.

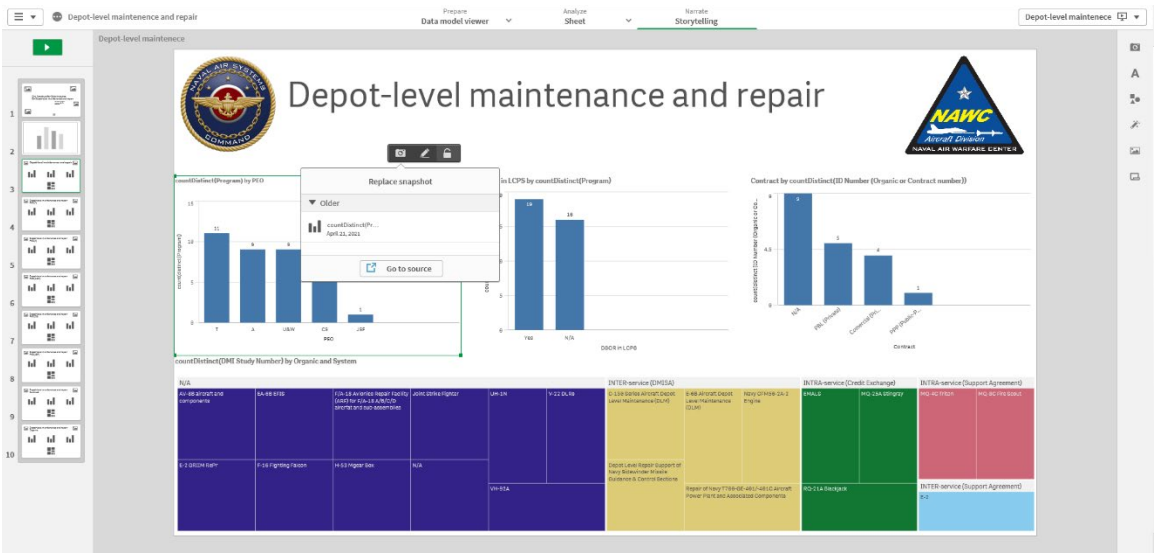

Figure 29. Qlik narrate (storytelling) snapshoot view.

The depot-level maintenance complete story is shared in APPENDIX B. PROTOTYPE TOOL QLIK STORY PRESENTATION. The tool performs as expected; connecting the data and query the information as designed. The tool accommodates changes in views and allows targeting visualizations based on stakeholders needs. Based on interviewee feedback, the tool can offer valuable data to stakeholders to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria for program managers and systems engineers. Overall, interviewees had positive feedback and agreed the tool offers valuable insight, access, and analysis to understand, evaluate, and support decision making related to depot-level maintenance and repair or DMISAs.

D. SUMMARY

The analysis and result chapter covered the DMISA evaluation, semi-structure interviews feedback, and the prototype tool. A total of 15 DMISAs were evaluated against the DMISA standard format according to the DMISA desktop reference (MISMO 2013). Special emphasis was given to the DMISA technical data and quality control under the DMISA section I, II, and exhibit requirements. Figure 30 shows how the DMISA evaluation was divided. Each section was compared against the DMISA standard format

according to the DMISA desktop reference (MISMO 2013). The comparison was summarized in a series of tables (Table 3, Table 4, Table 5, and Table 6) to evaluate each section against the DMISA standard format (boilerplate). Changes, additions, and omissions were discussed for each section.

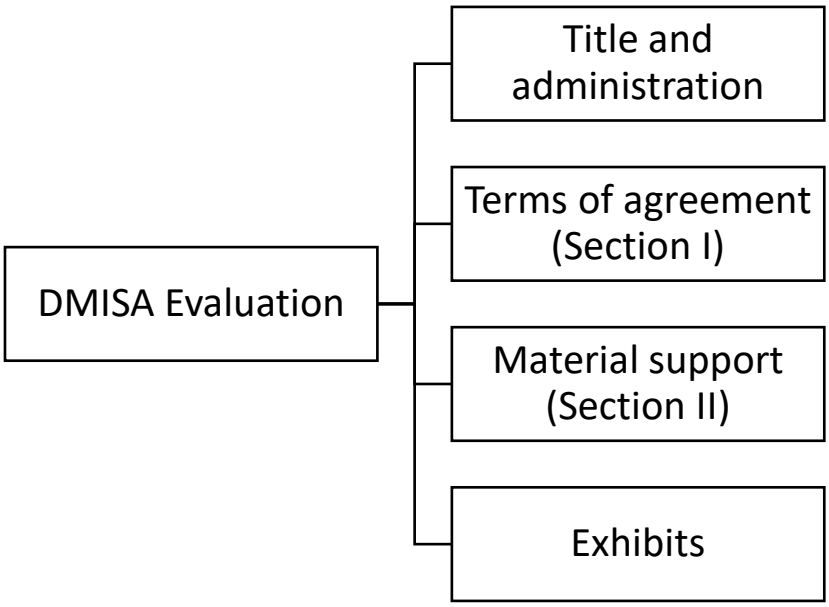

Figure 30. DMISA Evaluation.

The semi-structure interviews (see Appendix A for questions content and interviewee feedback) were conducted to understand how the DMISA process is being applied. During the interviews a prototype tool (see Appendix B for prototype tool Qlik story presentation) for holistic evaluation of DMISAs was presented to the participants to gather feedback. A total of nine interviewees participated in the semi-structure interviews and an additional participant (interviewee number 10) opted to share process experience examples for depot-level maintenance. Appendix C includes a depot-level maintenance agreement between federal program agencies for intergovernmental reimbursable buy and sell activity, a partially filled example with annex A trough E. Interviewees feedback (see Appendix A was divided per question and presented in a tabulated format for comparison.

The interviewees were analyzed based on two sub-groups, as shown in Figure 31, logisticians and domain experts. All logisticians (interviewees 2, 3, 5, and 10) have a good

understanding and knowledge about DMISAs, DMISA process, or DMI activities. All domain experts (interviewees 1, 4, 6, 7, 8, and 9) have some to little knowledge about DMISAs, DMISA process, or DMI activities and appear to be involved in a reactive approach in the DMISA process for reviews of their domain expertise. While domain experts are expected to support DMISAs, DMISA process, or DMI activities their knowledge in regards these three topics is low. Given that systems engineers and domain experts carry the responsibility of maintaining quality, technical data, and airworthiness in the DMISAs it is imperative making sure they understand the role they play in DMI activities and DMISAs.

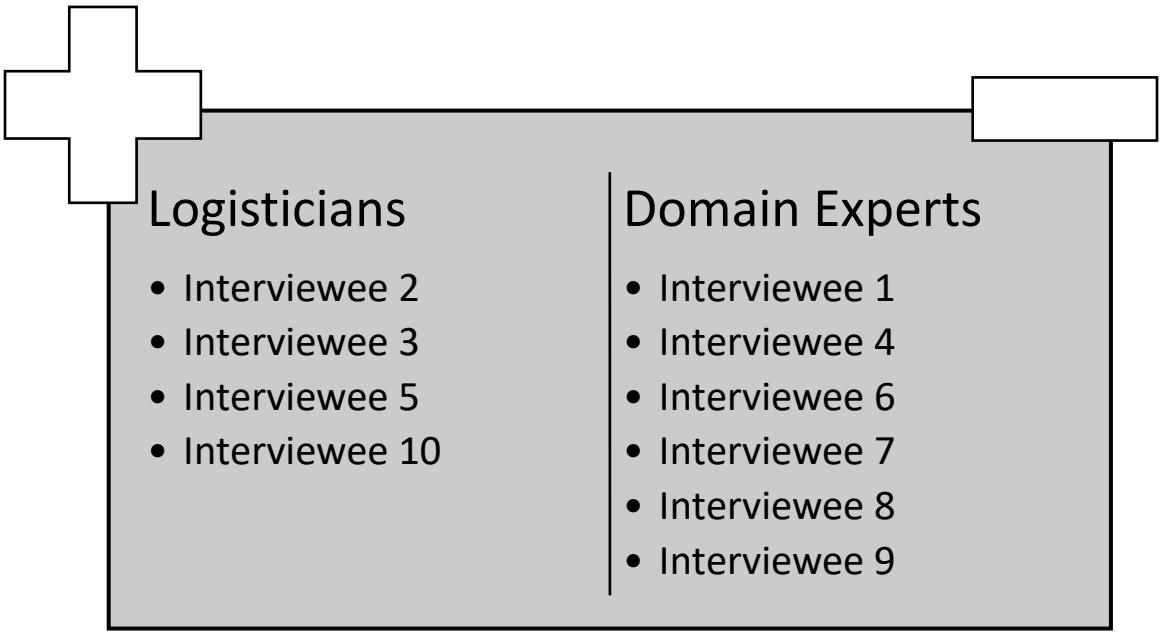

Figure 31. Interviewees divided in two sub-groups.

Lastly, the prototype tool created in Qlik and presented to the participants is discussed in detail. The prototype tool has a single application named depot-level maintenance and repair. Inside the application it is divided in three main sections prepare (data manager), analyze (sheet), and narrate (storytelling). Each section is furthered described with examples of the tool with dummy data.

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V. CONCLUSION AND AREAS OF FURTHER STUDIES

This chapter provides the thesis conclusions, elaborates on areas of further studies, and makes recommendations.

A. CONCLUSIONS

This thesis evaluates the DMISAs technical data compliance, quality control, and a prototype tool to analyze DMISAs at an individual and enterprise level. The study is divided into three parts and provides program managers and systems engineers the information and tools to accurately evaluate DMISAs. First, the thesis includes the evaluation by the author of 15 Navy-owned agreements (Navy as the principal) to analyze cross-program DMISAs. Second, a semi-structured interview where the author collects and documents the information related to the DMISA process from various subject matter experts. Third, the evaluation of a prototype tool created by the author to analyze DMISAs at an individual and enterprise level that documents the most relevant information for analyzing DMI and DMISAs from a technical data compliance and quality control point of view. The study successfully collects DMISA process information, evaluates a sample of DMISAs, and collects the feedback related to the prototype tool to provide a holistic view of DMISA evaluation.

One key objective of the thesis is to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria for program managers and systems engineers. The objective was accomplished by gathering all the DMISA reference material in one place for PMs and systems engineers while creating process views for them to understand their roles and responsibilities. In addition, a prototype tool to aid in the decision-making process was presented to support the DMISA and DMI management and evaluation. This study successfully documents the DMISA process, evaluates a sample of current DMISAs where the Navy is the principal, and creates an evaluation criterion that program managers or system engineers can use to manage and evaluate DMISAs at an individual or enterprise level.

The thesis achieves the goal of developing an evaluation system to identify, document, and manage inter-service depot-level maintenance and repair activities for program managers and systems engineers to allow cross-program and individual DMISA evaluation. The thesis completed the objectives to:

- answer the main and subsidiary research questions
- document the DMISA process
- evaluate 15 Navy DMISAs with the Navy as the principal
- collect (factual) DMISA process information using a semi-structured interview
- create and publish a prototype tool to analyze DMISAs.

1. Research Questions

The research question of: "How shall we evaluate Depot Maintenance Inter-Service Support Agreements (DMISAs) from a Program Manager or Systems Engineer perspective when one military department supports another?" is answered via the literature review (Chapter I). The information is decomposed under three major sections, depot-level maintenance, and repair, JDM program, and DMISA. Depot-level maintenance performs the most complex test, repair, and overhaul tasks on end items, parts, assemblies, and subassemblies that includes complete rebuilding of weapons systems, parts manufacturing, and technical assistance. DMISAs result from a DSOR assignment for one service "to provide depot maintenance support to another service" (MISMO 2013, enclosure 2–2). DMISAs are an "execution tool by which depot maintenance support is provided for weapons systems across DOD" (DAU 2020, lesson 1 DMISA). PMs and systems engineers have specific roles and responsibilities in the DMISA process.

1. How are the program manager or systems engineer involved, and how do they evaluate, and manage DMISAs?

Program managers are involved in the DMISA process since the DSOR assignment. After the DSOR assignment, the PM is responsible of document the DSOR assignment in

the LCSP, finalize requirements, incorporate program and budget planning, and coordinate to establish the maintenance capability. The system engineers are involved during the DMISA through the PM and service MISMO to make sure quality, technical data, and other systems requirements are addressed. The PM and systems engineers evaluate and manage DMISAs through the principal and agent. The JDM program has eight relevant roles related to DMISA management and evaluation. No overall (or holistic) management and evaluation is done across services or programs. Each DMISA is managed under the PM and JDM program following the DMISA desktop reference format (boilerplate) provided by the Navy MISMO office.

2. What is the DMISA process after the depot source of repair (DSOR) assignment?

After the DSOR assignment the PM has the responsibility of kicking off the DMISA negotiations through the JDM program. The eight relevant roles related to DMISA management are identified and a DMISA is implemented after successful principal and agent negotiations. Both (principal and agent) must agree, sign, and have funding for the DMISA to be active.

3. How is the DMISA maintained, managed, and evaluated over time?

Under the JDM program, each DMISA is maintained, managed, and evaluated at least annually. A standard DMISA format (tittle and administration, terms of agreement [section I], material support [section II], and exhibits) is used as the boilerplate for the development of all DMISAs across services. The Navy MISMO office provides and updates the standard DMISA format.

4. How is technical data compliance addressed?

Technical data is specifically addressed in section I paragraph d in the standard DMISA desktop reference boilerplate. Section I paragraph 10.d work specifications from the DMISA desktop reference boilerplate is discussed under Chapter II literature review Section C.5. Only 10 out of 15 DMISAs followed the prescribed technical data standard DMISA format; all other DMISAs had some type of deviation from the boilerplate.

5. How is quality control ensured?

Quality assurance is specifically addressed section I paragraph 10.e in the standard DMISA desktop reference boilerplate. Section I paragraph 10.e quality assurance from the DMISA desktop reference boilerplate is discussed under Chapter II literature review Section C.5. Only 4 out of 15 DMISAs followed the prescribed quality assurance standard DMISA format; all other DMISAs had some type of deviation from the boilerplate.

2. DMISA Evaluation

In summary, the 15 evaluated DMISAs conformed to the recommended DMISA standard format according to the DMISA desktop reference. Of the DMISAs evaluated, all 15 agreements had the required title and administration format expected per the DMISA desktop reference guidance and only three had an incomplete table of contents. Technical data is specifically addressed in section I paragraph d in the standard DMISA desktop reference boilerplate. Only 10 out of 15 DMISAs followed the prescribed technical data standard DMISA format language; all other DMISAs had some type of deviation from the boilerplate recommended language. Quality assurance is specifically addressed in section I paragraph 10.e in the standard DMISA desktop reference boilerplate. Only 4 out of 15 DMISAs followed the prescribed quality assurance standard DMISA language; all other DMISAs had some type of deviation from the boilerplate recommended language.

For the exhibit evaluation, all 15 agreements included exhibit VII-A, statement of work, but all others differ in what is applicable or not depending on the needs and negotiations between the principal and agent. The six exhibits (VI, VII-A, VII-B, VII-C, VIII, and IX) play an integral role in assuring technical data and quality control is consistent. Special consideration should be given to the applicability to the exhibits. Exhibits play an integral role making sure that the appropriate changes, expectations, and needs are kept up to date over time. As a reminder, DMISAs remain active over long periods of time and the exhibits provide the most efficient way to maintain the requirements updated on an annual basis. Changes, additions, and omissions to the DMISA desktop reference or standard DMISA format language were included in Chapter IV (ANALYSIS

AND RESULTS) under Section A (DMISA EVALUATION) and summarized in four tables (Table 3, Table 4, Table 5, and Table 6).

3. Semi-Structure Interviews

Interviewees were divided into two sub-groups, domain experts and logisticians. All domain experts (interviewees 1, 4, 6, 7, 8, and 9) had some to little knowledge about DMISAs, DMISA process, or DMI activities and appear to be involved in a reactive approach in the DMISA process being required to conduct reviews based on their domain expertise. All logisticians (interviewees 2, 3, 5, and 10) had a good understanding and knowledge about DMISAs, DMISA process, or DMI activities. It can be assumed that there is a training gap between logisticians and the domain expert's knowledge to understand DMISAs, DMISA process, or DMI activities. Given that systems engineers and domain experts carry the responsibility of maintaining quality, technical data, and airworthiness in the DMISAs it is imperative making sure they understand the role they play in DMI activities and DMISAs.

4. Prototype Tool

The purpose of the prototype tool is to apply data analytics to target the inspection, cleaning, transformation, and modeling of the data with the goal of visualizing the data to discover useful information, inform conclusions, and support decision-making. The prototype tool basic design has a single application named depot-level maintenance and repair. Inside the application it is divided in three main sections prepare (data manager), analyze (sheet), and narrate (storytelling). The tool performs as expected; connecting the data and query the information as designed. The tool accommodates changes in views and allows targeting visualizations based on stakeholders needs. Based on interviewee feedback, the tool can offer valuable data to stakeholders to shorten the cycle time from data gathering to decision making to support the DMISA management and evaluation criteria for program managers and systems engineers. Overall, interviewees had positive feedback and agreed the tool offers valuable insight, access, and analysis to understand, evaluate, and support decision making related to depot-level maintenance and repair or DMISAs.

B. RECOMMENDATIONS FOR FURTHER STUDIES

It is recommended to follow up with a bigger sample for the semi-structure interviews and include program managers and more systems engineers. Regarding the analytics tool prototype, instead of using Qlik, to apply any other query-base technology, focused on self-service visualization (e.g., Tableu). Explore the DMA tool and how it can be used to connect to Qlik to apply query-base technology and analyze DMISAs. Explore how having depot-level maintenance and repair information at a holistic level and exploring PEO, PMA, and across services activities can benefit multiple stakeholders to shorten the cycle time from data gathering to decision making.

It is recommended that the systems engineers and domain experts take DAU LOG 0250 DMISA training for a high level DMISA process understanding. The training explains key duties and the process for creating a DMISA divided in 12 lessons targeted to MISOs, managers, and others who prepare, review, negotiate, and manage DMISAs. In addition, for the Navy MISMO office to revise the DMISA boilerplate. It was clear that the boilerplate recommendations for technical data and quality assurance is outdated and needs an update to capture more accurately technical data and quality assurance with today's expectations. Furthermore, to make sure the six applicable exhibits are reiterated in the boilerplate as key elements to maintain technical data and quality assurance over the life of the DMISA.

C. SUMMARY

Technical data compliance, quality control, and a prototype tool to analyze DMISAs at an individual and enterprise level are the central topic of this thesis. The study provides program managers and systems engineers the information and tools to accurately evaluate DMISAs. First, the thesis includes the evaluation by the author of 15 Navy-owned DMISAs. Second, a semi-structured interview that collects information related to the DMISA process from various subject matter experts. Third, the evaluation of a prototype tool created by the author to analyze DMISAs at an individual and enterprise level.

APPENDIX A. SEMI-STRUCTURED INTERVIEW

SEMI-STRUCTURED INTERVIEW

Research Title: Evaluation of Navy Depot Maintenance Inter-Service Support Agreement (DMISA) Technical Data Compliance and Quality Control

A. INTRODUCTION

I am a current student in the Naval Postgraduate School Systems Engineering Management program researching the evaluation of Navy Depot Maintenance Inter-Service Support Agreement (DMISA) technical data compliance and quality control. The objective is to evaluate Navy DMISAs from a Program Manager or Systems Engineer perspective for depot-level maintenance activities. The following are the topic areas (B-G) to be discussed in this semi-structured interview. I expect the interview to take approximately one (1) hour and thirty (30) minutes.

Summary Data.

Across all the interviews, I will collect the following DAU training data and only report the totals.

1. Data Point: For how many, is the training LOG 0250 DMISA required? *# of Yes: ____ # of No: ____*

2. Data Point: How many have taken the LOG 0250 DMISA? *# of Yes: ____ # of No: ____*

B. WHAT INFORMATION, SYSTEMS, AND PEOPLE ARE NEEDED TO EVALUATE A DMISA?

1. **Describe** the DMISA evaluation process.
2. What **information** does the current process dictate is needed for DMISA evaluation? Why is it needed?
3. What **information** is needed for DMISA evaluation? Why?
4. Who **provides** the information?
5. Who is **involved** in the DMISA evaluation? How do they interact?

C. WHAT ARE THE KEY CHARACTERISTICS OF THE DMISA STRUCTURE?

6. **Describe** the DMISA.
7. Are there any **assessment tools** currently available to manage, evaluate or compare DMISAs?

D. WHAT TRIGGERS A DMISA AND AN EVALUATION?

8. **Describe** what triggers the creation of a DMISA.
9. **Describe** what triggers the evaluation of a DMISA.

E. HOW IS TECHNICAL DATA COMPLIANCE ADDRESSED?

10. **Describe** how technical compliance is addressed in the DMISA.
11. What **information** is collected or evaluated for technical data compliance?
12. **Describe** how technical data compliance is evaluated.

F. HOW IS QUALITY CONTROL ENSURED?

13. **Describe** how quality control is managed in the DMISA.
14. **Describe** how quality control is applied in the depot.
15. What **information** is collected for quality control evaluation?

G. PROTOTYPE FEEDBACK

16. Based on the prototype tool presented, what **information** is useful or lacking regarding DMISAs?
17. Based on the prototype tool presented, what **information** is useful or lacking regarding technical data compliance?
18. Based on the prototype tool presented, what **information** is useful or lacking regarding quality control?
19. Based on the prototype tool presented, **step through** how an organization would use it.
20. **Describe** what you see and compare it to current processes.

Page **1** of **1**

Figure 32. Semi-structured interview questions.

1. What Information, Systems, and People are Needed to Evaluate a DMISA?

Table 9 summarizes the interviewee feedback for question B. What information, systems, and people are needed to evaluate a DMISA?

Table 9. Feedback for B. What information, systems, and people are needed to evaluate a DMISA?

Interviewee	Feedback for B. What information, systems, and people are needed to evaluate a DMISA?
1	Zero activity involvement in the DMISA process or developing DMISAs. Only experience was over an argument for the applicable policy needed for discrepancy reports requirement but the DMISA layout the policy to be followed for discrepancy reports.
2	Principal side that owns the requirements. Agent and depot side that does the repair. Each side has specific responsibilities under a DMISA. Principal serves as item manager and product management specialist. Military Interdepartmental Purchase Request (MIPR) are used for the financial transaction (payments) for the services rendered under DMISAs. DMISAs require technical assistance from domain experts, SOW evaluation, bill of materials (BOM) among others from both sides (principal and agent). In the agent and depot side planners and schedulers assure the work can be done per the requirements and timeline. The depot produces or receives a BOM for the repair and a costing model is created for predicting cost for repair services per line items. You can identify two distinct lines for depot-level maintenance. One, is program depot maintenance e.g., T/M/S support. Second, is material subject to repair e.g., components maintenance or spare assets. Exhibit 1 covers major programs (e.g., T/M/S) and exhibit 2 minor programs (e.g., components or spares). Section II defines major and minor programs using DMISA boiler plate language as a starting point for negotiations.
3	Refer to the DMISA flow process for DMISA creation flow chart and DMISA management flow chart (DOD 2020b, 6–7). DMISAs are fluid and can be changed quickly compared to a commercial contract. The DMISA allows for adjustments to be made quicker, as required, compared to a commercial contract. That fluidity and dynamic makes a DMISA a powerful tool to maintain the depot-level maintenance going with the required support needed to complete the work. DMISA are not contracts they are agreements that allow fluidity, changes, and is more dynamic than a commercial contract. It can be as detailed as needed starting from the DMISA boilerplate (minimum recommended language requirements).

Interviewee	Feedback for B. What information, systems, and people are needed to evaluate a DMISA?
4	Have some awareness, not expertise nor specific knowledge towards information, systems, and people needed to evaluate a DMISA. Have had instances that reviewed quality sections per program requests but not any specific expertise for DMISAs.
5	The DMISA evaluation is comparable to a step process. It starts about 6 months prior the new fiscal year to be signed by the Deputy, Assistant Program Manager for Logistics (DAPML) from the program or designee for depot maintenance. DAPML or designee will be responsible to bring the domain experts needed (e.g., supply, engineering, subject matter experts like quality) for the review of the DMISA, SOW, and exhibits. Then the agent and depot domain experts receive and review the draft DMISA and provide feedback and inputs. The PM will also review it along with the logisticians to verify tooling and parts (e.g., BOM) requirements among other related information. In summary, the principal gathers all input from domain experts, then the agent reviews the draft with domain experts and provides inputs to the principal, then a date is scheduled for a joint review (page by page or just added changes). Once agreed, the DMISA is signed and sent to all applicable stakeholders.
6	For the evaluation, I was contacted to review a DMISA based on domain expertise from the program office to evaluate specific sections for the assigned workload. The PM contacted me and through the program office I got the MISO information and the assigned sections I needed to review. I provided the information to the MISO and was introduced to the MICO to coordinate with the agent and depot domain experts to negotiate and agree on the quality sections being updated, negotiated, and revised.
7	DMISA evaluation is targeted to the need of the service that needs the work done, the capability available to meet the need is evaluated in the depot facility chosen to do the work.
8	No knowledge of the process, information, systems, and people needed to evaluate a DMISA.
9	The first step in the process is the analysis of what level of repair is required. From there, there is a business case study that is done; if applicable a DSOR decision is assigned towards organic work specifically a DMISA having depot, PM, logisticians, engineers, and domain experts evaluate the work needed. DSOR process dictates the need for a DMISA, and it is what triggers the process. High collaboration is needed for the work to be done per the need of the repair. From experience we lack in documenting the specific "why it is repaired?" specifically looking at why the part failed (e.g., it is being repaired because maintenance dictated it or is it because something else). That missing feedback could help prevent failures in the future. There is a deficiency in understanding the process, and it needs to be divided in two. First, the sustainment of an existing DMISA that requires certain

Interviewee	Feedback for B. What information, systems, and people are needed to evaluate a DMISA?
	processes and feedback to be maintained. Second, the establishment of a new DMISAs that requires a different level of effort and feedback.
10	Not applicable.

2. What Are the Key Characteristics of the DMISA Structure?

Table 10 summarizes the interviewee feedback for question C. What are the key characteristics of the DMISA structure?

Table 10. Feedback for C. What are the key characteristics for the DMISA structure?

Interviewee	Feedback for C. What are the key characteristics for the DMISA structure?
1	No knowledge of DMISA characteristics. No knowledge of tools currently available to manage, evaluate, or compare DMISAS.
2	No knowledge of tools currently available to manage, evaluate, or compare DMISAS. The characteristics for a DMISA is equivalent to a MOA perse between services. The commonality is the boilerplate; very little is changed in the standardized language. Changes, additions, or special requirements are normally covered in the exhibits, if possible. DMISA structure includes a section I, section II, and exhibits. While section I and II are standardized, the exhibits are unique for the purpose of tailoring the agreement for each program needs. Because of that, section I and II are less inclined to change over time while the exhibits are reviewed at least yearly or as agreed in the DMISA.
3	It is enforced to structure across agencies using the DMISA boilerplate to maintain integrity and sameness in formatting for all services. This allows understanding of the structure and makes it easier for everyone to understand where and what to look for in a DMISA for any specific information. As a MISO going from one DMISA to another the same structure exists but the technical information and requirements for the work are the only thing that differs; structurally they are the same. Once you understand the basic structure and layout of a DMISA is easy to understand or evaluate any other. Even exhibits that are not applicable are included as a page place holder but added a “not applicable” in the text to maintain consistency throughout in numbering assuring that section does not pertain to the DMISA and maintaining the basic structure. The DMISA boilerplate structure and wording does not change until all Services agree and approve the change. There are no assessment tools that will evaluate and asses DMISAs with each other. A DMA exists

Interviewee	Feedback for C. What are the key characteristics for the DMISA structure?
	under a joint DMISA integrated product team that developed a prototype because DMISAs experience issues related to document control and execution. The USAF developed the DMA to manage DMISAs and all supporting documentation and exhibits. The DMA serves as a DMISA oversight, management, and execution tool and repository. The Navy has requested access and it is in the process of uploading and populate the tool with the DMISAs. The tool manages the process e.g., it routes the DMISA for changes, signatures, approvals, maintains configuration management of the document, and stores the final agreement along with supplemental information and exhibits. The DMA will provide the Navy the ability to maintain and manage in a centralize location the DMISA process for updates, track changes, and storage of a DMISA and related documentation. The DMA is a housing tool to maintain and manage the DMISA documentation process, yearly reviews, changes, and sign offs (approvals) of the agreement.
4	No knowledge of DMISA characteristics. No knowledge of tools currently available to manage, evaluate, or compare DMISAs.
5	No knowledge of tools currently available to manage, evaluate, or compare DMISAs. Knowledge of the Air Force DMA tool to manage the DMISA process and currently in the process to transition Navy DMISA in that tool to manage the structure and routing of DMISAs. The DMISA is a three-part document structure (section I, section II, and exhibits). There are 17 main exhibits that concentrate more in-depth in the details of how to support the product. Exhibits change to reflect the needed support or work. Not all exhibits are required (it is very tailorable depending on the program needs). The applicable exhibits provide the needs and expectations for the work to be accomplished by the agent designated depot location.
6	The DMISA is a "contract" between DOD entities that include provisions of workload, responsibilities, support, and scope of the agreement. In the exhibits they have the details for the work to be assigned and expectations from the principal and domain experts' requirements. No knowledge of tools currently available to manage, evaluate, or compare DMISAs. For the actual DMISA review we tracked changes in Microsoft word and submitted to a single point for consolidation.
7	No knowledge of DMISA characteristics. No knowledge of tools currently available to manage, evaluate, or compare DMISAs. Not clear communication flow from the different stakeholders to monitor across the organization and have a clear understanding of depot-level maintenance and DMISAs.
8	No knowledge of DMISA characteristics. No knowledge of tools currently available to manage, evaluate, or compare DMISAs.

Interviewee	Feedback for C. What are the key characteristics for the DMISA structure?
9	It will include program management, technical data, schedule information, item logistics, technical standards, and general expectations. A DMISA is more like a planning tool for the work to be accomplished at the highest level. During DMISA execution, there is a lot happening; if the expectation is not well described in the DMISA (e.g., quality or engineering changes) that is when the work deviates and prompt problems like we had with the C-130 propellers described in MARFORRES 2018. The DMISA helps lay out the expectation of the work. No knowledge of tools currently available to manage, evaluate, or compare DMISAs.
10	Not applicable.

3. What Triggers a DMISA and an Evaluation?

Table 11 summarizes the interviewee feedback for question D. What triggers a DMISA and an evaluation?

Table 11. Feedback for D. What triggers a DMISA and an evaluation?

Interviewee	Feedback for D. What triggers a DMISA and an evaluation?
1	No knowledge of what triggers a DMISA and how they are evaluated.
2	A depot maintenance interservice study for work going to an organic repair facility will trigger a DMI study via the MISMO to evaluate depot feasibility. A DSOR memorandum is then sent to the services stating the source of repair, that will trigger the DMISA and depot activation. If it is an existing DMISA, then it is reviewed at least annually because of internal boiler plate language that triggers the action unless otherwise is negotiated.
3	Creation is triggered when a new interservice relationship where one service that needs items repaired by another service; or an addition (line item) to an existing DMISA but this only applies to similar type items e.g., an upgrade to an engine from a delta configuration to an echo configuration requiring similar processes. Anything that the MISO, MICO, program, or depot thinks needs to be looked at and changed could trigger an evaluation at any time. This is the dynamic and fluid portion of the DMISAs, the opportunity to change or clarify requirements as needed or add line items at any time. There is also a yearly evaluation and review cycle to look at the yearly requirements.
4	No knowledge of what triggers a DMISA or an evaluation.
5	The creation of the DMISA starts with the DMI and DSOR processes. You need an assigned DSOR letter for organic work (DMISA). The

Interviewee	Feedback for D. What triggers a DMISA and an evaluation?
	DMISA is evaluated annually according to the OPNAV Instruction 4790.14B (OPNAV 2013) by the principal and agent or add changes from the domain experts' feedback as needed (the latter can be an out of cycle evaluation at any time).
6	Workload shift between DOD organizational entities requires a new DMISA to be created. All active DMISAs are submitted to a yearly review cycle at a minimum.
7	No knowledge of what triggers a DMISA or an evaluation. Not familiar with the process. Had previous experience and exposure with DMISAs by being contacted for reviews or evaluations last minute with little background feeling reactive. The process feels more like a trigger than proactive from a domain expert point of view in quality.
8	A DMISA will be triggered by the need for a depot level repair capability or activity to perform some work between services.
9	Annual planning, instruction, or a domain expert trigger the DMISA evaluation. It needs to be evaluated annually at a minimum.
10	Not applicable.

4. How Is Technical Data Compliance Addressed?

Table 12 summarizes the interviewee feedback for question E. How is technical data compliance addressed?

Table 12. Feedback for E. How is technical data compliance addressed?

Interviewee	Feedback for E. How is technical data compliance addressed?
1	No knowledge of how technical data compliance is addressed.
2	Technical data compliance is enforced and evaluated by the onsite quality assurance department e.g., hands on inspections. Agent is responsible to follow technical data requirements. Reporting normally is per the onsite quality system and reports are automated for escapes or discrepancies through JDRS for the Navy e.g., PQDRs.
3	Technical data is required for the depot to do the work. The information is contained under section I paragraph 10.d work specifications and include the SOW, technical data, bill of materials or material requirement list, and configuration management of the DMISA boiler plate (section I paragraph 10.d.1 to 4).
4	No knowledge of how technical data compliance is addressed.
5	The review of the DMISA technical data relies on the domain experts and their expertise (feedback) to ensure accurate and dated data to be included in the applicable sections and exhibits. Logistics related data is reviewed by the DAPML or designated logistician.

Interviewee	Feedback for E. How is technical data compliance addressed?
6	Technical data is addressed in the DMISA in a specific section.
7	No knowledge of how technical data compliance is addressed.
8	There is a dedicated section to have technical data evaluated for the work needed. The depot is responsible for the repair scope need and have a process to survey if the technical data information is present and complete before executing the repair. While executing the repair the depot will have some type of validation and verification process per the QMS to assure sufficient technical data is available to complete the repair to the requirement, quality, and expectations. Once the activity is complete configuration management is updated accordingly and locked in for the repair. Two resourceful references related to technical data package and technical data are the military standard 31000 Technical Data Packages and the American Society of Mechanical Engineers (ASME) Y14 series; specifically, ASME 14.100 Engineering Drawing Practices. Specific ASME Y14 series (e.g., ASME Y14.1, Y14.24, Y14.34, Y14.34, Y14.35, Y14.41, and Y14.5) are called out in the 31000 standard as applicable documents for technical data packages.
9	Depends on the PM, logistician, or depot in what they provide in terms of technical data evaluation. Only feedback collected are deficiencies in JDRS for Navy DMISAs.
10	Not applicable.

5. How Is Quality Control Ensured?

Table 13 summarizes the interviewee feedback for question F. How is quality control ensured?

Table 13. Feedback for F. How is quality control ensured?

Interviewee	Feedback for F. How is quality control ensured?
1	No knowledge of how quality control is ensured in a DMISA.
2	The principal basically relies on the Agent or depot quality management system (QMS) for quality related actions. Principal relies in the agent's (or depot) ability to maintain and follow the onsite QMS. If additional quality requirements are needed, they will be added to the DMISA in the appropriate sections or exhibit related to quality.
3	The DMISA has several places where quality is addressed, and it can be as detailed as necessary to cover the expectations of the principal as agreed with the agent. Quality will be subject to the agent QMS used in the depot where the item is being repaired or maintained. If more or specific quality requirements are needed, they are normally specified in

Interviewee	Feedback for F. How is quality control ensured?
	exhibit VII-C. Usually is expected that a domain expert for quality from the principal and agent will review the quality sections.
4	Quality assurance and control will depend on the type of QMS the depot has e.g., local engineering specifications and local production specifications; in addition to any specific requirements included in the DMISA and related documentation.
5	Quality is addressed in section I paragraph 10.e.1 to 3 in the DMISA boiler plate. Exhibit VII-C will have specific quality requirements or specific quality needs that can be expanded to meet program requirements for the work to be performed. Also, the program can add quality requirements in the SOW under section I paragraph 10.d.1 from the DMISA boiler plate.
6	Navy quality requirements are in section I paragraph 10.e of the expectations of the agreement and a QMS to be maintained in the depot for the work to be performed. Under the depot QMS, quality control is assured. Reliant on the depot QMS requirements for quality assurance, control, and management. Review the depot QMS to assure quality is evaluated to the principal minimum requirements and expectations. Other added information to evaluate quality of the work performed is included in the DMISA at the exhibit VII-C. The QMS is applied at each depot a little different and is up to us the domain experts to understand the differences and include in the DMISA the applicable requirements and expectation to evaluate the item and work to the standards, specifications, and controls the principal is expecting from the services provided.
7	Evaluating the depot QMS and understanding that the depot has an equivalent QMS for depot work that meets the expectations and requirements of the principal.
8	The depot has a quality planning process in the sites audited or regulated against a QMS e.g., using AS9110. With that the depot develops the appropriate controls needed for the repairs e.g., identify critical characteristics, perform multiple process audits, inspection controls, corrective action program, monitoring of escapes, and report of deficiencies. Overall, the activities are aligned with the depot QMS and tailored for the needs of the repair requirements. Limited knowledge for how quality control is applied or applicable to DMISAs. In general, the depot QMS will include feedback for process, escapes, deviations, and metrics. The Naval Aviation Maintenance Program (NAMP) 4790 and AS9110 is used in the Navy COMFRC depots for quality management.
9	The Navy requires the use of JDRS for deficiency feedback in DMISAs. Each depot has their own QMS to manage quality and we are dependent on what they have and how they maintain it. Data is collected in each depot QMS but not necessarily shared unless we ask for it specifically.
10	Not applicable

6. Prototype Feedback

Table 14 summarizes the interviewee feedback for question G. Prototype tool presentation.

Table 14. Feedback for G. Prototype tool presentation.

Interviewee	Feedback for G. Prototype tool presentation.
1	Explore the possibility to use data from the procurement integrated enterprise environment (PIEE) wide area workflow (WAWF) to analyze depot-level maintenance contracts or agreements information. Explore the possibility to store DMISAs in the WAWF system environment, if possible. Access to the DMISA information is crucial; having a single source to locate, access, and evaluate the DMISA documentation allows a faster turnout for communication, reports, management, and evaluations. The prototype will serve as a one stop shop to evaluate depot-level maintenance at an enterprise, PMA, or component level.
2	The intention to include PQDR and embed JDRS is a good target to evaluate and cross reference the data with the PEO, PMA, and other relevant stakeholders. Including a cost comparison sheet to evaluate DMISAs per DMISA or even line items within a DMISA will be a powerful tool to see where and how the money is being spent and will provide an ability to defend future funding. The tool could provide a traceable break down from PEO, PMA, per DMISA, line item, configuration type, or component level granularity while maintaining traceability will be very powerful. This type of repository can be very useful for high level briefs but still maintaining traceability to the source and details to trace back any assigned actions. In addition, having a sheet with depot locations with a description of what each depot does can be very beneficial to understand current available capability. Understanding that will allow being more proficient when an unscheduled need to repair arises; a location could be identified faster with the right capability or even a current agreement in place for a similar item that will facilitate negotiations and lower cost of opening a redundant line somewhere else.
3	Dynamic tool for reviewing information from different sources. Changes and adjustments to the tool are easy and tailorable to meet stakeholders needs or specific information the stakeholders are interested in analyzing for trends. Tool can be changed on the fly or tailored to look at lower or higher traceable levels of the data without losing the connection. Accessibility via common access card (CAC) to everyone will be key to share the information across the services, PEO, PMA, domain experts among other interested parties.
4	Useful to pull different databases into one place and create the connections and filter accordingly without losing the traceability and granularity of the

Interviewee	Feedback for G. Prototype tool presentation.
	information allowing a deeper understanding and analysis of the information in one place. The tool will provide visibility of hidden scenarios or discovery of trends across depot-level maintenance. For example, pulling in JDRS data and connecting it with the depot-level maintenance provides another layer of awareness and detail in one place. The tool can give the ability to tell a story right away of what is failing or working with the "why and where" connected to it. It can be powerful for connecting discrepancies and could show how contracts or agreements may need to change to adapt to the needs and triggered discrepancies to maintain quality of the products. The tool provides segregation and interrelationships maintaining traceability for high level and lower-level granularity of information. The tool can be useful for product integrity and domain experts to get familiarized and analyze more efficient depot-level maintenance. This can allow more integration of domain experts, program, and logistics to share information and status more efficiently, faster, and easier. Easy access to the depot-level maintenance information, contract, or agreements is crucial. Access for a specific PEO or PMA or system is sometimes time consuming, and it takes several people to get to the information, but the tool can provide a one stop shop to access and evaluate the information.
5	Having an interactive map showing locations for depot-level maintenance is very useful to understand the scope and evaluate impact for disasters (e.g., earthquakes, hurricanes, flooding, forest fires) and allow the command to understand who in the PMA, PEO, T/M/S, or component is being impacted or at risk. The information shared is very useful and one of the perks I see is the ability to see which programs are supported by what type of maintenance being done (e.g., commercial, organic) through the Navy. This type of tool will allow to see traceability and easy access to compare organic and commercial depot-level maintenance. The tool could show where the depot products are located and who is doing what and where in a visual way. Dividing by PEO and PMA is very useful for higher level reporting. If the tool could bring in the workload standard by site related to the PEO, PMA, line item, or component that will be very powerful to analyze and identify trends, commonalities, or redundancy. This type of tool and information could be used for the monthly, quarterly, or annual meetings for the DMISA.
6	Having all that information in one place is very useful because of fluidity. The tool allows filtering, granularity, keeps traceability from high to lower levels, and it can be adjusted on the fly if management or leadership has a question. Having the most current or active DMISA or a link that will point to it will be very beneficial for all the domain experts. Even having the DMISA numbers is very useful because from experience sometimes the DMISA identification numbers were shared incorrectly and added redundant work to find the right information from the right people. Also, sending or receiving the DMISA for review, from experience, sometimes

Interviewee	Feedback for G. Prototype tool presentation.
	version control was a challenge and making sure I was working on the latest in parallel with others was frustrating. A centralized location for storage, management, and even access could be a game changer for all domain experts regarding depot-level maintenance. It will alleviate the need to track and run around trying to find the right point of contact to get the information. Being able to extrapolate information, compare with JDRS, and other tools will provide a more efficient process for collaboration not just between the immediate stakeholders but even between services, PEO, and PMAs. Even having access to the DSOR letter or memorandum in one place connected to all the data is useful. This type of tool will make the response for data calls very easy and accessible to respond with the latest information and still having traceability of where it comes from. This is a step up from the way we are currently doing business and more efficient to share and communicate between stakeholders. Normally this type of data is accessible from two or three sources and four or five people. This type of tool will be an immediate return of investment for domain experts, principal, agents, and the program office.
7	The place holders or views presented are very useful; is a one stop shop versus having to make calls to different stakeholders to connect the dots or have access to the data. Currently to access the data presented it takes a laborious time to get a complete picture and understand the DMISA or depot-level maintenance and evaluate it from a domain expert perspective, even only looking just at quality and quality requirements. This tool could prove to be powerful to get a complete picture of depot-level maintenance and communicate across PEOs, PMAs, and across services. Include metrics for performance, contract performance, capacity for depot, and depot capability will be very beneficial and something we get asked in addition to what was presented.
8	Recommend changing in procurement management tool (PMT) or the procurement initiation document (PID) to have an option of adding or choosing if the contract is acquisition or if it is in support of depot-level maintenance if the option is not there. It is important that the metrics are aligned to a reporting system if this project were to take life and be implemented. Without the underline need of a reporting structure for high level the tool will eventually die. The matrix is from a top-level view based in the PEOs and PMAs, but it will be beneficial to have granularity and access to the repairs to determine the BOM or components being worked. From the list we could assess the total population and measure certain parameters and evaluate the percentage of them that have internal depot designations and evaluate how many have assigned DSORs. In general, to look for the total population that it is out there now for depot-level maintenance, how many have determinations, breakout the type of determinations, and can dive into commercial or organic. Understanding from a total perspective depot-level maintenance actions that are currently

Interviewee	Feedback for G. Prototype tool presentation.
	active and where are they being performed. Try to embed the DMISAs in the current tool we use for commercial contracts to have them in the same place and maybe apply a different workflow to them. Drive a change to the PMT tool or added data field for identification of depot-level maintenance and repair contracting efforts from normal new acquisition could be beneficial.
9	The tool provides a good global view of where the work is being done and how is being managed. It gives the ability to see the data for DMISAs and depot-level maintenance. Quality and technical data is not showing if it is being done correct but only if it is being done. Right now, is difficult to evaluate that piece of it. Execution of DMISAs is hard to evaluate right now. Two main what ifs are: "How can we get the feedback that the plans are being deviated from the agreed work?" and "Can this tool capture or force any changes to be reviewed or updated and capture deviations in the plans?" This is a blind spot area and at a minimum documenting it and showing how a tool like this could help manage depot-level maintenance helps shedding light into it.
10	Not applicable

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APPENDIX B. PROTOTYPE TOOL QLIK STORY PRESENTATION

The following presentation was used in the semi-structure interviews to demonstrate the capability of Qlik in organizing the information and share the data to different stakeholders. It is the example used from the narrate (storytelling) section in Qlik for the depot-level maintenance story. Figure 33 shows the narrate (storytelling) section first slide for the depot-level maintenance story and in the left the 10 slides that incorporate the full story. The presentation was shared live during the semi-structure interviews along with the Qlik prototype application.

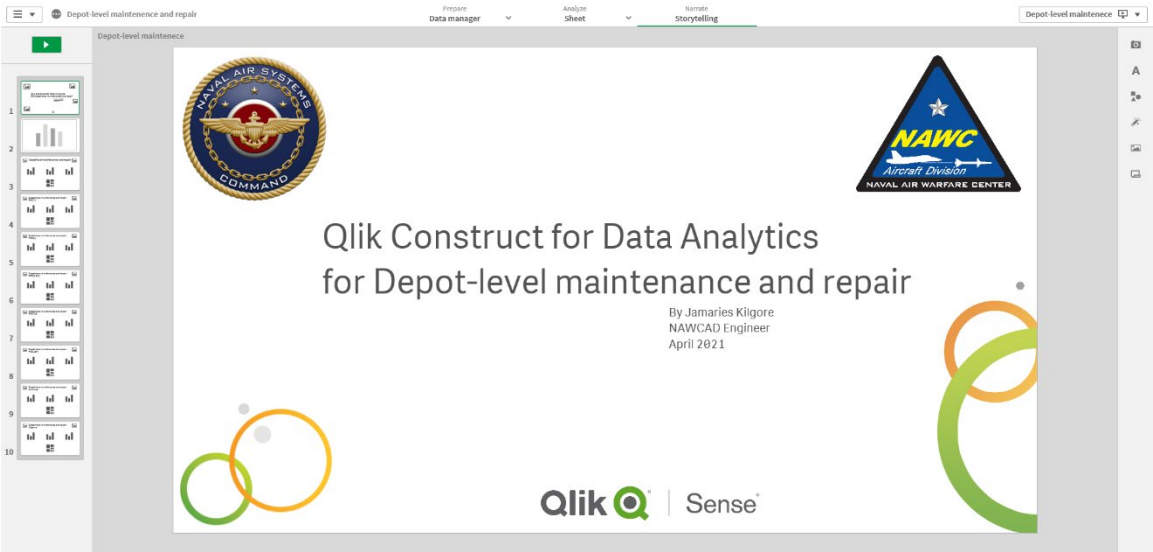

Figure 33. Qlik story slide 1 under the narrate (storytelling) section for the depot-level maintenance.

Slide number two to slide number ten are shared below. Figure 34 shows the live data sheet for depot-level maintenance and repair (slide two). Figure 35 show the data sheet for depot-level maintenance and repair with no selections applied (slide three). Figure 36 show the data sheet for depot-level maintenance and repair with the PEO(T) selection applied (slide four). Figure 37 show the data sheet for depot-level maintenance and repair with the PEO(A) selection applied (slide five). Figure 38 show the data sheet for depot-level maintenance and repair with the PEO(U&W) selection applied (slide six). Figure 39

show the data sheet for depot-level maintenance and repair with the PEO(CS) selection applied (slide seven). Figure 40 show the data sheet for depot-level maintenance and repair with the PEO(JSF) selection applied (slide eight). Figure 41 show the data sheet for depot-level maintenance and repair with the contract selection applied (slide nine). Figure 42 show the data sheet for depot-level maintenance and repair with the organic selection applied (slide ten).

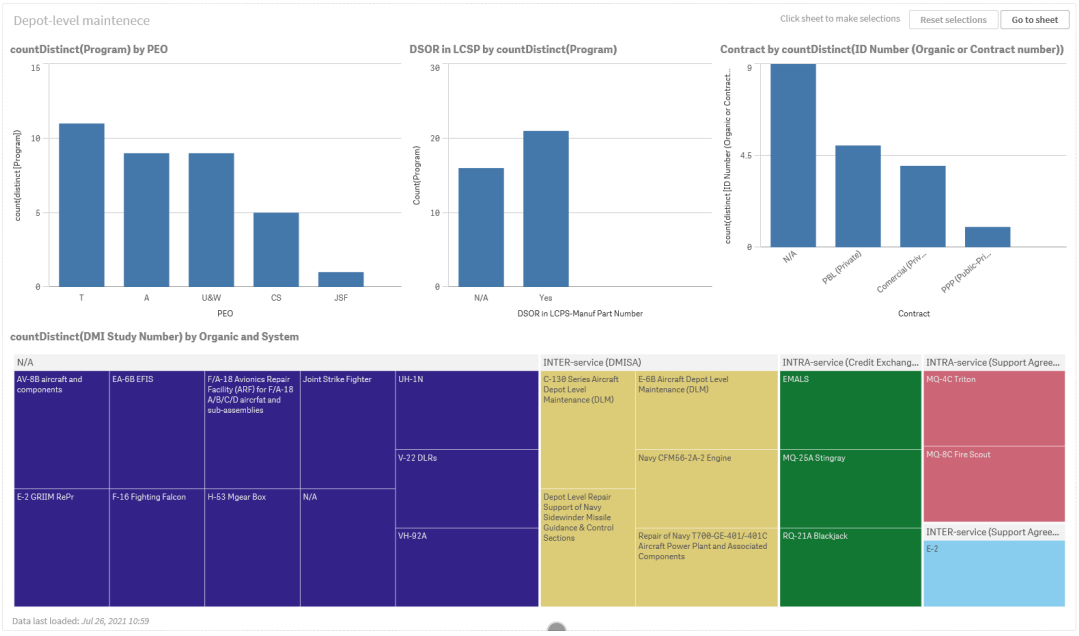

Figure 34. Qlik story slide 2 depot-level maintenance and repair live data sheet.

Figure 35. Qlik story slide 3 depot-level maintenance and repair view (no selections applied).

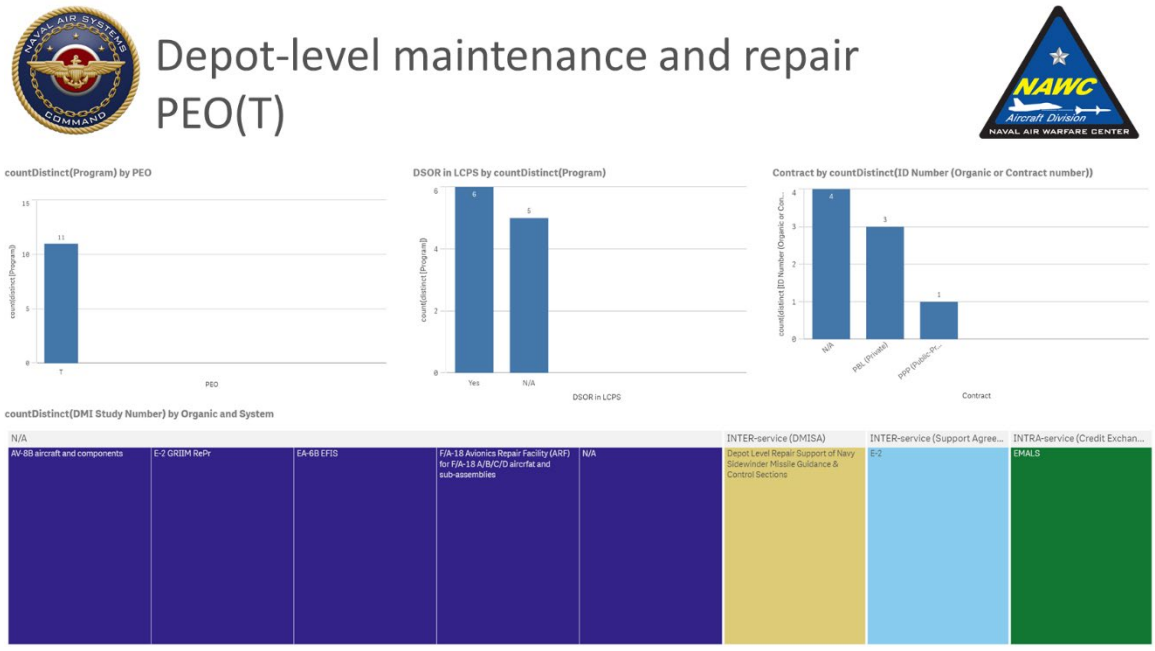

Figure 36. Qlik story slide 4 depot-level maintenance and repair PEO(T) filter.

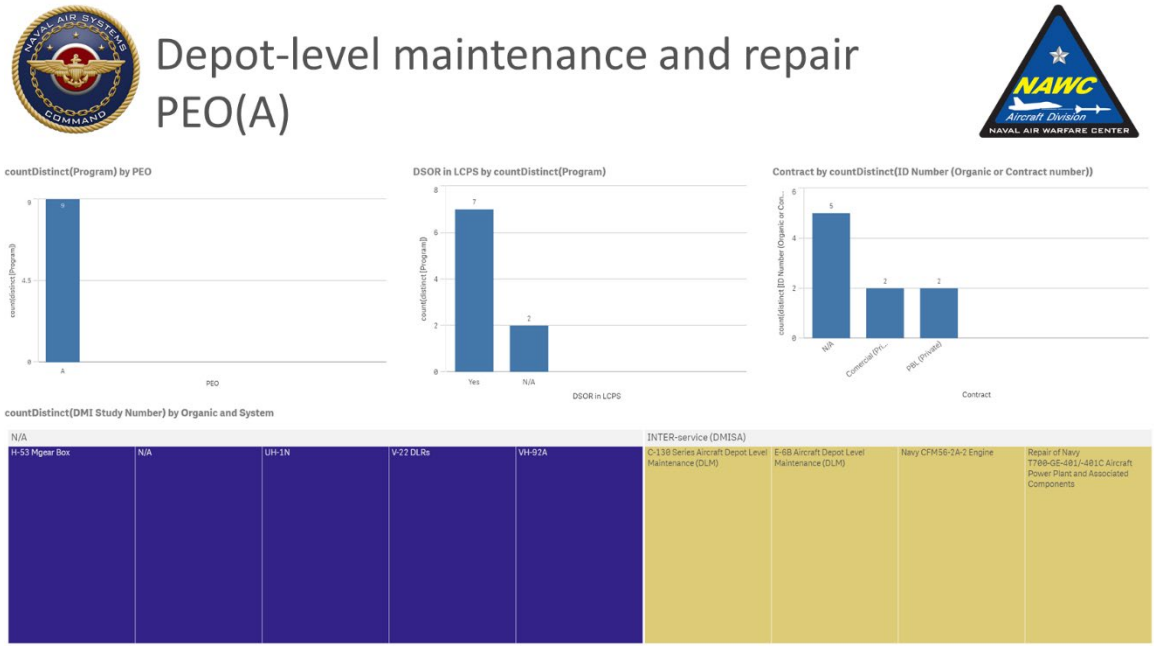

Figure 37. Qlik story slide 5 depot-level maintenance and repair PEO(A) selection.

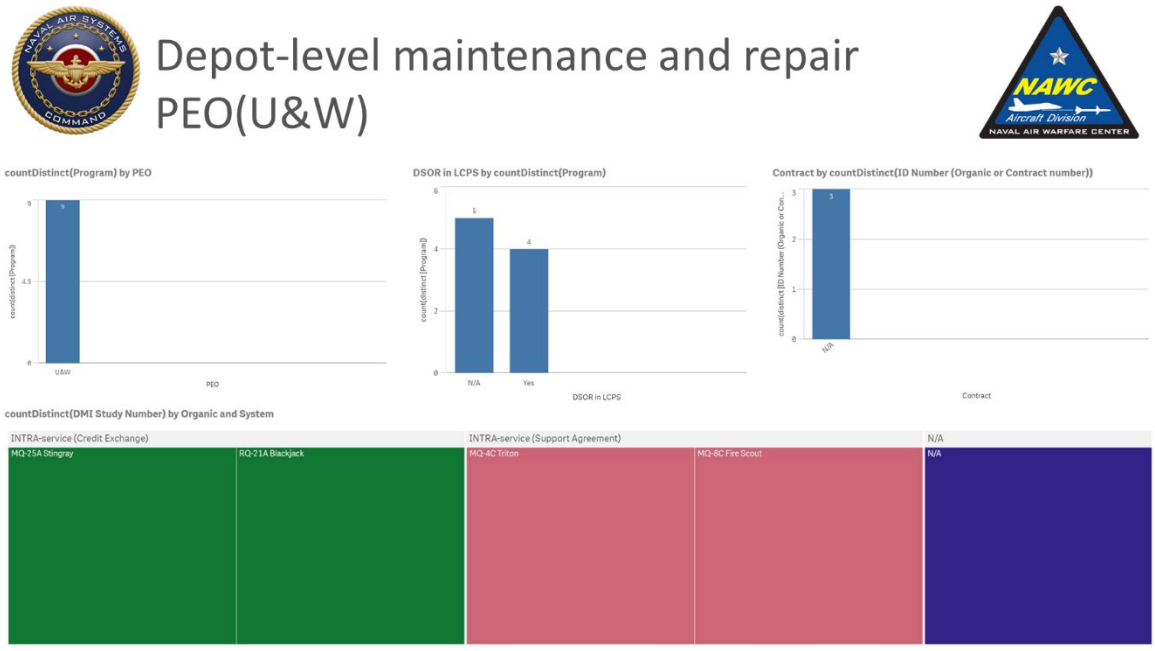

Figure 38. Qlik story slide 6 depot-level maintenance and repair PEO(U&W) selection.

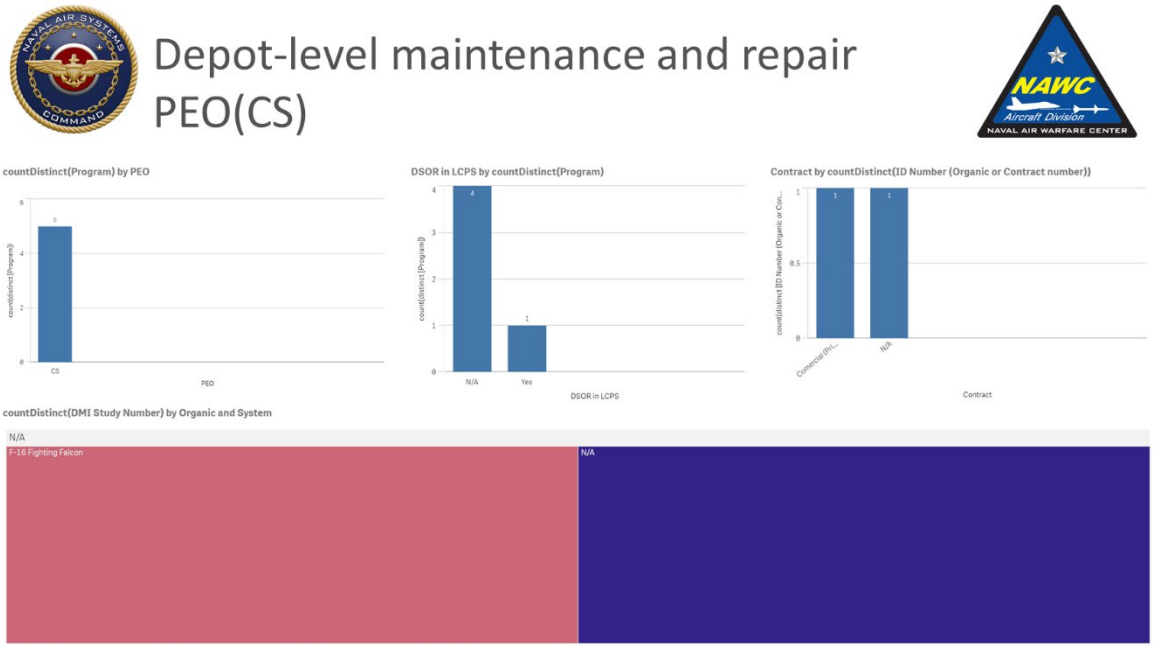

Figure 39. Qlik story slide 7 depot-level maintenance and repair PEO(CS) selection.

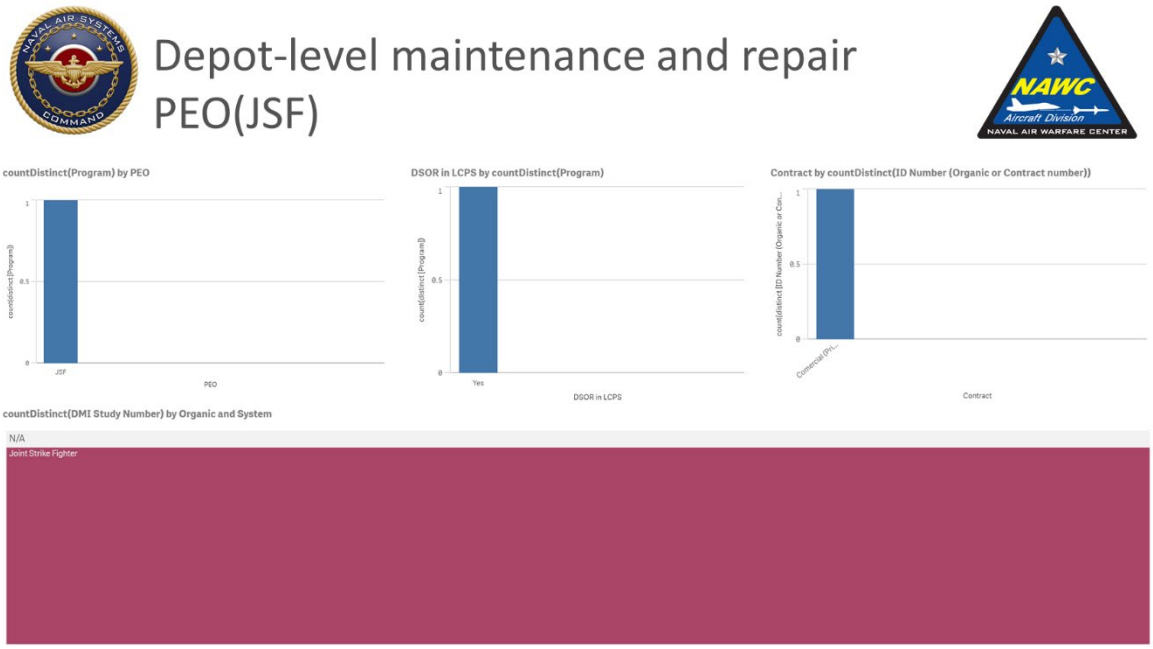

Figure 40. Qlik story slide 8 depot-level maintenance and repair PEO(JSF) selection.

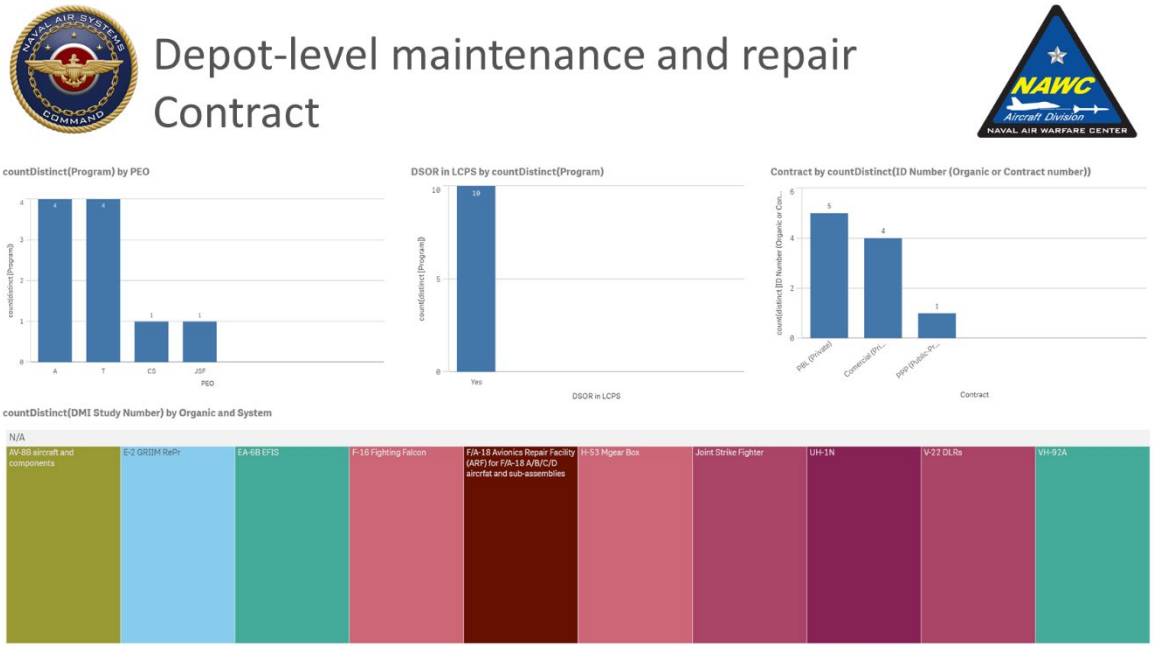

Figure 41. Qlik story slide 9 depot-level maintenance and repair contract selection.

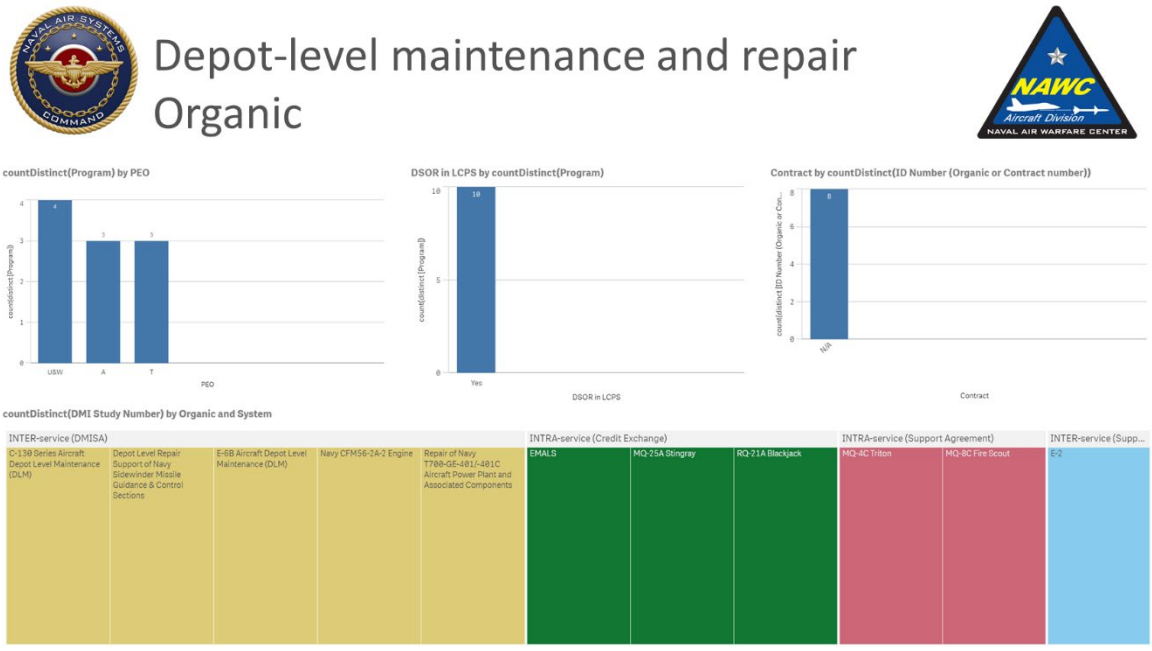

Figure 42. Qlik story slide 10 depot-level maintenance and repair organic selection.

APPENDIX C. DEPOT-LEVEL MAINTENANCE

Interviewee number 10 shared the following information as an example of an agreement between federal program agencies for intragovernmental reimbursable, buy and sell activities. The U.S. Department of Treasury has a U.S. Government general terms & conditions (GT&C) form (FS Form 7600A) used for intragovernmental reimbursable, buy and sell activities.

1. FS Form 7600A Agreement Between Federal Program Agencies

Figure 43, Figure 44, Figure 45, Figure 46, and Figure 47 show an example of pages one through five for a partially filled agreement between DLA and NAVSUP. The example mentions under page two, additional agreement information, an annex A to D for statement of work (SOW) and an annex E for standard legal clauses. The annex A through E were included for information purposes to give a clear picture of the entire form requirements for the intragovernmental reimbursable, buy and sell activities.

Reset Form | Print Form

UNITED STATES GOVERNMENT
GENERAL TERMS & CONDITIONS (GT&C)
FS Form 7600A

BUREAU OF THE Fiscal Service
U.S. DEPARTMENT OF THE TREASURY

Agreement Between Federal Program Agencies for Intragovernmental Reimbursable, Buy/Sell Activity. In Accordance with TFM Volume 1, Part 2, Chapter 4700, Appendix 8.

https://www.fiscal.treasury.gov/fsservices/gov/acctg/g_invoice/g_invoice_home.htm

G-Invoicing Required Fields have an (*)

NEW OR MODIFIED GT&C			
*General Terms and Conditions (GT&C) Number		GT&C Number: EXAMPLE	
		Modification Number:	
		Status: Shared Draft	
AGENCY INFORMATION			
1.		Requesting Agency (Buyer)	Servicing Agency (Seller)
	*Agency Account Name	Defense Logsitics Agency (DLA)	United States Navy
	*Agency Location Code (ALC)		
	*ALC Description	Department of Defense Defense Logistics Agency (DLA) Aviation	United States Navy Naval Supply Systems Command
	Group Name	DLA Aviation	NAVSUP HQ
	Group Description		
	Cost Center		
	Business Unit		
	Department ID		
GT&C INFORMATION			
2.	GT&C Title	DLA-USN-FY##-AVN-NAVSUP Multi-service Support	
3.	Agency Agreement Tracking Number		A210#-0##-0##-00####
4.	*Agreement Period	Start Date (yyyy/mm/dd): TBD	End Date (yyyy/mm/dd): TBD
5.	Termination Days	180	
6.	*Agreement Type	Multiple Order	
7.	*Advance Payment Indicator	Are Advance Payments allowed for this GT&C? ○ Yes ● No *If "Yes", the Requesting Agency Advance Payment Authority Title and Citation are required upon creation of an Order against this GT&C.	
8.	*Assisted Acquisition Indicator	Will this GT&C accommodate Assisted Acquisitions? ○ Yes ● No *If "Yes", the Servicing Agency provides acquisition support in awarding and managing contracts on behalf of the Requesting Agency's requirements for products or services. Lines 17 & 18 below for additional detail.	
ESTIMATED AGREEMENT AMOUNT			
9.	Total Direct Cost Amount	$95,000,000.00	
	Total Overhead Fees and Charges Amount		

Figure 43. FS Form 7600A example page 1 of 5.

	*Total Estimated Amount	$95,000,000.00
	Enforce Total Remaining Amount	Should G-Invoicing enforce the total value of orders to remain below the Total Amount on the GT&C? ○ Yes ● No If "Yes", G-Invoicing will not allow Order total to exceed the GT&C total.
ADDITIONAL AGREEMENT INFORMATION		
10.	Explanation of Overhead Fees and Charges	
11.	Requesting Scope	NAVSUP to provide multi-service support
12.	Requesting Roles	The Requesting Agency has a requirement for supply and service support which can only be supported by the servicing agency. This includes: • Procurement Agent — strategic acquisition of consumable and depot-level repairable materiel • Weapon Systems Support — engine components; bearings; airframes; electrical cable assemblies • Industrial Support — maintain retail supply and storage in direct support of aircraft maintenance depot production lines • Kitting — flexible kit designs, service and support, oriented to maintenance users, by end-item for specific tasks • Environmental — green products; re-refined motor oil; environmental products catalog and information Web page; ozone-friendly chemicals; remanufactured toner cartridges; recycled antifreeze • Acquisition Support • Industrial Capability Support See also Annex A-D Statements of Work (SOW)
13.	Servicing Roles	
14.	Restrictions	
15.	Assisted Acquisition Small Business Credit Clause	The Servicing Agency will allocate the socio-economic credit to the Requesting Agency for any contract actions it has executed on behalf of the Requesting Agency.
16.	Disputes	Disputes related to this GT&C and any related Orders shall be resolved in accordance with instructions provided in the Treasury Financial Manual (TFM) Volume I, Part 2, Chapter 4700, Appendix 5; Intragovernmental Transaction (IGT) Guide, at http://tfm.fiscal.treasury.gov/content/tfm/v1/p2/c470.html
17.	Requesting Assisted Acquisitions	
18.	Servicing Assisted Acquisitions	
19.	Requesting Clauses	See also Annex E Standard Legal Clauses This IAA does not itself obligate funds. Any obligation of funds in support of this agreement will be accomplished by executing an order on a FS Form 7600B or a DD Form 448, MIPR. Further, any costs payable under this agreement shall not exceed the amount obligated by the applicable FS Form 7600B or MIPR, as may be amended from time to time. No provision of this agreement or any order issued under this agreement will be interpreted to require obligation or payment of funds in violation of the Anti-deficiency Act. No work under this agreement will commence for any fiscal year prior to the Requesting Agency providing full fiscal year funding to the Servicing Agency via a FS Form 7600B or other valid Purchase Request/Order. In the event of termination of this agreement, Buyer shall continue to be

Figure 44. FS Form 7600A example page 2 of 5.

		responsible for all costs incurred by Seller under this agreement through the date of termination. Buyer shall also be responsible for reimbursing Seller for all costs incurred by Seller that are directly related to terminating an order under this agreement, including but not limited to cancellation and reduction costs allowable under law and DoD policy a. "Buyer will be responsible for reimbursing Seller for all costs it incurs in performance of orders issued under this agreement. If Seller forecasts its actual costs in performance of an order under this agreement to exceed the amount of funds available for that order, it shall promptly notify Buyer of the amount of additional funds necessary to complete the work under that order. Buyer shall either (1) agree to the increase in cost and provide the additional funds to Seller via amendment to the associated order or a new order, (2) request that the scope of work be limited to that which can be paid for by the then-available funds, or (3) direct termination of the work under that order. b. Buyer shall promptly provide any additional funding necessary through a modification of the applicable MIPR/FS Form 7600B, or issuance of a new order. If additional funding has not been received within 15 days of Seller notifying Buyer that additional funds are necessary, Seller will notify Buyer's finance office and request a funded order. If funding is not received within 30 days, Seller will request authorization from OUSD(C) to direct bill. Buyer must reimburse Seller for all costs it incurs in excess of funded orders unless Buyer informs Seller of its intent to limit or terminate such performance in accordance with this agreement." c. In situations where additional funding is required, Seller may stop performance of work under this agreement if Buyer does not submit a funded order within 30 days. Seller may not perform reimbursable work for Buyer if Buyer becomes 90 days or more in arrears in payment of previous reimbursable billings."	
20.	Servicing Clauses		
21.	Agency Additional Information	Requesting Agency (Buyer) Functional/Finance POCs: Support Agreement POC: Name: Email: Following agreement are hereby superseded:	Servicing Agency (Seller) Functional POC: Name: Email: Phone: Support Agreement POC: Name: Email: Phone: Finance POC: Name: Email: Phone:
MODIFY GT&C			
22.	Modification Date (yyyy/mm/dd):		
	Brief explanation required for modifying this GT&C prior to the original End Date:		
CLOSE GT&C			
23.	Closing Date (yyyy/mm/dd):		

Figure 45. FS Form 7600A example page 3 of 5.

	Brief explanation required for closing this GT&C prior to the original End Date resulting in early termination:	
REJECT GT&C		
24.	Rejection Date (yyyy/mm/dd):	
	Brief explanation required for rejecting this GT&C prior to the original End Date resulting in early termination:	
PREPARER INFORMATION		
25.	*Preparer Name	
	*Preparer Phone	
	*Preparer E-mail	

Figure 46. FS Form 7600A example page 4 of 5.

General Terms and Conditions (GT&C) Number: EXAMPLE

AGREEMENT APPROVALS			
By signing this agreement, you authorize the General Terms and Conditions as stated, and that the scope of the work can be fulfilled. By signing, you agree to periodically review the terms and conditions of the agreement and make any necessary modifications to the GT&C and any affected Order(s).			
		Requesting Initial Approval (required)	Servicing Initial Approval (required)
26.	*Approver's Name		
	*Signature:		
	Title	Comptroller	Support Agreement Coordinator
	*E-mail		
	*Phone		
	Fax		
	*Date (yyyy/mm/dd)		
		Requesting Final Approval (required)	Servicing Final Approval (required)
27.	*Approver's Name		
	*Signature:		
	Title	Director, DLA	Deputy Commander Financial Management
	*E-mail		
	*Phone		
	Fax		
	*Date (yyyy/mm/dd)		

Figure 47. FS Form 7600A example page 5 of 5.

2. FS Form 7600A - Annex A-D Statement of Work

EXAMPLE Annex A SOW – First Article Testing (FAT)

STATEMENT OF WORK (SOW) FOR: FIRST ARTICLE TESTING

1. NATURE OF WORK: Funds are provided to perform Government First Article Testing and/or Special Inspections for DLA Aviation (AVN) at Defense Supply Center Richmond (DSCR). These funds are provided for the First Article Testing (FAT) personnel to test/inspect items for the above designated organizations. These funds are not authorized to purchase equipment, calibrate equipment, etc., that are not directly related to testing/inspection performed for DLA AVN.

2. FUNDING: This Statement of Work (SOW) authorizes the work to be accomplished on a reimbursable basis. No billing (SF 1080) should be submitted until DLA AVN-FAU has received a complete test report. Billing should be submitted quarterly to DLA AVN-DOMB referring to the MIPR number as authority. NOTE: A copy of this funding document must accompany your request for payment in order for DFAS to process payment. Copies of the invoices submitted to DFAS should be provided electronically to the DLA AVN Accountable Receipt Official (ARO) at the time of submission to DFAS as evidentiary matter IAW OSD Memo.

    a. EXPENSE ACCRUAL: The Seller is not required to provide minimum quarterly accrual amounts for this order. DLA AVN, as the Buyer, processes accruals monthly using a monthly calculated cost average for periods not yet invoiced and expensed, based upon the approved performance period (order lifecycle) and order's total estimated cost. Accruals are systemically calculated and posted within the DLA accounting system on the last day of each month and reversed on the first day of the subsequent month. DoD 7000.14-R, Financial Management Regulation, Volume 4, Chapter 9, paragraph 090201

3. REPORTING:

    a. When testing/inspection has been completed, Supplier will send DLA AVN a copy of each test report detailing, at a minimum the following elements: Contract Number and Delivery Order, NSN, Manufacturer Name and Cage, Part name, Total Cost, any noted discrepancies, and an Approval, Conditional, or Disapproval determination. Only Conditional or Disapproval results will require an appropriate Engineering review. Document the reviewing Engineer on the Report Cover Sheet. Email report and applicable supporting documentation (i.e. DD 250/WAWF Receiving Report) to the above designated POC's.

    b. At the beginning of each week, provide, via email, a Work in Process (WIP) Spreadsheet to the above designated POC's. At a minimum, the spreadsheet shall include: Contract Number, NSN, Receipt, and Estimated Completion Dates.

    c. At the beginning of each month, provide, via email, Work in Process and Work Completed Spreadsheets to the above designated POC's. At a minimum, the spreadsheets shall include: Contract Number, NSN, Receipt Date, Estimated Completion Date or Date Completed as appropriate.

6. ADDENDUMS:
   a. Materials exceeding the FAT delivery schedule, as based on contract FAT Delivery Date requirements, are to be tested when received. Document the number of days late arriving at the Lab on all FAT Report Cover Sheets.

   b. On those occasions where multiple DLA AVN contracts are received at the FAT Lab for the same cage and NSN, prior to testing, a notification of duplicates shall be sent to the DLA AVN FAT Coordinator. The DLA AVN FAT Coordinator shall provide the Lab specific testing and return instructions.

   c. On those occasions where an expedite of FAT Testing is requested, with appropriate WEDGE, NMCS/MICAP, or PDM/Program Shutdown justification, by any concerned party, the DLA AVN FAT Coordinator shall function as the focal point to coordinate Work-in-Process List modifications with FAT Lab Management.

7. CHANGES TO TERMS & CONDITIONS: Without exception, changes made to any portion or part of the terms and conditions contained within this order, to include the need to increase or decrease funds, alter the performance period, or any other alterations that impact the order scope, if agreed to by both the buying and selling parties, will be documented with an order amendment generated by the buyer that requires seller acceptance. Communicate all desired alterations to the identified DLA AVN MIPR/FS7600B Generator. Defense Federal Acquisition Regulation (DFARS), Procedures, Guidance, & Information (PGI) 253.208

8. ORDER ACCEPTANCE & FUNDS OBLIGATION REIMBURSABLE (CATEGORY I): Considering funds expiration and the need for timely obligation, DLA requires that acceptance of this Reimbursable (Category I) order be provided to the identified DLA AVN MIPR/FS7600B Generator within 10 calendar days, by the second week of October of the new FY. DoD 7000.14-R, Financial Management Regulation, Volume 3, Chapter 8, paragraph 080610 and Volume 11A, Chapter 1, paragraph 010204.

9. RECEIPT & ACCEPTANCE TIMELY EVIDENTIAL MATTER: Proper receipt and acceptance of services or goods received on this order, initiated by the Selling Agency's bill (within 30 calendar days following the month of reimbursable work performance), is mandatory. The DLA AVN MIPR/FS7600B ARO specified above is responsible for ensuring that the goods/services received satisfy the criteria in the order and for providing acknowledgement that the goods/services are of acceptable condition/quality. For this reason, adequate documentation that substantiates the Selling Agency's billed amount must be provided to the DLA AVN MIPR/FS7600B ARO as bills are generated. Refer to the reimbursable billing standard contained within DoD 7000.14-R, Financial Management Regulation, Volume 11A, Chapter 1, paragraph 010202. Furthermore, IAW the audit evidence criteria outlined within DoD 7000.14-R, Financial Management Regulation, Volume 4, Chapter 9, paragraph 090201, the substantiating billing document must contain, at a minimum, the following information:
   a. Service or goods description, Order Number (JON, ION, Sales Order Number, MIPR/FS7600B Number, and/or WBS number, etc.). Billed Amount. Period of Performance for the Billed Amount.

STATEMENT OF WORK (SOW): HAZARDOUS MINIMIZATION (HAZMIN) & GREEN PRODUCTS

Requestor (Hazardous Minimization (HazMin) & Green Products Branch) utilizes Servicer as its servicing agency to execute HazMin/Green Products-Services-Processes projects. These projects support: 1) the strategies/goals in Executive Order (EO) 13834 Efficient Federal Operations; (2) DoDI 4105.72 Procurement of Sustainable Goods and Services; (3) DoD Strategic Sustainability Performance Plan (sub goal 7.1); and (4) Servicer's Sustainability goals, policies, and regulations thereby lessening its HazMat footprint while lowering its Environmental, Safety, and Occupational Health (ESOH) burdens.

For Requestor, these projects, in concert with the cited DoD references, (1) support its Strategic Goal of - Warfighter Always; (2) implement elements of DLAI 4140.22 (Supply Chain Hazard Communication, Hazardous Minimization/Sustainability, and the Ozone Depleting Substances Reserve); (3) enhance its portfolio of sustainable products and services that it can offer; (4) reflect Servicer's knowledge and understanding of its organizational HazMin/Green Products needs /requirements; and (5) utilize field testing, demonstrations, etc., for validation.

During the term of this Support Agreement (SA), the various HazMin projects that Servicer executes on our behalf can differ; however, each project reflects the sustainability requirements/needs (i.e., HazMin/Green Products/Services-Processes) which the Servicer has obtained from its various organizational entities.

For each Servicer proposal which Requestor approves during the period of this SA, Servicer will coordinate with its Requestor POC, prepare and submit a specific and detailed HazMin Project Statement of Work (SOW). SA will remain in effect for an agreed amount of time from date of last party signature. SA identifies the total estimated cost for term of agreement. Subsequent DD Form 448s/FS7600B will identify actual funding for each Fiscal Year (FY) Period of Performance (PoP) based on SA effective date.

Each HazMin SOW shall include: (1) title, (2) problem statement or background; (3) estimated cost, (4) estimated period of performance, (5) objectives; (6) approach; (7) stakeholders and respective tasks; and (8) project time schedule. Also included are: (1) technical and financial POCs, and (2) Military Interdepartmental Purchase Request (MIPR) category (i.e. Category 1 for reimbursable MIPR or Category 2 for direct citation MIPR).

Requestor's Project Manager will collaborate with the Servicer in initiating, implementing, overseeing, and completing any funded project. Projects may include testing and/or field demonstrations of environmentally responsible products and services as well as any revision of Servicer's technical manuals and specification revision or development.

Servicer shall not utilize Defense Working Capital Fund (DWCF) provided via Requestor's MIPR to procure equipment or modify or update existing equipment (i.e., no capital investments are permitted).

Servicer will abide by Requestor's detailed General Terms and Conditions (GT&C) contained in the Requestor's Outbound MIPR utilized to fund and execute the Servicer's detailed HazMin project SOW requirements and tasks.

FJT/IMGL, rev4; Feb 21

EXAMPLE Annex C SOW – Engineering Support

STATEMENT OF WORK: ENGINEERING SUPPORT

1. PROJECT DESCRIPTION: The purpose of this Statement of Work (SOW) is to identify tasks for Engineering Support Services specifically requested by Defense Logistics Agency (DLA). Engineering Support requests are defined as DLA Form 339 requests and other DLA pre-approved and documented requests. This SOW is applicable to the Defense Logistics Agency Activities (Aviation, Land & Maritime, and Troop Support) and Engineering Support Activity (ESA).

2. FUNDING: Funding will typically be obligated on a quarterly basis as identified on DD Form 448/FS7600B. Billing must be presented based on actual work performed. Funding will be adjusted as necessary if the actual work performed exceeds the estimated workload.

   Special projects may be considered, as necessary, to ensure engineering support workload is sufficient to meet the Funding Level.

   Limits: The following funding limits for individual DLA Form 339 requests are as follows:

   A. **Extended Engineering Efforts (EEE):** The funding for all EEE (Block 20 k DLA Form 339) requests are to be negotiated in advance and in writing.

   B. **Engineering Support Request**: (DLA 339's) ESA will consult with DLA Engineering Support for any Engineering Support Request (DLA 339's) exceeding 40 hours. A cost breakdown will have to be provided to DLA for any requests exceeding 40 hours.

3. MONHLY FINANCIAL REPORT (SF-1080) AND MONTHLY COST TRACKING:

   A. Servicing Agency will ensure an SF-1080 or equivalent billing document is forwarded to Defense Financial Accounting Services (DFAS) on a monthly basis. A copy must be forwarded to DLA Engineering Support.

   B. Servicing Agency will provide actual cost data and hours worked to the DLA Engineering Technical Manager's (ETMs) on a monthly basis, no later than the 15th of the following month, using the attached spreadsheet. Cost tracking will be submitted in accordance with the requirements of this Military Interdepartmental Purchase Request (MIPR) with total dollars provided each month. The ESA shall provide in detail, 339 case number, NSN, hours worked and costs.

   C. Any direct costs other than hourly labor costs shall be approved in advance in writing (E-mail acceptable) between the ESA and DLA Engineering Support and be documented/itemized in detail.

4. ADDITIONAL INFORMATION: DD Form 448-2/FS7600B will be signed and forwarded to the MIPR Administrator within 7 working days of receipt of MIPR.

5. HOURLY LABOR RATES: Hourly rates must be determined by the appropriate ESA and conveyed to DLA, prior to executing funding.

   NOTE: The rate is based on the ESA rate formulation sheet agreed upon by both the ESA and DLA Engineering Support.

6. DEVIATIONS: No deviation to this SOW is allowed without written bilateral agreement between the ESA and the DLA Engineering Support.

EXAMPLE Annex D SOW – National Stock Number Organic Manufacturing

STATEMENT OF WORK (SOW): NATIONAL STOCK NUMBER ORGANIC MANUFACTURING

GENERAL PROVISIONS

1. It is the responsibility of the performing activity to bring any required or requested change in support to the attention of the DLA Organic Manufacturing POC listed on the Military Interdepartmental Purchase Request (MIPR-DD448)/FS7600B via email to OMAviation@dla.mil prior to changing or cancelling support. A telephone call will be initiated to the requesting activity if acknowledgment is not received within 5 business days.
2. The performing activity providing reimbursable support in this agreement will submit statements of costs to the requesting activity, DLA Organic Manufacturing POC listed on the DD448, via email to OMAviation@dla.mil prior to changing or cancelling support. A telephone call will be initiated if requesting activity acknowledgment is not received within 5 business days.
3. AUTHORITY AND TERMS USED IN THIS GENERAL TERMS & CONDITIONS (GT&C (FS7600A)): This *GT&C* is *established* under the authority of the Project Order Law, 41 USC 6307 and the DOD Financial Management Regulation 7000.14-R volume 11A chapter 2. GT&C identifies the total estimated cost. Subsequent DD448/FS7600B will identify actual funding and Period of Performance (POP) for each FY based on GT&C effective date. The requesting and performing activities as used herein refers to the entities shown in block 1 respectively on page 1 of GT&C. The approving official refers to the individual authorized to accept or modify orders at the performing activity. The authorizing officer refers to the individual authorized to issue, modify, or terminate orders at the requesting activity.
4. Specific Project Orders against the approved support agreement will be denoted on the properly executed DD448/FS7600B by the Requesting Activity and acknowledged by the Performing Activity using DD448-2, Acceptance of DD448 or FS7600B.

SPECIFIC PROVISIONS

1. **ADMINISTRATION:** The Administration of the orders are performed by the authorizing officer at the requesting activity in a manner similar to that performed for commercial / private purchase order contracts.

2. **DESCRIPTION OF THE ITEM(S) TO BE PROVIDED**: The project order (DD448 or FS7600B) that also represents a purchase order includes the National Stock Number(s) (NSN) or item(s) description(s), reflecting a sufficient and detailed description, shown in the DD448 order. The order identifies the item(s) for manufacture of new condition code "A" serviceable material. Assets shall be delivered to the location specified in the order by the performing activity with traceable means and proof of delivery (POD), if necessary.

3. **RESTRICTIONS:** Project Orders are issued to government-owned and government-operated establishments that have the authority to operate a reimbursable program. In

addition, the facility must be capable of performing the majority of the ordered work and incur at least 51% of the workload cost. Project Orders cannot be issued to an organic facility for the purpose of establishing a capability to manufacture an item. Total costs to render the work or services ordered include the cost of goods or services obtained from or provided by contractors. No work, performance, or billing will start by the performing activity or approving official without prior conveyance of the Award Procurement Instrument Identification Number (PIIN) by the authorizing officer. Orders are invalid without a valid PIIN.

4. **TERMINATION FOR CONVENIENCE:** In event the requirement for the item changes, the requesting activity or the authorizing officer retains the right to terminate the order. In the event of termination, amount due by the performing activity shall be determined by level of effort, negotiation and mutual agreement between the approving official and the authorizing officer.

5. **PRE AWARD:** Service OM Sites shall use the most current DL-1838 Organic Manufacturing Quote, completing pages 1 and 2 and provide the quote and cost element breakdown in 30 days or less with correct information as follows:
    a. UNIT COST - total cost to whole dollar; divisible to whole dollar
    b. COMPLETE LEAD TIME- (raw material acquisition & production days) accuracy
    c. PROVIDE PLANNING COVERAGE DURATION (COVDUR) TO MATERIAL PREPOSITION
    d. ADDITIVE CLIN IDENTIFICATION – Providing notice of any equipment, tooling, or gauges required to be locally produced or purchased with DLA money, as well as any type of Test Requirement (FAT, PLT, FFF, FIT)
    e. MATERIAL ORDERING IF DLA IS BACKORDERED – Local Purchase (LP) buy-around of raw material requirements
    f. NON-RECURRING COST IDENTIFICATION AND BREAKDOWN

6. **ACCEPTANCE AND CHANGES:** This order is effective only when signed and accepted by the approving official and the authorizing officer. A signed DD448-2 or FS7600B must be returned to the requesting activity within 10 days after receipt. After acceptance, changes to the order shall be effective only by written mutual agreement between the approving official and the authorizing officer. The following POC shall be listed on the DD448-2 or FS7600B:
    a. Project manager POC
    b. Financial POC
    c. Quality POC

7. **POST AWARD/PAYMENT:** There is no expiration date applicable to the funds cited on page 1 of the DD448 order. The order is issued on a reimbursable basis, based on the quote provided by the performing activity for organic manufacture requirement. A copy

of this order must be attached to any request for payment. Payment will be made by the activity specified as the paying office in block 13 on the order. The billing amount shall not exceed that shown in the order unless mutually agreed upon and a modification of the amount payable is issued by the authorizing officer. Bills rendered shall not be subject to audit in advance of payment and payment will be made within 30 calendar days after receipt of the billing at the paying office. All funding must be invoiced within 30 days after the shipping delivery date IAW DOD Financial Management Regulation (FMR) Final Billing after which all remaining funding will be de-obligated. Post awards correspondence and Evidential Matter documents shall be delivered via email to vecompa@dla.mil .

8. **DELIVERY:** Delivery is freight on board (f.o.b.) destination direct to the address specified in the DD448 order. The required delivery date is firm, unless otherwise modified by the authorizing officer. A completed copy of the DD Form 250 and shipping tracking information shall be sent by E-Mail to the Organic Manufacturing Authorizing Officer documented in signature of DD-448 or FS7600B.

9. **PROJECT ORDER DEFAULT:** In event the item(s) is not delivered in accordance with the terms and conditions of the order in respect to delivery date, quantities, quality, technical acceptability, or other special requirements, the authorizing officer retains the right to terminate the order as allowed under the DOD FMR 7000.14-R, Volume 11A, chapter 2, paragraph 0205, subparagraph 020517. In event the order is terminated, the amount due the performing activity shall be determined by negotiation and mutual agreement between the approving official and the authorizing officer. The amount due shall be computed as of the date of the termination and in accordance with the procedures of the aforementioned regulation. The amount due shall in no event exceed the total price under the order as modified. For any request to cancel the DD448 the following information shall be sent to the Organic Manufacturing authorizing officer from block 15 of DD448.
    a. In depth reason as to why the DD448 is being cancelled.
    b. Provide incurred cost that defines DLA liability.
    c. Complete billing history to date by CLIN lines.
    d. Evidentiary material for the Project Order record

10. **RECONCILIATION/ RETURN OF FUNDS (ROF)**: ROF shall be initiated by the performing activity's Comptroller/Financial Point of Contact. The DD448-2 data block 12b shall be checked and the dollar amount to be returned shall be recorded.: Service OM sites shall provide the following close out documentation:
    a. Accounts Receivable Official (G-INVOICING)
    b. Complete billing history to date by CLIN lines
    c. Proof of Delivery (POD) DD Form 250 Material Inspection and Receiving Report

11. **QUALITY STANDARDS/INSPECTION**: Inspection will be conducted at the address in block 7, page 1 of the DD448. Contracting officers shall ensure that quality assurance provisions consistent with private sector vendor requirements are contained in the award document. A resident Quality POC must be made available for investigation of PQDRs and SDRs of OM produced products.

12. **COMMUNICATION/LATENESS NOTIFICATION:** The performing activity's (Block 7 of DD448) Business Office shall notify DLA (Block 8 of DD448) as soon as possible if the order will not be delivered according to the delivery due date. At that time, the approving official shall provide the reason for delay and provide a new delivery date. DLA will evaluate and provide a response.

13. **REPORTING FOR PROJECT PROGRESS OR MODIFICATION OF PURCHASE ORDERS:** The performing activity's Business Office will provide progress reports at regular occurring intervals occurring as 25%, 50% and 75% of funds are consumed. If over 75% of funds are consumed within 30 days of award, the approving official shall provide monthly updates along with a goods receipt, invoicing and final bill 90-days after final delivery. The approving official or respective Business Office shall alert DLA of delivery delays no later than 30 days prior to the contracted delivery date. Any other deviations to include reduced quantity or adjustment to cost shall also be cause for early notification prior to shipment.

14. **OTHER ARTIFACTS, NOTIFICATION AND PROJECT ORDER DETAILS:** All documents that form a basis for the project order shall be in agreement for details. This shall include quantity, cost, and delivery. Quotes shall provide a cost breakdown with line items that include tooling, material, and man hours as a minimum.

3. FS Form 7600A - Annex E Standard Legal Clauses

EXAMPLE Annex C SOW – Standard Legal Clauses

STANDARD LEGAL CLAUSES:

1. In case of mobilization or other emergency, this agreement will remain in force only within supplier's capabilities.

2. Any disputes relating to this agreement will, subject to any applicable law, Executive order, DoD Directive, or other DoD instruction, be resolved by consultation between the Parties or in accordance with DoDI 5145.05.

3. Supplier agrees to provide Receiver support/services as specified in the attached supporting documents within available resources and capabilities. Determination and findings for funding support and contract award shall be in accordance with the DoD Financial Management Regulation (FMR) 7000.14R and Federal Acquisition Regulation (FAR) 17.502-1.

4. For reimbursable agreements: The parties will review agreement each year for financial impact; if there are substantial changes in resource requirements the agreement will be reviewed in its entirety. Either party may initiate a review and/or modification at any time should changing conditions warrant. Any modifications or amendment to this agreement will be in writing and approved by both parties. Either Party may unilaterally terminate this agreement by providing at least 180 days written notice to the other Party. The date of termination shall be 180 days after such notice is received, unless otherwise agreed upon by the parties. In the event of termination, Requestor shall also be responsible for reimbursing Servicer for all costs incurred by Servicer that are directly related to terminating an order under this agreement, including but not limited to cancellation and reduction costs allowable under DoD policy through the date of termination.

5. For non-reimbursable agreements: All agreements must be reviewed and validated by both parties no less often than mid-point (e.g., year 4 in an 8 year agreement) from the agreement effective date.

6. For G-Invoicing Agreements, the FS Form 7600A (General Terms & Conditions (GT&C)) and any attachment, document the general terms and conditions but does not obligate funds. Funds are obligated via the FS7600B order form/ DD Form 448 Military Interdepartmental Purchase Request (MIPR). This is similar to an IDIQ/Task Order contract construct but does not require a minimum obligation. Obligations arise when a 7600B/MIPR order is issued, and therefore these orders must include detailed information about what is being ordered to satisfy legal obligation requirements. The terms of that order also govern the amount of the obligation. The FS7600 forms generally dictate the billing and payment terms (if not, ensure these terms are addressed). Further, any costs payable under this agreement shall not exceed the amount obligated by the applicable FS7600B or MIPR, as may be amended from time to time. No provision of this agreement or any order issued under this agreement will be interpreted to require obligation or payment of funds in violation of the Anti-deficiency Act. No work under this agreement will

commence for any fiscal year prior to the Requesting Agency providing full fiscal year funding to the Servicing Agency via a FS7600B or other valid Purchase Request/Order.

7. GT&C reimbursement costs for hourly support services plus material cost shall be identified on a separate reimbursable funding document FS7600B/MIPR.

8. This Agreement is not transferable except with the written consent of the Parties.

9. Servicer acknowledges that Requester funds applied to this agreement are time- limited funds subject to expiration at the end of each FY. By September 1 of the FY, Servicer will report to Requester that amount of funds under this agreement that have not yet been obligated by Servicer and its intentions with respect to the obligation of those funds. Requester will require a refund by September 10 of all funds under this agreement not expected to be obligated by Servicer by September 30.

10. If Servicer forecasts its actual costs under an order to exceed the amount of funds available under that order, it shall promptly notify Requestor of the amount of additional funds necessary to complete the work under that order. Requestor shall either (1) agree to the increase in cost and provide the additional funds to Servicer via amendment to the associated order or a new order, (2) require that the scope of work be limited to that which can be paid for by the then-available funds, or (3) direct termination of the work under that order.

11. This GT&C shall not affect any pre-existing or independent relationships or obligations between the parties. Nothing in this agreement, express or implied, is intended to give to, or will be construed to confer upon, any person not a party any remedy or claim under or by reason of this agreement and this agreement will be for the sole and exclusive benefit of the Parties.

12. The provisions of this GT&C that the parties agree during termination will require performance after the expiration or termination of this GT&C shall remain in force notwithstanding the expiration or termination of this GT&C.

13. If any provision of this GT&C is determined to be invalid or unenforceable, the remaining provisions shall remain in force and unaffected to the fullest extent permitted by law and regulation.

14. For Agreements executed after the start date: This GT&C memorializes an agreement made between individuals authorized to bind their respective agencies entered into on 10/01/2019. The signatories to this agreement have the authority to, and have, ratified this agreement to account for the period starting 10/01/2019 through the date of last signature.

15. In the event where an emergency repair/buy is required (even if the material remains Service owned), and supporting documentation will delay the repair/buy, then funding and repair/buy should be authorized. Supporting documentation will still be required to be approved in the event the funding and repair is completed prior to approved documentation.

16. Although this GT&C does not obligate funding, it does however document the acceptance/delivery of both Reimbursable (CAT I) and Direct Cite (CAT II), which is identified separately on the 7600B/MIPR.

17. For Economy Act Assisted Acquisitions, Economy Act determinations have been made to support the scope of this agreement. The use of an interagency acquisition is in the best interest of the Government. The goods and/or services within the scope of this agreement cannot be obtained as conveniently or economically by contracting directly with a private source; and the Servicing Agency is specifically authorized by law or regulation to purchase such good and/or services on behalf of Requesting Agency. In accordance with Section 1535 of Title 31, United States Code, the Requesting agency determines that it is in the best interests of the government to place an order with Servicer under the authority of the Economy Act.

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