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3.1 Hazardous Operations: The contractor shall provide safety oversight of hazardous operations, from pre-launch activities through post-launch pad safing, in accordance with the requirements of EWR 127-1. Specific hazardous operations include, but are not limited to, ordnance, solid propellants, liquid propellants, cryogenics, radiological materials, other sources of radiation, high pressure systems, critical handling equipment, readying booster/payload stages for launch, off-line support activities, launch countdown, launches, launch rehearsals, static firings, and other activities as defined by 45 SW Range Safety. The contractor shall verify facility preparedness prior to commencement of hazardous operations, give concurrence prior to commencing a hazardous task, verify hazardous operations are complete and all systems are safe at the end of a hazardous task, and verify facility readiness to secure from hazardous operations. The contractor shall provide surveillance checklists that detail operations safety actions (or verifications) that need to be performed for each hazardous operation for which the contractor is expected to provide oversight (**CDRL A107**). The contractor shall provide system safety engineering expertise for the operation being overseen and shall possess the capability to technically advise the systems engineer on the hazards, recommend alternate solutions, and ensure public and launch area safety. The contractor shall provide a detailed plan that describes, at a minimum, the required personnel training and certification necessary to perform oversight of hazardous operations (**CDRL A112**). At a minimum, all personnel providing safety oversight of hazardous operations shall have training on the relevant range user's program, systems, facilities, and procedures. Deviations from the certification and training plan will be approved by 45 SW Range Safety. Refresher training is required at least every three years to maintain certification.

3.2 Safety-Critical Operations: The contractor shall provide safety oversight of operations that are critical to safety but may not pose immediate hazards (as determined by 45 SW Range Safety and the range users), in accordance with the requirements of EWR 127-1. Specific safety-critical operations include, but are not limited to, flight termination system (FTS) installation, checkout, and testing. The contractor shall verify that all FTS requirements are met including hardware, software, and test. The contractor shall provide surveillance checklists that detail operations safety actions (or verifications) that need to be performed for each safety-critical operation for which the contractor is expected to provide oversight (**CDRL A107**). The contractor shall provide system safety engineering expertise for the operation being overseen and shall possess the capability to technically advise the systems engineer on the hazards, recommend alternate solutions, and ensure FTS integrity and resource protection for all safety-critical operations. The system safety engineer will not need to be present at every safety-critical operation normally covered by the contractor's operations safety personnel. The contractor shall possess the capability of tracing, interpreting, and understanding FTS schematics, ordnance circuits, and other electrical systems as necessary. The contractor shall provide a detailed training and certification plan that describes, at a minimum, what training and certification is required prior to providing oversight of safety-critical operations (**CDRL A112**). In addition, all personnel providing safety oversight of safety-critical operations shall have training on the relevant range user's program, systems, facilities, and procedures. Deviations from the certification and training plan will be approved by 45 SW Range Safety. Refresher training is required at least every three years to maintain certification.

3.3 Launch Countdown Operations: The contractor shall provide safety support for launch rehearsals and launch countdown operations, when the launch vehicle is in a launch configuration, in accordance with the requirements of EWR 127-1. Specific tasks include, but are not limited to, verifying safety clear zones, Operations Safety Manager Console (OSMC) operations, Launch Disaster Control Group (LDCG) operations per the Consolidated Comprehensive Emergency Management Plan (CCEMP), pad re-entry and safing, pad restoration, and other activities as defined by 45 SW Range Safety and the range users. The contractor will operate the OSMC whenever the vehicle is in a launch configuration. The contractor will control roadblocks, activate a launch enable or disable/HOLD (as appropriate), and direct pad safing activities. All personnel supporting launch operations shall be trained on the particular user program at least twice within a 24-month period (**CDRL A112**). If the specific operation is a first time operation or has not occurred within the past 24 months, comparable experience is acceptable, if approved by 45 SW Range Safety. The contractor shall provide surveillance checklists that detail

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3.7 Engineering Reviews: The contractor shall perform engineering reviews of procedures, plans (test and operational), drawings, specifications, and data packages in accordance with the requirements of EWR 127-1. The focus of these reviews shall be on the design, test, fabrication, assembly, and function of hazardous/safety-critical systems (hardware/software) to verify compliance with safety requirements. Systems that will be reviewed/evaluated include those that are currently operational, under development, or prototype (such as the real-time dispersion monitoring system (RDMS)). For launch vehicles that are commercially licensed by the Federal Aviation Administration (FAA)/Associate Secretary of Transportation (AST), reviews will include an evaluation of FAA flight and ground safety rules and identification of any discrepancies or variances between these rules and the 45 SW Range Safety requirements. Degreed engineers, or those holding a Professional Engineering (PE) certification, shall perform engineering reviews. 45 SW Range Safety or the range user will make requests for reviews (CDRL A109).

3.8 Occupational Safety and Health: The contractor shall provide occupational safety and health training and support to government personnel, as directed by 45 SW Range Safety. Specific tasks include, but are not limited to, developing and providing safety training courses, maintaining training records, collecting, storing, analyzing, and reporting injury data, developing and implementing an operational risk management program, and developing and maintaining a hazard abatement program. Specific courses include, but are not limited to, new employees orientation, new supervisors orientation, new commanders orientation/familiarization, supervisor refresher training, confined space entry orientation, lockout/tagout training for workers and supervisors, motorcycle safety training, and mishap data management. The contractor shall develop and maintain a comprehensive master occupational safety training plan (CDRL A113) which outlines, at a minimum, the courses to be developed or procured, presentation material for courses, course scheduling, training record keeping processes, and maintenance.

An injury data collection and record keeping system shall be developed and maintained. It should include, but not be limited to, developing a data gathering system for notification of injuries, the capability to perform follow-up requests as needed (AF Form 87, Injury Report); OSHA and AFI 91-204 data format compatibility; monthly trend analysis (metrics) generation and report preparation as defined by 45 SW Range Safety. The contractor shall develop and maintain a hazard abatement tracking program that meets the requirements of AFI 91-301 and includes the preparation of inspection reports, data entry of findings, monthly metrics and tracking of open issues from unit safety representatives (USR), and preparation of reports for the 45 SW Ground Safety Office.

3.9 Process Safety Management (PSM) and Risk Management Program (RMP): The contractor shall provide an implementation plan that shows the contractor's capability to support the 45 SW PSM and RMP programs (per 45 SWI 91-101 and 91-202). These shall be updated at least annually (CDRLs A114 & A115).

3.10 Pressure System Certification/Recertification, Process Safety Information, and Mechanical Integrity Program: The contractor shall provide experienced, trained, and certified personnel to administer, facilitate, and implement a pressure vessel certification/recertification, process safety information, and mechanical integrity program at the 45 SW in accordance with the requirements of EWR 127-1, ESMC-TR-88-01, 29 CFR 1910.119, 40 CFR 68, and other applicable federal laws and national consensus standards. Specific tasking and schedule to accomplish this program will be as directed by 45 CES/CEL. Tasks will include, but are not limited to, system documentation review, design engineering analysis, inspection and test planning, nondestructive examinations (surface and ultrasonic), hazard assessments, design reviews, establishing/maintaining inventory of highly hazardous and pressurized systems under the jurisdiction of the 45 SW, field inspections, review of systems configuration, compliance analyses, managing and implementing the in-service inspection program, and management of the pressure system information and mechanical integrity database and making it available on the

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45 SW LAN (read only). Reports, evaluations, analyses, inventories, plans, etc., shall be provided to 45 CES/CEL as directed (**CDRL A109**).

3.11 Special Operations Safety Task Support: The contractor shall provide experienced and qualified personnel to perform safety support services for special tasks pertaining to safety engineering, on-site operational support, and special safety analyses as directed by the contracting officer. Work under the implementation plan shall begin only after the government issues a fully executed work request defining the scope, resources, and schedule of the task. Tasks being considered include, but are not limited to, the following:

1. Establish, implement, and manage a comprehensive process safety management (PSM) and risk management program (RMP) for the 45 SW that supports both DOD and commercial customers.
2. Evaluate hazards associated with launch vehicle pre-launch and launch operations including, but not limited to, explosives, toxics, and radiation.
3. Conduct tests to characterize launch vehicle hazards.
4. Develop/test prototype systems used to enhance the range safety mission at the 45 SW.

4.0 Flight Safety Analysis: The contractor shall provide qualified, experienced personnel to perform flight safety analyses for generally known and expected launch vehicles. Contractor resources shall be managed to ensure adequate support of planned and unplanned activities that may occur at any time. Activities that are not time critical shall be planned and scheduled to best meet the overall needs of 45 SW Range Safety and the various range users.

4.1 Impact Probabilities and Casualty Expectations: The contractor shall perform assessments of hazards and risks to life and property resulting from launch vehicle flight failures in the form of impact probabilities, facility damage probabilities, and casualty expectations. Risk assessments of launch vehicles that are commercially licensed by the FAA/AST will include an evaluation of FAA flight safety rules and identification of any discrepancies and variances between these rules and 45 SW Range Safety requirements (**CDRL A109**).

4.2 Safety Criteria and Missile Abort Logic: The contractor shall evaluate launch vehicle characteristics in order to recommend and possibly develop range safety criteria and launch vehicle abort logic (**CDRL A109**).

4.3 Mathematical Models, Algorithms, and Computer Programs: The contractor shall develop requirements used to generate mathematical models, algorithms, and computer programs for evaluation of instantaneous impact prediction and associated risks to life and property during launch vehicle flight (**CDRL A109**).

4.4 Performance Requirements: The contractor shall evaluate performance requirements for range instrumentation, processing equipment, and display systems for use in real time launch support (**CDRL A109**).

4.5 Launch Operations: The contractor shall evaluate toxic, radiation, explosion, and acoustic hazards associated with launch vehicle launch operations and provide technical support to range safety during all launch operations (**CDRL A109**).

4.6 Range Testing: The contractor shall evaluate directed energy systems and hazards associated during open range testing (**CDRL A109**).

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4.7 Launch Vehicle Systems: The contractor shall perform theoretical and statistical analysis of various launch vehicle systems and components to determine reliability, resultant failure rates, failure mode scenarios, and resultant threat envelopes (**CDRL A109**).

4.8 Flight Safety Support: The contractor shall evaluate performance specifications and design requirements for hardware/software used for flight safety support. Hardware/software evaluated will include, but is not limited to, real-time impact prediction, impact dispersions due to uncertainties, toxic diffusion/risks, prototype real-time dispersion monitoring system (RDMS), real-time debris pattern generation, RF link analysis, blast overpressure, and safety display preparations. To perform these tasks, the contractor will frequently be required to develop prototype systems (hardware/ software), and conduct analyses and tests simulating an operational environment in order to validate adequacy of performance/design requirements, characterize hazards, and/or determine risks (**CDRL A109**).

4.9 Impact Prediction Accuracy: The contractor shall evaluate the accuracy and system effectiveness of real-time instantaneous impact predictions generated for a particular launch vehicle using various combinations of instrumentation and telemetry data (**CDRL A109**).

4.10 Data Editing, Filtering, and Differentiation: The contractor shall perform analyses, systems requirements development, and evaluation of real-time mathematical models and algorithms for data editing, filtering, differentiation, and source selection (**CDRL A109**).

4.11 Support Systems: The contractor shall evaluate design requirements for range safety ground systems and flight safety support systems (**CDRL A109**).

4.12 Flight Safety Applications: The contractor shall perform analyses, systems requirements development, and evaluation of real-time and nonreal-time prototype artificial intelligence and expert system algorithms and databases with flight safety applications (**CDRL A109**).

4.13 Risk Acceptance Criteria: The contractor shall perform assessments of government and public agency risk acceptance criteria and their application to missile and space booster launch operations (**CDRL A109**).

4.14 Interagency Nuclear Safety Review Panel (INSRP) Support: The contractor shall provide engineering and technical support to the INSRP/Launch Abort Subpanel for Eastern Range missions (**CDRL A109**).

4.15 Special Flight Safety Task Support: The contractor shall provide qualified and experienced personnel to perform flight safety task support and safety analyses as directed by the contracting officer. Work under this special task support shall begin only after the government issues a fully executed work request defining scope, resources, and schedule of the task. Tasks may include, but are not limited to, development of blast algorithms, debris risk model development, risk analysis data development, INSRP/Launch Abort Subpanel support, and space-based range safety. Tasks may include baseline risk assessments for new or significantly modified launch vehicles with all or some of the following hazards: inert debris, explosive debris, far-field blast effects, toxic commodities, and radiological materials. Additional tasks may include preliminary feasibility analyses of vehicle and trajectory data for proposed vehicles at the eastern range, and other flight safety analysis tasks as requested by safety customers and defined by the government program manager.

5.0 Responsibility and Authority: The contractor shall support 45 SW Range Safety and the 45 SW Commander in carrying out his or her responsibilities for the safety of the public, the general CCAFS population, and all range users as derived from Public Law 60 and DOD Directive 3200.11, and described in FWR 127-1, paragraphs 1.3.7.3.g and 6.2.2. Appropriate measures shall be taken by the contractor, in consonance with 45 SW Range

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Safety, to prevent and/or mitigate the consequences of anomalies, emergencies, and mishaps. The contractor has the authority to stop any operation if it determines that a significant risk to personnel, equipment, and/or facilities exists, and not allow the operation to resume until the required safety actions are accomplished. The contractor shall enforce 45 SW Range Safety requirements, as defined in the applicable version of EWR 127-1, on all range users. The contractor has the authority to direct range users to protect the scene of an incident with proper regard to safety and mission risks. All incidents will be investigated for information and lessons learned unless directed otherwise by the government program manager or special restrictions are imposed by other appropriate authority. Sound judgment and specific program knowledge will be used to ensure safety while minimizing impacts to on-going operations and activities. In the event of a conflict between safety and operational impact, safety is more important. When the contractor stops an operation, the reasons and the requirements to end the stoppage shall be clearly communicated and documented to the range user. When the contractor does not approve a document submitted for review and approval, the deficiencies and required corrections shall be clearly communicated to the range user. The contractor shall work closely with the range user to correct the situation to allow operations to proceed or the document to be approved. The contractor is the ultimate authority for evacuating and securing an area when an imminent danger exists.

6.0 Personnel Qualification Requirements:**6.1 Management:**

- Has a Professional Engineering (PE) certificate or is a senior scientist.
- 10 years relevant management or supervisory experience.
- 7 years experience in at least three of the four functional areas outlined below:
 - Large missile, space vehicle, rocket, torpedo, pre-launch/post-launch operations, and/or recovery operations.
 - System safety hazards analysis, design, or research/development testing of ordnance, explosives, other types of munitions, pyrotechnics, cryogenic and toxic/hypergolic propellants, high pressure gases, radioactive materials, or other hazardous systems/components.
 - Nuclear safety and/or ionizing/non-ionizing radiation.
 - Preparation and/or review and approval of hazardous operating procedures for missile/weapons systems.
- 3 years experience in CCAFS launch operations (or equivalent) providing familiarity with operations safety.
- 5 years experience in flight safety analyses and related duties.

6.2 On-Site Support Personnel: All contractor technical personnel shall be capable of reviewing technical procedures, schematics, engineering drawings and plans, and providing comments in a clear, comprehensible, and professional manner. Field personnel shall be physically capable of performing required safety tasks in assigned areas including, but not limited to, launch complexes and off-road areas. Missile safety experience constitutes knowledge and experience dealing with the hazards associated with missiles, space vehicles, rockets, torpedoes, pre-launch/ launch/post-launch operations, and/or recovery operations. Explosives/weapons safety experience

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constitutes knowledge and experience dealing with hazards associated with working in the ordnance field, dealing with explosives, other types of munitions, pyrotechnics, cryogenic and toxic/hypergolic propellants, high pressure gases, radioactive materials, and other hazardous systems/components. The contractor shall utilize as direct labor for operations safety support only personnel who are fully qualified and competent to perform their assigned work and who possess the minimum qualifications listed below. The contractor shall, in performance of the services required by this contract, provide, at a minimum, the personnel proposed. Any substitute personnel shall have qualifications equivalent to or greater than the personnel proposed. The contractor will provide all pertinent information on new personnel to the contracting officer for approval, with guidance from the government program manager. When requested by the contracting officer, the contractor shall submit evidence of the qualifications of any personnel (regular or substitute).

- 25% with an engineering degree or certified safety professional certificate and at least 5 years experience in the missile, explosives, or armament/weapons business, and first-hand knowledge of the safe handling of explosives or propellants.
- 30% with 8 years or more experience in the missile or explosives/weapons field.
- 35% with 6 or more years experience in the missile or explosives/weapons business.
- 10% or less at any given time may be trainees. A trainee is defined as anyone not meeting the criteria mentioned above. The number of trainees at any location is limited to not cause a safety risk, unduly interfere with operations, or to exceed allowed man-loading limitations.
- Of the total on-site support workforce, at least 60% must have first-hand knowledge of the safe handling of explosives or propellants, hazardous procedure review, and operations oversight.
- Of the total on-site support workforce, at least 10% must be Self-Contained Atmospheric Protective Ensemble (SCAPE) certified or demonstrate some other way SCAPE safety support capabilities can be provided for areas of concern.
- Of the total on-site support workforce, at least 5% must have nuclear safety experience or demonstrate some other way this experience can be provided as needed.

6.3 Flight Safety Analysis Personnel: The contractor shall utilize as direct labor for flight safety analysis only personnel who are fully qualified and competent to perform their assigned work and who possess the minimum qualifications listed below. The contractor shall, in performance of the services required by this contract, provide, at a minimum, the personnel proposed. Any substitute personnel shall have qualifications equivalent to or greater than the personnel proposed. The contractor will provide all pertinent information on new personnel to the contracting officer for approval, with guidance from the government program manager. When requested by the contracting officer, the contractor shall submit evidence of the qualifications of any personnel (regular or substitute). At least 50% of the flight safety analysis personnel must be Senior Scientists. The remaining 50% must meet the qualifications of a Senior Engineer or Engineer/Scientist.

- Senior Scientist

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6.5 Security: The contractor shall ensure that its personnel have the necessary security clearances to perform its duties. A SECRET clearance will be required of all personnel handling SECRET information.

7.0 Other Requirements: The contractor shall provide all management, administration, training, supervision, labor, materials, supplies, and equipment, except those designated as government furnished, necessary to perform all tasks related to the operations and flight safety functions as described within this work statement.

8.0 Vehicles: The contractor is responsible for transporting its personnel from its home-base facility to another local facility in order to support 45 SW Range Safety or range user taskings. Some support vehicles shall be capable of providing off-road access to locations not typically accessed by motorized vehicles in order to adequately meet the requirements of the PWS. The contractor is responsible for all vehicle expenses unless there is government direction to the contrary.

9.0 Communications and Safety Equipment: The contractor shall provide hand-held communication radios to its personnel providing on-site support. Hand-held and mobile radios shall be equipped for all frequencies deemed necessary by 45 SW Range Safety including, but not limited to, Safety (a.k.a. "B-net"), security, fire, KSC Safety, Disaster Preparedness, and the National Oceanographic and Atmospheric Administration (NOAA) Weather. The contractor shall provide adequate communications capability to key personnel to ensure an around-the-clock response capability. The contractor shall provide its personnel the necessary protective equipment to perform required duties. The contractor shall identify all areas requiring protective equipment and supply it as necessary.

10.0 Management Information System (MIS): The contractor shall provide sufficient computer hardware, software, and networking capability to its personnel. At a minimum, the contractor shall have networking capability between the operations safety manager and 45 SW Range Safety. The contractor's hardware and software shall be compatible with 45 SW Range Safety's computer systems as necessary to transmit, receive, open, modify, and print files. The contractor shall provide the capability of interfacing with the base management information system (MIS) and financial accounting system. At a minimum, the system shall have the capability to adequately interface with the government program manager and the 45 SW financial accounting system using best available technology (i.e., 45 SW local area network (LAN), internet, etc.). The system shall offer maximum flexibility for modification in the out years, while providing seamless and "user friendly" interface capabilities. The contractor shall also support efforts to develop and use a resource data exchange standard or equivalent function to share information concerning Air Force and National Aviation and Space Administration (NASA) resources between organizations.

11.0 Program Management: The contractor shall discuss its program management approach, describing the structure of the proposed organization, the relationships, interfaces, and authority of the elements of program management with the remainder of the contractor's organization and with the management of any subcontractors, as applicable. The contractor shall provide a business approach based upon concepts such as stewardship, innovation, and best business practices that will result in services and processes that meet or exceed all contractual requirements, are provided at the estimated cost in the contract, require minimal government involvement, and ensure customer service is provided. Resource planning, flexibility, management control systems and policies, and subcontract management (as applicable), shall be demonstrated, along with corresponding documentation to validate these practices. The contractor shall specify the geographic locations and size of all corporate entities that will participate in this contract.

11.1 Management Reviews and Reporting. The contractor shall present at and facilitate program management review (PMR) meetings at least quarterly. Topics of discussion shall include, but not be limited to, total contract costs and expenditures to date, performance metrics, plans and schedules for upcoming workloads.

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completed taskings, and problems encountered. The contractor shall maintain and provide records, documentation, and reports, as required. CDRL items will be prepared and delivered as specified.

11.2 Program Documents: The contractor shall keep accurate, complete, comprehensive, and valid records, including but not limited to: its work performance, audits, inspections, safety monitoring, incidents, document reviews, training, cost, and lessons learned. These records shall be available for review by the government program manager and 45 SW Range Safety, as required. The contractor shall provide timely, accurate, complete, comprehensive, and valid contract data requirements list (CDRL) item reporting to the government program manager and 45 SW Range Safety. The contractor shall use a format of his choice, subject to government program manager review. Traceability of all records shall be maintained to facilitate easy and timely retrieval. Each plan the contractor develops shall attempt to improve efficiency and reduce costs without compromising the basic requirements of operations safety, while protecting people and property. Electronic transmittal of CDRL items is highly encouraged and should be utilized as much as possible. The contractor will develop, coordinate, publish, implement, and maintain the following documents:

11.2.1 Monthly Activity Report: The contractor shall provide a monthly activity report summarizing work performed over each month, consolidated contract costs, and projections of future activities and costs for the previous months of the fiscal year or other reporting period as specified by the government program manager (CDRL A102).

11.2.2 Operations Safety Plans: The contractor shall provide operations safety plans (OSPs) for all hazardous processing facilities located on CCAFS in accordance with 45 SW Range Safety requirements and EWR 127-1 (CDRL A103). OSPs provide for implementation of 45 SW Range Safety requirements by identifying specific safety implementation requirements unique to a facility, multiple facilities, or range user program. OSPs shall be developed per government program manager request.

11.2.3 Safety Operating Plans: The contractor shall provide safety operating plans (SOPs) in accordance with 45 SW Range Safety requirements and EWR 127-1 (CDRL A104). SOPs provide for implementation of 45 SW Range Safety requirements by identifying specific safety requirements for recurring operations at a facility or multiple facilities, for certain unique range user operations, or for other hazardous or safety-critical tasks on the eastern range as deemed appropriate by 45 SW Range Safety. The contractor shall develop an SOP for recurring and (when deemed necessary) non-recurring operations upon government program manager request. SOPs shall be consolidated and made an attachment to OSPs when appropriate.

11.2.4 Explosive Safety Plans: The contractor shall provide explosive safety plans (ESPs) in accordance with 45 SW Range Safety requirements and EWR 127-1 (CDRL A105). ESPs provide for implementation of 45 SW Range Safety and DOD/USAF explosive safety requirements by identifying specific safety requirements which are unique to an explosive facility, multiple facilities, range user program situation, or type of solid/liquid explosive/propellant or operation present on the eastern range. ESPs shall be developed per government program manager request.

11.2.5 Danger Area Information Plan: The contractor shall provide a danger area information plan in accordance with 45 SW Range Safety requirements (CDRL A106). Each launch pad on the eastern range shall be addressed in the danger area information plan. The danger area information plan identifies the blast danger area, the flight hazard area, and associated safety clear zones and traffic controls for each launch vehicle/launch complex configuration.

12.0 Customer Relations: The contractor shall establish and maintain open lines of communication with the

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45 SW and its customers at all levels. Provide clear and continuous visibility into all aspects of the program through information concerning systems status, schedule, technical performance, risk, and cost. Participate as a team member with the government, its contractors, and customers in working issues, devising solutions, and implementing plans.

13.0 Quality Assurance: The contractor shall implement a quality management system that adheres to ISO 9002:1994. This includes providing a quality assurance program plan (QAPP) to implement the applicable ISO elements (**CDRL A118**). The contractor has the option to use ISO 9002:2000 at no additional cost to the government.

14.0 Metrics: The contractor shall develop performance metrics. The metrics shall be linked to performance objectives in the service delivery summary (SDS). They shall be derived from data that can be readily collected and repeated, distinguish between desirable and undesirable results, and be easily understood. The metrics shall be trendable, capable of being displayed visually, and understandable by personnel outside of the program area being measured. The contractor shall team with government personnel to validate and modify performance metrics, to include those provided in the contractor's proposal, within the first performance period of the contract. Contractor shall review metrics for validity as needed and identify deviations, reasons for deviations, and recommendations for adjustment. Metrics will be updated as required and made available to the government. Contractor shall brief performance, utilizing metrics, at quarterly program reviews.

15.0 Financial Management: The contractor shall establish and maintain a financial management system according to the applicable Federal Acquisition Regulation (FAR). Establish a job ordered cost reporting and accounting system that identifies all work and related costs for each appropriate cost data element (**CDRL A116**). Additionally, cross correlate all work and related costs to this PWS utilizing a meaningful, and traceable, work breakdown structure (**CDRL A119**). The contractor shall strive to support the government's efforts to adequately estimate and maintain fixed price commercial launch costs by providing metrics, which adequately plot costs per payload. Significant deltas from projections shall be justified.

15.1 Cost Reporting and Accounting System: Establish, operate and maintain a job order cost reporting and accounting system (CRAS) that identifies, tracks, and reports all contractor work and related contract cost by 45 SW direct and reimbursable funding (DBA/RBA). This system shall be the official basis (record system) for 45 SW range customer billings and management accounting, and shall be linked to the contractor's financial accounting system. The CRAS shall be capable of collecting and costing contractor work management for subsequent transmittal to the job order cost accounting system (JOCAS).

15.2 Connectivity: Provide CRAS connectivity to a government-furnished interface on the 45 SW metropolitan area network (MAN) for the purpose of data uploads to the JOCAS. The CRAS shall have adequate internal controls built in to isolate and identify timely corrective action, and have the capability to process and classify individual work items by cost objectives.

15.3 Adjustments: Reflect adjustments of costs, which affect costs reported in prior periods, as current month transactions in the period in which the adjustment is recorded. Use data elements associated with the adjustments, which identify the record balances being adjusted, and carefully research monthly adjustments to ensure the negative balances do not appear in the year-to-date fields for current fiscal year (FY). Ensure requested changes are processed no later than the month following the requested change.

15.4 Cost Transaction Data Reporting: Accumulate and report bi-weekly all cost transaction data to

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45 CPTS/FMAS (CDRL A117). The electronic file that is interfaced shall be compatible with the standard USAF JOCAS. The contractor shall ensure that all current FY costs are included in the report for the period ending 30 September. All late charges occurring after the end of a fiscal year shall be reported within six months.

15.5 Cost Distribution: The contractor's cost accounting system shall reflect total contractor costs directly charged and/or allocated to cost objectives and final cost objectives. The total contract costs charged to cost objectives and final cost objectives shall include direct costs, indirect costs, allocated contract-wide costs, and government-furnished supplies and materials.

16.0 Service Delivery Summary (SDS): This section of the PWS describes performance objectives and thresholds for critical services. Reference paragraph (Para.) 14.0 of the PWS for details concerning post-contract award joint negotiation of performance metrics.

16.1 Hazardous Operations:

Performance Objective	PWS Para.	Performance Threshold
Provide safety oversight of hazardous operations when given at least 24 hours advance notification.	3.0, 3.1	On-time support of operations 100% of the time.
Support short suspense (less than 24 hours notification) hazardous operations.	3.0, 3.1	On-time support of operations 90% of the time. The remaining 10% of the time, support shall be provided within 48 hours of short suspense notification.
Perform hazardous operations oversight in accordance with EWR 127-1.	2.0, 3.1	No more than one violation of EWR 127-1 oversight requirements per half year.

16.2 Safety-Critical Operations:

Performance Objective	PWS Para.	Performance Threshold
Provide safety oversight of safety-critical operations when given at least 24 hours advance notification.	3.0, 3.2	On-time support of operations 100% of the time.
Support short suspense (less than 24 hours notification) safety-critical operations.	3.0, 3.2	On-time support of operations 90% of the time. The remaining 10% of the time, support shall be provided within 48 hours of short suspense notification.
Perform safety-critical operations oversight in accordance with EWR 127-1.	2.0, 3.2	No more than one violation of EWR 127-1 oversight requirements per half year.

16.3 Launch Countdown Operations:

Performance Objective	PWS Para.	Performance Threshold
Provide safety oversight and support of launch countdown operations when given at least 24 hours advance notification.	3.0, 3.3	Satisfactory support of launch operations 100% of the time.

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Perform launch countdown operations oversight and support in accordance with EWR 127-1.	2.0, 3.3	No more than one violation of EWR 127-1 oversight and support requirements per year.
Support the Launch Disaster Control Group (LDCG) in accordance with EWR 127-1 and the CCEMP.	2.0, 3.3	No more than one violation of EWR 127-1 and CCEMP oversight and support requirements per year.

16.4 Incidents:

Performance Objective	PWS Para.	Performance Threshold
Support mishap response in a timely manner.	3.4	Support shall be provided within one hour or less of mishap notification 100% of the time.
Perform mishap response in accordance with EWR 127-1 and the CCEMP.	2.0, 3.4	No more than one violation of EWR 127-1 or CCEMP support requirements per year.

16.5 Inspections, Tests, Audits, and Visits:

Performance Objective	PWS Para.	Performance Threshold
Inspect alleged unsafe conditions and acts in a prompt manner following notification.	3.5	Performance of inspections within one workday 100% of the time.
Take appropriate actions to resolve unsafe conditions and acts.	3.5	Unsafe conditions and acts are halted or mitigated 100% of the time.
Inspect new and modified hazardous operating locations and facilities prior to initial use.	3.5	Performance of initial inspections prior to initial use 100% of the time.
Complete annual and quarterly inspections in a timely, scheduled fashion.	3.5	Performance of inspections within one week of the scheduled date 90% of the time. The remaining 10% of the time, inspections shall be complete within two weeks of the scheduled date.
Provide all reports of inspections and audits to the appropriate range users and 45 SW Range Safety.	3.5	95% of inspection and audit reports are provided to Range Safety within seven days of completion with no more than 1 verified and validated error per quarter. The remaining 5% of these reports shall be provided within 14 days of completion and in the same manner.
Facilities identified as toxic shelters shall be tested to verify compliance with 45 SWI 91-203.	3.5	No more than one error or oversight per year.

16.6 Operations Safety Reviews:

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Performance Objective	PWS Para.	Performance Threshold
Review contractor procedures following receipt.	3.6	Completion of reviews within seven workdays 80% of the time. The remaining 20% of the time, reviews shall be complete within 14 workdays of receipt.
Review contractor procedure changes or modifications following receipt.	3.6	Completion of reviews within 3 workdays 80% of the time. The remaining 20% of the time, review shall be complete within 7 workdays of receipt.
Perform operations safety reviews of procedures in accordance with EWR 127-1.	2.0, 3.6	No more than one missed violation of EWR 127-1 procedural/safety requirements per every two procedures reviewed.

16.7 Engineering Reviews:

Performance Objective	PWS Para.	Performance Threshold
Perform engineering reviews in accordance with EWR 127-1.	2.0, 3.7	No more than one missed violation of EWR 127-1 design/performance requirements per design package.
Meet suspense dates for required engineering reviews.	3.7	Performance of completed reviews by suspense date 80% of the time. The remaining 20% of the time, engineering reviews shall be complete within 7 workdays of the suspense.

16.8 Occupational Safety and Health

Performance Objective	PWS Para.	Performance Threshold
Provide occupational safety and health training and support to government personnel.	3.8	Provide 90% of training per schedule. The remaining 10% shall be provided within 14 workdays of the original schedule date.
Provide an accurate and up-to-date occupational safety and health training and support to government personnel.	3.8	No more than one inaccurate or out-of-date training class per year.
Develop and maintain a hazard abatement program.	3.8	No more than one violation of AFI 91-301 per year.
Provide an injury data record-keeping system and monthly trend analyses.	3.8	Updated monthly with 95% accuracy

16.9 Pressure System Certification/Recertification, Process Safety Information, and Mechanical Integrity Program

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Performance Objective	PWS Para.	Performance Threshold
Develop and maintain a process safety information and mechanical integrity database program. Perform reviews, analyses, assessments, studies, and tests to support the pressure system certification/recertification, process safety information, and the mechanical integrity program.	3.10	No more than one formal, justified complaint regarding technical accuracy per year.
	3.10	Draft submissions of technical reports and data shall be within mutually agreed suspenses 90% of the time. The remaining 10 of the time, draft submissions shall be provided within 14 workdays of the initial suspense. Final submissions shall be within mutually agreed suspenses 95% of the time and with no more than one formal, justified complaint regarding technical accuracy per year. The remaining 5% of the time, final submissions shall be rprovided within 7 workdays of the initial suspense and in the same manner.

16.10 Flight Safety Analysis

Performance Objective	PWS Para.	Performance Threshold
Provide technical support to Range Safety during all launch operations. Perform reviews, assessments, predictions, mathematical models, evaluations, theoretical and statistical analyses, requirements development, engineering, and technical support for flight safety analysis and testing.	4.5	Provide on time technical launch support 100% of the time.
	4.1 – 4.14	Draft and final submissions of scientific and technical reports and data shall be within mutually agreed suspenses 75% of the time. The remaining 25% of the time, submissions shall be provided within 21 workdays of the initial suspense. No more than 5% of final submissions shall require rework as the result of a technical mistake or oversight by the contractor.

16.11 Personnel Qualification Requirements

Performance Objective	PWS Para.	Performance Threshold
Provide fully qualified and experienced personnel to manage and direct the overall safety support team and effort.	6.1	Fully qualified and experienced personnel perform the management function 100% of the time.
Provide fully qualified and experienced personnel to perform operations safety oversight, support, and tasks.	3.0-3.10, 6.2	Fully qualified and experienced personnel perform operations safety oversight, support, and tasks 100% of the time.
Provide fully qualified and experienced personnel to perform flight safety analysis support and tasks.	4.0-4.14, 6.3	Fully qualified and experienced personnel perform flight safety analysis support and tasks 100% of the time.

16.12 Program Management

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Performance Objective	PWS Para.	Performance Threshold
Establish and maintain an organizational structure to manage, direct, and provide CSSC support.	11.0	No more than 1 complaint per year pertaining to the lack of managerial involvement or evidence thereof.
Maintain customer satisfaction and ensure support is provided in a customer-oriented manner.	11.1 12.0	No more than 2 complaints per year pertaining to customer service.
Maintain actual costs on target with estimated cost of contract, while providing contractually required levels of support	11.0	No cost overruns within the contractor's control.
Conduct program management reviews with the government that address the status of current activities, expenditures, problem areas, and other topics as directed by the government.	11.1	Complete a PMR for the government on a quarterly basis within 1 week of the date scheduled with Range Safety. The PMR shall address 100% of mutually agreed current issues.
Provide contractually required program documentation in a complete and timely fashion.	11.2	Delivery of program documentation, as specified in the CDRL list, 90% of the time. The remaining 10% of the time, delivery shall be within 14 workdays of the date specified in the CDRL list.

16.13 Quality Assurance

Performance Objective	PWS Para.	Performance Threshold
Document/respond to non-conformances.	13.0	90% of non-conformances documented and responded to within the allotted time period. The remaining 10% shall be documented and responded to within the negotiated date.
Schedule and perform internal quality audits.	13.0	Completion of 85% of QA audits as scheduled and 100% by date negotiated.

16.14 Financial Management

Performance Objective	PWS Para.	Performance Threshold
Prepare and submit financial reports.	15.1	Submit 90% of financial reports on time with 98% accuracy. The remaining 10% shall be submitted within 7 workdays of the initial required date and with the same accuracy.
Update the JOCAS inputs monthly.	15.1	Inputs and corrections completed by required date 90% of the time. The remaining 10% of the time, inputs and corrections shall be submitted within 7 workdays of the initial required date.
Prepare and submit budget data when requested.	15.0-15.6	Provide estimates by required completion date 90% of the time. The remaining 10% of the time, provide estimates within 7 workdays of the initial required date.

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17.0 LIST OF ABBREVIATIONS AND ACRONYMS

- a.k.a. – Also Known As*
- AF – Air Force*
- AFI – Air Force Instruction
- AFSPC – Air Force Space Command
- AST – Associate Administrator for Commercial Space Transportation
- CCAFS – Cape Canaveral Air Force Station
- CCEMP – Consolidated Comprehensive Emergency Management Plan
- CDRL – Contract Data Requirements List
- CES – Civil Engineering Squadron
- CFIS – Comptroller Financial Information System
- CFR – Code of Federal Regulations
- CRAS – Cost Reporting and Accounting System
- CSP – Certified Safety Professional
- CSSC – Consolidated Safety Support Contract
- DAIP – Danger Area Information Plan
- DBA – Direct Budget Authority
- DOD – Department of Defense
- ESMC – Eastern Space and Missile Center
- ESP – Explosive Safety Plan
- EWR – Eastern and Western Range
- FAA – Federal Aviation Administration
- FAR – Federal Acquisition Regulation
- FTS – Flight Termination System
- FY – Fiscal Year
- HP – High Pressure
- hrs - Hours
- INSRP – Interagency Nuclear Safety Review Panel
- ISO – International Standards Organization
- JOCAS – Job Order Cost Accounting System
- KSC – Kennedy Space Center
- LAN – Local Area Network
- LDCG – Launch Disaster Control Group
- MAN – Metropolitan Area Network
- MIS – Management Information System
- NASA – National Aeronautics and Space Administration
- NOAA – National Oceanic and Atmospheric Administration
- OSHA – Occupational Safety and Health Administration
- OSP – Operations Safety Plan
- OSMC – Operations Safety Manager Console
- PAFB – Patrick Air Force Base
- Para. - Paragraph
- PE – Professional Engineer
- PMR – Program Management Review
- PSM – Process Safety Management
- PWS – Performance Work Statement

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SDS – Service Delivery Summary
 QA – Quality Assurance
 QAPP - Quality Assurance Program Plan
 QD – Quantity Distance
 RBA – Reimbursable Budget Authority
 RDMS – Real time Dispersion Monitoring System
 RF – Radio Frequency
 RMP – Risk Management Program
 SCAPE – Self Contained Atmospheric Protective Ensemble
 SDS- Service Delivery Summary
 SOP – Safety Operating Plan
 SW – Space Wing
 SWI – Space Wing Instruction
 USAF – United States Air Force
 USR – Unit Safety Representative
 WBS – Work Breakdown Structure

HISTORICAL WORK ESTIMATES

NOTE: Significant changes to task allocation percentages have occurred in the past and will continue to occur due to changing 45 SW priorities in its safety program.

PWS Requirement	Percentage of Support per FY
3.0 Operations Safety	
3.1 Hazardous Operations	28%
3.2 Safety-Critical Operations	5%
3.3 Launch Countdown Operations	2%
3.4 Incidents	1%
3.5 Inspections, Tests, Audits, and Visits	2%
3.6 Operations Safety Reviews	32%
3.7 Engineering Reviews	12%
3.8 Occupational Safety and Health	6%
3.9 Process Safety Management (PSM) and Risk Management Program (RMP)	4%
3.10 Pressure System Certification/Recertification, Process Safety Information, and Mechanical Integrity Program	8%
PWS Requirement	Percentage of Support per FY
4.0 Flight Safety Analysis	
4.1 Impact Probabilities and Casualty Expectations	15%
4.2 Safety Criteria and Missile Abort Logic	9%
4.3 Mathematical Models, Algorithms, and Computer Programs	6%
4.4 Performance Requirements	3%
4.5 Launch Operations	10%
4.6 Range Testing	1%

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4.7 Launch Vehicle Systems	2%
4.8 Flight Safety Support	38%
4.9 Impact Prediction Accuracy	6%
4.10 Data Editing, Filtering, and Differentiation	2%
4.11 Support systems	2%
4.12 Flight Safety Applications	2%
4.13 Risk Acceptance Criteria	2%
4.14 Interagency Nuclear Safety Review Panel (INSRP) Support	2%

APPROXIMATE OVERALL COST ESTIMATES (BY PROGRAM)ATLAS - 8.24%
DELTA - 9.37%
TITAN - 40.22%
RANGE - 35.45%
DSCS - .15%
CE - 6.57%