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DETERMINATION FOR UNITED STATES SPACE
FORCE SPACE LAUNCH SERVICES**

Miller, April M.; Steff, James L., Jr.

Monterey, CA; Naval Postgraduate School

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

CAPSTONE APPLIED PROJECT REPORT

**AN ANALYSIS OF THE COMMERCIALITY
DETERMINATION FOR UNITED STATES
SPACE FORCE SPACE LAUNCH SERVICES**

December 2022

**By: April M. Miller
James L. Steff Jr.**

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AN ANALYSIS OF THE COMMERCIALITY DETERMINATION FOR UNITED STATES SPACE FORCE SPACE LAUNCH SERVICES

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN CONTRACT MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
December 2022**

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AN ANALYSIS OF THE COMMERCIALITY DETERMINATION FOR UNITED STATES SPACE FORCE SPACE LAUNCH SERVICES

ABSTRACT

The Orbital Service Program-4 (OSP-4) acquires launch missions as commercial items in accordance with FAR Part 12 to comply with 51 USC §50132, “Acquisition of commercial space transportation services,” which requires space transportation to be considered a commercial item under acquisition laws. As a result, acquisition professionals must opt for contract structures that only allow for Firm Fixed Price contract types and consequently are prohibited from utilizing cost reimbursement contract types. The National Security Space Launch program (NSSL) and the Orbital Service Program (as part of the Rocket Systems Launch Program) share a common commercial item determination and operated under the same Launch Enterprise Division of Space Systems Command until March 2022. As of March 2022, the two programs were realigned under different Deltas within Space Systems Command. This Capstone Applied Project analyzes the current policy for the acquisition of commercial space transportation services as it applies to both the NSSL and OSP-4 programs. Furthermore, the research seeks to address difficulties in determining fair and reasonable prices for space launch services due to the commercial contracts for space launch services containing noncommercial requirements.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|--------|--|
| AATS | Assured Access to Space |
| AFSPCI | Air Force Space Command Instruction |
| AT&L | Acquisition Technology and Logistics |
| CAS | Contract Accounting Standard |
| CID | Commercial Item Determination |
| CLIN | Contract Line Item Number |
| CMBOK | Contract Management Body of Knowledge |
| CMS | Contract Management Standard |
| CPD | Capabilities Production Document |
| CRS | Congressional Research Study |
| D&F | Determination and Findings |
| DFARS | Department of Defense Federal Acquisition Regulation |
| DOD | Department of Defense |
| EDA | Electronic Document Access |
| EELV | Evolved Expendable Launch Vehicle |
| FAA | Federal Aviation Administration |
| FAR | Federal Acquisition Regulation |
| FASA | Federal Acquisitions Streamlining Act |
| FY | Fiscal Year |
| GAO | U.S. Government Accountability Office |
| GFE | Government Furnished Equipment |
| ICBM | Intercontinental Ballistic Missile |
| IDIQ | Indefinite Delivery Indefinite Quantity |
| LEO | Lower Earth Orbit |
| MRD | Mission Requirements Document |
| MRR | Market Research Report |
| NASA | National Aeronautics and Space Administration |
| NCMA | National Contract Management Association |
| NDAA | National Defense Authorization Act |
| NGIS | Northrop Grumman Innovation Systems |

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| NSPD | National Security Presidential Directive |
| NSSL | National Security Space Launch Program |
| OIG | Office of the Inspector General |
| OSD | Office of the Secretary of Defense |
| OSP | Orbital Services Program |
| PEO | Program Element Office |
| PIEE | Procurement Integrated Enterprise Environment |
| PNM | Price Negotiation Memoranda |
| PWS | Performance Work Statement |
| RSLP | Rocket Systems Launch Program |
| SAR | Selected Acquisition Report |
| SLIS | Small Launch Interface Specification |
| SLPRD | Small Launch Performance Requirements Document |
| SMC | Space and Missiles Command |
| SME | Subject Matter Expert |
| SpaceX | Space Exploration and Technologies Corporation |
| SPD | Space Policy Directive |
| SpOC | Space Operations Command |
| SSC | Space Systems Command |
| STARCOM | Space Training and Readiness Command |
| ULA | United Launch Alliance |
| ULS | United Launch Services |
| USAF | United States Air Force |
| USC | United States Code |
| USD(AT&L) | Under Secretary of Defense for Acquisition and Sustainment |
| USSF | United States Space Force |

I. INTRODUCTION

This chapter provides an introduction to our research. We will first discuss the background for our research. The problem statement and purpose of the research will be identified. The questions this research seeks to answer will follow. The methodology for conducting the research, benefits and limitations of the research, and the organization of this report will each be presented. Lastly, a brief summary will be provided before moving onto Chapter II.

A. BACKGROUND

The USSF was formed on December 19, 2019. The catalyst for the formation of the USSF was on February 19, 2019 when former President Trump issued a Space Policy Directive (SPD) titled “Establishment of the United States Space Force.” This directive provided instructions for the Department of Defense (DOD) to develop a legislative proposal to establish a USSF (Executive Office of the President, 2019). Ten months later, the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2020 was signed, officially creating the sixth branch of the United States Armed Forces (National Defense Authorization Act for Fiscal Year 2020, 2019).

The USSF is comprised of three separate commands: Space Systems Command (SSC), Space Operations Command, and Space Training and Readiness Command. SSC is “headquartered in Los Angeles, California, and is responsible for developing, acquiring, equipping, fielding, and sustaining lethal and resilient space capabilities for warfighters” (*Space Systems Command Mission Video*, 2022, n.p.).

The mission of the USSF, and specifically SSC, is to acquire goods and services to provide space capability to the warfighter. Some of these acquisitions are for military unique, or noncommercial, types of goods and services. Other acquisitions are for commercial types of goods and services. Contracting for the noncommercial goods and services uses a traditional acquisition approach. Contracting for commercial goods and services utilizes a more streamlined acquisition approach. Both approaches require the negotiation of a fair and reasonable price, which can sometimes be challenging. In order

for an acquisition to utilize a streamlined approach, the goods and services must be determined commercial by the government. In some instances, goods and services determined to be commercial are not, and may include noncommercial goods and services. In these instances, the challenge to negotiate a fair and reasonable price becomes greater.

B. PROBLEM STATEMENT

Two of the USSF acquisition programs, National Security Space Launch (NSSL) and Rocket Systems Launch Program's (RSLP) Orbital Services Program-4 (OSP-4), have been determined to be commercial services. Thus, the programs utilize the streamlined acquisition procedures set forth in the Federal Acquisition Regulation (FAR) Part 12. However, though the two programs were determined to be commercial, there are noncommercial requirements that do not support a commercial acquisition approach. These noncommercial requirements present a greater challenge to negotiate a fair and reasonable price.

C. PURPOSE STATEMENT

The focus of this analysis will be to determine if the noncommercial requirements in these otherwise commercial launch services are significant enough to require an alternative acquisition approach. The purpose of our research is to conduct an analysis of the commerciality determination and analyze the specific noncommercial requirements to answer the research questions in the following section.

D. RESEARCH QUESTIONS

An analysis of the commerciality of space launch services will be accomplished to provide current procuring contracting officers and policy makers with insight to ensure the policies of determining prices fair and reasonable as well as the procurement of space launch services are consistent with what is offered in the commercial marketplace. We focus our research to answer the following three research questions:

1. How did the NSSL and RSLP programs determine that their space launch services are commercial?

2. What are the noncommercial requirements in the RSLP OSP-4 program that are creating a challenge to negotiating a fair and reasonable price?
3. What recommendations can we provide to the USSF for improving the acquisition of space launch services in the future?

E. METHODOLOGY

In order to answer the first research question and determine how the NSSL and RSLP programs determined space launch services are commercial, we will obtain and review the commercial item determination used for the NSSL and RSLP acquisitions. In order to answer the second research question of identifying the noncommercial requirements that create a challenge to negotiating fair and reasonable prices, we will obtain the performance work statement to extract and identify noncommercial requirements of the RSLP OSP-4 program. We will obtain the price analysis information performed on RSLP OSP-4 acquisition and identify the challenges to negotiating a fair and reasonable price for the commercial acquisitions.

Finally, after we obtain and analyze the commerciality determination of both programs, the noncommercial requirements, and the challenges to determine prices fair and reasonable, we will recommend alternative acquisition approaches to the USSF to acquire space launch services in the future.

F. BENEFITS OF THE RESEARCH

Some benefits to conducting this research apply to multiple agencies that acquire commercial services that may include noncommercial requirements. This research may assist in these agencies' fair and reasonable price negotiations. A secondary benefit would be to the USSF for specifically addressing those noncommercial requirements within the commercial space launch services it acquires. This research will provide awareness of space launch services that have elements of noncommercial criteria but are determined to be commercial. It will also provide information on the impact commerciality have regarding determination of a fair and reasonable price. Finally, this research may provide

recommendations for alternative methods of acquiring space launch services that support negotiating a fair and reasonable price.

G. LIMITATIONS OF THE RESEARCH

Space launch services are procured by several organizations, including those at SSC and USSF. The limitations of this research are that this thesis will only focus on the RSLP OSP-4 program within SSC and USSF. Additionally, this research will only discuss the information that was accessible and releasable on the RSLP OSP-4 program.

H. ORGANIZATION OF REPORT

This report is divided into six chapters. Chapter I discusses the background of USSF, SSC, and the commercial launch services acquisitions we will focus our research on. The remainder of Chapter I discusses the problem and purpose statements, some benefits and limitations of the research, our research questions are also discussed along with the research methodology, and the organization of the report. Chapter II includes a literature review that forms the basis of the research. It begins with the theoretical foundations that inform our research and the statutes and policies that govern the acquisition of space launch services. Additionally, Chapter II will present the contract management process, including the pre-award, award, and post award phases. Chapter II will also present policies and research on determining fair and reasonable prices for commercial items. Chapter III will provide an overview and history of the NSSL and RSLP OSP-4 acquisitions for commercial space launch services. It will also discuss organizational structure as it pertains to the programs. Chapter IV will present the research methodology that will include the sources of data we will analyze, the types of data we will obtain, and discuss how we will analyze the data. Chapter V will report the findings and analysis of our research, and will consist of a comprehensive look at how commerciality was determined for NSSL and RSLP programs. We will then present the noncommercial requirements within the RSLP OSP-4 program. Additionally, we will present how the program determined their prices fair and reasonable and the challenges the program faced. We will include quantitative data from the RSLP OSP-4 acquisition to demonstrate these

challenges. Chapter VI will provide a summary, a conclusion, and areas for further research.

I. SUMMARY

This chapter introduced our research. We discussed the background for our research. The problem statement and purpose of the research were identified. The questions this research seeks to answer were presented along with the methodology for conducting the research, benefits and limitations of the research, and lastly the organization of this report. The next chapter will be a literature review that forms the basis of the research.

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II. LITERATURE REVIEW

This chapter discusses the theoretical foundation that informs this research. Agency theory as applied to contract models presents the principal-agent relationship between The United States Space Force (USSF) and contractor. Auditability theory presents a conceptualized framework for internal processes and controls to increase confidence and auditability of price fair and reasonable determinations. Next, we will examine the legal basis for procurement of space launch services and applicable policies obtained through research of laws and regulations. We will present research on phases of the contract life cycle to identify key elements for pre-award, award, and post award phases. This literature review will also review research on commerciality determinations and previous research on determining price fair and reasonable for commercial items. Lastly, we will review previous research on space launch services and other government reports related to this research.

A. THEORETICAL FOUNDATION FOR RESEARCH

1. Agency theory

Agency theory has been used to analyze contract formation and the relationships between the contract parties (Rendon, 2015). For this research, the space launch service contracts reflect a principal-agent relationship between the USSF and contractor, respectively. Through task orders placed under the contract, the principal (USSF) assigns tasks to the agent (contractor) to perform a service. This service includes space launch services and data deliverables.

Agency theory and the principal agent relationship is presented in a 2015 article by Rene Rendon for *Benchmarking: An International Journal* and provides that the principal and agent have conflicting objectives. When the principal and agent try to negotiate a fair and reasonable price, a challenge is presented due to the conflicting objectives of the principal and the agent. The principal's objectives are to obtain the right product/service for the right price, on the agreed upon schedule and quality, and in accordance with policy and regulations (Monczka et al., 2016, as cited in Rendon, 2015). The services in this

research are for a successful space launch. The right price is determined through the negotiation of a fair and reasonable price. The tasks, schedule and quality requirements are defined in each task order for each space launch mission. The policy and regulations provide the direction of and how the USSF shall acquire the space launch services. The agent's objectives include profit, cashflow, risk mitigation for shareholders, positive publicity, market share, and positive past performance for future efforts. Agency theory informs ways of structuring contracts to lessen the impact of the principal and agent's competing objectives in achieving their individual goals (Eisenhardt, 1989).

Agency theory further presents the concept of asymmetrical information. The information each party contributes to the contract is asymmetric. Each party may withhold information that may be detrimental to the other party's objectives (Banker et al., 2019). The principal provides information on the mission, scope, purpose, and national security impacts of their mission, while the agent possesses information on the level of effort, cost, and delivery timelines required to successfully perform the space launch service. The information becomes more asymmetric due to the commerciality of space launch services because the policy and regulations for commercial services do not require the agent to provide cost element information in the form of certified cost and pricing data. This may lead to the agent withholding specific cost data to maximize their profit. Because of their competing interests and asymmetrical information, the principal and agent are driven to act in a certain way (Rendon, 2015).

Agency theory also presents the idea of adverse selection and moral hazard, which cause tension between the contract parties. Adverse selection is present as the action of the principal selecting an agent based on the pre-award information the agent provides to the principal (Banker et al., 2019). For this research example, the agent is allowed to withhold cost element information that may prevent the principal from negotiating a true fair and reasonable price. The agent's lack of transparency may result in the principal paying a higher price, which incentivizes the agent to withhold information. Moral hazard presents itself as the ability of the principal to measure the effort performed by the agent in the post award phase of the contract. The agent, in the commercial launch service contracts, is able to hide behavior to limit the principal's insight into their performance of the contract (labor

hours, level of effort, etc). The agent’s ability to withhold information incentivizes the agent to limit the principal’s insight into their performance in order to keep receiving a potentially higher profit on their space launch services. “Because of this tension between pre-award and post award incentivization, the principal could potentially gain (better pricing) from better pre-award information” (Banker et al., 2019, p. 1203).

This research utilizes the elements of agency theory to gain insight into the contracting process and seeks to confirm that information sharing is the cornerstone of having confidence in awarding contracts to perform the government’s requirements, and may contribute to a fairer and more reasonable price. Space launch services determined to be commercial may limit the amount of information the agent (contractor) is required to provide to the principal (government) when negotiating a fair and reasonable price as part of a best value decision.

2. Auditability theory

Research related to auditability theory as applied to the contract management process by Rendon and Rendon (2015), asserts “auditability theory emphasizes the need for competent personnel, capable processes and effective internal controls to ensure integrity, accountability and transparency in procurement operations” (p. 750). Rendon and Rendon further state that “The processes aspect of auditability refers to the effectiveness of organizational processes in performing tasks during contract life cycle phases” (p. 754). This research will examine the pre-award phase process of determining the commerciality of space launch services that contain noncommercial requirements. We further seek to analyze how that process impacts the effectiveness of fair and reasonable price negotiations.

The impact of determining a service as commercial during the pre-award phase, removes the requirement for the government to obtain certified cost and pricing data. Without sufficient insight or historical data to trace the cost elements for those noncommercial requirements included in the National Security Space Launch (NSSL) and Rocket Systems Launch Program (RSLP) Orbital Services Program-4 (OSP-4) space launch services contracts, there is reduced confidence in the process used to negotiate a fair

and reasonable price. These weakened areas impact the effectiveness of the organization and are illustrated by the auditability-conceptualized framework (Figure 1) as presented by Rendon and Rendon (2015) in their paper titled “Procurement fraud in the U.S. Department of Defense - Implications for contracting processes and internal controls” (2015).



Figure 1. Conceptualized Auditability Framework. Source: Rendon & Rendon (2015, p. 8).

The capable processes in the contract life cycle phases performed by competent employees, strengthen transparency, reinforce effective internal controls, and ensure value for money (Rendon & Rendon, 2015). Rendon and Rendon (2015) cite Power’s claim of “Such focus on auditability is more about ‘making things auditable’ than it is about conducting an audit or an inspection” (Power, 1996, p. 289, as cited in Rendon & Rendon, 2015).

This research utilizes the elements of auditability theory to analyze the capable process of determining space launch service contracts commercial when some of the requirements are noncommercial. Furthermore, we seek to analyze the difficulty in negotiating fair and reasonable prices for space launch service contracts. The next section will discuss the laws and policies governing space launch acquisition that apply to the federal government.

B. LAWS AND POLICIES GOVERNING SPACE LAUNCH ACQUISITION

In this section, we present the legal and policy guidance, which govern the space launch service contracts in our research. The laws mandate acquisition strategy for federal agencies procuring space launch services. Priorities Frameworks from The White House do not carry the force and effect of law; however, they are a complement to presidential policy directives. Executive Orders are a type of presidential directive used to direct executive branch officials and provide instructions on how to manage agency operations. (Wilhelm, 2019).

1. Acquisition of commercial space transportation services

The United States mandates the acquisition strategy for federal agencies procuring space launch services. United States Code (USC) Title 51, section 50132 (a), “Acquisition of commercial space transportation services,” states, “Acquisition of space transportation services by the federal government shall be carried out in accordance with applicable acquisition laws and regulations. For purposes of such law and regulations, space transportation services shall be considered to be a commercial item” (2013, n.p.).

In accordance with this law, the NSSL program, determined the space launch services as a commercial service “of a type.” This research will analyze the acquisition of RSLP OSP-4, which utilized the commercial item determination from NSSL. The commerciality of space launch services causes difficulty in determining price reasonableness.

2. Assured Access to Space Law

The Assured Access to Space Law provides a level of redundancy and a secondary mode of launching payloads critical to national defense should one of the modes become unavailable or unusable. This is achieved by having multiple programs procuring USSF and DOD Launch Missions (McCall, 2022).

USC Title 10, chapter 135, section 2273, defines the policy regarding assured access to space. The President of the United States shall take action to ensure the “availability of at least two space launch vehicles (or families of space launch vehicles)

capable of delivering into space any payload designated by the Secretary of Defense or the Director of National Intelligence as a national security payload; and to maintain a robust space launch infrastructure and industrial base” (National Defense Authorization Act for Fiscal Year 2003, 2003).

Our research discusses both the NSSL and RSLP OSP-4 acquisitions. The Phase II acquisition of the NSSL program provides two space launch service providers as mandated by the Assured Access to Space Law. RSLP OSP-4 also conforms to the Assured Access to Space Law by competing launch requirements amongst eleven providers, which satisfies the continued maintenance of the nation’s space launch infrastructure and industrial base.

3. United States space priorities framework

The President of the United States directs national space policy. The White House released the United States Space Priorities Framework in December 2021 outlining President Biden’s direction for the U.S. Space Enterprise. The priority as outlined in the framework is “maintaining a robust and responsible U.S. Space Enterprise” (White House, 2021, p. 5). The focus is to “maintain a vibrant space enterprise for the civil, commercial, and national security sectors” (White House, 2021, p. 5). The White House’s priorities framework identifies several dictates required to secure this priority:

1. The United States will maintain its leadership in space exploration and space science.
2. The United States will advance the development and use of space-based Earth observation capabilities that support action on climate change.
3. The United States will foster a policy and regulatory environment that enables a competitive and burgeoning U.S. commercial space sector.
4. The United States will protect space-related critical infrastructure and strengthen the security of the U.S. space industrial base.
5. The United States will defend its national security interests from space’s growing scope and scale and counter-space threats.
6. The United States will invest in the next generation. (White House, 2021, p. 5)

The second priority identified in the White House’s priorities framework is Preserving Space for Current and Future Generations. The following dictates are identified to achieve this priority:

1. The United States will lead in strengthening global governance of space activities.
2. The United States will bolster space situational awareness sharing and space traffic coordination.
3. The United States will prioritize space sustainability and planetary protection. (White House, 2021, p. 6)

The promise as outlined in the framework is that “The United States will harness the use of space to tackle the most pressing challenges at home and abroad, while leading the international community in preserving the benefits of space for current and future generations” (White House, 2021, p. 7). The flow of policies and directives is important in understanding the regulatory requirements that contribute to contract formation for the small launch efforts discussed in this research. Our research examines the acquisitions the USSF implements to adhere to the laws and regulations governing the acquisition of space launch services. The next section discusses the contract management process.

C. CONTRACT MANAGEMENT PROCESS

This research focuses on the process of making commercial item determinations and the subsequent process of negotiating a fair and reasonable price. These processes are part of a larger contract management process and occur during the phases that make up the contract life cycle. The National Contract Management Association (NCMA) Contract Management Standard (CMS) states that “contracts have a distinct beginning and end, and the contract life cycle defines these parameters” (2019, p. 3). According to the NCMA’s Contract Management Body of Knowledge (CMBOK), “the three discrete contract phases of the contract life cycle commonly consist of Pre-Award, Award, and Post-Award” (2019, p. 3). This section will discuss these phases and present the processes of commercial item determinations and fair and reasonable price negotiation within those contract life cycle phases.

1. Pre-award phase

According to the CMBOK, “Contract managers fall into two primary functions: Buyer and Seller. Buyers require goods and/or services to be fulfilled by the seller. Sellers are tasked with fulfilling the buyer’s requirement for goods and/or services” (NCMA,

2019, p. 92). Under each contract life cycle phase, the contract manager operates in a specific domain. In Pre-Award, the buyer works in the domain of Develop Solicitation. The Seller operates in the Pre-Award domain of Develop Offer. (NCMA, 2019, p. 126)

In order to develop the solicitation, the requirement must be well defined, market research must be conducted, a risk analysis must be performed, and the contracting strategy must be developed. The buyer has specific pre-award tasks to perform. The most applicable of these for our research are the requirements analysis and conducting market research. These tasks most heavily weigh in the decision to formulate contracting strategy. Specifically, determining contract type (ranging from cost to firm fixed price) and proper contract method (commercial, simplified, formal source selection) (NCMA, 2019, p.126).

This research will discuss the commercial item determination as part of the Pre-Award Phase of the contract life cycle as well as how the determination affects contract types and acquisition approaches.

2. Award phase

The Award Phase consists of the domain of Forming the Contract. The contract type and contract method defined in the Pre-Award Phase determines the Price or Cost Analysis method performed in the Award Phase. Price or Cost Analysis is the method used in determining a fair and reasonable price. This responsibility is attributed to the contracting officer in their role of “safeguarding the interests of the United States in its contractual relationships” (Federal Acquisition Regulation [FAR] 1.602-2, 2022, n.p.).

The RSLP OSP-4 contracts were awarded as an Indefinite Delivery, Indefinite Quantity (IDIQ), Multiple Award Contracts with each space launch service to be awarded as a separate task order. Our research will present the challenges associated with price analysis during the Award Phase of the contract life cycle as it applies to our research questions and the RSLP OSP-4 contracts specifically due to each task order being a commercial contract awarded on a firm-fixed-price basis.

3. Post-award phase

The Post-Award phase consists of two domains, the Perform Contract Domain and the Close Contract Domain. Within the Perform Contract Domain, there are four competencies: Administer Contract, Ensure Quality, Manage Subcontracts, and Manage Changes (NCMA, 2019).

Our research will focus on the Manage Changes competency as it applies to the process contracting officers must perform when changes to a contract or task order are necessary. Changes to a contract or task order may result in the need for equitable adjustment. When an equitable adjustment to the price is made, an additional fair and reasonable price negotiation must be documented (FAR 15.406-3, 2022). Next, we will discuss commerciality determinations.

A. COMMERCIALITY DETERMINATIONS

Current DOD policy states a preference for utilizing commercial practices when procuring items/services. In 1994, the Federal Acquisitions Streamlining Act (FASA) created FAR Part 12, dedicated solely to the acquisition of commercial items/services and which stated this preference. FAR Part 12, Acquisition of Commercial Products and Commercial Services (2022) provides a streamlined acquisition approach when procuring commercial items/services by “establishing acquisition policies more closely resembling those of the commercial marketplace and encouraging the acquisition of commercial products and commercial services.” The Pre-Award Phase of the contract life cycle, specifically the Develop Solicitation domain, include the process of determining if items or services are commercial. This research presents the regulatory definition and requirements for an item/service to be determined commercial.

A “Commercial Item” is defined by FAR 2.101. Broad descriptors state: “sold, leased or licensed” to the public, and “of a type” which are “customarily used by the public” (FAR 2.101, 2022, n.p.). The Contracting Officer must use sound business judgement in determining an item/service as commercial. To assist in the determination, pre-solicitation market research is to be accomplished in the Develop Solicitation domain. This determines commercial availability of an item/service that would meet the government’s requirement,

or if the item/service needs modification in order to meet the requirement (OSD AT&L, 2018). Additionally, in the DOD Guidebook for acquiring commercial items states, “DOD specific requirements for the acquisition of commercial items are provided in the Department of Defense Federal Acquisition Regulation (DFARS) Part 212. Most notable is the long-standing requirement for DOD contracting officers to determination in writing that an acquisition exceeding \$1 million in value meets the commercial item definition in FAR 2.101 and to include the written determination in the contract file” (OSD AT&L, 2018, p. 13). The USSF (formerly as U.S. Air Force) determined space launch to be a commercial service by issuing a commercial item determination in 2015 for the NSSL Phase 1A acquisition (USSF RSLP OSP-4, Personal Communication, May 19, 2022). The commercial item determination was provided to us via email as part of this research from the RSLP OSP-4 program office’s contract files.

As of April 28, 2022, DOD issued a final rule amending the DFARS to further implement section 848 of the NDAA for FY 2018, codifying this requirement (Defense Federal Acquisition Regulation Supplement [DFARS], 2022).

The final rule in the DFARS states, If a prior DOD commercial item determination for the same item is made by [DOD], contracting officers may presume that the prior commercial item determination shall serve as a determination for subsequent procurements of such item, unless the process is followed to overturn the prior determination. (DFARS 212.102, 2022, n.p.)

Prior to this final rule the DOD Guidebook for Acquiring Commercial Items, Part A, 2018 stated “DOD contracting officers may rely on the most recent, prior DOD contracting officer’s determinations for any future purchases of the same item without additional justification” (OSD AT&L, 2018, p.15).

This research will examine the elements that formed the basis of the NSSL’s commerciality determination and explore the noncommercial requirements that were not factored into the subsequent commerciality determination for RSLP OSP-4. We will also examine the timeline in which the commerciality determinations related to our research were made. If a service is determined to be commercial, the subsequent price analysis and

fair and reasonable price negotiations are impacted. The next section will discuss fair and reasonable price determinations.

B. FAIR AND REASONABLE PRICE DETERMINATIONS

The Award Phase of the Contract Life Cycle and Form the Contract Domain include the competencies of Price Analysis and Planning Negotiations (NCMA, 2019, p.181). The determination of a fair and reasonable price is made from the Price Analysis and resultant negotiations that must be documented in the contract file (FAR 15.406-3, 2022). FAR 15.305-(a)(1) states that “normally, competition establishes price reasonableness. Therefore, when contracting on a firm-fixed-price basis, comparison of the proposed prices will usually satisfy the requirement to perform a price analysis, and a cost analysis need not be performed” (FAR 15.305, 2022, n.p.). Furthermore, price analysis is defined as the “process of examining and evaluating a proposed price to determine if it is reasonable, without breaking down the price and evaluating its separate cost elements and proposed profit” (FAR 15.305, 2022, n.p.).

The contract actions in this research were solicited and awarded as commercial services on a firm-fixed-price basis, which only allow for price analysis. However, these contracts contain noncommercial elements not found in the commercial space launch service marketplace. The contract actions in our research contain noncommercial requirements within the commercial contracts making the price analysis and fair and reasonable price negotiations more difficult. Additionally, the commerciality of these contracts remove the requirement for the contractor to provide certified cost and pricing data nor do the contractors have to establish and maintain a Cost Accounting Standards (CAS) compliant accounting system (Agnello, 2016). As Moye (2016) stated “Classifying an item as commercial reduces the government’s ability to ask for information to determine whether prices are fair or reasonable, based on the assumption that these prices would be shaped by market forces” (p.1). The removal of the requirement for the contractor to provide certified cost and pricing data and have a CAS compliant accounting system, puts the government at a disadvantage when negotiating a fair and reasonable price. This research will identify the methods used to conduct price analysis on the RSLP OSP-4

contract and subsequent task orders. The next section will discuss the manage change process.

C. MANAGE CHANGE PROCESS

As previously discussed, this research presents the Manage Changes competency of the Perform Contract domain within the Post-Award Phase of the contract life cycle. The Manage Changes competency applies to the process contracting officers must perform when changes to a contract or task order are necessary. The CMBOK outlines a six-step Manage Change process. The process provided in Table 1 closely resembles the basic contract life cycle but only includes the aspects of the original contract that must be changed (NCMA, 2019, p. 217).

Table 1. Six-Step Manage Change Process Source: NCMA (2019, p. 219)

| Six Step Manage Change Process | |
|--------------------------------|---|
| Step 1 | Initiate the Contract Change |
| Step 2 | Plan the Contract Change |
| Step 3 | Approve and Negotiate the Contract Change |
| Step 4 | Award the Contract Change |
| Step 5 | Administer the Contract Change |
| Step 6 | Closeout the Contract Change |

As Contracting Officers, we recognize this process as issuing contract modifications in accordance with FAR Part 43. Changes to a contract can be unilateral or bilateral. Unilateral modifications are changes made to the contract without the agreement of the seller. These mostly include administrative changes, changes made in accordance with clauses, and termination notices. Bilateral modifications are considered supplemental agreements and are agreed to by both parties (NCMA, 2019, p.218). Some changes may require the negotiation of an equitable adjustment when such changes result in a change to the contract price. Step 3 of the six-step process, Approve and Negotiate the Contract Change, would include negotiating and determining a fair and reasonable price prior to awarding the contract change via a contract modification in accordance with the FAR and DFARS.

This research will address the RSLP OSP-4 task orders for space launch services and resultant contract modifications that require equitable adjustments. Once a contract or task order is awarded, the subsequent modifications then put the government into the position of negotiating with a single seller. As previously discussed, when negotiating a fair and reasonable price for a commercial firm-fixed-price contract, “competition usually determines the price reasonableness” (FAR 15.305, 2022, n.p.). If the government must negotiate a price for a commercial service on a firm-fixed-price basis without the presence of adequate price competition or supporting certified cost or pricing data, determining price reasonableness may be difficult. The next section will discuss previous research found in government reports on space launch services, commerciality determinations, and price reasonableness determinations.

D. OTHER GOVERNMENT REPORTS

This research focuses on space launch services procured by the USSF and SSC and more specifically the RSLP OSP-4 program. This section presents reports published by the government on space launch services, commerciality determinations, and price reasonableness determinations.

1. Government reports on space launch services

The GAO published a report (GAO-14-377r) in 2014 entitled, “The Air Force’s Evolved Expendable Launch Vehicle Competitive Procurement.” Responding to a congressional request to discuss DOD’s efforts to introduce competition into Evolved Expendable Launch Vehicle (EELV) acquisitions, the DOD provided slides on January 28, 2014 (Chaplain, 2014). As previously stated, EELV was the predecessor to NSSL. The report addressed launch costs under past EELV contracts as well as the cost implications for potential EELV contract changes. At the time, EELV had only one provider and forward funded the infrastructure ULA used to provide the space launch services. DOD was compensated when ULA provided the facilities and infrastructure the DOD funded to non-government customers (Chaplain, 2014).

This report predated the commercial item determination made in 2015, which we will examine in Chapter V. However, this report identified the potential challenges to

determining fair and reasonable prices if the procurements were acquired as commercial services on a firm-fixed-price basis. Some of the challenges identified are as follows:

1. Access to contractor cost or pricing data would be very limited.
2. Loss of flexibility in rescheduling launches if satellite deliveries slip; rearranging launch manifest would increase costs to DOD.
3. Launch market may not sustain more than one provider and not increase competition. (Chaplain, 2014, p. 1)

This research will demonstrate the noncommercial requirements in the RSLP OSP-4 acquisition and identify the challenges to determining fair and reasonable prices because of the procurement, and subsequent contract actions, being acquired as commercial services on a firm-fixed-price basis. The next section will discuss other government reports on commerciality determinations and price reasonableness determinations.

2. Government reports on commerciality determinations and price reasonableness determinations

A DOD Office of the Inspector General (OIG) Report, published in October 2021, identified Fiscal Year 2022 Top DOD Management Challenges. The report identified pricing of commercial items as one of those challenges. As previously discussed, DOD prefers commercial buying practices and requires the commercial item determination for services “of a type” to continue to be purchased in the same manner. DOD OIG reports that because of the continued reliance on commercial buying practices, and the ability of contractors to deny access to cost and pricing data related to that item/service presents challenges to price reasonableness determinations. The cost and pricing data is needed when contracting officers cannot rely on adequate price competition for fair and reasonable price determinations (DOD OIG, 2021).

The intent of FAR Part 12 was to streamline the contracting process when acquiring commercial items/services in order to lower prices, and reduce the amount of time it took to award a contract. However, the DOD OIG Report asserts that the “DOD is paying excessive prices because it does not have access to the cost data to determine the reasonableness of the prices” (DOD OIG, 2021, p. 49).

In 2022, GAO published a report by Timothy DiNapoli entitled, Federal Contracting: Implementation of changes to cost or pricing data requirement. The report provides that the government spend billions of dollars to buy products and services. According to DiNapoli, “Contracting officers commonly rely on competition to ensure that the government pays fair and reasonable prices” (2022, p. 1). Additionally, the report highlighted the following:

When a contract is awarded without adequate price competition, contracting officers may rely on certified cost or pricing data from offerors to determine if the prices are reasonable. When these data are not required, such as when an item is determined to be commercial, contracting officers use data other than certified cost or pricing data, such as information from previous contracts, market research, or the contractor. (DiNapoli, 2022, p. 1)

A GAO Report (GAO-18-530) aimed to “identify the factors that influenced the DOD’s commercial item and price reasonableness determinations and assess the extent to which DOD has taken steps to make information available to help make these determinations” (Woods, 2018, p. 1). The GAO identified interrelated factors that affect commercial item and price reasonableness determinations. These interrelated factors are:

- Availability of marketplace information
- Ability to obtain contractor data
- Extent of modifications to an item needed to satisfy DOD requirements
- Reliability of prior commercial item determinations (Woods, 2018, p. 1)

The report provides that “when dealing with a limited marketplace and price data, determining commerciality and price reasonableness can be challenging for DOD’s contracting staff. Ultimately, the effectiveness of determining commerciality and fair and reasonable prices will depend on what meaningful information the government successfully obtains to conduct its analysis” (Woods, 2018, p.24).

Our research will identify that determining the price reasonableness for RSLP OSP-4 task orders is challenging. We will identify the noncommercial requirements and present the data that demonstrates the difficulty in the fair and reasonable price determinations. This research will also discuss the information the contracting officers seek to obtain to make fair and reasonable price determinations.

E. SUMMARY

This chapter discussed the theoretical foundation that informed this research. Agency theory as applied to contract models presented the principal-agent relationship between the USSF and contractor. Auditability theory presents a conceptualized framework for internal processes and controls to increase confidence and auditability of price fair and reasonable determinations. Next, the legal basis for procurement of space launch services and applicable policies obtained through research of laws and regulations was discussed. Research on phases of the contract life cycle to identify key elements for pre-award, award, and post award phases were identified. This literature review also presented research on commerciality determinations and determining price fair and reasonable for commercial items. Lastly, previous research on space launch services and other government reports related to this research were presented. The next chapter will present the history of the NSSL and RSLP programs and their current organizational structure.

III. SPACE FORCE PROGRAMS AND LAUNCH SERVICES ACQUISITIONS

In this chapter, we provide the history the National Security Space Launch (NSSL) and Rocket Systems Launch Program (RSLP) Orbital Services Program-4 (OSP-4) acquisitions that we are focusing our research on as well as the current organization structure of the USSF Acquisition Deltas for government-sponsored space launch services. As discussed in Chapter I, the USSF is navigating new command structures and faces a new threat in the space realm. This chapter discusses how two of the USSF's programs acquire the government-sponsored space launch services and the contract structures of those two acquisition programs.

A. HISTORY OF THE NSSL

The NSSL Program has its roots in the 1995 establishment of the Evolved Expendable Launch Vehicle (EELV) program. In a Congressional Research Service report, McCall states, "The purpose of EELV was to provide the United States affordable, reliable, and assured access to space with two families of space launch vehicles" (McCall, 2022, p. 1).

In 1998, the Air Force competitively selected two companies for award of "other transaction agreements" for "the development of, and associated infrastructure to meet EELV requirements" (Woods, 2008, p. 7). Those two companies were Boeing and Lockheed Martin. In 1998, Lockheed Martin proposed the use of the Russian RD-180 engine for use with the Atlas launch vehicles, with plans to transition to a domestically produced engine within four years. A notable assumption at the time was that the commercial space launch industry would grow sufficiently to somewhat support itself. However, the commercial market failed to fully materialize (McCartney et al., 2006). The National Security Presidential Directive (NSPD-40) issued in 2004 directed the Secretary of Defense to "fund the annual fixed costs for both launch providers" (USAF NSSL, Personal Communication, 2014, p. 2). The DOD revised the EELV strategy in 2005 and funded both Boeing's Delta line and Lockheed Martin's Atlas families of launch vehicles.

Shortly after, in December 2006, Boeing and Lockheed Martin entered into a joint venture, United Launch Alliance, LLC (ULA). United Launch Services (ULS), as a subsidiary of ULA, was approved by the Federal Trade Commission to perform expendable launch services for the U.S. Government. Prior to production, the domestically produced engine was estimated to be significantly higher in price than the Russian RD-180 engine. In September 2007 EELV officials received approval to maintain an inventory of RD-180 engines, rather than establishing a domestic engine production capability (USAF NSSL, Personal Communication, 2014).

In June 2012, a commercial item determination was made regarding the RD-180, since the engine possessed 70% commonality with the commercially produced RD-170 and was “of a type” customarily used by non-government entities (USAF NSSL, Personal Communication, 2014).

The 2019 National Defense Authorization Act (NDAA) changed the name of the EELV program to the NSSL program. McCall wrote in a Congressional Research Report, *National Security Space Launch* that “The EELV program’s original acquisition strategy was to ultimately select one company to ensure national security space launches were affordable and reliable” (2020, p. 1). Concerns over the lack of competition prompted the name change but also drove the USSF to solicit for two companies to provide the national security launches (McCall, 2022). As a step towards this goal, four companies were awarded contracts to initially design a cost-effective launch vehicle system. As McCall reports, and in support of launches for the USSF, Navy, and National Reconnaissance Office, “the NSSL program currently consists of four launch vehicles, ULA’s Atlas V and Delta IV Heavy launch vehicles, and Space-X’s Falcon 9 and Falcon Heavy Launch Vehicles” (McCall, 2022, p. 1).

B. HISTORY OF THE RSLP

The Rocket Systems Launch Program (RSLP) began in 1972 under SSC’s Test and Evaluation Directorate though its original roots go back to 1965. The mission of RSLP was “to collect and store excess ballistic missile assets and convert them on demand to government launch vehicles” (Stodghill et al., 1999, p. 2). Initially, the use of the excess

ballistic missile assets were used for creating targets for missile defense. The government considered the usefulness of the excess ballistic missile assets and when a series of unsuccessful launches in the 1990 has occurred, the utilization of the excess rocket motors was authorized and RSLP expanded into launches to space (Stodghill et al., 1999).

Orbital Sciences Corporation, now owned by Northrup Grumman Innovation Systems, was awarded the first Orbital/Suborbital Program contract and “proposed the ‘Minotaur’ for their orbital vehicle” (Stodghill et al., 1999, p. 3). As of 2022, approximately 22 missions have been launched successfully using the Minotaur I or Minotaur IV launch vehicle configurations. This paved the way for the future OSP follow-on contracts, which allow providers to propose launch solutions utilizing the excess ballistic missile assets. It is important to note that the excess ballistic missile assets can only be used for government sponsored launches. The ballistic missile assets are considered Government Furnished Equipment (GFE) and are not available to the commercial sector unless they are performing a government sponsored launch service.

The evolution of the RSLP program now encompasses multiple contract vehicles and programs that support the mission of Assured Access to Space. Our research will focus on the OSP – 4 contract, which includes small and medium launches to lower earth orbit (LEO). Additionally, RSLP maintains an independent Mission Assurance contract for the missions acquired to support RSLP. We will discuss Mission Assurance in Chapters IV and V. The next section will discuss the current structure of the NSSL space launch contract.

C. CURRENT STRUCTURE OF NSSL PHASE 2 CONTRACT

According to a DOD Selected Acquisition Report, the goal of the NSSL program is to procure space launch services in order to fulfill federal space lift tasks for the DOD and other Government stakeholders while providing to and promoting interagency and commercial cooperation to achieve 100% effectiveness and success of executed missions. “In order to retain assured access to space and ensure complete mission success, this mission requires the execution of flight worthiness certification processes and booster-to-satellite mission integration” (Selected Acquisition Report [SAR], 2019, p. 7). The NSSL

system encompasses multiple space launch capabilities and individual vehicles (United States Air Force (USAF), 2020). However, this research only focuses on the RSLP OSP-4 subset of contracts.

In accordance with policy, NSSL maintains at least two families of space launch vehicles capable of reliably launching national security payloads. Currently, with the award of the NSSL Phase 2 Acquisitions, the program has two domestic, commercially viable, space launch providers that meet all National Security Space launch requirements. In accordance with section 2273 of Title 10, U.S. Code and 2013 U.S. Space Transportation Policy, the DOD is responsible for maintaining assured access to space. NSSL is the foundation for the access for intermediate and larger class payloads for the near future. (SAR, 2019, p. 7)

ULA and Space Exploration Technologies Corp (SpaceX) were awarded requirements contracts for the NSSL Phase 2 acquisition on August 7, 2020. As is the case with all NSSL Phase 2 contracts, their awards were firm-fixed-price utilizing FAR Part 12, Commercial Acquisition procedures for indefinite-delivery launch services throughout a defined five-year period of performance. Service requirements include an assortment of activities in support of launch needs. These requirements include: integrated studies, general launch service support, surveillance, launch vehicle manufacturing, mission launch integration and operations, Mission Assurance to increase likelihood of successful launch, spaceflight readiness and preparation, as well as specific tasks for each mission (USAF, 2020). The next section will discuss the current structure of the RSLP OSP-4 space launch contract.

D. CURRENT STRUCTURE OF RSLP OSP-4 CONTRACT

The OSP-4 contract has a ceiling of \$986,000,000 and is a multiple-award, indefinite-delivery/indefinite-quantity (IDIQ), firm-fixed-price contract with a nine-year ordering period (Albon, 2019). The original award announcement on Defense.gov (2019) stated “While offering “dedicated and primary launch services to the Department of Defense and other government organizations, the OSP-4 IDIQ contract aims to take advantage of the growing small launch providers” (*Defense.gov*, 2019, n.p.). An Inside Defense article by Albon (2019) further provides that “The program enables launch to any

orbit within 12–24 months following task order award and allows for the quick acquisition of launch services to meet mission objectives for payloads in excess of 400 pounds” (p. 1).

The current multiple-award IDIQ pool of awardees has eleven providers, as identified in Table 2. (DOD contract files, 2022) The initial award of OSP-4 included eight providers in October 2019 and three additional providers were added in August 2021 after soliciting for an on ramp opportunity. As of May 2022, only two OSP-4 space launch services task orders have been awarded though there are three more in fair opportunity selection that are anticipated to be awarded in 2022, as identified in Table 3. Each OSP-4 task order is competed amongst the providers (fair opportunity) whereas NSSL has a set number of requirements, which are already competed and awarded to the providers. OSP-4 was solicited and awarded as commercial FAR Part 12, multiple award IDIQ due to the determination of NSSL also being commercial. Each provider has a unique launch vehicle design and approach to providing a launch service for the USSF and its mission partners.

Table 2. OSP-4 Current Providers Source: Adapted from DOD contract files, (2022)

| OSP – 4 Provider | Launch Service Task Orders Awarded | OSP-4 Provider | Launch Service Task Orders Awarded |
|-------------------------------------|------------------------------------|------------------------|------------------------------------|
| SpaceX | | ULA | |
| Northrop Grumman Innovation Systems | TacRL-2 | Firefly Black | |
| Aevum | | Vox Space | STP-S28 |
| Astra Space, Inc. | | Relativity Space, Inc. | |
| Rocket Lab USA | | ABL Space Systems Corp | |
| X-Bow Launch Systems | | | |

Table 3. OSP-4 Upcoming Launch Services Task Orders

| OSP-4 Upcoming Launch Services Task Orders | Status | Anticipated Award |
|--|-------------------------------|-------------------|
| STP-S29A | In Fair Opportunity Selection | 2022 |
| STP-S29B | In Fair Opportunity Selection | 2022 |
| TacRS-3 | In Fair Opportunity Selection | 2022 |

This research focuses on the RSLP OSP-4 IDIQ and subsequent task orders. The next section will discuss the organizational structure of the Assured Access to Space Program Element Office (PEO).

E. ORGANIZATIONAL STRUCTURE OF ASSURED ACCESS TO SPACE PROGRAM ELEMENT OFFICE

The organizational chart presented in Figure 2 is provided to convey the command structure of both the NSSL program and the RSLP (and OSP-4 acquisition) programs. Prior to March 2022, NSSL and RSLP were combined under the Launch Enterprise Division of Space Systems Command. The USSF implemented flattened organizational structures in June 2020, one of which is named a “Delta.” The Delta field organization is similar to the USAF structure of a field command, similar to a major command or squadron, depending on the collection of subordinate units (United States Space Force, 2020).

As of May 2022, the USSF is still undergoing a reorganization to include acquisition deltas under the Space Systems Command and Program Element Offices. The NSSL and RSLP programs will belong to separate ‘deltas’ under the Assured Access to Space Program Element Office (AATS PEO) and are considered separate acquisition deltas. NSSL is aligned under the Launch Execution Acquisition Delta and RLSP is aligned under the Mission Solutions Acquisition Delta (SSC AATS PEO, Personal Communication 2022).

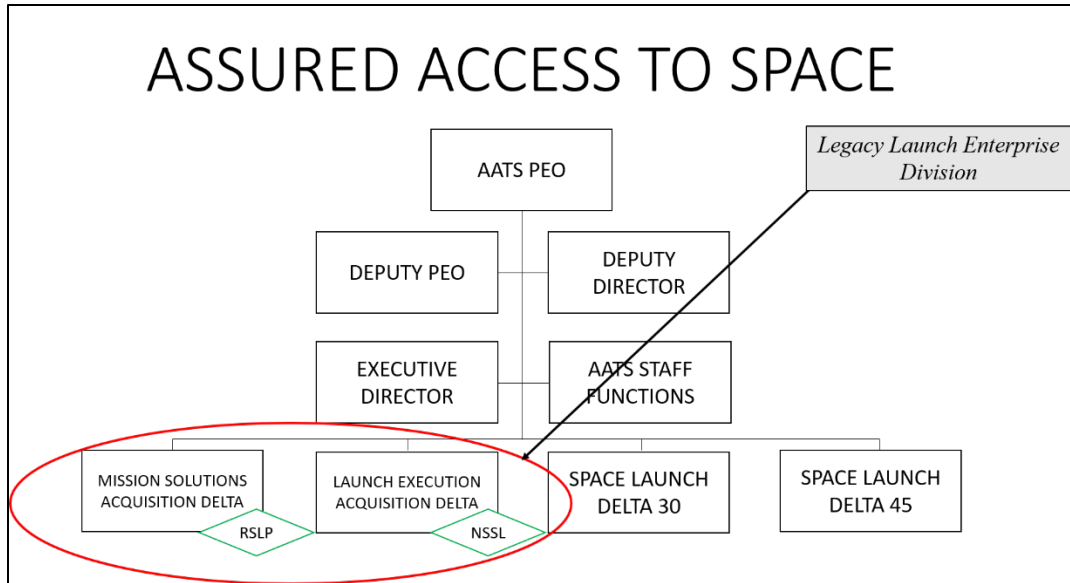


Figure 2. Pre-Decisional AATS Organizational Structure Source: Adapted from SSC AATS PEO personal communication (2022).

F. SUMMARY

This chapter provided the history the National Security Space Launch (NSSL) and Rocket Systems Launch Program (RSLP) Orbital Services Program-4 (OSP-4) acquisitions. It identified the current organization structure of the USSF Acquisition Deltas for government-sponsored space launch services and discussed how these two USSF programs acquire government-sponsored space launch services. The contract structures of those two acquisition programs were also discussed. The next chapter presents the methodology for this research.

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IV. METHODOLOGY

This chapter discusses the methodology we will use to identify and source required data. It will also discuss methods we will use to analyze the gathered data to answer our research questions. A summary of our methodology will be provided before moving on to Chapter V.

A. SOURCES AND TYPES OF DATA

The data required to answer our research questions will be acquired from both publicly available venues and through personal communication with the Contracting Officer for the Rocket Systems Launch Program (RSLP) Orbital Services Program (OSP-4) contract. The data we will collect, the source, and location of data will be discussed below.

1. Commercial Item Determination (CID) and Market Research Report (MRR)

The data will include the CID (2015) originally authored by the National Security Space Launch (NSSL) program's contracting officer. The CID is the contracting officer's written determination that the item/service being acquired meets the definition of a commercial item in accordance with FAR 2.101. In addition to the definition, the CID also discusses how the contracting officer determined that the services were "of a type" and how market and catalog prices were factored into the determination. The CID will be obtained through personal communication with the contracting officer for the RSLP OSP-4 Indefinite Delivery Indefinite Quantity (IDIQ) contract.

The data will also include the MRR for the RSLP OSP-4 IDIQ. The MRR (2018) is the report that summarizes the acquisition planning and decision process based on the findings included in the report. The report addresses a survey of potential vendors and their capabilities, commercial opportunities, and a myriad of factors the contracting officer considers when determining acquisition strategy. We will obtain this report from the OSP-4 official contract file through personal communication with the contracting officer.

2. Determination and Findings (D&F)

We will obtain the D&F (2019) for the OSP-4 IDIQ contract which addresses the tailored commercial clauses within the contract and subsequent task orders. According to FAR 1.701 (2022), a D&F is a “special form of written approval by a contracting officer that is required before taking certain actions. Determination is the contracting officer’s decision supported by the findings. Findings are the statements of fact or rationale to support the determination.” We will obtain the D&F from the OSP-4 IDIQ contract file through personal communication with the contracting officer.

3. Performance Work Statements (PWS) and Mission Requirements Documents (MRD)

The data will include the PWS (2019) for the OSP-4 IDIQ contract and the Mission Requirements Documents (2019) for the OSP-4 Task Orders for space launch services currently awarded. FAR 2.101 (2022) defines the PWS as a contractual document that states the government’s requirements “in clear, specific, and objective terms with measurable outcomes.” An MRD is a task order specific document that describes and clarifies PWS requirements for launch missions awarded on OSP-4. We will obtain the PWS’ that were publicized with the solicitation documents from the publicly accessible government-wide point of entry (GPE). The GPE is the website, SAM.gov, where all notices that require publicizing are posted (FAR 5.003, 2022). We will obtain the Mission Requirements Documents from the OSP-4 official contract file through personal communication with the contracting officer.

4. Price Negotiation Memoranda (PNM)

This data will include obtaining the PNMs (2019-2022) for the currently awarded OSP-4 Task Orders. A PNM is the summary of a negotiated agreement between the government and contractor. The PNM addresses each factor that informs the negotiation and serves as the contracting officer’s documented determination of a fair and reasonable price. We will also obtain PNMs for task order modifications when equitable adjustments are required. We will obtain these documents from the OSP-4 contract and task order files through personal communication with the contracting officer.

B. HOW WE WILL ANALYZE THE DATA

This section will discuss how we will analyze the data we obtain for this research. The data will be analyzed to answer our research questions and the findings from our analysis, which will be presented and discussed in our next chapter.

1. CID and MRR

The CID (2015) will be analyzed to determine the criteria used when initially determining space launch as a commercial service. It will also be assessed against current criteria to determine if the existing CID is sufficient to support future reliance on it as a determination document. The OSP-4 MRR (2018) will be analyzed to identify market conditions and factors that led to the acquisition strategy and commerciality of the OSP-4 IDIQ contract.

2. D&F

The tailored clause D&F (2019) will be analyzed to identify noncommercial clauses that the contracting officer included in an otherwise commercial contract. This D&F will be reviewed to provide insight into the noncommercial requirements within the OSP-4 contract.

3. PWS and MRD

The OSP-4 PWS (2019) will be reviewed to identify noncommercial tasks required in performance of the contract. This will support a determination of either commerciality or noncommerciality. The OSP-4 Mission Requirements Documents (2019) will be reviewed for any Contract Data Requirements that would not normally be required in a commercial contract. This will support a determination of either commerciality or noncommerciality.

4. PNMs

The OSP-4 PNMs (2019-2022) will be reviewed to identify difficulties in negotiating fair and reasonable pricing with the allowable pricing support information (or lack thereof) provided in the price proposals. We will also identify the resultant timelines

of negotiations for contract modifications when an equitable adjustment is required and review the factors that informed and/or caused difficulty for the contracting officer's price reasonableness determinations.

C. SUMMARY

This chapter discussed the methodology used to identify and source required data. It also discussed methods used to analyze the gathered data to answer our research questions. The next chapter will discuss our findings, analysis and discussion of our findings, and implications for future space launch services.

V. ANALYSIS OF FINDINGS, IMPLICATIONS AND RECOMMENDATIONS

Chapter V discusses the analysis of findings from this research. In addition, this chapter presents the implications of the findings along with recommendations to the United States Space Force (USSF) for improving the procurement of space launch services. A summary of the chapter will be provided before moving on to Chapter VI.

A. ANALYSIS OF FINDINGS:

As discussed in the previous chapter, our research focuses on the analysis of the Orbital Services Program-4 (OSP-4) Market Research Report (MRR) (2018) and the National Security Space Launch (NSSL) Commercial Item Determination (CID) (2015). Additionally, we will analyze the findings of the OSP-4 nonstandard terms and conditions, the performance work statement (PWS) (2019), mission requirements documents (MRD) (2019), and price negotiation memoranda (PNM) (2019-2022). The following section consists of the analysis of those findings within these data sources.

1. Market Research Report (MRR)

The Rocket Systems Launch Program (RSLP) office followed applicable guidance to ensure sufficient market research was conducted to support the determination that the OSP-4 contract would procure space launch services as a commercial service. The RSLP OSP-4 program office's Market Research Report (MRR) addressed the commerciality of small space launch services previously determined to be commercial by the determination NSSL CID.

Our research found that sufficient Market Research was conducted to support the initial CID. In accordance with Defense Federal Acquisition Regulation Supplement (DFARS) Procedures, Guidance, and Information (PGI) applicable in 2018, the RSLP program office did not process a new CID since the NSSL had already approved a CID in 2015. According to the MRR for OSP-4, dated June 4, 2018, the small launch services market was very dynamic and had seen an influx of new launch providers. OSP-4 capitalized on the market's increased competition and innovation by establishing a wide

vendor pool. Additionally, the MRR addressed the commercial launch community vocalizing their requests that all launch service contracts should be acquired in accordance with the Commercial Space Transportation Law. This would mean applying Federal Acquisition Regulation (FAR) Part 12 - Acquisition of Commercial Items procedures vice FAR Part 15 - Contracting by Negotiation (Rocket Systems Launch Program [RSLP], 2018).

The MRR further identified the government's Independent Verification and Validation Mission Assurance process as not being a standard commercial practice. The report identified the challenge of ensuring the same level of insight, documentation, and certified cost and pricing data is provided to the government under a FAR Part 12 contract (RSLP, 2018). The NSSL contract was awarded as commercial. The program office obtained approval to significantly tailor the FAR Part 12 terms and conditions (FAR 52.212-4) to mitigate the Government's Mission Assurance concern. This significant tailoring effectively rewrote the streamlined commercial clauses of FAR Part 12 (FAR 52.212-4) that were designed to simplify the process of purchasing commercial services. Lastly, the report determined that there was not enough data to determine if this approach would be successful (RSLP, 2018).

2. Commercial Item Determination (CID)

The NSSL program office processed a CID for space launch services in 2015 prior to awarding the NSSL Phase 1A contract. The CID written by the NSSL contracting officer was in accordance with Department of Defense Federal Acquisition Regulation Supplement (DFARS) guidance at the time of award. In 2018, the RSLP OSP-4 contract was awarded in accordance with DFARS guidance and utilized the NSSL CID as determination that OSP-4 would also be commercial.

The DFARS PGI current on September 24, 2015 did not include the guidance on commercial item determinations that it now includes and was recently added as a final ruling. In 2015, the DFARS PGI did not specify that subsequent services must also be determined commercial; it only included the following information:

PGI 212.1—ACQUISITION OF COMMERCIAL ITEMS—GENERAL
PGI 212.102 Applicability. (a) Contracting officers shall ensure that contract files fully and adequately document the market research and rationale supporting a conclusion that the commercial item definition in FAR 2.101 has been satisfied. Particular care must be taken to document determinations involving “modifications of a type customarily available in the marketplace,” and items only “offered for sale, lease, or license to the general public,” but not yet actually sold, leased, or licensed. In these situations, the documentation must clearly detail the particulars of the modifications and sales offers. When such items lack sufficient market pricing histories, additional diligence must be given to determinations that prices are fair and reasonable as required by FAR Subpart 15.4. (DFARS PGI 212.1, 2008, n.p.)

The contract file reflects that the Contracting Officer relied upon the following reference as justification for commerciality as written in the NSSL CID:

United States Code (USC) title 51, section 50132(a) that states, “Acquisition of Space Transportation services by the Federal Government shall be carried out in accordance with applicable acquisition laws and regulations.” It further states, “For purposes of such laws and regulations, space transportation services shall be considered a commercial item” USC title 51 section 50101(4) defines Space Transportation Services as “the preparation of a space transportation vehicle and its payloads for transportation to, from, or within outer space, or in suborbital trajectory” (National Security Space Launch [NSSL] Commercial Item Determination. [CID], 2015, p. 1)

While this appears to be consistent with the intent of the requirement, the CID does not specifically state the requirement as “space transportation services” or refer to the definition. Paragraph 1 of the CID identifies “Launch Services” with no direct correlation stated to “space transportation services” other than the referenced USC title 51, section 50132(a) commercial item procurement directive (NSSL CID, 2015).

The NSSL CID, which was also used to determine OSP-4 as commercial, was analyzed and the current criteria (June 2022) from the DFARS was reviewed to determine if the existing CID is sufficient for future space launch service contracts. The result of each comparison is discussed as follows:

1. The contract file documentation reflects that market research has established that the government’s need can be met, with minor

adjustments, by the type of space launch services customarily available in the domestic launch vehicle industry commercial marketplace (NSSL CID, 2015). This generic statement cannot be validated without specifics regarding the “minor adjustments.” In addition, the reference is to the domestic launch vehicle industry, not the domestic “launch services” industry. It is unclear if the terms are to be considered the same or if they have different meanings (NSSL CID, 2015).

2. The contract file documentation reflects that launch services meets the FAR 2.101, Commercial Service definitions of catalog price and market price (NSSL CID, 2015). The FAR 2.101 catalog price definition includes “sales are currently, or were last, made to a significant number of buyers constituting the general public” (FAR 2.101, n.p.). No details of the quantity of past market sales of launch services was provided.
3. The FAR 2.101 market price definition includes “current prices can be substantiated through competition from sources independent of the offerors” (FAR 2.101, n.p.). Paragraph 4 of the CID identifies a current commercial price of one of the offerors, and the average price per launch of the second offeror. This does not meet the standards of the definition of market price since the pricing is not independent of the offerors (contract awardees) (NSSL CID, 2015, n.p.).

Based on the content of the NSSL’s CID, procedures for determining launch services as commercial based on the definition set forth in FAR 2.101 were followed, while also taking into consideration the Commercial Space Transportation Law. A redacted version of the CID is provided in Appendix A. Our research found that the timeframe of when each document was processed led to gaps in the justification of commerciality due to changing guidance. NSSL processed the initial CID in 2015. From 2016 through 2018, NSSL competed and awarded the Phase 1A NSSL contract as a commercial contract. In 2018, OSP-4 utilized the NSSL CID based on market research and DFARS PGI guidance. In 2019, OSP-4 competed and awarded eight commercial IDIQ contracts. A timeline of the commercial determination and subsequent commercial contracts for space launch services

is provided in Appendix B. Through analysis of the CID, we determined the existing CID is not supportable under current regulations and guidance. Based on the CID and subsequent commercial contracts for space launch services, the government will most likely continue to utilize commercial contracts to procure space launch services.

3. Nonstandard Terms and Conditions

The determination and findings (D&F) documents within the OSP-4 contract files support that the government maintain noncommercial requirements in this otherwise commercial contract. For the government to ensure performance of these noncommercial requirements, the Contracting Officer tailored the standard commercial clauses to add nonstandard clauses to this FAR Part 12 commercial indefinite delivery indefinite quantity (IDIQ) contract. The D&F is required to be filed in the contract file when tailoring commercial clauses.

Tailoring clauses for commercial contracts required approval of the head of the contracting agency (or as delegated). This approval was delegated to the Chief of Contracting Office (COCO). This clause tailored the Excusable Delays section included in the commercial clause. FAR 52.212-4(f) was tailored to state “This subpart (f) shall not apply to postponements and delays subject to Clause H001” (OSP-4 D&F, 2019, p. 1).

The OSP-4 included two nonstandard clauses. One of the two nonstandard clauses, ADK H001 Launch Delay Clause (April 2019) addressed launch delays. This requirement does not exist in the commercial launch sector. The D&F document provided the justification for adding this nonstandard clause.

The standard language of FAR 52.212-4(f) allows “Acts of the Government” to be excusable delays and is consistent with commercial practices, as commercial practice launch service providers simply agree to a launch date and provide the best effort to meet the established date. However, due to warfighter mission needs the Government has a requirement to establish the launch date within a certain window. Therefore, a Launch Delay Clause (H001) which provides detailed information regarding Initial Launch Capability (ILC) date, and detailed information regarding grace period is required. (ADK H001, 2019)

The second nonstandard clause, known as the Enabling Clause, was approved for the purposes of requiring the space launch service provider to interface with The Aerospace Corporation as a Federally Funded Research Center. The practice of interfacing with an independent entity for purposes of technical review and system integration is not standard in the commercial launch sector. The enabling clause requiring the space launch service provider to interface with The Aerospace Corporation exists only for government sponsored space launch services.

The tailoring of FAR 52.212-4 Contract Terms and Conditions – Commercial Products and Services (2022), includes addenda for inspection/acceptance, changes, excusable delays, title, and warranty. The full text of the tailored and nonstandard clauses is included as Appendix C. In noncommercial contracts, there are standard individual clauses that address each addendum. However, commercial contracts include the addenda under the scope of the single clause for contract terms and conditions for commercial products and services.

FAR clause 52.246-4 Inspection of Services (2022), is included as an addendum to FAR 52.212-4 and is tailored for space launch services. Inspection of Services is a right reserved by the government to perform in-process inspection of testing of space launch services for acceptance prior to launch. Acceptance occurs when the payload is successfully inserted to the prescribed orbit and after the contractor prepares and delivers a material and receiving report to the government.

FAR clause 52.243-1 Changes-Fixed Price Alternate II (2022) and FAR clause 52.243-7 Notification of Changes (2022) were both incorporated into the commercial terms and conditions. Both clauses prescribe how changes are implemented in the task order and how the contractor should promptly report “government conduct that the contractor considers to constitute a change.”

FAR clause 52.249-14 Excusable Delays (2022) are included with the tailored language previously discussed to include the nonstandard Launch Delay Clause. Lastly, the tailored terms and conditions discuss that the government does not take title to any launch vehicle used for the space launch service and the contractor is not required to

provide warranty for the space launch service. The successful delivery of a payload to orbit is not guaranteed and the government does not purchase a launch vehicle. The government awards a task order for a space launch service only.

4. Performance Work Statements (PWS)

The OSP-4 PWS and mission-specific Mission Requirements Documents (MRD) also contain noncommercial requirements. The most prevalent noncommercial requirement throughout is Mission Assurance. The PWS prescribes the Mission Assurance process and defines the tailorable categories of Mission Assurance for OSP-4 at the basic IDIQ level.

Mission Assurance, as defined by Pawlikowski (2008), is both a process and a culture that is followed by all individuals involved with a space launch service. Mission Assurance is involved throughout the entire life cycle of a space launch service to achieve confidence in mission success. As performed by the United States Space Force for space launch services, the Mission Assurance process combines a tailorable process of system design assurance, operational Mission Assurance, and independent space vehicle Mission Assurance (Pawlikowski, 2008). Mission Assurance is prescribed in the Air Force Space Command Instruction (AFSPCI) 13–610 Launch and Range Operations. The command instruction document states that SSC’s Launch Enterprise, “Develops standardized LV Mission Assurance and fleet surveillance requirements for SSC-procured launch systems/services” (AFSPCI 13–610, 2013, p. 3). Additionally, the Spacelift Systems Capabilities Production Document (CPD) requires a 95% mission reliability for small launch (SSC CPD, 2016).

The Mission Assurance process is unique to the government. The commercial sector does not require the robust process, which mitigates the risk for mission failure. The figure and tables in Appendix D demonstrate the eleven different mission reviews the OSP-4 PWS requires for space launch services, and the entrance and exit criteria for the major reviews. These mission reviews ensure the Mission Assurance process is continuous throughout the space launch service and satisfies the 95% mission reliability requirement for small launch.

Further analysis of the PWS and Mission Assurance requirements provide that space launch service providers be required to perform a variety of tests and analyses depending on the category of Mission Assurance for a mission. For example, a space launch service requiring Category 2 Mission Assurance has to perform over sixty tests and/or analysis in order to satisfy the Mission Assurance requirements. The Mission Assurance categories and their testing and analysis requirements are included in Appendix E. Additional specific requirements for a government-sponsored mission are included in MRDs for OSP-4 task orders discussed in the next section.

5. Mission Requirements Documents (MRD)

The MRD controls the source and authority for the mission-specific requirements of an OSP-4 task order for space launch services. In addition to defining mission-specific requirements, the MRD identifies “roles and responsibilities and interfaces among the various contractors and government agencies supporting the mission” (RSLP MRD, 2018, p.1). Additionally, the MRD identifies the need to tailor requirements as necessary for the individual OSP-4 task order for the mission from the OSP-4 contract PWS, the Small Launch Interface Specification (SLIS), and the Small Launch Performance Requirements Document (SLPRD).

The MRD are complimentary documents to the PWS for the purposes of prescribing and clarifying the portions of the PWS that are applicable to individual OSP-4 task orders. The analysis of the MRDs found that the tailored requirements included in the MRDs are mainly attributed to the noncommercial requirements of Mission Assurance for these government-sponsored space launch services.

The OSP-4 task orders are awarded with mission-specific MRDs. The MRD prescribes the specific PWS paragraphs that are applicable to the space launch mission and include the category of Mission Assurance required for individual, mission-specific OSP-4 task orders. The two missions awarded to date on OSP-4 have tailored Mission Assurance requirements. The first mission required Category 2 Mission Assurance. The second mission required Category 1 Mission Assurance. The category of Mission Assurance determines how many tests and analyses need to be performed and reported back to the

government as deliverables as previously discussed in the PWS analysis. The findings determined that all the tailored requirements contained in the MRDs are government-specific and noncommercial.

Other than providing a space launch service as proposed during fair opportunity selection, the requirements in the 22-page MRD for the first mission are government-specific. The requirements include enhancements to the mission parameters, associate contractor agreements, and clarification of the roles and responsibilities of the parties (OSP-4 MRD, 2018). In the commercial sector, a customer merely procures the services of a space launch provider and receives data to ensure the service requirements have been met. In a government-sponsored launch, as demonstrated by the MRD, the government is involved in every step of the process (OSP-4 MRD, 2018). Government participation includes involvement in program management, managing the range support at government launch ranges, managing the launch vehicle integration, coordinating the space vehicle interface, and managing the launch vehicle Mission Assurance (OSP-4 MRD, 2018).

A subject matter expert (SME) for RSLP described Mission Assurance in the context of shipping a package via a commercial carrier, such as FedEx or UPS. The SME described the action in the commercial sector as the customer pays the commercial carrier to deliver a package. The customer considers the delivery confirmation as successful performance. If Mission Assurance were required for a package delivery, the customer would inspect the vehicles used for delivery, analyze the processes the company has in place to deliver the package, review the analysis the company performed to ensure the most effective delivery route, and possibly observe the delivery in real time (Personal Communication with RSLP SME, 2022).

RSLP incorporates Mission Assurance and other noncommercial requirements into every space launch service contract and task order they award. The largest noncommercial requirement is Mission Assurance. Mission assurance is not required and not common in the commercial market. Given that Mission Assurance is such a significant feature of space launch services procured on behalf of the government, the analysis provides that commerciality and Mission Assurance objectives conflict with one another.

6. Price Negotiation Memoranda (PNM)

The negotiation of a fair and reasonable price is challenging when negotiating a price for a commercial contract containing noncommercial requirements. The pricing challenges are demonstrated in the price negotiation memoranda discussed in this section. The task orders researched utilized adequate price competition as justification for fair and reasonable price for the initial award of the space launch services. “Adequate price competition” exists when two or more offerors propose priced offers that can meet the government’s requirements (FAR 15.403-1, 2022). The pricing and comparison of prices between launch providers was difficult due to the providers pricing Mission Assurance differently and due to the unique launch solutions proposed by each provider. In reviewing the contract files, each provider’s unique solution also comes with a unique price and method of pricing the noncommercial requirements of a launch services contract. The comparison of the launch solutions add a layer of complexity when trying to determine price reasonableness utilizing adequate price competition.

The difficulty of negotiating a fair and reasonable price becomes even more challenging for modifications to the OSP-4 task orders. Once a task order is awarded, the government is then negotiating with a single provider. Modifications to OSP-4 task orders that require equitable adjustment are more difficult to negotiate a fair and reasonable price because there is no longer adequate price competition.

The price negotiation memoranda sources in this research provided that the contracting officer had to rely on pricing information that was not certified due to the commerciality of the OSP-4 contract. Furthermore, analyzing the prices proposed by the space launch service providers, were difficult because there were limited sources to compare historical prices or prices offered to the public that would directly correlate to services provided to the government.

In our review of the contract files for OSP-4, we reviewed the modifications to the task orders to determine how many modifications were driven by noncommercial requirements. Those modifications were further analyzed to determine the contracting officer’s method of determining a fair and reasonable price when an equitable adjustment

was required. Of the two task orders awarded on OSP-4, one task order had five modifications that were caused by the space launch service provider's difficulty in meeting the government's noncommercial requirements. Our analysis found that the provider's commercial practices were not aligned with the government's requirements for space launch services. The task order required category 2 Mission Assurance, which included sixty-six separate tests and analysis to be performed and reported on. The price negotiation memoranda, supported by the technical evaluation, attributed the modification to the space launch service provider's inability to meet the entrance and exit criteria of the reviews based on the Mission Assurance test and analysis requirements. There were multiple delays, correspondence, negotiations, and ultimately a series of modifications in order to keep the task order on track. This lack of fulfillment of requirements resulted in delays of eight months and a price disparity of close to seventy-five percent when compared to initial award price when negotiating the equitable adjustments.

Price analysis for each of the modifications that required an equitable adjustment was challenging. The Contracting Officer needed to obtain additional pricing data from the contractor. The space launch service provider had no requirement to certify the data, and the provider was not required to have an approved accounting system since the requirement was awarded under commercial procedures. Given that the space launch service provider does not perform Mission Assurance tasks in the commercial sector, the fidelity of the prices proposed are ultimately a business decision based on the judgement of the Contracting Officer. The space launch service provider included published labor rates to correspond with the hours and labor mix proposed though they specify that if a security clearance is required, the rates are subject to change. Additionally, the rates did not encompass all the labor categories proposed and sufficient rationale for using other than published rates were not included in the proposals.

In the PNMs we analyzed, multiple rounds of fact-finding questions pertaining to pricing and technical evaluation were accomplished and adjudicated in order for the Contracting Officer to ultimately determine a fair and reasonable price (PNMs, 2019–2022). The space launch service providers simply do not perform space launch services in the commercial sector in the same manner that they provide the service to the government due

to the government's noncommercial requirements. The next section will discuss the implications of the findings and recommendations for the USSF to acquire space launch services in the future.

B. IMPLICATIONS AND RECOMMENDATIONS

This section will present the implications of the findings for each data source and provide recommendations to the USSF. The implications of the findings will discuss how the findings may be important for policy, guidance, and later research. The recommendations are presented for each data source and will be summarized in the next chapter.

1. Market Research Report (MRR)

The research limitations and restricted sources of data limited the ability to obtain the market research report to support the finding for the NSSL CID. However, the findings and analysis determined that sufficient market research was conducted to support the OSP-4 commerciality determination. Although sufficient at time of initial OSP-4 contract award, current market research must be conducted to determine the existing market capabilities in this rapidly evolving service.

The implications of the MRR and data contained within it is that continued market research is imperative to the government to continue to leverage the commercial marketplace to provide space launch services. The commerciality of space launch services will most likely remain, therefore, market research, business intelligence, and industry communication must be prioritized and continuously analyzed. Based on the implications of the findings within the MRR, our first recommendation is the following:

Recommendation 1. USSF establish a market intelligence cell to continuously monitor and engage with existing and emerging space launch service providers to take advantage of new space launch capabilities and incorporate more commercial space launch practices.

2. Commercial Item Determination (CID)

The OSP-4 CID was documented in accordance with Department of Defense Federal Acquisition Regulation Supplement (DFARS) guidance at the time of award since it was utilizing the NSSL CID. There are currently no impacts to future OSP-4 task orders. Although sufficient at the time of initial OSP-4 contract award, the NSSL (and consequently OSP-4) CID is insufficient when applied to current (June 2022) DFARS guidance. The Commercial Space Transportation Law requires space launch services to be acquired as a commercial service but the law does not consider the detailed CID required by the FAR and DFARS. The current CID, while insufficient based on guidance in the FAR and DFARS, creates additional documentation requirements for the Contracting Officer when the law takes precedence over FAR and DFARS guidance. Ultimately, the law and the regulatory guidance are in conflict with one another providing for confusing and time-consuming documentation requirements.

Implications of all space launch services being determined commercial based on the Commercial Space Transportation Law should relieve the contracting officers from writing CIDs. The USSF may benefit from adding supplemental guidance providing exception for CIDs for space launch services based on statute into Space Systems Command (SSC) Supplemental Acquisition Guidance in the future. SSC Supplemental Acquisition Guidance would ensure Contracting Officers could continue to streamline the pre-award process when acquiring space launch services. Based on the implications of the findings within the CID, our next recommendations are as follows:

Recommendation 2. USSF publish SSC Supplemental Acquisitions Guidance providing for exception for CIDs for space launch services.

Recommendation 3. USSF, through SSC Supplemental Acquisitions Guidance, provide definitions of “Space Transportation Services” and “Launch Services” or equate the two.

3. Nonstandard Terms and Conditions

Continued commerciality of space launch services will require tailored and nonstandard clauses to be approved and included in future contracts. This specific D&F

requires HCA approval (or delegated) and may add time to the contract management process pre-award phase. As documentation may require approval through higher levels, the higher the level of approval, the longer the process will take. The process to tailor and add nonstandard terms and conditions to commercial space launch services is minor, however the implications of requiring commercial space launch service providers to abide by these nonstandard terms and conditions are far reaching. The nonstandard terms and conditions require the space launch service providers to deviate from their standard commercial practices, resulting in added costs, lack of auditability of the true costs of space launch services, and continued difficulty in negotiating a fair and reasonable price.

Contracting as a career field has to balance the expectation to increase acquisition speed to meet mission requirements while also adhering to all law, policy, and regulatory guidance. However, if space launch services are to remain commercial, the USSF may benefit from supplemental guidance to incorporate these tailored and noncommercial clauses into SSC Supplemental Acquisition Guidance in the future. Based on the implications of the findings within the nonstandard terms and conditions, our fourth recommendation is the following:

Recommendation 4. USSF publish SSC Supplemental Acquisitions Guidance providing for standard provisions and clauses to be included in all commercial space launch services contracts.

4. Performance Work Statements (PWS)

Performance work statements are intended to identify the service that the government requires and what performance criteria are required to ensure mission success. The analysis of the PWS demonstrated that while the government allows the space launch service provider to perform a launch solution in line with their commercial practices, the noncommercial requirements within the PWS conflict with those commercial practices. Mission assurance requirements are prescriptive and detailed with the intent that the mission will not fail and the government requires the 95% reliability for mission success.

The implication that the OSP-4 PWS requires a substantial amount of noncommercial performance is that the government is mandating a time consuming process and places itself

in risk averse posture. The Chief of Space Operations published the CSO Planning Guidance (2021) and stated, “While our mission in space has evolved dramatically, shifting from strategic to operational and finally tactical warfighting, our acquisition paradigm has remained largely static” (Raymond, 2021, p. 3). In order to meet the emerging threat in space, contracting must go faster. The USSF may consider accepting more moderate risk and significantly lessen the Mission Assurance requirements. On the other hand, if the Mission Assurance requirements remain, the USSF should consider alternative ways to tailor Mission Assurance requirements that take advantage of proven space launch solutions and focus more on new and emerging space launch service providers. Sustaining a robust industrial base for space launch services will increase competition and continue to drive down prices. Based on the implications of the performance work statement, we combined our recommendation to the USSF in the next section.

5. Mission Requirements Documents (MRD)

The implications of the analysis of the MRD are that the mission-specific requirements may move the space launch service further away from commercial practices. The MRDs are prescriptive and mission-specific. The MRD could further complicate interpretation of technical requirements and provide ambiguity for a new emerging space launch service provider.

Despite the potential for the MRD to cause further difficulty in meeting the government’s requirement, the analysis provides that the MRD is still paramount to the government receiving the space launch service that meets all its requirements. The tailorable Mission Assurance we analyzed included category 2, which if revised has the potential to prescribe category 1 Mission Assurance. Category 1 would significantly ease the burden on a space launch service provider and would be more in line with their commercial practices. The USSF should consider the space launch solutions of the OSP-4 providers to determine which missions could be executed with only category 1 Mission Assurance. The easing of Mission Assurance requirements would allow the contract process to accelerate to meet the emerging threat in space. Based on the implications of the findings within the performance

work statement and mission requirements documents, our fifth recommendation is the following:

Recommendation 5. USSF implementation of a certification process for launch solutions and use of tailorable Mission Assurance categories for configurations previously and successfully flown.

6. Price Negotiation Memoranda (PNM)

Future OSP-4 contracts containing noncommercial requirements must be thoroughly supported by quantifiable, reliable data to support negotiation of a fair and reasonable price. Modifications to OSP-4 task orders which require equitable adjustment are more difficult to negotiate a fair and reasonable price. Future OSP-4 task orders containing noncommercial items (e.g. Mission Assurance) must be thoroughly supported by data to support negotiation of a fair and reasonable price, since pricing cannot be sufficiently supported without competitive pricing or validated data. In addition, modifications requiring equitable adjustment add significant administrative burden on the contracting team. The time from request for equitable adjustment through award of modification may be significant. These delays, the difficulties on behalf of the space launch service provider to meet the government's requirements, and the lack of fidelity in the true price of the space launch service hinders the government's ability to go faster and adds risk to the mission.

The Air Force Installation Contracting Center's Cost Savings Tracker Guidebook published acquisition process times referenced in Appendix F. The process times are reflected in hours for various processes. Previously discussed was the time it took to negotiate a fair and reasonable price for an equitable adjustment in a task order modification. The most similar process is Service Task Order because we are effectively negotiating pricing for additional scope (219.66 hrs) through revised requirements documents and evaluation of the contractor's proposal. If modifications for task orders take up to eight months to negotiate, and we can assume a minimum of two hours per day for two hundred days, a modification for a task order could take four hundred hours. Four hundred hours is almost double the standard process time for a Service Task Order. Effectively, the commerciality of space

launch services and resultant negotiations of equitable adjustments are creating a burden to the contracting professionals and to the space launch services providers.

The implications of commerciality on the difficulty in determining a fair and reasonable price is that the government will continue to have difficulty unless policies for price analysis are changed. Alternatively, since much of the difficulty on behalf of the launch service provider was attributed to Mission Assurance requirements, the USSF should look at whether there is better way to perform Mission Assurance or if the Mission Assurance should be tailored further depending on the maturing of the space launch service provider's launch solution. The FAR prohibits the contracting officer to require the space launch service provider from certifying cost and pricing data for commercial contracts. The FAR also does not require the space launch service provider to obtain an approved accounting system. Pricing commercial space launch service contracts will remain difficult based on the current regulations. Based on the implications of the findings within the price negotiation memoranda, our final recommendation is the following:

Recommendation 6. USSF should seek a FAR deviation to allow cost contract line items for Mission Assurance in order to trace and properly price Mission Assurance included in commercial space launch service contracts.

C. SUMMARY:

Chapter V discussed the analysis of findings from this research. In addition, this chapter presented the implications of the findings along with recommendations to the United States Space Force (USSF) for improving the procurement of space launch services. The next chapter will provide the summary, conclusion, and areas for further research.

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VI. SUMMARY, CONCLUSION, AND AREAS FOR FURTHER RESEARCH

This chapter summarizes the background, the problem statement and the purpose of this research. Furthermore, we finalize the research and summarize answers to our research questions. To conclude, we present recommended areas for further research.

A. SUMMARY

The mission of the USSF, and specifically Space Systems Command (SSC), is to acquire goods and services to provide space capability to the warfighter. Some of these acquisitions are for military unique, or noncommercial, types of goods and services. Other acquisitions are for commercial types of goods and services. Contracting for noncommercial and commercial goods and services normally utilize separate acquisition approaches, traditional or streamlined. The approach is determined through a commerciality determination. When a commercial streamlined acquisition approach is used and the requirements contain both commercial and noncommercial requirements, the determination of a fair and reasonable price becomes difficult. This research focused on the Rocket Systems Launch Program's (RSLP) Orbital Services Program-4 (OSP-4) commerciality, which was based on a previous commerciality determination of the National Security Space Launch Program (NSSL). The NSSL determination effectively made all space launch service contracts commercial. OSP-4 utilizes a streamlined commercial acquisition approach and contains noncommercial requirements which presents a challenge when negotiating a fair and reasonable price. The purpose of this research was to conduct an analysis of the commerciality determination and analyze the specific noncommercial requirements which make determining a fair and reasonable price difficult.

B. CONCLUSION

Through the research and analysis of the commerciality determinations and analysis of specific noncommercial requirements of the OSP-4 space launch services contract, we were able to answer the following research questions:

1. How did the NSSL and RSLP programs determine that their space launch services are commercial?

The NSSL based their commerciality determination on the Commercial Space Transportation Law and the publication of average prices for space launch services posted on public websites. The RSLP OSP-4 program determined their commerciality in accordance with DFARS guidance which provides that previous commercial item determinations for the same “of a type” services shall apply to subsequent contracts (DFARS 212.104, 2022). As a result, the OSP-4 contract utilized the NSSL’s commercial item determination to utilize FAR Part 12 streamlined procedures.

2. What are the noncommercial requirements in the RSLP OSP-4 program that are creating a challenge to negotiating a fair and reasonable price?

The noncommercial requirements in the RSLP OSP-4 program are summarized in Table 4. The research found that the government’s Mission Assurance requirements were the overarching noncommercial requirement which created a challenge to negotiating a fair and reasonable price. The other noncommercial requirements are ancillary to Mission Assurance meaning they are caused by the government unique requirements and add to the overall complexity of services being procured and provided by a commercial space launch provider. The fair and reasonable price negotiations became difficult because the noncommercial requirements created a challenge to the launch service provider in meeting the requirements and also caused them to seek further equitable adjustment. Without the benefit of adequate price competition for equitable adjustments, the price analysis and subsequent negotiations are challenging for the contracting officer.

Table 4. Summary of OSP-4 Noncommercial Requirements

| No. | Noncommercial Requirement | Implication |
|-----|--|--|
| 1 | Mission Assurance | Consists of 66+ tests and analyses the space launch service provider must provide data for. |
| 2 | Nonstandard Terms and Conditions | Requires Contracting Officer Determination and Findings and HCA approval. |
| | Tailored Clauses | Requires Contracting Officer Determination and Findings and HCA approval. |
| | Launch Delay Clause | Removes and replaces language tailored for “Excusable Delays” |
| | Enabling Clause | Requires space launch service provider to interface with Aerospace Corporation for technical review and system integration. |
| 3 | Space Transportation vs. Launch Services | Systemic use of both provides conflicting definitions and guidance. |
| 4 | 95% mission reliability for space launch | 95% mission reliability is the reason Mission Assurance must be performed for every government-sponsored space launch service. |
| 5 | Small Launch Interface Specification | Government specific 50+ interface specifications for space launch service provider practices. |
| 6 | Small Launch Performance Requirements Document | Government specific 36 standard performance requirements, 12 additional enhancements, and 5 verification provisions for space launch service provider practices. |
| 7 | Launch Mission Enhancements | Government specific 20+ specific enhancements to space launch service provider practices. |
| 8 | Associate Contractor Agreements | Requires space launch service provider to interface with other Government contractors via formal agreements in order to execute contract. |

3. What recommendations can we provide to the USSF for improving the acquisition of space launch services in the future?

Commerciality and a streamlined acquisition approach is the preferred method to acquire space launch services. The USSF is addressing an emerging threat in the space realm which dictates the need to acquire space capability faster and more efficiently. Absent a complete FAR deviation for space launch services, we cannot recommend an alternative acquisition approach, however Table 5 outlines our six recommendations to increase the efficiency of the acquisition process for space launch services based on our findings and analysis.

Table 5. Recommendations

| |
|--|
| Recommendation 1. USSF establish a market intelligence cell to continuously monitor and engage with existing and emerging space launch service providers to take advantage of new space launch capabilities and incorporate more commercial space launch practices. |
| Recommendation 2. USSF publish SSC Supplemental Acquisitions Guidance providing for exception for CIDs for space launch services. |
| Recommendation 3. USSF, through SSC Supplemental Acquisitions Guidance, provide definitions of “Space Transportation Services” and “Launch Services” or equate the two. |
| Recommendation 4. USSF publish SSC Supplemental Acquisitions Guidance providing for standard provisions and clauses to be included in all commercial space launch services contracts. |
| Recommendation 5. USSF implementation of a certification process for launch solutions and use of tailorable Mission Assurance categories for configurations previously and successfully flown. |
| Recommendation 6. USSF should seek a FAR deviation to allow cost contract line items for Mission Assurance in order to trace and properly price Mission Assurance included in commercial space launch service contracts. |

C. AREAS FOR FURTHER RESEARCH

Succeeding the conclusion of this research, we have identified areas for further research which may benefit other space launch programs and other Department of Defense (DOD) programs.

1. Reassess the commerciality of the National Security Space Launch (NSSL) Program and analyze the price fair and reasonable determinations.

Since the commerciality of OSP-4 was based on the commerciality of the NSSL program, further research into the noncommercial requirements and possible challenges to determining a fair and reasonable price is warranted.

2. Analyze other space launch service contracts that are not commercial, such as the Sounding Rocket Program-4 (SRP-4), to assess if noncommercial contracts utilizing a traditional acquisition method also experience challenges when determining a fair and reasonable price.

Though the NSSL commerciality determination resulted in OSP-4 also being determined commercial, there are other space launch service contracts, such as RSLP's SRP-4 contract that are still considered noncommercial. Further research of those contracts may provide insight into how prices are determined fair and reasonable and if there are similar challenges present.

3. Analyze other DOD commercial services contracts that contain noncommercial requirements to assess and analyze the challenges when determining a fair and reasonable price and when utilizing a streamlined acquisition approach.

Lastly, the research found that much of the difficulty in determining a fair and reasonable price was a result of the noncommercial requirements within a commercial contract. Commerciality has the subsequent effect of the government not being able to obtain certified cost and pricing data and also the absence of approved accounting systems. Certified cost and pricing data and approved accounting systems aid in the price and cost analysis of contracts to ensure the government is able to negotiate a fair and reasonable price.

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APPENDIX A. NATIONAL SECURITY SPACE LAUNCH COMMERCIAL ITEM DETERMINATION (NSSL CID, 2015)

24 September 2015

DETERMINATION AND FINDINGS Evolved Expendable Launch Vehicle (EELV) PHASE 1A Commercial Item Determination

This determination is made upon the basis of the following findings and the review of the definition of Commercial Items in FAR 2.101, as well as DFARS PGI 212.1--Acquisition of Commercial Items—General.

1. United States Code (USC) title 51, section 50132(a), "Acquisition of commercial space transportation services" states that, "Acquisition of space transportation services by the Federal Government shall be carried out in accordance with applicable acquisition laws and regulations (including chapters 137 and 140 of title 10). For purposes of such law and regulations, space transportation services shall be considered to be a commercial item." In accordance with this Act, the EELV Phase 1A acquisition will procure launch services as a commercial item in accordance with FAR Part 12.
2. Additionally, pursuant to FAR 10.002(d)(1), market research has established that the Government's need under the EELV Phase 1A procurement can be met, with minor adjustments, by the type of launch services customarily available in the domestic launch vehicle industry commercial marketplace.
3. Launch services meets the following definition of commercial services as defined in FAR 2.101 and is consistent with United States Code (USC) title 51, section 50132(a).

"Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed or specific outcomes to be achieved and under standard commercial terms and conditions. For purposes of these services—

(i) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) "Market prices" means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors."

4. [REDACTED] publicly lists its [REDACTED] commercial launch price on its website at: [REDACTED] This commercial price is [REDACTED]

currently listed as [REDACTED] publicly lists the average price of a mission, accounting for all current firm contracts for [REDACTED] and [REDACTED] launch services, at [REDACTED]. This price includes all missions, Department of Defense (DoD), NASA, commercial, [REDACTED] through [REDACTED]. This information is posted on the company website at: [http://\[REDACTED\]](http://[REDACTED])

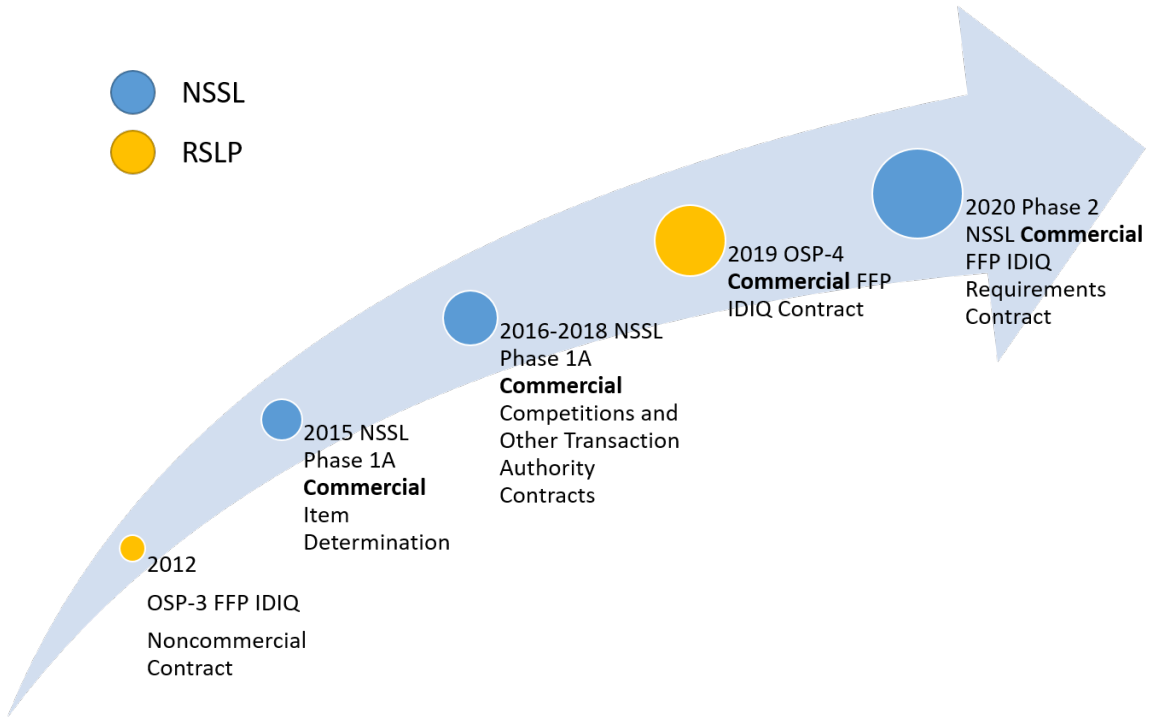
DETERMINATION

Pursuant to FAR 2.101 and the above findings and in accordance with USC title 51, section 50132(a), I hereby make the determination that the launch services performed under the EELV Phase 1A contract constitute commercial services. Pursuant to this determination, FAR Part 12 commercial item acquisition procedures shall be utilized for EELV Phase 1A launch services acquisitions.

A large black rectangular redaction box covering the signature of the Contracting Officer.

Contracting Officer
Launch Systems Directorate

APPENDIX B. TIMELINE OF USSF COMMERCIALITY OF SPACE LAUNCH SERVICE CONTRACTS



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APPENDIX C. NONSTANDARD TERMS AND CONDITIONS DETERMINATION AND FINDINGS (OSP-4 D&F, 2019)

52.212-4 -- Contract Terms and Conditions -- Commercial Items.

As prescribed in 12.301(b)(3), insert the following clause:

Addendum to Contract Terms and Conditions -- Commercial Items (Oct 2018)

(a) *Inspection/Acceptance.* Pursuant to FAR Subpart 12.402(b), FAR clauses 52.246-4 Inspection of Services-Fixed Price shall govern and apply to this contract and are incorporated herein by reference and in full text separately. The Government reserves the right to perform in-process inspection of testing of any launch services tendered for acceptance prior to launch.

(1) Acceptance for launch service is upon mission meeting orbit insertion requirements. At the time of delivery, the Contractor shall prepare and furnish to the Government a material inspection and receiving report in accordance with DFARS 252.246-7000. In the event the Government determines the mission was not a success the Government may withhold up to 20% of the firm fixed price.

(2) Acceptance for Data & Reports shall be as specified in the attached Contract Data Requirements Lists (CDRL), DD Form 1423.

(3) For services other than launch services, the Government must exercise its post acceptance rights:

(i) Within a reasonable time after the defect was discovered or should have been discovered; and

(ii) Before any substantial changes occurs in the condition of the item, unless the change is due to the defect in the item.

(b) *Assignment.* The Contractor or its assignee may assign its rights to receive payment due as a result of performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C.3727). However, when a third party makes payment (e.g., use of the Government wide commercial purchase card), the Contractor may not assign its rights to receive payment under this contract.

(c) *Changes.* FAR clause 52.243-1 Changes- Fixed Price Alternate II, is hereby incorporated by reference and in full text separately. FAR clause 52.243-7 Notification of Changes is incorporated herein by reference and in full-text separately.

(d) *Disputes.* This contract is subject to 41 U.S.C. chapter 71, Contract Disputes. Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The

Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) *Definitions.* The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) *Excusable delays.* The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence. **This subpart (f) shall not apply to postponements and delays subject to Clause H001 Launch Delay.**

(g) *Invoice.*

(1) The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized) to the address designated in the contract to receive invoices. An invoice must include --

- (i) Name and address of the Contractor;
- (ii) Invoice date and number;
- (iii) Contract number, line item number and, if applicable, the order number;
- (iv) Description, quantity, unit of measure, unit price and extended price of the items delivered;
- (v) Shipping number and date of shipment, including the bill of lading number and weight of shipment if shipped on Government bill of lading;
- (vi) Terms of any discount for prompt payment offered;
- (vii) Name and address of official to whom payment is to be sent;
- (viii) Name, title, and phone number of person to notify in event of defective invoice; and
- (ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.
- (x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision, contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer— System for Award Management, or 52.232-34, Payment by Electronic Funds Transfer—Other Than System for Award Management), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(2) Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) prompt payment regulations at 5 CFR part 1315.

(h) *Patent indemnity.* The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) **Payment.**

(1) *Items accepted.* Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract.

(2) *Prompt Payment.* The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and prompt payment regulations at 5 CFR Part 1315.

(3) *Electronic Funds Transfer (EFT).* If the Government makes payment by EFT, see 52.212-5(b) for the appropriate EFT clause.

(4) *Discount.* In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.

(5) *Overpayments.* If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall—

(i) Remit the overpayment amount to the payment office cited in the contract along with a description of the overpayment including the—

(A) Circumstances of the overpayment (e.g., duplicate payment, erroneous payment, liquidation errors, date(s) of overpayment);

(B) Affected contract number and delivery order number, if applicable;

(C) Affected line item or subline item, if applicable; and

(D) Contractor point of contact.

(ii) Provide a copy of the remittance and supporting documentation to the Contracting Officer.

(6) Interest.

(i) All amounts that become payable by the Contractor to the Government under this contract shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in 41 U.S.C. 7109, which is applicable to the period in which the amount becomes due, as provided in (i)(6)(v) of this clause, and then at the rate applicable for each six-month period at fixed by the Secretary until the amount is paid.

(ii) The Government may issue a demand for payment to the Contractor upon finding a debt is due under the contract.

(iii) Final decisions. The Contracting Officer will issue a final decision as required by 33.211 if—

(A) The Contracting Officer and the Contractor are unable to reach agreement on the existence or amount of a debt within 30 days;

(B) The Contractor fails to liquidate a debt previously demanded by the Contracting Officer within the timeline specified in the demand for payment unless the amounts were not repaid because the Contractor has requested an installment payment agreement; or

(C) The Contractor requests a deferment of collection on a debt previously demanded by the Contracting Officer (see 32.607-2).

(iv) If a demand for payment was previously issued for the debt, the demand for payment included in the final decision shall identify the same due date as the original demand for payment.

(v) Amounts shall be due at the earliest of the following dates:

(A) The date fixed under this contract.

(B) The date of the first written demand for payment, including any demand for payment resulting from a default termination.

(vi) The interest charge shall be computed for the actual number of calendar days involved beginning on the due date and ending on—

(A) The date on which the designated office receives payment from the Contractor;

(B) The date of issuance of a Government check to the Contractor from which an amount otherwise payable has been withheld as a credit against the contract debt; or

(C) The date on which an amount withheld and applied to the contract debt would otherwise have become payable to the Contractor.

(vii) The interest charge made under this clause may be reduced under the procedures prescribed in 32.608-2 of the Federal Acquisition Regulation in effect on the date of this contract.

(j) *Risk of loss.* Unless the contract specifically provides otherwise, risk of loss or damage to the supplies provided under this contract shall remain with the Contractor until, and shall pass to the Government upon:

(1) Delivery of the supplies to a carrier, if transportation is f.o.b. origin; or

(2) Delivery of the supplies to the Government at the destination specified in the contract, if transportation is f.o.b. destination.

(k) *Taxes.* The contract price includes all applicable Federal, State, and local taxes and duties.

(l) *Termination for the Government's convenience.* The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred which reasonably could have been avoided.

(m) *Termination for cause.* The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(n) *Title.* Unless specified elsewhere in this contract, title to items furnished under this contract shall remain with the Contractor. The Government shall not take title to launch vehicles under contracts for launch services.

(o) *Warranty.* Unless otherwise specified, the Contractor makes no warranty, express or implied, with respect to the services delivered or performed hereunder. To the extent any supplies are delivered under this contract, the Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(p) *Limitation of liability.* Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(q) *Other compliances.* The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(r) *Compliance with laws unique to Government contracts.* The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. chapter 37, Contract Work Hours and Safety Standards; 41 U.S.C. chapter 87, Kickbacks; 41 U.S.C. 4712 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. chapter 21 relating to procurement integrity.

(s) *Order of precedence.* Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order:

- (1) The schedule of supplies/services.
- (2) The Assignments, Disputes, Payments, Invoice, Other Compliances, Compliance with Laws Unique to Government Contracts, and Unauthorized Obligations paragraphs of this clause.
- (3) The clause at 52.212-5.
- (4) Addenda to this solicitation or contract, including any license agreements for computer software.

(5) Solicitation provisions if this is a solicitation.

(6) Other paragraphs of this clause.

(7) The Standard Form 1449.

(8) Other documents, exhibits, and attachments.

(9) The specification.

(t) Reserved

(u) Unauthorized Obligations.

(1) Except as stated in paragraph (u)(2) of this clause, when any supply or service acquired under this contract is subject to any End Use License Agreement (EULA), Terms of Service (TOS), or similar legal instrument or agreement, that includes any clause requiring the Government to indemnify the Contractor or any person or entity for damages, costs, fees, or any other loss or liability that would create an Anti-Deficiency Act violation (31 U.S.C. 1341), the following shall govern:

(i) Any such clause is unenforceable against the Government.

(ii) Neither the Government nor any Government authorized end user shall be deemed to have agreed to such clause by virtue of it appearing in the EULA, TOS, or similar legal instrument or agreement. If the EULA, TOS, or similar legal instrument or agreement is invoked through an "I agree" click box or other comparable mechanism (e.g., "click-wrap" or "browse-wrap" agreements), execution does not bind the Government or any Government authorized end user to such clause.

(iii) Any such clause is deemed to be stricken from the EULA, TOS, or similar legal instrument or agreement.

(2) Paragraph (u)(1) of this clause does not apply to indemnification by the Government that is expressly authorized by statute and specifically authorized under applicable agency regulations and procedures.

(v) *Incorporation by reference.* The Contractor's representations and certifications, including those completed electronically via the System for Award Management (SAM), are incorporated by reference into the contract.

***Note: BOLD text indicates tailored language.**

(End of Clause)

**REQUEST FOR APPROVAL
CONTRACT CLAUSE OR PROVISION NOT PUBLISHED IN THE
FAR/DFARS/AFFARS**

**ORBITAL SERVICES PROGRAM-4 (OSP-4)
FA8818-19-R-0001**

Requesting approval for two OSP-4 Program-Unique Nonstandard Clauses. The suggested language and justification for the Launch Delay Clause and Enabling Requirements for Government Program Contracts Requiring Interface with Aerospace FFRDC Contract Support are detailed below.

1a. SUGGESTED CONTRACT CLAUSE OR PROVISION:

ADK H001 LAUNCH DELAY CLAUSE (Apr 2019)

1. Initial Launch Capability: An Initial Launch Capability (ILC) date shall be established with the issuance of each Mission Requirements Document. ILC is defined as the first day on which the mission can be launched and shall be the first day of a 60 calendar day Launch Window during which the Government can select the actual launch date.

2. Launch Date: No later than 60 calendar days before the ILC, the Government will either establish a Launch Date within the 60 calendar day Launch Window, or change the ILC through supplemental agreement. Should the Government fail to establish the Launch Date by ILC minus 60 calendar days, the ILC becomes the Launch Date.

3. Grace Period: Once the Launch Date is established, the 15 calendar days following the Launch Date shall be considered a Grace Period. No additional consideration shall be charged to either party for delays during this 15 calendar day Grace Period.

§ The Launch Date may be modified by mutual agreement between the Government and Contractor and will not require notification from the Procuring Contracting Officer within this 15 calendar day Grace Period.

§ If the Launch Date slips beyond the 15 calendar day Grace Period due to Government or Contractor action, a new Launch Date shall be established and consideration may be negotiated.

4. Delays Beyond Grace Period: In the event of delays beyond the grace period, e.g. a brief range or weather delay, the rescheduling may be mutually agreed upon without increase in Launch Service price, or consideration. This requires PCO approval.

(end of clause)

1b. APPLICABLE FAR PART/SUBJECT AREA:

FAR 12.301 – Solicitation Provisions and Contract Clauses for the Acquisition of Commercial Items.

1c. JUSTIFICATION:

FAR 52.212-4(f) Excusable Delays was tailored to state that "This subpart (f) shall not apply to postponements and delays subject to Clause H001." The standard language of paragraph (f) allows "Acts of the Government" to be excusable delays and is consistent with commercial practices, as a commercial practice launch service providers simply agree to a launch date and provide the best effort to meet the established date. However, due to warfighter missions needs the Government has a requirement to establish the launch date within a certain window. Therefore, a Launch Delay Clause (H001) which provides detailed information regarding Initial Launch Capability (ILC) date, and detailed information regarding grace period is required.

2a. SUGGESTED CONTRACT CLAUSE OR PROVISION:

ADK H002 ENABLING REQUIREMENTS FOR GOVERNMENT PROGRAM CONTRACTS REQUIRING INTERFACE WITH AEROSPACE FFRDC CONTRACT SUPPORT (May 2019)

a. This contract covers part of a program which is under the general program management of the Air Force Space and Missile Systems Center (SMC). The Air Force has entered into a contract with The Aerospace Corporation, a California nonprofit corporation operating a Federally Funded Research and Development Center (FFRDC), for the services of a technical group that will support the DoD/U.S. Government program office by performing General Systems Engineering and Integration, Technical Review, and/or Technical Support including informing the commander or director of the various Department of Defense ("DoD") organizations it supports and any U.S. Government program office of product or process defects and other relevant information, which, if not disclosed to the U.S. Government, could have adverse effects on the reliability and mission success of a U.S. Government program.

1. General Systems Engineering and Integration (GSE&I) deals with overall system definition; integration both within the system and with associated systems; analysis of system segment and subsystem design; design compromises and tradeoffs; definition of interfaces; review of hardware and software, including manufacturing and quality control; observation, review and evaluation of tests and test data; support of launch, flight test, and orbital operations; appraisal of the contractors' technical performance through meetings with contractors and subcontractors, exchange and analysis of information on progress and problems; review of plans for future work; developing solutions to problems; technical alternatives for reduced program risk; providing comments and recommendations in writing to the applicable DoD System Program Manager and/or Project Officer as an independent technical assessment for consideration for modifying the program or redirecting the contractor's efforts; all to the extent

necessary to assure timely and economical accomplishment of program objectives consistent with mission requirements.

2. Technical Review (TR) includes the process of appraising the technical performance of the contractor through meetings, exchanging information on progress and problems, reviewing reports, evaluating presentations, reviewing hardware and software, witnessing and evaluating tests, analyzing plans for future work, evaluating efforts relative to contract technical objectives, and providing comments and recommendations in writing to the applicable Air Force Program Manager as an independent technical assessment for consideration for modifying the program or redirecting the contractor's efforts to assure timely and economical accomplishment of program objectives.

3. Technical Support (TS) deals with broad areas of specialized needs of customers for planning, system architecting, research and development, horizontal engineering, or analytical activities for which The Aerospace Corporation is uniquely qualified by virtue of its specially qualified personnel, facilities, or corporate memory. The categories of TS tasks are: Selected Research, Development, Test and Evaluation; Plans and System Architecture; Multi-Program Systems Enhancement; International Technology Assessment; and Acquisition Support.

b. In the performance of this contract, the contractor agrees to cooperate with The Aerospace Corporation by 1) responding to invitations from authorized U. S. Government personnel to attend meetings; 2) by providing access to technical information and research, development planning data such as, but not limited to, design and development analyses, test data and results, equipment and process specifications, test and test equipment specifications and procedures, parts and quality control procedures, records and data, manufacturing and assembly procedures, and schedule and milestone data, all in their original form or reproduced form and including top-level life cycle cost* data, where available; 3) by delivering data as specified in the Contract Data Requirements List; 4) by discussing technical matters relating to this program; 5) by providing access to contractor facilities utilized in the performance of this contract; 6) and by allowing observation of technical activities by appropriate technical personnel of The Aerospace Corporation. The Aerospace Corporation personnel engaged in GSE&I, TR, and/or TS efforts: (i) are authorized access to all such technical information (including proprietary information) pertaining to this contract and may discuss and disclose it to the applicable DoD personnel in a program office; (ii) are authorized to discuss and disclose such technical information (including proprietary information) to the commander or director of the various DoD organizations it supports and any U.S. Government personnel in a program office which, if not disclosed to the U.S. Government, could have adverse effects on the reliability and mission success of a U.S. Government program; and (iii) Aerospace shall make the technical information (including proprietary information) available only to its Trustees, officers, employees, contract labor, consultants, and attorneys who have a need to know.

c. The contractor further agrees to include in all subcontracts a clause requiring compliance by subcontractor and supplier and succeeding levels of subcontractors and suppliers with the

response and access and disclosure provisions of this Enabling Clause, subject to coordination with the contractor, except for subcontracts for commercial items or commercial services. This agreement does not relieve the contractor of its responsibility to manage the subcontracts effectively and efficiently nor is it intended to establish privity of contract between the Government or The Aerospace Corporation and such subcontractors or suppliers, except as indicated in paragraph (d) below.

d. The Aerospace Corporation shall protect the proprietary information of contractors, subcontractors, and suppliers in accordance with the Master Non-disclosure Agreement The Aerospace Corporation entered into with the Air Force, a copy of which is available upon request. This Master Non-disclosure Agreement satisfies the Nondisclosure Agreement requirements set forth in 10 U.S.C. §2320 (f)(2)(B), and provides that such contractors, subcontractors, and suppliers are intended third-party beneficiaries under the Master Non-disclosure Agreement and shall have the full rights to enforce the terms and conditions of the Master Non-disclosure Agreement directly against The Aerospace Corporation, as if they had been signatory party hereto. Each such contractor, subcontractor, or supplier hereby waives any requirement for The Aerospace Corporation to enter into any separate company-to-company confidentiality or other non-disclosure agreements.

e. Aerospace shall make the technical information (including proprietary information) available only to its Trustees, officers, employees, contract labor, consultants, and attorneys who have a need to know, and Aerospace shall maintain between itself and the foregoing binding agreements of general application as may be necessary to fulfill their obligations under the Master Non-disclosure Agreement referred to herein, and Aerospace agrees that it will inform contractors, subcontractors, and suppliers if it plans to use consultants, or contract labor personnel and, upon the request of such contractor, subcontractor, or supplier, to have its consultants and contract labor personnel execute non-disclosure agreements directly therewith.

f. The Aerospace Corporation personnel are not authorized to direct the contractor in any manner. The contractor agrees to accept technical direction as follows:

1. Technical direction under this contract will be given to the contractor solely by SMC.
2. Whenever it becomes necessary to modify the contract and redirect the effort, a change order signed by the Contracting Officer or a Supplemental Agreement signed by both the Contracting Officer and the contractor will be issued.

* Cost data is defined as information associated with the programmatic elements of life cycle (concept, development, production, operations, and retirement) of the system/program. As defined, cost data differs from "financial" data, which is defined as information associated with the internal workings of a company or contractor that is not specific to a project or program."

(end of clause)

2b. APPLICABLE FAR PART/SUBJECT AREA:

FAR 35.017 – Federally Funded Research and Development Centers

2c. JUSTIFICATION:

This clause implements FAR 35.017 – Federally Funded Research and Development Centers, by defining the relationship, roles, and responsibilities of the contractor and the FFRDC.

CONTRACTING OFFICER'S DETERMINATION:

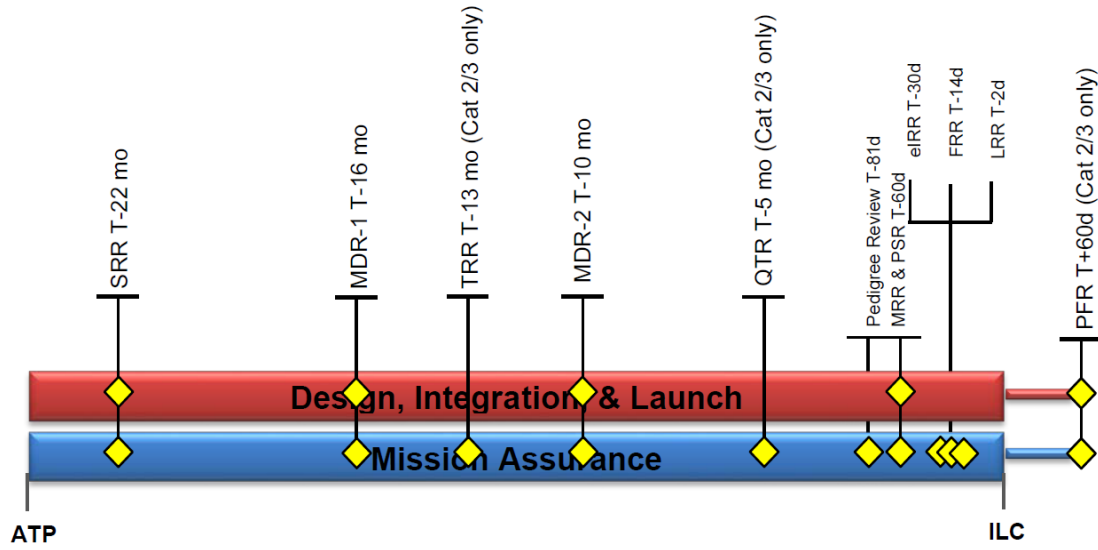
The undersigned contracting officer has determined that the attached contract clause or provision does not duplicate or deviate from the FAR or FAR Supplements and is necessary for use in the subject solicitation or contract.

[REDACTED]
CONTRACTING OFFICER

NONSTANDARD CLAUSE APPROVAL

[REDACTED]
Deputy Contracting Division Chief

APPENDIX D. MISSION ASSURANCE MAJOR REVIEWS (OSP-4 PWS, 2019)



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APPENDIX E. MISSION ASSURANCE REQUIREMENTS ANNEX TO OSP-4 PWS, (OSP-4 PWS, 2019)

Annex 2: Performance Threshold Entrance and Exit Criteria

The following are the entrance and exit criteria for:

- Service Requirements Review (SRR)
- Mission Design Review-1 (MDR-1)
- Test Readiness Review (TRR) (Cat 2/3 missions only)
- Mission Design Review-2 (MDR-2)
- Qualification Test Review (QTR) (Cat 2/3 missions only)
- Pedigree Review (PR) (Cat 2/3 missions only)
- Pre-Ship Readiness Review (PSR)

| SRR | | |
|--|-------|--|
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. Integrated Schedule (PWS 2.1.5.2) | A025 | Monthly – Most recent version to be included with Review submission at SRR-30d |
| 2. Documentation/Specification Tree diagram showing all relevant documents and drawings (PWS 2.1.1.1.1) – Category 2/3 missions only | A015 | Draft: SRR-30d |
| 3. Requirements Traceability and Verification Matrix (RTVM) submitted (SPS RTVM, PWS RTVM, MRD RTVM) (PWS 2.1.1.1.1, 2.1.1.3.1) – Category 2/3 missions only | A021 | Prelim: SRR-30d (requirements and planned verification only) |
| 4. System Safety Program Plan (SSPP) (PWS 2.1.2.3) | A020 | Draft: SRR-30d |
| 5. Program Management Plan (PMP) (PWS 2.1.1.2) | A031 | SRR-30d |
| 6. Draft SRR briefing chart package, Design Review Information Package (DRIP) review charts that include (PWS 2.1.1.1): <ul style="list-style-type: none"> a. Overview of the proposed Mission concept b. Proposed SS design c. Assessment of compliance with requirements d. Current integrated schedule and critical path e. Planned special studies f. Proposed plan for submittal of all required contract deliverables including projected submittal dates g. Initial risk assessment and mitigation plan presented (including first flight items) h. Proposed logistics concept i. Safety program j. Proposed plan for compliance with Range Interface and Range Safety requirements | A002 | SRR-30d Rev: SRR-5d |

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| k. GFP requirements and requested delivery schedule reviewed (if applicable) | | |
| 1. Path ahead to MDR outlined | | |
| SRR Exit Criteria | | |
| Description | CDRL# | Due |
| 1. Review of action items with assignee and closure dates (PWS 2.1.1) | A001 | NLT SRR+7d |
| 2. Final SRR briefing chart package (PWS 2.1.1.1) | A002 | SRR |

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| MDR-1 | | |
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. All liens and action items from SRR completed and closed out | | |
| 2. Updated Integrated Schedule (PWS 2.1.5.2) | A025 | Monthly – Most recent version to be included with Review submission at MDR1-30d |
| 3. System Performance Specification (PWS 2.1.1.1.1) – Category 2/3 missions only | A016 | Rev: MDR1-30d |
| 4. Documentation/Specification Tree diagram showing all relevant documents and drawings (PWS 2.1.1.1.1) – Category 2/3 missions only | A015 | Rev: MDR1-30d |
| 5. Updated RTVM (SPS, PWS, MRD, ICD) (PWS 2.1.1.1.1, 2.1.1.3.1) – Category 2/3 missions only | A021 | Rev: MDR1-30d |
| 6. Draft ICDs (PWS 2.1.1.3.1) | A018 | MDR1-30d Rev: MDR1+30 |
| 7. Software Requirements Specification (SRS) (PWS 2.1.2.2.2) – Category 2/3 missions only | B006 | Draft: MDR1-30d Rev: MDR1 |
| 8. Software Design Description (SDD) (PWS A1-2.14) – Category 2/3 missions only | A008 | Draft: MDR1-30d Rev: MDR1 |
| 9. Cyber Security Implementation Plan (CSIP) (PWS 2.1.2.8.2) | A023 | Final: MDR1-30d |
| 10. Schedule and status of all range documents (PWS 2.1.2.2) | A003 | MDR1-30d |
| 11. System Safety Program Plan (PWS 2.1.2.3) | A020 | Revision: MDR1-30d Final: MDR1+10d |
| 12. Test and Evaluation Program Plan (TEPP) with Test Planning assessment (PWS A1-2.16) – Category 2/3 missions only | A027 | Draft: MDR1-30d |
| 13. Draft MDR-1 briefing chart package, Design Review Information Package (DRIP) review charts that include (PWS 2.1.1.3.2): a. Final special study results b. Current integrated schedule and critical path | A002 | MDR1-30d Rev MDR1-5d |

| <ul style="list-style-type: none"> c. Proposed plan for submittal of all required contract deliverables including projected submittal dates d. Updated risk and opportunity assessment and mitigation e. Test Planning assessment and exceptions (PWS 2.2.1.2.4.1) – Category 2/3 missions only f. Status of long lead items and critical spares procurement g. Hazard analysis and data to support System Safety Assessment h. Software architecture, qualification testing plan presented – Category 2/3 missions only i. Preliminary environments defined j. SS performance analysis reviewed k. Path ahead to MDR-2 outlined l. Current SS Design m. Current Logistics Concept | | |
|---|-------|-------------|
| MDR-1 Exit Criteria | | |
| Description | CDRL# | Due |
| 1. Review of action items with assignee and closure dates (PWS 2.1.1.3.2) | A001 | NLT MDR1+7d |
| 2. Final MDR-1 briefing chart package (PWS 2.1.1.3.2) | A002 | MDR1 |

| TRR (Cat 2/3 missions only) | | |
|---|-------|--|
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. All liens and action items from MDR-2 completed and closed out | | |
| 2. Test requirements traceability to system requirements verified (PWS 2.1.1.1.1, 2.1.1.3.1) | A021 | Rev: TRR-30d |
| 3. Software Requirements Specification (SRS) (PWS 2.1.2.2.2) | B006 | Draft: TRR-30d Rev: Test-15d Final: Launch-30d |
| 4. Software Design Description (SDD) (PWS A1-2.14) | A008 | Draft: TRR-30d Rev: Test-15d Final: Launch-30d |
| 5. Software Test Description (STD) (PWS A1-2.15) | A024 | Test-15d |
| 6. Flight hardware delivery and software completion schedule supports planned testing (PWS 2.1.5.2) | A025 | Monthly – Most recent version to be included with Review submission at TRR-30d |

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| 7. Qualification/Acceptance matrices (PWS A1-2.21 through 2.26) | A012 | Test+30d |
| 8. Qualification and Acceptance test plans completed (PWS A1-2.19) | A027 | Draft: TRR-30d Factory: Test-15d Field: Test-7d |
| 9. Draft test procedures (PWS 2.1.1.4.7) | A027 | Draft: TRR-30d Factory: Test-15d Field: Test-7d |
| 10. Hazardous operations reviewed and approved by Safety (PWS 2.1.2.4) | A020 | Start of Haz Ops-30d |
| 11. Test Planning assessment presented and exceptions reviewed (PWS A1-2.16) | A027 | TRR-30d Factory: Test-15d Field: Test-7d |
| 12. Support equipment and test facility checked out and ready to support (PWS 2.1.2.10.5) | A027 | TRR-30d Factory: Test-15d Field: Test-7d |
| 13. Planned and completed Qualification/Acceptance testing reviewed (PWS 2.1.1.4.5) | A027 | TRR-30d Factory: Test-15d Field: Test-7d |
| 14. All test-related system safety and range safety issues addressed and path ahead approved (PWS 2.1.2.2) | A003 | |
| 15. Draft TRR briefing chart package (PWS 2.2.1.2.5.2) | B002 | TRR-30d Rev TRR-5d |
| TRR Exit Criteria | | |
| Description | CDRL# | Due |
| 1. Review of action items with assignee and closure dates (PWS 2.1.1) | A001 | NLT TRR+7d |
| 2. Final TRR briefing chart package (PWS 2.2.1.2.5.2) | B002 | TRR |

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| MDR-2 | | |
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. All liens and action items from MDR-1 completed and closed out | | |
| 2. Updated Integrated Schedule (PWS 2.1.5.2) | A025 | Monthly – Most recent version to be included with Review submission at MDR2-30d |
| 3. System Performance Specification (2.1.1.1.1) – Category 2/3 missions only | A016 | Rev: MDR2-15d Final: MDR2+45d |
| 4. Space Debris Assessment Report (SDAR) (PWS 2.1.1.4.1) | A004 | Draft: MDR2-45d |

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| 5. Space Flight Worthiness Criteria (SFWC) provided, with completion status and plan forward (PWS 2.2.1.2.1) – Category 2/3 missions only | B002 | Draft: MDR2-30d |
| 6. Documentation/Specification Tree diagram showing all relevant documents and drawings (PWS 2.1.1.1.1) – Category 2/3 missions only a. 90% of specifications completed b. 90% of detail and assembly drawings released for both AVE and GSE | A015 | Final: MDR2-30d |
| 7. Updated RTVM (SPS, PWS, MRD, ICD) (PWS 2.1.1.1.1, 2.1.1.3.1) – Category 2/3 missions only | A021 | Rev: MDR2-30d |
| 8. Coordinated and signature ready ICDs (PWS 2.1.1.3.1) | A018 | MDR2-30d Signed: MDR2+30 |
| 9. Software Requirements Specification (SRS) (PWS 1.8.3.2) – Category 2/3 missions only | B006 | Draft: MDR2-30d Rev: MDR2 |
| 10. Software Design Description (SDD) (PWS A1-2.14) – Category 2/3 missions only | A008 | Draft: MDR2-30d Rev: MDR2 |
| 11. Software Test Description (STD) (PWS A1-2.15) – Category 2/3 missions only a. 90% of Software development and testing completed | A024 | Draft: MDR2-30d Rev: MDR2 |
| 12. Schedule and status of all range documents (PWS 2.1.2.2) | A003 | MDR2-30d |
| 13. Preliminary Safety Assessment Report (PWS 2.1.2.4.1) | A020 | MDR2-30d Final: Haz Ops-30d |
| 14. Test and Evaluation Program Plan (TEPP) with Test Planning assessment (PWS A1-2.16) – Category 2/3 missions only | A027 | Draft: MDR2-30d Final: Test-7d |
| 15. Integrated Field Processing Procedures (PWS 2.1.2.10.1) | A027 | Draft: MDR2-30d Final: Test-7d |
| 16. Reliability Analysis Report (PWS 2.1.2.4.1, 2.2.1.2.2) | B009 A028 | Final: MDR2 |
| 17. FMECA (PWS 2.1.2.4.1) – Category 2/3 missions only | A029 | Final: MDR2 |
| 18. Draft MDR-2 briefing chart package, Design Review Information Package (DRIP) review charts that include (PWS 2.1.1.3.3): a. Current integrated schedule and critical path b. Planned and completed qualification and acceptance testing c. Updated risk and opportunity assessment and mitigation d. Test Planning assessment and exceptions (PWS 2.2.1.2.4.1) e. Status of long lead items and critical spares procurement | A002 | MDR2-30d Rev MDR2-5d |

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| f. All system safety and range safety issues addressed and status of documents briefed | | |
| g. Software Requirements, Design, & Test status | | |
| h. SFWC status – Category 2/3 missions only | | |
| i. Proposed plan for compliance with Range Interface and Range Safety requirements | | |
| j. Path ahead to TRR & PSR outlined | | |
| k. Final SS Design | | |
| l. Final Logistics Concept | | |
| MDR-2 Exit Criteria | | |
| Description | CDRL# | Due |
| 1. Review of action items with assignee and closure dates (PWS 2.1.1.3.3) | A001 | NLT MDR2+7d |
| 2. Final MDR-2 briefing chart package (PWS 2.1.1.3.3) | A002 | MDR2 |

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| QTR (Cat 2/3 missions only) | | |
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. All liens and action items from TRR completed and closed out | | |
| 2. All Qualification Testing has been completed, analyzed, and anomalies explained (PWS 2.1.2.2.5.3) | A013 | Notification: w/in 24 hs Preliminary: NLT Incident +3d Final: Review completion +7d |
| 3. Draft Qualification Test Report(s) completed (PWS 2.1.1.4.5) a. Design qualification completion status documented b. Adequate qualification of all components verified c. Range safety system qualification issues addressed d. Risk and opportunity assessment and mitigation documented (focus on changes due to qualification completion and/or any qualification test issues) | A012 | NLT Test Completion+30d |
| 4. Integrated Schedule provided (focus on flight hardware acceptance tests) (PWS 2.1.5.2) | A025 | Monthly – Most recent version to be included with Review submission at QTR-30d |
| 5. Path ahead to Pedigree Review outlined | | |
| QTR Exit Criteria | | |

| Description | CDRL# | Due |
|---|-------|------------|
| 1. Review of action items with assignee and closure dates (PWS 2.1.1) | A001 | NLT QTR+7d |
| 2. LSC's responses to all RFIs (PWS 2.1.1) | A001 | QTR+7d |

| PR (Cat 2/3 missions only) | | |
|---|-------|-----|
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. Acceptance testing of subassemblies and/or components | | |
| 2. Factory system level testing including PL integration tests | | |
| 3. Documentation that all SS systems have been fabricated and assembled as designed, including documentation of rationale for deltas | | |
| 4. Mechanical top assembly drawings, with parts list and sub-tier drawings necessary to locate all major units on the vehicle, including mounting configuration (hard mounted or on isolators) | | |
| 5. Component qualification matrix with the test spectra and levels (thermal cycle, vacuum/thermal vacuum, random vibration, sine vibration, shock, and EMI) to which each component has been qualified. | | |
| 6. Qualification and Acceptance test data and reports including lot qualification data on ordnance | | |
| 7. Component service life data and manufacturing dates on ordnance and other limited life items are documented and within service life | | |
| 8. Qualification by similarity analyses and reports | | |
| 9. Documentation/analyses used as basis for qualification and acceptance test levels | | |
| 10. All Discrepancy Reports (DRs) and referenced documents as well as a complete summary listing. A reduced set of DRs, deemed engineering significant by the review team, may be requested after review of the DR list and description | | |
| 11. Documentation of concurrence/approval on all DRs | | |
| 12. Documentation of concurrence/approval on all waivers and deviations including a summary listing | | |
| 13. Copies of waivers granted to the system, or in-process | | |

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| 14. GIDEP alerts and other advisories and how they were addressed | A014 | PR-15d |
| 15. Current ICDs and signed off documentation | | |
| 16. Documentation of Software development and mission specific software test and qualification | | |
| 17. LSC's qualification, acceptance, and non-complying product process documentation, including acceptance test reports for all LSC fabricated and vendor supplied components (mechanical and electrical, software if applicable) and subassemblies | | |
| 18. Acceptance level test results | | |
| 19. System level test results | | |
| 20. Build paperwork and travelers | | |
| 21. Limited-life items documentation of service life | | |
| 22. Documentation of Fatigue analysis showing component fatigue life remaining after exposure to environmental tests as required by test standards | | |
| 23. Critical connections list showing all connections that cannot be tested after final mating | | |
| 24. SS electrical interconnect drawing(s), including Cable Layout Drawings showing proper routing of all cables | | |
| 25. Pedigree Report | A005 | PR-15d |
| PR Exit Criteria | | |
| Description | CDRL# | Due |
| 1. Review of action items and Requests for Information (RFIs) with assignee and closure dates (PWS 2.1.1) | A001 | NLT PR+7d |
| 2. LSC's responses to all RFIs (PWS 2.1.1) | A001 | PR+7d |

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| PSR | | |
| Entrance Criteria | | |
| Description | CDRL# | Due |
| 1. All action items / liens from QTR closed | | |
| 2. Integrated Schedule (PWS 2.1.5.2) | A025 | Monthly – Most recent version to be included with Review submission at PSR-30d |
| 3. All hardware to be shipped has been verified available and mission ready | | |
| 4. All field processing procedures released (PWS 2.1.4.9.1) | | |

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| 5. Updated RTVM (SPS RTVM, PWS RTVM, MRD RTVM) (PWS 2.1.1.1.1, 2.1.1.3.1) - Category 2/3 missions only | A021 | Final: PSR-30d |
| 6. Final Qualification Test Reports completed (PWS 2.1.1.5.1) | A012 | Final: PSR-15 |
| 7. Safety Assessment Report complete (PWS 2.1.2.4.1) | A020 | Final: Haz Ops-30d |
| 8. Schedule and status of all range documents (PWS 2.1.2.2) | A003 | Final: PSR-30d |
| 9. Final, Signed Range Safety documents (PWS 2.1.4.3) | | |
| 10. All Cybersecurity documents, with Range approval to connect, approved finalized (PWS 2.1.2.8.2) | A023 | Monthly – Most recent version of CSIP PSR-30d |
| 11. All Radio Frequency (RF) documents approved | | |
| 12. FAA License(s) and license package(s) with all attachments and submittals (MA Cat 1 only) | | |
| 13. For any open non-compliances, closure dates identified and approved to proceed with shipment to the field | | |
| 14. Path ahead to ILC outlined | | |
| 15. Draft PSR briefing chart package (PWS 2.1.1.5) <ul style="list-style-type: none"> a. Mission specific requirements and analyses reviewed b. Final SFWC Compliance Verification Matrices reviewed c. Hardware qualification and acceptance testing completed and reviewed d. System Testing complete and reviewed e. Flight software testing completed f. Risk mitigation status reviewed g. Status of range safety approvals reviewed h. Documentation of Range readiness reviewed i. All licensing approved (exceptions noted – to be carried as risks) j. Launch Campaign Concept of Operations (CONOPS) reviewed k. Launch Campaign daily schedule reviewed | A002 | PSR-30d Rev PSR-5d |
| PSR Exit Criteria | | |
| Description | CDRL# | Due |
| 1. Review of action items with assignee and closure dates (PWS 2.1.1) | A001 | NLT PSR+7d |
| 2. Final PSR briefing chart package (PWS 2.1.1.5) | A002 | PSR |

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**APPENDIX F. AFICC COST SAVINGS TRACKER GUIDEBOOK
ACQUISITION PROCESS TIMES (AFICC CST GUIDEBOOK, 2016)**

| Process Type | Process Time (hours) | Process Description |
|----------------------------|---------------------------------|--|
| Commodity | 475.1 | Any Commodity Purchase using FAR Part 16 |
| Commodity Delivery Order | 40.25 | Any Commodity Delivery Order under FAR Part 12 or 16 |
| Commodity Purchase Order | 35.46 | Any Commodity Purchase Order using FAR Part 8 |
| Service | 615.08 | Any Service Contract using FAR Part 37 |
| Service Task Order | 219.66 | Any Service Task Order under FAR Part 16 |
| Service Purchase Order | 38.37 | Any Commercial Service Purchase Order <150K using FAR |
| Construction | 477.92 | Any construction contract using FAR Part 36 |
| Construction Task Order | 86.7 | Any Construction Task Order under FAR Part 15 |
| A&E | 449.19 | Any A&E using FAR Part 36 |
| A&E Task Order | 145.42 | Any A&E Tasker Order using FAR Part 36 |
| Sealed Bid | 214.13 | Any Sealed Bid contract using FAR Part 14 |
| Blanket Purchase Agreement | 69.1 | Any Blanket Purchase Agreement using FAR Part 8 (including calls) |
| Options | 22.34 | Any Options exercised under FAR 52.217-8 |

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