

FA9101-13-R-0100

Attachment 8

**Performance Work Statement (PWS)
AEDC Test Operations and Sustainment
(TOS)**

28 August 2014

1 Introduction	4
1.1 Mission.....	4
1.2 Background.....	5
1.3 Scope.....	5
2 General Requirements	7
2.1 Business Relations.....	7
2.2 Contract Administration and Management	8
2.3 Subcontract Management	9
2.4 Contractor Personnel, Disciplines, and Specialties.....	9
3 Performance Requirements	10
3.1 Test and Evaluation	10
3.2 Technology Projects.....	18
3.3 Operation of Test Assets and Test Articles	20
3.4 Integrated Scheduling	25
3.5 Lifecycle Sustainment of Test and Test Support Assets.....	26
3.6 ID&C Engineering Services and Lifecycle Sustainment.....	30
3.7 Test, Measurement, and Diagnostic Equipment (TMDE) Management	32
3.8 Capital Improvements	35
3.9 Fuels Management Services.....	40
3.10 Machining / Fabrication and Chemical / Material Analysis	45
3.11 Operations and Lifecycle Sustainment of AEDC Base Support Assets.....	47
3.12 Utilities General Support	53
3.13 Data and Documentation for AEDC Configuration Items	55
3.14 AEDC Ground, Weapons and System Safety Programs	56
3.15 Sensitive Compartmented Information (SCI) Security and associated SCI Information Assurance (IA) Support.....	60

3.16 Financial Management	64
3.17 Acquisition of Supplies, Services, and Equipment	66
3.18 Interface Management	68
3.19 General Management	84
3.20 Strategic Planning	91
3.21 Foreign Technology	92
3.22 Public Affairs	94
3.23 Real Property Management and Accountability Services	97
3.24 Continuous Improvement Program.....	99
3.25 Integrated Performance Management Program	100
4 Special Requirements	101
5 Acronyms.....	102
6 Deliverables	106
Performance Requirement Summary (PRS)	113
APPENDICES.....	130
APPENDIX A TEST ASSETS.....	130
APPENDIX B COMMON ASSETS	144
APPENDIX C BASE SUPPORT UTILITY ASSETS	145
APPENDIX D BASE SUPPORT ASSETS	148

Performance Work Statement (PWS)

AEDC Test Operations and Sustainment (TOS)

Vision Statement

In 2024, Arnold Engineering Development Complex (AEDC) will continue to be headquartered at Arnold AFB, TN, but will have a nationwide footprint that is expanded from today's. It will have active collaborations with personnel assigned to Air Force Research Laboratory, various strategically chosen academic institutions, Air Force Life Cycle Management Center, Test Resource Management Center, and the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. Its facilities, business models, and processes will be designed to facilitate those collaborations. It will be widely externally recognized as both the leader in analysis of aerodynamic and propulsion test data as well as a key developer of technology for ground-test systems.

1 Introduction

The Air Force Test Center's AEDC is a national aerospace ground test facility that conducts tests, engineering analyses, and technical evaluations for research, system development, and operational programs of the Air Force (AF) and Department of Defense (DoD), other Government agencies, and industry. Using ground test facilities and computational engineering, AEDC supports propulsion, aerodynamic, reentry, trans-atmospheric, and space-flight systems testing. This testing underpins the technical knowledge required for the development and qualification of key warfighter aerospace weapons. Testing is performed in an environment that simulates operational conditions. AEDC also performs research to develop new test technology for advanced test facilities, test techniques, and measurement methodologies associated with ground tests. The purpose of this solicitation (TOS) is to obtain the technical expertise and services necessary to support AEDC in execution of its mission. The TOS Contractor efforts will be integrated with other contract efforts known overall as Test Operations and Support. Innovative business arrangements and initiatives are necessary. Constrained fiscal environments endanger the continued operation of some test facilities - near term efficiencies will be necessary to allow continued operation of required capabilities at technical levels necessary to sustain the world's most capable Air Force. Effective teamwork with other contractors supporting overall mission and base support operations will be essential.

1.1 Mission

AEDC exists to test and evaluate weapon, propulsion, aerodynamic and space systems at realistic conditions for the nation through modeling, simulation, and ground test facilities.

The mission is essential to developing and fielding weapons systems for the nation's warfighters.

The TOS Contractor will be expected to perform in this mission, while smoothly integrated with the other AEDC contractors and Government personnel, in a manner that makes AEDC the most effective ground test and evaluation (T&E) complex in the world – suitable for supporting the best Air Force in the world.

1.2 Background

The AEDC Test Operations and Support Contracts will provide the contractor workforce necessary to successfully operate and sustain AEDC's test facilities at Arnold AFB, TN, and geographically separated units (GSUs) at White Oak, MD, and Moffett Field, CA. Since its inception, AEDC has been contractor-operated, and contractors provide the majority of the workforce. Contractors conduct test operations, base operations, test facility and base infrastructure maintenance and improvement efforts, and many other services critical to operating and sustaining the nation's largest collection of aerospace ground test facilities as well as an Air Force Base. Several significant changes from current contracting arrangements will occur with the awarding of the Test Operations and Support contract(s). Enterprise contracting initiatives will result in information technology tasks and the operation of the Precision Measurement Equipment Laboratory (PMEL) being performed under separate contracts (Information Technology Support Contract and PMEL Contract). In addition, some portions of base operating support tasks, historically part of the overall contract, will be set aside for small business under a Facility Support Services (FSS) contract. Refuse, janitorial, and grounds maintenance functions will be awarded to an AbilityOne Contractor. Finally, Government personnel will accomplish the technical management and engineering analysis for test programs conducted at AEDC Arnold AFB with advice and assistance from the Test Services Contractor.

AEDC must award flexible contract vehicle(s) that allow meeting customer's needs while:

- Ensuring effective and efficient Test Operations and Support;
- Preserving intellectual capital for test support and analysis;
- Increasing technical work by the Government workforce;
- Implementing innovative solutions that immediately begin cost reductions;
- Accommodating dynamic changes in workload;
- Increasing small business participation;
- Rewarding management / technical innovation;
- Providing incentives to increase efficiency and productivity in workforce labor practices;

1.3 Scope

The TOS contract acquires test operations, technology development, equipment and facility sustainment, capital improvements and some support services for AEDC. AEDC provides the

most comprehensive set of aerospace ground test facilities in the world. Many of the individual test facilities are unique in the country or in the world. AEDC facilities at its three operating sites include very large- to medium-sized wind tunnels which cover the entire flight envelope from subsonic to hypersonic speeds. Simulated altitude testing for very large commercial-type turbofan engines and the world's most powerful fighter engines as well as large rocket motors can be conducted at AEDC. Facilities at AEDC can further simulate space environments and space vehicle reentry speeds and temperatures.

AEDC Test Capabilities include:

Arnold AFB:

- Turbine Engine Altitude Ground T&E simulated altitude testing of jet engines;
- Turbine Engine Ram / Sea Level Ground T&E testing of jet engines at sea level, with and without pressurized inlet air;
- Hypersonic Propulsion Ground T&E ground testing of propulsion systems designed for flight at hypersonic speeds;
- High Mach Number Engine Altitude Ground T&E simulated altitude testing of very high supersonic jet engines;
- High-Temperature Material Characterization and Evaluation testing of material characteristics at atmospheric reentry temperatures;
- Hypervelocity Flyout, Impact, and Lethality Ground T&E ground testing of projectiles and their lethality characteristics at missile intercept velocities;
- High-Altitude / Space Environmental Effects and Sensor Ground T&E testing of components and systems performance in space environments;
- Multi-Spectral Signature Measurement & Analysis Measurement and analysis of signal signatures of objects such as missiles, aircraft, etc.;
- Super / Hypersonic Aerodynamic / Aerothermal Ground T&E High speed wind tunnels for making aerodynamic and aerothermal measurements on aerospace system models;
- Transonic Aerodynamic / Propulsion Ground T&E medium and large aerodynamic wind tunnels for making aerodynamic measurements on aerospace system models. The large wind tunnel also has propulsion capability;
- Solid Rocket Motor Ground T&E - simulated altitude testing of solid rocket motors.

White Oak Site (Tunnel 9)

- Hypervelocity Ground T&E - a specialized wind tunnel for performing very high speed measurements on aerospace system models.

National Aeronautics and Space Administration (NASA) Ames Site (National Full Scale Aerodynamics Complex (NFAC))

- Subsonic Aerodynamic Ground T&E - Low speed, very large aerodynamic wind tunnels.

All sites have similar missions, although different facilities and specialties. All require similar support but obtain that support from a variety of sources. GSUs obtain some of these services

through leases and support agreements as tenants on the property of other Government activities. Requirements provided by the TOS contract include:

- Test project management and analysis support necessary to execute the AEDC mission;
- Analysis, evaluation, and reporting of foreign scientific and technical information;
- Project management and technical support necessary to accomplish effective test technology development in support of the AEDC mission;
- Advancing test capability by advancing techniques in modeling and simulation, instrumentation, and test techniques;
- Capital improvement planning, programming, and execution of projects / programs to repair, modernize, improve, and acquire Research, Development, Test, and Evaluation (RDT&E) assets;
- Maintenance and repair activities on all RDT&E and Test Support assets;
- Operation and maintenance of all shop and laboratory assets including the Machine and Fabrication Shop, the Metrology / Non-Destructive Examination Laboratory, and the Chemistry Laboratory;
- Development and application of a Quality program in accordance with (IAW) Government requirements;
- Maintenance, repair, improvement, modernization, and acquisition of all AEDC base support assets, including real property consisting of over 300 buildings, 700 facilities, and 40,000 acres;
- Purchasing of supplies, equipment, and services for all authorized Complex operations including tenant organizations;
- Management of the requisition, receipt, storage, issuance, quality, and accounting of petroleum fuels and cryogenic products;
- Defining, planning, managing and executing projects / programs to repair, modernize, improve and acquire instrumentation, data acquisition, and control systems;
- Providing performance management, business management, process management in support of the performance of this contract(s).

2 General Requirements

The effort will be performed primarily at the AEDC site at Arnold Air Force Base in Tennessee. Performance will also be required at AEDC facilities housed as tenants on sites in White Oak, MD and on the NASA Ames Research Laboratory grounds at Moffett Field, CA. Requirements listed in this PWS are assumed to be AEDC-wide unless specifically noted otherwise.

Period of performance is expected to start the first day of FY16 and extends eight years if all options are exercised.

2.1 Business Relations

The Contractor shall successfully integrate and coordinate all activity needed to execute the requirement. The Contractor shall manage the timeliness, completeness, and quality of problem

identification. The Contractor shall provide corrective action plans, proposal submittals, timely identification of issues, and effective management of subcontractors. The Contractor shall coordinate and cooperate closely with associate contractors involved in the execution of AEDC's mission. The Contractor shall seek to ensure satisfaction of all internal and external customers and professional and ethical behavior of all Contractor personnel.

2.2 Contract Administration and Management

The Contractor shall perform all contract management functions required to ensure proactive and sustained contract excellence in providing accurate, safe, secure, timely, and efficient contract test and mission support to meet the Government's established requirements.

2.2.1 Contract Management

The Contractor shall designate a responsible corporate official, to be located at AEDC, with no responsibility other than for this contract and empowered to make and implement all decisions regarding the performance of this contract.

2.2.2 Contract Administration

The Contractor shall:

- Develop proposals and negotiate annual workload; and supplemental contract modifications;
- Ensure performance of the business and administrative aspects of the contract;
- Report all Full-Time Equivalent (FTEs) IAW Section 8108 of Public Law 112-10 of the DoD and Full-Year Continuing Appropriations Act, 2011;
- Ensure resources are efficiently and effectively managed and contract status (including Government-furnished resources) is reported to Government representatives as required;
- Recommend AEDC Instructions and changes to existing instructions as needed to assist in managing and executing this contract and to facilitate the efficient operation of AEDC;
- Develop, implement, and manage formal associate contractor agreements as required.

2.2.3 Personnel Administration

The Contractor shall:

- Maintain a qualified work force able to perform the broad spectrum of functions necessary to operate, support, and sustain AEDC facilities;
- Plan and administer a wage and salary structure, using position classification, standards, and grade levels and adapted to the appropriate geographic locations (OT-2014-30001);
- Provide and administer a fringe benefit program, which may include an insurance program associated with worker's compensation and employee health, vacation, sick leave, holidays, and a retirement program;
- Continue and administer a defined benefit pension program for legacy Operations, Maintenance, Information Management, and Support (OMIMS) employees on the TOS and FSS contracts at Arnold AFB;
- Maintain staffing records identifying company organizational designations, a brief description of the functions, and the number and types of personnel assigned;
- Report personnel strength to include hiring and termination trends, number of personnel employed by pay category and organization, number of additions and deletions to the payroll (OT-2014-30000);
- Provide and administer an Equal Opportunity Affirmative Action Program that complies with all Federal statutes.

2.3 Subcontract Management

The Contractor shall award and administer subcontracts IAW the Contractor's established policies, procedures, and approved purchasing system.

2.4 Contractor Personnel, Disciplines, and Specialties

The Contractor shall:

- Conduct craft, supervision, and management training programs;
- Provide opportunities for graduate-level education for employees to the extent permitted by the Federal Acquisition Regulation, Part 31;
- Accept Government personnel for assignment to positions within the Contractor's organization for immersion or other purposes approved by the Contracting Officer;
- Coordinate joint training programs for all Contractor and Government personnel, as appropriate.

3 Performance Requirements

The following section specifies the Performance Objectives and Performance Elements for the contract. Unless otherwise specified, all requirements apply to all AEDC locations (AEDC Arnold AFB, AEDC White Oak, and AEDC Moffett Field).

3.1 Test and Evaluation

This section outlines requirements to direct and manage test and analysis projects.

A test customer engages AEDC with the intent to generate data and acquire knowledge needed in the development, qualification, and / or sustainment of an aerospace system or system of systems. Technical direction and management are focused on ensuring that the data and information acquired during testing is suitable for decision making and for supporting technical risk management for acquisition programs and other test customer needs. This is a collaborative process that engages the expertise of the testers and the test customer to fully understand the capabilities and limitations of the proposed test program. Careful test planning, including test plans and cost and schedule estimates, participated in by AEDC and its test customer, is an important element of successful testing.

Performance Standards

a) STD: At least 98% of validated customer feedback responses indicate TOS Contractor has met or exceeded expectations

3.1.1 The Contractor shall support the development of the rough order of magnitude (ROM) cost estimates for testing.

ROMs provide the test customer a cost and schedule estimate based on preliminary information available from the test customer. The level of detail that the test customer provides varies and usually includes test duration and specific requirements, including test conditions and instrumentation. The ROM shall restate to the test customer the requirements as provided, any assumptions used in estimating, and a range in possible costs with rationale. Emphasis shall be applied to determining analysis requirements needed to support the customer's test.

Deliverables

OT-2014-30027 Rough Order of Magnitude Estimate

3.1.2 The Contractor shall support the development of the Statement of Capability (SOC) for tests.

SOCs provide the programmatic and technical approach being proposed for a test and analysis project based on the test customer's known requirements. SOC's are detailed documents which effectively act as a contract for tests conducted for Government customers.

The TOS Contractor shall deliver a completed SOC for testing conducted at AEDC Moffett Field.

Deliverables

OT-2014-30048 SOC Report

3.1.3 The Contractor shall develop test plans for testing when a test plan is not provided by the test customer.

Test plans include test article configurations, test environmental conditions, test points, required instrumentation, test article operating limits and other information directly required to conduct the test.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be performed by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Sections 3.3 and 3.6.

Deliverables

DI-NDTI-80566A Test Plan

3.1.4 Baseline test and analysis project plans.

The following subparagraphs outline the requirements for the project plan for all tests. Test projects are divided into eight phases. The phases are: Planning, Design, Fabrication, Installation, Test, Removal, Analysis, and Reporting. The design phase is comprised of two sections, one for the test installation and the other addresses the design of the test.

Deliverables

OT-2014-30049 Test and Analysis Project Plan

3.1.4.1 The Contractor shall assess the suitability of the test, develop the analysis requirements, develop the best approach to meeting the test objectives, and support test technical review boards IAW Air Force Instruction (AFI) 99-103 and AEDC Instruction (AEDCI) 99-100.

A determination of the test suitability shall be accomplished in coordination with the test customer. The assessment shall address the intent of the test (e.g. demonstration, qualification, developmental) and shall address the technical approach, method of test, and objectives. The test facility capabilities required to conduct the test must be identified and determined to be available for use. Analysis requirements will either be qualitative or quantitative based on the customer's test objectives. The analysis requirements for quantitative results shall incorporate the following items at a minimum: a) pre-test measurement uncertainty assessment, statistical assessment of the suitability of the test for each test objective, and uncertainty propagation to test customer required results; b) the requirements for configuring the test data systems to meet the customer's test objectives including the implementation of custom algorithms and data reduction necessary to meet the customer's test objectives; c) data validation approach to ensure data integrity. The assessment of the test shall be documented in an engineering report IAW AEDC Operating Instruction (AEDCOI) 99-10. The analysis requirements include defining the delivery schedules for data, analysis products, and technical reports shall be included in the project plan.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be performed by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Sections 3.3, 3.6 and 3.7.

Deliverables

OT-2014-30044 Technical Reports

3.1.4.2 The Contractor shall review and coordinate instrumentation and control system requirements for the provided customer test plan for tests.

This requires coordination and communication with the test customer and the Original Equipment Manufacturer (OEM) of the test article should they be different organizations. This can involve confirming and clarifying sampling rates, data time skew, installation requirements for specific instruments, channel counts, instrumentation mortality concerns, test article control interfacing, and other technical requirements not listed here. The scope of work for the first entry of a test article to configure the test data acquisition system and test data acquisition systems database configuration will be greater than for a repeat entry of the same or similar test article with respect to form, fit and function of the test article. The data acquisition systems and controls systems requirements shall be defined for fulfillment IAW paragraph 3.6.3.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Sections 3.3, 3.6 and 3.7.

3.1.4.3 The Contractor shall define and document requirements for buildup, installation, modification, and removal for test articles.

This requirement can vary in the scope of work depending on the customer's test requirements and if it is a first or repeat entry for the test article. First entries will usually require the development of support test equipment, test article unique interface hardware, and definition of the operating requirements for preparation of the initial procedures to operate the test article and test facilities. This includes planning to procure and to fabricate necessary test support equipment and includes equipment that shall be supplied by the test customer or their designated representatives. A second or repeat entry of the same or similar test article, with respect to form, fit and function, will generally require minor modifications or reuse of the support test equipment previously procured, fabricated, or provided by the test customer or their designated representatives. The fulfillment shall be IAW section 3.3.9 and 3.3.10.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Section 3.3 and 3.6.

3.1.4.4 The Contractor shall develop test period run programs, test article configuration requirements, and test installation configuration requirements for customer provided test plans for tests.

The test period run programs shall account for any test sequence or prescribe translations for the test article or test support equipment, the test article configuration, test environment including stabilization time, efficient use of power, requirements for acquiring data, and shall be linked directly to the test plan provided by the test customer.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Sections 3.3 and 3.6.

Deliverables

OT-2014-30045 Test Period Run Plan

3.1.4.5 The Contractor shall identify resource requirements including materials, utilities, and labor required to complete tests.

The definition of resources shall include the identification of support from other AEDC contractors for work required to complete planning, design of installation, fabrication, installation, test operations including facilities and data systems, and removal.

3.1.4.6 The Contractor shall provide requested information to the Government to support project planning, reviews, and execution.

Information may include but is not limited to resource estimates for labor, materiel, and utilities, schedules, configuration, operational options and recommendations to meet required test conditions. Information may be used to develop ROM Estimates, Test Project SOCs, Test Plans, Test Readiness Reviews (TRR)s, and other project documentation.

3.1.4.7 The Contractor shall prepare and organize required documentation for the Safety Review Board.

The test and analysis project safety assessment and the documentation of the assessment shall be accomplished IAW AEDC–SHE-STD-A4, Systems Safety sections 4.9 and 4.10.

3.1.5 The Contractor shall provide test and analysis project management support and direction for tests.

The performance standard as defined applies to project information provided to the Government.

The TOS Contractor shall complete this requirement for testing conducted at the GSUs.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB.

Performance Standards

a) STD: Complete the project within SOC cost and schedule proposals +/- 10% without contingency or +0%/-10% with contingency.

3.1.5.1 The Contractor shall support TRRs for tests conducted at the GSUs and at AEDC Arnold AFB.

Refer to AFI 99-103, Capabilities Based Test and Evaluation, AFMCI SUP 99-103, Capabilities Based Test and Evaluation, and AEDCI 99-100, Test and Evaluation Project Management.

3.1.5.2 The Contractor shall direct the accomplishment of the test objectives during testing at AEDC Moffett Field.

The direction of test objectives includes ensuring that the test is executed according to the test period run plan and does not include providing specific instruction for the operation of the test facility and test article; these requirements are met in sections 3.3 and 3.6 of this PWS.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak.

3.1.5.3 The Contractor shall monitor, investigate, and report all test data anomalies.

Data anomalies include but are not limited to, individual channels that exceed the tolerance for measurement noise, dynamic and transient data that exhibit noise or signal characteristics that are inconsistent with the phenomena being measured, and other indicators that would indicate faulty test data.

3.1.5.4 The Contractor shall track, manage, and report project cost, schedule, and technical performance for tests.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak.

Deliverables

DI-MGMT-81861 Integrated Program Management Report

3.1.5.5 The Contractor shall identify and document project scope changes IAW AEDCI 65-105. The Contractor shall incorporate Government-approved scope changes and project deviations.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Sections 3.3, 3.6, and 3.7.

Performance Standards

a) STD: No out of scope work performed during project execution

Deliverables

OT-2014-30004 Project Change Agreement

3.1.5.6 The Contractor shall document and maintain project records and project reviews for tests.

Provide access to the following: test requirements, project and analysis plans, test analysis, test reports, test plan, test requirements information, test configurations, deliverable reports, operating logs for test article and test article support equipment, and test data used for reports, test and facility data associated with anomalous events, and test productivity metrics. This database will incorporate existing data and accessibility will be limited to the Government, TOS Contractor, and Test Services Contractor.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak for test analysis, test reports, test plan, and test requirements information.

3.1.6 The Contractor shall prepare and deliver data packages and technical reports for tests.

This section outlines the requirements for technical reporting identified in the SOC and the approved test and analysis project plan. Data validation and fault checking, to the extent feasible, shall occur in real time for test programs to accomplish the test objectives; this shall be accomplished to ensure the ability to deliver data real-time and / or at the end of each test period. The data shall be analyzed and evaluated with respect to the test objectives and

analyzed for performance with respect to test objectives. The data evaluation shall at a minimum include the definition of the overall uncertainty for steady state data for the designated performance parameters and associated measurement standards. Reports shall be formatted IAW AEDCOI 99-10, Technical Reporting.

The TOS Contractor shall complete this requirement for testing conducted at AEDC Moffett Field.

This requirement will be met by the Government for tests to be conducted at AEDC Arnold AFB and AEDC White Oak, with support from the TOS Contractor in performance of scope defined in PWS Sections 3.3, 3.6, and 3.7.

Performance Standards

a) STD: Meets security safeguards provided by customer

b) STD: Uncertainty analysis traceable to test data and calibration information, graphs accurate with correct units include success thresholds as appropriate. All test objectives addressed.

Deliverables

OT-2014-30044 Technical Reports

3.1.7 The Contractor shall provide recommendations, conclusions, and lessons learned for continuous test capability and test process improvement. The information requested shall be entered into a lessons learned data base provided by the Information Technology Support Contractor.

3.1.8 Applicable Documents (Mandatory)

	AFI 99-103	Capabilities Based Test and Evaluation
	AFMCI SUP 99-103	Capabilities Based Test and Evaluation
	AEDC-SHE-STD-A4	Systems Safety
	AEDCI 99-100	Test and Evaluation Project Management
	AEDCOI 99-10	Technical Reporting

3.2 Technology Projects

The technology program is managed by the Government and includes the development of new test techniques, instrumentation, analytical methods, and computational modeling and simulation to solve particular test problems or to generally advance the state of the art in test effectiveness and efficiency. Technology projects are performed to first specifically support AEDC testing, and, secondly, for support of external customers, or in cooperation with other Government agencies or private industry. External customers include contracts awarded under the Small Business Innovative Research (SBIR) program. Projects vary widely in magnitude and scientific and engineering disciplines. Projects may include mechanical, electrical, electronic, and aeronautical engineering, optics, basic physics, nuclear physics, computational techniques, information technology, mathematical modeling and more.

3.2.1 The Contractor shall identify, design, develop and execute technology projects that will eliminate requirements gaps in facility and plant hardware, software, instrumentation, analytical methods, computational modeling and simulation, and test methodology improvements.

Technology projects will be captured and prioritized in the Integrated Technology Investment Plan (ITIP), which is managed by the Government and supports the AEDC strategic plan. Topic candidates for ITIP inclusion and funding will be submitted to the Government by the Contractor. The ITIP will have detailed plans for the upcoming year's projects and 5 year plans for additional topics, as funding allows, in support of the Future Years Defense Program (FYDP). These topics should be identified in collaboration with other DoD T&E complexes and developers, academic institutions, and industry. A continual professional interchange should be maintained with technology oriented representatives from industry and Government, consistent with AEDC Agreements, by attending and being involved with technical conferences and seminars. A yearly technology program review will be provided by the Contractor. The technology program review will include highlights of the major projects, a review of the transition candidates and identification and prioritization of the upcoming candidate projects.

Deliverables

OT-2014-30023 ITIP Candidate Topic List

OT-2014-30026 Technology Progress Report

3.2.2 The Contractor shall assure the transition of technology products to the intended environment with operational and maintenance activities identified, as required.

Technology product transition will be coordinated with and approved by the Government, including proof-of-concept, prototypes, incremental development products, and SBIR products. Transition activities should assess the need for training, operators' manuals and maintenance

requirements. Software product requirements, technology software product transition, and technology instrumentation and control product transitions will be IAW with Section 3.6 requirements. Technology products requiring calibration will be coordinated with the PMEL Contractor.

Performance Standards

a) STD: Transition technology products IAW project plan

3.2.3 The Contractor shall conduct advanced measurement and troubleshooting services.

The AEDC Technology program supports advanced measurements and troubleshooting for on-base test activities, and off-base customers including commercial and other Government groups. The advanced measurement and troubleshooting activities may require operation of specialized measurement equipment, innovative data gathering tools, technical evaluations and / or data analysis. Examples of this activity include gaseous emissions sampling and analysis, non-contact Stress Measurement System (NSMS) testing, and multispectral signature data gathering. The off-base testing support requires packing and shipping of equipment, travel for personnel, and operation and maintenance of equipment in a field environment.

Requirement 3.2.3 does not apply to AEDC White Oak or AEDC Moffett Field.

Performance Standards

a) STD: At least 98% of validated customer feedback responses indicate TOS Contractor has met or exceeded expectations

3.2.4 The Contractor shall provide engineering support for SBIR programs.

The SBIR program allows for awarding contracts to small business with the intent of developing a new test technique, instrumentation package, or sustainment activity that would benefit the Government and allow for the commercialization of the product by the small business. These awards are based on proposals on topics that are identified and broadcast by the Government. The Contractor shall support the Government SBIR Program Manager in identifying candidate topic ideas and supporting transition of SBIR developments into operation. Transition activities include training, operation and maintenance of the product.

Deliverables

OT-2014-30019 SBIR topic candidate list

3.2.5 The Contractor shall effectively execute and track progress of test technology projects.

Technology project execution and progress tracking shall be the responsibility of the TOS Contractor as well as providing inputs for development ROMs, SOCs, and project baseline plans for technology projects as requested by the Government. These requirements may be tailored for technology projects where applicable based on project scope. Tailoring will be directed and / or approved by the Government.

Performance Standards

a) STD: Execution of projects within cost, schedule and performance as documented in the ROM or SOC documents. Tracking data is acquired, stored, and available as required for evaluation of project execution.

3.3 Operation of Test Assets and Test Articles

This section defines objectives for safe, efficient, and effective operations of test cells, process air plants, test utilities (steam, electrical, and raw water), and their associated systems including Test Instrumentation, Data, and Controls (ID&C) assets, test articles, and other non-AEDC test peculiar support equipment and Technology development labs and equipment used to conduct testing, checkouts, and general operations activities. Fuel operations requirements are covered in Section 3.9. The test and test support assets are listed in Appendix A.

3.3.1 The Contractor shall provide requested test conditions during operation of test assets, test articles, and non-AEDC test support equipment.

Specific test conditions will be requested prior to the test via test period directives or via other designated communication methods, and may also be requested during the actual test period execution. These requests may originate with the Customer, but are communicated to the operators via designated AEDC personnel depending on the location.

3.3.2 The Contractor shall deliver specified productive test time (PTT) for test and test support operations.

AEDCOI 99-1, Lost Time Assessment provides specific policy and procedures to identify, record, report, and assess the loss of available test time due to unplanned interruptions.

Performance Standards

a) STD: Meet or exceed PTT standards specified in Table 3.3-1

Acceptable Quality Level (AQL): 5% below specified goal

Table 3.3-1

Test Cell	PTT STD	PTT Formula
16T	85%	$\%PTT = [1 - (AEDC\ LTT^*/(AOH^{**} + TOTAL\ LTT^{***}))] \times 100$
4T	85%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
Tunnel A	75%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
Tunnel B	75%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
Tunnel C	70%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
C1	85%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
C2	85%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
J1	85%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
J2	85%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
SL2	90%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
SL3	90%	$\%PTT = [1 - (AEDC\ LTT/(AOH + TOTAL\ LTT))] \times 100$
7V	95%	$PTT = [1 - (AEDC\ LTT/(OSH^{****} + TOTAL\ LTT))] \times 100$
8V (STAT)	95%	$PTT = [1 - (AEDC\ LTT/(OSH + TOTAL\ LTT))] \times 100$
10V	95%	$PTT = [1 - (AEDC\ LTT/(OSH + TOTAL\ LTT))] \times 100$
Range G, Range I, APTU, J6, H1, H2, H3	95%	$\%PTT = [1 - (AEDC\ Aborts^{*****} / (Total\ Achieved\ Runs,\ Shots,\ or\ Firings\ ^{*****} + AEDC\ Aborts^{*****}))] \times 100$

Lost test time (LTT) is the time during a test period when customer testing cannot be accomplished due to unplanned interruptions.

An Abort is an event when a run, shot, or firing is not successfully accomplished on the test day due to an unplanned interruption. A partial abort and a partial achieved run, shot, or firing is scored for runs, shots, or firings where some objectives are not met (e.g.; partial rack of models tested in H1 or shorter than required run time in APTU).

AOH + Total LTT and OSH + Total LTT equal the scheduled operations time including approved extensions.

* AEDC LTT – AEDC LTT is the LTT that is attributable to AEDC systems or personnel.

** AOH – Air On Hours are the achieved test facility operations time.

*** Total LTT – The total actual test time where testing cannot be accomplished for any reason.

**** OSH – Operational Shift Hours are the achieved operational hours.

***** AEDC Abort - An AEDC Abort is an Abort attributable to AEDC systems or personnel.

***** Total Achieved Runs, Shots, Firings – The total number of runs, shots, firings where test objectives are met.

3.3.3 The Contractor shall deliver specified test cell availability for test and test support operations.

3.3.4 The Contractor shall provide operational data for test facilities and test utilities.

Logs provide operational use data for analysis, historical record, and compliance with laws and regulations.

Deliverables

OT-2014-30021 Daily Operating Time Log

OT-2014-30039 Test Unit Status Log

OT-2014-30047 Title V Major Source Operations Log

3.3.5 The Contractor shall maintain data logs for maintenance and operation activities related to test articles and test peculiar support equipment.

Test peculiar support equipment is items that are either customer-supplied or AEDC-procured, such as a waterbrake, to support a specific test project or program. Logs are used to track operational usage, configuration changes, and maintenance actions.

Deliverables

OT-2014-30021 Daily Operating Time Log

OT-2014-30053 Test Article Activity Log

3.3.6 The Contractor shall develop and document work instructions (procedures) for operation and maintenance of test articles and test peculiar support equipment.

Operations or maintenance procedures are required for customer-supplied equipment and test articles as well as procured test peculiar equipment that will be operated by the TOS Contractor when procedures are not supplied. Any equipment to be added to the AEDC inventory as new Configuration Items upon test completion shall be accepted and conformed to the requirements in AEDC-STD-CM-1 Configuration Management.

Deliverables

OT-2014-30018 Operations and Maintenance Procedures

3.3.7 The Contractor shall provide and document requested maintenance for test articles and test peculiar support equipment.

Test article maintenance is typically performed by the customer or customer's representative. The customer may request AEDC to perform or support a maintenance activity on their test article or test peculiar support equipment. This requirement may be documented in project documentation such as a SOC, or may be a real-time request from the customer. Examples of maintenance activities: oil changes, borescope inspections, and failed customer-installed sensor change out.

Deliverables

OT-2014-30053 Test Article Activity Log

3.3.8 The Contractor shall conduct and document receipt inspections and conduct preparation for return shipment or storage for test articles and test peculiar support equipment.

This requirement includes any special inspections performed upon delivery to test article buildup areas or test areas and preparation activities conducted in test areas in order to prepare the test article or test peculiar support equipment for shipping. This requirement does not include the initial receipt inspections and return shipments performed by the FSS Contractor at AEDC Arnold AFB, by the TOS Contractor at AEDC White Oak, and through special agreements with NASA at AEDC Moffett Field.

3.3.9 The Contractor shall provide test article and test peculiar support equipment installation designs, hardware, and software.

Designs, hardware, and software shall comply with applicable AEDC Engineering Standards, AEDC Safety, Health, and Environmental (SHE) Standards, AEDC Configuration Management Standard, and AEDC Systems Engineering requirements and standards.

3.3.10 The Contractor shall build-up, install, re-configure, and remove test articles and test support equipment for test projects.

This requirement defines work in the Fabrication, Installation, Test, and Removal Phases of a project including preparing for test execution, making required changes during testing, removing the test article, and returning test cell systems to a baseline configuration. Buildup, installation, re-configuration, and removal applies to all assets associated with the test including the test article, test peculiar support equipment, and test cell assets (e.g. thrust stands, data acquisition

systems, model support systems). Specific requirements for these actions may come from the Project Manager, the Customer, or project documentation.

3.3.11 The Contractor shall operate steam plants IAW UFC 3-430-02 FA Central Heating Boiler Plants and AFI 32-1068, Heating Systems and Unfired Pressure Vessels; at AEDC Moffett Field, the Contractor shall also operate IAW the Bay Area Air Quality Management District.

The Contractor shall notify the Government of pending boiler inspections.

Requirement 3.3.11 does not apply to AEDC White Oak.

3.3.12 The Contractor shall operate the AEDC Arnold AFB Propulsion Research Facility (PRF) J85 engines IAW current USAF Technical Orders (TO)s listed in paragraph 3.3.13.

The PRF is located off-base at the University of Tennessee Space Institute (UTSI) and is a collaborative effort with UTSI in its operation. The PRF uses J85 turbojet engines to provide an environment to evaluate and advance the TRL of technology products.

3.3.13 Applicable Documents (Mandatory)

	AFI 32-1068	Heating Systems and Unfired Pressure Vessels
	AEDC-STD- CM-1	Configuration Management
	AEDCOI 99-1	Lost Test Time
	UFC 3-430-02	Central Heating Boiler Plants
	TO 1T-38A-2-6	Org. Maint., T-38A Aircraft Powerplant
	TO 1T-38A-6WC-4	T-38 Power Pack Installation and Inspection
	TO 2J-J85-9	Nondestructive Inspection Procedures
	TO 2J-J85-54	J-85 Turbojet Engine IPB
	TO 2J-J85-102	Corrosion Control / Cleaning Manual

	TO 2J-J85-111 (1-2)	Test, Troubleshooting, and Handling Maintenance Manual
	TO 2J-J85-113-CD-1	Turbojet Engine J85 Technical Manual Set
	TO 2J-J85-113-(1-10)	Depot Maintenance Manual
	TO 2J-J85-116-(1-11)	Interim Maintenance Manual
	TO 2J-J85-154	Support Equipment for J85 IPB
	TO 6J3-2-16-13	Afterburner Control Overhaul Manual
	TO 6J3-2-16-14	Afterburner Control IPB
	TO 6J3-4-73-3	Main Fuel Control Overhaul Manual
	TO 6J3-4-73-4	Main Fuel Control IPB
	TO 33D4-6-264-1	Engine Control Kit Ops and Service Manual
	TO 33D4-6-264-4	Engine Control Kit IPB

3.4 Integrated Scheduling

The Integrated Scheduling process is used to schedule test, maintenance, capital improvements and civil engineering efforts, from all AEDC contracts and Government sources.

The outage process gives visibility to activities that impact the AEDC mission. An outage represents a specified period of time that an asset or assets will be unavailable for operations due to maintenance. These assets include Test Cells, Plants, Buildings, Utilities, Resources and Networks.

AEDC White Oak and AEDC Moffett Field will provide test, maintenance, and support activity information to the Integrated Schedule for location activity visibility. The performance standards do not apply to these locations.

3.4.1 The Contractor shall manage the integrated scheduling process for test, maintenance, and all support activities IAW AEDCI 21-205.

Performance Standards

STD: a) Ninety (90) per cent or greater Test Scheduling Effectiveness measured as: (Total Test Events scheduled) minus (Total chargeable deviations) divided by (Total Test Events

scheduled) times 100, measured weekly. Chargeable deviations are those that, in the judgment of the Government, were within the Contractor's responsibility and control. Chargeable deviations include activities, regardless of duration, that were added or deleted from the approved schedule and activities that fail to start or stop on-time.

STD: b) Ninety (90) per cent or greater outage scheduling effectiveness measured as: (Total Outages Scheduled) minus (Total Chargeable Deviations) divided by (Total Outages Scheduled) times 100, measured monthly. Chargeable deviations are those that in the judgment of the Government were within the Contractor's responsibility and control. Chargeable deviations include activities, regardless of duration, that were added or deleted from the approved schedule and activities that fail to start or stop on-time. On-time equals +/- 4 hours with no impact to other activities. Late equals failure to stop / start as scheduled with any impact to other activities.

Deliverables

- OT-2014-30013 Schedule deviation report
- OT-2014-30015 90-day Outage Report
- OT-2014-30020 Integrated Schedule

3.4.2 Applicable Documents (Mandatory)

	AEDCOI 21-205	Tactical Integration Group
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3.5 Lifecycle Sustainment of Test and Test Support Assets

This section includes specific requirements related to providing lifecycle sustainment of test cell, process air plant, test utility (electrical power, steam, and raw water) systems (including Test ID&C), machine and fabrication shop equipment, and laboratory equipment including Technology Laboratories. Fuel system sustainment requirements are covered in Section 3.9.

In-place calibration and removal for calibration of TMDE is covered in Section 3.7. The test and test support assets are listed in Appendix A.

3.5.1 The Contractor shall develop, execute, sustain, and continuously improve an efficient and effective Reliability Centered and Conditioned Based Maintenance Program

This section includes specific objectives for developing, executing, sustaining, and continuously improving an efficient and effective Reliability Centered Maintenance and Condition Based Maintenance Program for sustainment of AEDC test and test support assets. Guidance: DoD

Manual Number 4151.22-M (June 2011) and Conditioned Based Maintenance Plus DoD Guidebook (May 2008).

3.5.1.1 The Contractor shall develop and deliver status reports for maintenance program execution.

AEDC White Oak and AEDC Moffett Field will provide information to support this requirement.

Deliverables

OT-2014-30051 RDT&E Asset Sustainment Status Report

3.5.1.2 The Contractor shall perform and report analysis of operation and maintenance data for continual improvement of reliability-centered maintenance program.

AEDC White Oak and AEDC Moffett Field will provide information to support this requirement.

Deliverables

OT-2014-30050 RDT&E Asset Sustainment Program Analysis Report

3.5.1.3 The Contractor shall perform and document condition (health) assessments for AEDC test and test support assets.

Perform and document health assessments on test and test support assets per DID / CDRL and Government direction. These are point-in-time condition assessments and projected (forecasted) future condition assessments to aid in lifecycle sustainment planning, not real-time daily condition of assets due to current failures or repair activities.

Deliverables

OT-2014-30028 Asset Condition Assessment

3.5.1.4 The Contractor shall document analyses used for development and execution of the maintenance program.

This requirement ensures that any analyses used by the TOS Contractor to support development and execution of the sustainment program are documented and available for review by the Government. Examples include but are not limited to Root Cause Analysis, Failure Modes and Effects Analysis (FMEA), and Criticality Analysis.

3.5.1.5 The Contractor shall submit to the Government for approval all proactive maintenance program changes that increase risks to equipment, personnel, capability, or data quality or increase lifecycle costs.

This requirement includes deferrals and waivers of scheduled proactive maintenance.

3.5.1.6 The Contractor shall maintain AEDC test and test support assets in Government-specified sustainment status.

Government specified sustainment statuses are defined in AEDC-STD-CM-1 Configuration Management. Current directed sustainment status for AEDC test and test support assets are provided in AEDC-STD-CM-1, Appendix D.

3.5.1.7 The Contractor shall perform and document corrections for Pressure and Hazardous Material System (PHMS) Program identified deficiencies.

This requirement is to make corrections and provide a report on completed corrections to systems that were identified in a PHMS Program Evaluation Report as having deficiencies. The Evaluation Report is prepared by the PHMS Contractor. The PHMS Contract provides evaluation of high pressure and hazardous material systems including piping, piping components, and vessels.

AEDC Moffett Field shall follow NASA Ames Research Center (ARC) Pressure Vessel instruction.

Deliverables

OT-2014-30022 PHMS Deficiencies Correction Report

3.5.1.8 The Contractor shall perform and document troubleshooting and repairs performed for failed, failing, and malfunctioning systems or equipment to restore functional capabilities.

Data shall be entered in the Computerized Maintenance Management System (CMMS)

Deliverables

OT-2014-30046 Maintenance Management Information

3.5.1.9 The Contractor shall execute and document proactive maintenance for AEDC test and test support assets.

Data shall be entered in the CMMS.

Deliverables

OT-2014-30046 Maintenance Management Information

3.5.2 The Contractor shall develop and submit lifecycle sustainment plan(s) for AEDC test and test support assets.

This requirement is to provide lifecycle sustainment plans for test and test support assets including test cell, plant, utilities, fuels, shops, laboratories, technology and Test ID&C assets.

OT-2014-30038 does not apply to AEDC Moffett Field or AEDC White Oak.

Deliverables

OT-2014-30038 Shops and Laboratory Management Plan

OT-2014-30060 Integrated RDT&E Asset Management Plan

3.5.3 The Contractor shall develop and deliver plans for transitioning from one sustainment status to another and sustaining a specified status (other than active) when directed by the Government.

By direction of the Government, active test cells shall be placed in a non-operational state or vice-versa, and shall be transitioned and maintained in the new status by the Contractor. Plans shall be developed that document options for actions, costs, and risks for the given scenario.

3.5.4 Applicable Documents

3.5.4.1 Mandatory

	AEDC-STD-CM-1	Configuration Management
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3.5.4.2 Guidance

	DoD Manual 4151.22-M	Reliability Centered Maintenance
	DoD Guidebook	Condition Based Maintenance Plus

3.6 ID&C Engineering Services and Lifecycle Sustainment

The Contractor shall provide and support instrumentation, data acquisition systems, control systems and the life cycle management of each category. Collectively Instrumentation, Data and Control Systems may be referred to as "ID&C". Requirements for sustainment of test support assets in section 3.5 and configuration management in section 3.13 fully apply to sustainment of ID&C assets. Additionally, the following requirements apply to ID&C operations and sustainment. The ID&C assets are listed in Appendix A Table A-1.

3.6.1 The Contractor shall manage data produced by test operations, system logs, and diagnostics for archival, retrieval, and delivery to Contractor, Government, or Customer personnel as required. Data shall be archived and maintained IAW AEDC data retention policy.

3.6.2 The Contractor shall document, manage, and maintain ALL existing, newly developed, and revised / re-engineered AEDC software using the Government provided version control system, Developing and Versioning Environment (DaVE).

Waivers for use of other configuration management tools or exclusion from entry into a configuration management tool must be obtained from the Government.

AEDC software includes all locally in-house or contracted-out software and COTS (modified or unmodified software). Any version control system used shall contain at a minimum:

- Latest production baselined source code for all Government-owned source code
- All previous versions of source code for all Government-owned source code
- Configuration information and custom developed components for AEDC GOTS / COTS software systems (HMI Screens, Network switch configurations, etc.)
- Version history
- ID of committer
- Log of changes
- CMMS change request information

Performance Standards

a) STD: 100% of software used in production systems is under configuration control in DaVE, or has a documented and Government-approved waiver

3.6.3 The Contractor shall identify, report, analyze, and document instrumentation and control system measurement uncertainties IAW paragraph 3.1.4.2 and paragraph 3.1.6.

Reports shall be generated for pre-, during-, and post- test analysis and as required for normal daily operations.

3.6.4 The Contractor shall input and track to completion ALL bug tracking and modifications to ID&C software using the Government provided tracking system "Trac".

ID&C software includes all software used in data acquisition systems, control systems, and processing systems. In addition to software source code, items to be vaulted also include scripts, ladder logic, COTS software and hardware configurations, and Human Machine Interface (HMI) screens maintained and developed for use at AEDC.

Performance Standards

a) STD: 100% of all submitted bugs and modifications are documented in Trac

b) STD: Emergency changes are documented in Trac no later than next business day after the change has been made

AQL: Emergency changes are documented in Trac no later than 3 business days after the change has been made

3.6.5 The Contractor shall maintain and modify as required a system allowing the entry, coordination, revision, archival, and retrieval of test ID&C system requirements.

This system shall be available for use by Government, Contractor, and customer personnel during all work shifts. A Government provided system, ARGUS, is available for turbine engine test requirements and can be expanded for use in all areas.

Performance Standards

a) STD: 100% of ID&C system configurations used in production are documented and approved

AQL: ID&C configuration changes are documented not later than (NLT) 3 business days after changes

3.6.6 The Contractor shall design, develop, prepare, update, and maintain drawings, schematics, manuals, installation and operating instructions, calibration records, maintenance and repair records, and reliability statistics programs for test unit instrumentation and control and data processing systems installed in the test facilities.

The Contractor shall interface with the Magic Draw Government case tool (GFE). All information and data shall be readily searchable and available to the Government. Systems, data, and interface links shall be updated daily.

3.6.7 The Contractor shall provide spare parts management and determine stock level requirements. Additionally a critical spares list (items which cannot be replaced / repaired, or that have fallen below stock level requirements) shall be provided monthly to the Government ID&C System Architects for review.

Spare parts management and stock level requirements apply for all AEDC ID&C assets.

Deliverables

OT-2014-30046 Maintenance Management Information

3.6.8 The Contractor shall ensure that all calibration data entered into ID&C systems are current and accurate.

Calibration data is vital to ensure quality of data delivered to test customers, and is required to be input as part of all test configurations.

3.7 Test, Measurement, and Diagnostic Equipment (TMDE) Management

This section includes the specific objectives for managing calibration of TMDE. The Contractor shall develop and maintain policies and procedures to meet with the requirements of TO-00-20-14, Air Force Metrology Calibration Program. The Contractor must ensure TMDE is properly managed throughout its lifecycle to include needs / requirements, acquisition, operation / maintenance, and disposal. For AEDC Arnold AFB TMDE, calibration services shall be provided by the PMEL Contractor. At AEDC's White Oak and Moffett Field, the Contractor shall use the PMEL Contractor, other Air Force PMELs, or commercial calibration sources which are ISO 17025 accredited and whose measurements are traceable to the National Institute of Standards and Technology (NIST). In addition, this section includes requirements for managing TMDE which is designated as USER calibration responsibility.

Deliverables

DI-QCIC-80278B Calibration Measurement Summary
OT-2014-30040 TMDE Report

3.7.1 The Contractor shall not use TMDE for measurements after the calibration due date has expired unless a calibration extension has been approved by the Government IAW TO 00-20-14.

Measurements traceable to the NIST shall be maintained at all times. Requests for calibration extensions shall be assessed to determine the amount of data / measurement risk which will be present as a result of extending a calibration.

3.7.2 The Contractor shall provide removal, proper care, handling, transportation, delivery, pick-up, storage, and reinstallation of TMDE requiring calibration and / or repair.

3.7.3 The Contractor shall ensure TMDE designated as a PMEL calibration responsibility is calibrated by the PMEL Contractor IAW published calibration schedules.

At AEDC's White Oak and Moffett Field, the Contractor shall use Arnold's PMEL Contractor, other Air Force PMELs, or commercial calibration sources which are accredited by ISO 17025 and traceable to the NIST.

3.7.4 The Contractor shall notify the PMEL Contractor and the Government of any data quality issues or delays which result from the services provided by the PMEL Contractor.

Performance Standards

a) STD: Notification to the local Government within one workday of determination / discovery

AQL: Notification to the local Government no later than two workdays after determination / discovery

3.7.5 The Contractor shall perform and document in-place calibrations and repairs designated as USER responsibility in TO 33K-1-100-2 or any applicable

Calibration Measurement Summary using approved technical data and PMEL Contractor certified TMDE.

“In-place calibrations” refer to TMDE which are part of control systems, data acquisition systems, or TMDE which is stand-alone. Measurement traceability shall exist from these systems, through the PMEL Contractor, and eventually to NIST. The calibrations shall be performed with procedures developed by AEDC and approved by the Government. The calibrations and repairs shall be documented in the CMMS in order to describe work performed and track calibration due dates.

Performance Standards

a) STD: No test data acquired using improperly USER calibrated TMDE and no lost test time attributed to improperly calibrated TMDE

3.7.6 The Contractor shall develop, document, and submit a Calibration and Measurement Summary (CMS) to the Government.

As a minimum, the CMS shall describe the calibration concept and calibration support necessary to ensure the measurement traceability and readiness of each system. The Government will submit the CMS to AFMETCAL for final approval.

3.7.7 Applicable Documents

3.7.7.1 Mandatory

	TO 00-20-14	Air Force Metrology Calibration Program
	TO 33K-1-100-2	Calibration Procedure for Maintenance Data Collection Codes and Calibration Measurement Summaries

3.7.7.2 Guidance

	NIST TN-1297	Guidelines for Evaluating and Expressing the Uncertainty of the NIST Measurement Results
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3.8 Capital Improvements

This PWS element focuses on eliminating capability gaps, ensuring that AEDC possesses the capability to satisfy future test customer requirements, and restoring / sustaining current capability. The types of projects under this PWS element include instrumentation, data acquisition, process control, mechanical systems, structural systems, utility systems, facilities (interior and exterior), horizontal structures (roads, parking lots, earthen structures), dams, cranes, machining equipment, fabrication equipment, laboratory equipment, and computer systems for all AEDC assets listed in Appendix A, B, C, and D. Future test capability planning and programming responsibilities include concept development, technology applications, validation of requirements, incremental development plans of identified technical shortfalls, and assessment of solution alternatives. Work performed in this PWS will include, but is not limited to, efforts funded by Military Construction, T&E Improvement & Modernization (I&M), Major Range and Test Facility Base (MRTFB), RDT&E Sustainment- Restoration & Modernization, O&M Sustainment-Restoration & Modernization, Non-Appropriated Fund Projects, Defense Logistics Agency (DLA), and Centralized Test and Evaluation Investment Program (CTEIP).

The Government's approach to executing capital improvement programs and projects for RDT&E assets is to divide the portfolio into two groups: large, complex programs / projects and smaller, less complex projects. The Government will serve as the lead program manager for large, complex programs and projects. The Contractor will support the Government's efforts for all programs by performing the tasks enumerated in this section as directed by the Government; however the Contractor will serve a greater role in the management of projects of lesser magnitude and complexity as directed by the Government. For all RDT&E asset programs and projects, the Government will have the lead role in requirements definition and planning efforts prior to Milestone A. The Contractor will have the lead role in the design, fabrication, and installation efforts executed by the TOS Contractor. The Government will have the lead role in verification and validation efforts to ensure that the program meets technical requirements.

3.8.1 General Requirements

3.8.1.1 The Contractor shall document cost, schedule (milestones), performance objectives, deliverables, resource requirements, verification and validation plans, and risk analysis data required to produce Comprehensive Program Management Plans (CPMP) as directed by the Government for each major effort.

The CPMP must address technical, fiscal, and resource issues and be structured to satisfy user requirements despite identified boundaries, risks, and constraints. The CPMP must employ a systems approach to define program delivery interface boundaries, ascertain potential implementation risks, identify innovative means to meet requirements within recognized constraints, create cost estimates, and integrate risk mitigation measures to ensure

implementation success while adhering to cost and schedule requirements. Operational suitability and effectiveness requirements must be validated and documented in the planning phase.

Deliverables

OT-2014-30012 RDT&E Program and Project Management Plan Data

3.8.1.2 The Contractor shall provide technical data packages to meet project requirements and Government standards.

AEDC Engineering Standards T-1, T-2, T-3, T-4, and T-5 are the governing standards for these activities.

Deliverables

OT-2014-30006 Technical Data Package

3.8.1.2.1 The Contractor shall provide asset knowledge, subject matter experts, and stakeholder involvement to support planning and design efforts and reviews.

The Contractor coordinates operations and maintenance requirements for RDT&E assets, TMDE, and tools to ensure the design solutions fully incorporate user requirements.

Deliverables

OT-2014-30005 Project Review Comments

3.8.1.3 The Contractor shall execute or support execution of capital improvement programs or projects.

The Contractor shall provide appropriately skilled resources to successfully deliver a quality capability within the dynamic AEDC environment and within cost and schedule constraints. Efforts that are contracted separately by the Government will require supporting expertise and tasks which include, but are not limited to, facility access, technical subject matter and facility input, design review participation, material submittal reviews, test facility operations to enable verification / validation, and construction inspection.

Performance Standards

a) STD: Meet all negotiated milestone and delivery dates

3.8.1.3.1 The Contractor shall plan and track program / project cost, schedule, technical performance, and approved project changes during execution.

Deliverables

OT-2014-30004 Project Change Agreement

3.8.1.3.2 The Contractor shall apply Earned Value Management for capital improvement projects as directed by the Government.

Deliverables

DI-MGMT-81861 Integrated Program Management Report

3.8.1.3.3 The Contractor shall inspect and document status, compliance with approved plan, and potential issues daily for active construction projects with on-site activity.

Deliverables

OT-2014-30003 Construction Inspection Record

3.8.1.3.4 The Contractor shall create and maintain digital photographic records for pertinent activities during capital improvement projects.

3.8.1.4 The Contractor shall transition Capital Improvement programs and projects to operations and maintenance by providing "as-built" drawings, operations and maintenance manuals, and final configuration documentation to the Government.

AEDC-STD-CM-1 is the governing standard for configuration management processes and documentation.

Deliverables

OT-2014-30002 As-Built Documentation

OT-2014-30011 Technical Manuals

OT-2014-30018 Operations and Maintenance Procedures

3.8.1.5 The Contractor shall apply Life Cycle Management methodology to all AEDC assets IAW AEDC instructions.

AEDCI 63-3733 Organizational Systems Engineering, AEDCI 63-100 Investment Planning, AEDC System Engineering Handbook, and AEDC Configuration Management Standard 1 are the governing instructions for life cycle management of AEDC RDT&E assets.

3.8.2 Base Support Asset Requirements

Requirement 3.8.2 and subparagraphs do not apply to AEDC Moffett Field or AEDC White Oak.

3.8.2.1 The Contractor shall provide planning, programming, execution, and technical support to Military Construction, Minor Construction, and Test Facility Construction programs.

Guidance is provided in AFI 32-1021 Planning and Programming Military Construction Projects, AFI 32-1022 Planning and Programming Non-Appropriated Funded Facility Construction Projects, AFI 32-1023 Designing and Constructing Military Construction Projects, AFI 32-1032 Planning and Programming Appropriated Funded Maintenance, Repair, and Construction Projects, and AFI 32-7062 Comprehensive Planning.

3.8.2.1.1 The Contractor shall provide analysis and supporting data for Requirements and Analysis Management Plans (RAMP) and DD Forms 1391 / 1391c (Military Construction Project Data).

Deliverables

OT-2014-30057 Military Construction Project Data

OT-2014-30058 Requirements and Analysis Management Plan (RAMP)

OT-2014-30059 Requirements Document

3.8.2.1.2 The Contractor shall use and maintain the Automated Civil Engineer System - Project Management (ACES-PM) module to prepare project listings and automated work requirement reports.

3.8.2.1.3 The Contractor shall submit final project documentation to Real Property records, along with the DD1354, Transfer and Acceptance of Military Real Property.

Deliverables

OT-2014-30007 Transfer and Acceptance of Military Real Property

3.8.3 Applicable Documents

3.8.3.1 Mandatory

		AEDC System Engineering Handbook
	AEDC- ENGR-STD-T-1	AEDC Standard Pressure Vessels
	AEDC- ENGR-STD- T-2	AEDC Standard Pressure Piping
	AEDC- ENGR-STD- T-3	AEDC Standard Engineering Drawing and Drafting Practices
	AEDC- ENGR-STD- T-4	AEDC Standard for Procurement Documentation
	AEDC- ENGR-STD- T-5	AEDC Standard Welding Practices
	AEDC-STD- CM-1	Configuration Management
	AEDCI 63-100	Investment Planning
	AEDCI 63-3733	Organizational Engineering

3.8.3.2 Guidance

	AFI 32-1021	Planning and Programming Military Construction Projects
	AFI 32-1022	Planning and Programming Non-Appropriated Funded Facility Construction Projects
	AFI 32-1023	Designing and Constructing Military Construction Projects
	AFI 32-1032	Planning and Programming Appropriated Funded

		Maintenance, Repair, and Construction Projects
	AFI 32-7062	Comprehensive Planning

3.9 Fuels Management Services

This section defines specific requirements to distribute, store, inspect, and account for cryogenics and fuels products to include ground fuels, aviation fuels, hypergolic fuels and both liquid and gaseous nitrogen and oxygen. This activity requires interaction with the Defense Logistics Agency - Energy (DLA-E) for purchasing, to project maintenance requirements for capitalized infrastructure, and for execution of preventive and corrective maintenance. It includes bulk and operational storage and all supporting infrastructure including the base service station. Guidance is provided in AFI 23-204, AFI 23-502, AFI 91-203, UFC 3-460-03F, TO 37-1-1, AFI 21-101, AFI 31-601, AFMAN 23-110, MIL-STD-1839C, UFC 3-570-06, T.O. 00-20-1

3.9.1 The Contractor shall assign a Terminal Manager (TM) IAW the qualifications and other requirements of DoD 4140.25-M and / or DLA-E Interim Policy and Procedures.

The TM shall be responsible for operating and performing maintenance on the bulk storage and operational facilities to ensure safe and accurate receipt, storage, transfer, and issue for all petroleum products under his / her control. The TM must supply all necessary Personal Protective Equipment (PPE) and assure tools, TMDE, instrumentation and all gauges / meters are calibrated as necessary to accomplish Fuels Management requirement.

3.9.2 The Contractor shall manage the requisition, receipt, storage, issue, quality and accounting of petroleum fuels and cryogenic products.

The Contractor shall account for all petroleum and cryogenic products and utilize a Secret Internet Protocol Router Network (SIPRNet) account for Joint Chiefs of Staff Petroleum Damage Deficiency Report (JCS REPOL) reporting procedures IAW AFI 23-201.

3.9.3 The Contractor shall ensure the fuels accountant / alternate uses the most current accounting program provided by DLA-E for the distribution and tracking of fuel issues, accounting of fuel transactions, inventories and daily account reconciliation with BSM-E.

The accountant shall operate and maintain all other current information on locally developed customized spreadsheets and systems capable of nightly back up. All aviation fuel issues and transactions will be documented on the appropriate forms as directed by DLA policy. All accounts shall be reconciled monthly.

Performance Standards

a) STD: Accounts must remain within established tolerances. Deviations must be investigated and errors corrected.

3.9.4 The Contractor shall receive, store, issue, account, and sign all responsible accounting documents for all products IAW DoD 4140.25-M, and all applicable DLA-E policies for the management and efficient distribution of all assigned petroleum, propellants, cryogenics, and ground fuels products.

3.9.5 The Contractor shall ensure that sufficient aviation fuel, ground products, Liquid Nitrogen (LIN) and Liquid Oxygen (LOX) are on hand, on order, or in transit to meet demands.

The Fuels Property Administrator (FPA) shall be notified any time inventories fall below or exceed required levels. The Contractor will provide the FPA with an estimated get well date for attainment of appropriate levels. Any abnormal gains / losses experienced or not within DLA tolerances shall be investigated, documented, reported, and corrective action taken when applicable IAW DoD 4140.25-M standards and AFI 23-201 sections which cover contractor-operated bases. Use AFI 23-502 as guidance.

Performance Standards

a) STD: Zero delays in service requests

3.9.6 The Contractor shall administer the Fuels Quality Control & Inspection Program IAW TO 42B-1-1 and all other applicable American Society for Testing and Materials (ASTM) methods.

Product shall be maintained to preclude degradation, contamination, commingling, or other occurrences which render the product unsuitable for its intended use. The TM shall perform quality control procedures on the R-11 aircraft mobile refueling unit IAW TO 42B-1-1. For all other required maintenance and inspections use TO 36A12-13-17-81, TO 36A12-13-17-84, TO 36-1-91 and TO 37A1-101. The TM shall maintain all required fuel sample requirements and results, system caution and danger tag status, and equipment / system sample due dates in the DLA Fuels Manager Database, which shall be backed up daily IAW DLA-E policies / procedures.

Performance Standards

a) STD: 100% compliance with standards

3.9.7 The Contractor shall maintain and inspect all operational and bulk fuel distribution systems including storage tanks, cryogenic production facilities and equipment, and the base service station.

Use UFC 3-460-03, AFI 91-203 and TO 37-1-1 or industry standards for guidance. The Contractor shall provide for the inspection, servicing, and preventive maintenance of equipment and facilities at the specified intervals. The Contractor shall also maintain documentation to support the accomplishment of such actions. Identify and maintain all fuels systems markings IAW MIL-STD-161G.

3.9.8 The Contractor shall immediately notify the FPA of any suspected contaminated or off- specification fuel. Immediately remove fuel stocks, equipment, and facilities from service to prevent use. Analyze samples to determine the problem and its cause.

3.9.9 The Contractor shall ensure that a two-person policy is applied during any fuel or cryogenic operation.

Ensure individual acting as a second person is knowledgeable of the hazards involved and corrective actions to take in an emergency. Two people must be present when:

- Conducting mobile refueling unit operations.
- Issuing fuel to organizational tanks.
- Entering confined spaces.
- Gauging and sampling above ground tanks.
- Receiving, generating or transferring cryogenic fluids and high pressure gases.
- Transferring and receiving fuel. Requires one person at the transfer point and one person at the receiving point. (NOTE: Ensure two-way communication is maintained between pumping and receiving stations for all fuel transfers)
- Collecting fuel samples from fixed fuel systems.

3.9.10 The Contractor is responsible for locking electrical control panels, gauge hatches and other access points on all storage tanks outside of protected (fenced) areas when not attended.

3.9.11 The Contractor shall establish proper key control.

All locked equipment shall have keys and their spares located in the Control Center. A semi-annual inspection shall be performed on all keys and documented. Each grade of fuel shall have a different keyed lock preventing the commingling of products. When required, Lock Out / Tag Out (LOTO) program will be executed IAW AEDC SHE Standards.

3.9.12 The Contractor shall provide personnel to perform the following functions:

- Alternate TM who shall perform all functions of the TM if the TM is absent from the duty location for more than five consecutive work days. The Contractor may delegate signatory authority IAW DLA-E contract provision I119.05;
- Fuels Product Distribution;
- Fuels Bulk Storage;
- AEDC Arnold AFB Base Service Station should automated system fail;
- Cryo-Maintenance. A Minimum of two personnel must have completed Special Experience Identifier (SEI) 036 AF Course J3AZR2F051 04AA;
- Fuels Accounting. The Primary Fuels Accountant must have completed the SEI 040 AF Account Joint BSM-E. An alternate fuels accountant must be trained by a qualified accountant who has been awarded the SEI 040 and participate in quarterly refresher training;
- Fuels Administration;
- Compliance and Environmental tracking;
- Fuels Service Center (FSC) operations;
- Checkpoint / Preventive Maintenance.

3.9.13 The Contractor shall ensure that only task-qualified personnel with AFSC 2F051 qualifications graduating from the AF Fuels Apprentice Course J3ABR2F031 00AB or sister service equivalent, IAW AFI 23-201 Chapter 5, are permitted to perform local fuels operational functions.

These fuel functions include but are not limited to, receipt, issue, storage, and transfer operations, cryogenic systems operation and storage, operating mobile refueling equipment, documenting fuels transactions for computer processing, and performing laboratory analysis on petroleum products. The Contractor shall also ensure that all personnel comply with federal, state, and local laws and regulations.

Performance Standard

a) STD: Employee training and qualifications meet Air Force Specialty Code 2F0x1 Career Field Education and Training Plan requirements for each duty position.

3.9.14 In the event of a fuel spill, the Contractor shall notify the FPA and other installation officials IAW base spill response plans and procedures.

The Contractor shall immediately initiate the necessary procedures required for containment and cleanup. Spill class determinations are to be decided by the Fire Department’s on-scene commander. The Contractor shall submit an initial mishap and a follow-up report IAW AFI 23-201 reporting procedures.

3.9.15 The Contractor shall ensure the base organizational fuel tank program meets the intent of AFI 23-204, Organizational Fuel Tanks.

3.9.16 Applicable Documents

3.9.16.1 Mandatory

	DoD 4140.25-M	DoD Management of Bulk Petroleum, Natural Gas, and Coal
	MIL-STD-161G	Identification Methods for Bulk Petroleum Product Systems
	AFI 23-201	Fuels Management
	AEDC SHE STDs	AEDC Safety, Health, and Environmental Standards
	TO 36A12-13-17-81	Illustrated Parts Breakdown
	TO 36A12-13-17-84	Operation and Operator Maintenance
	TO 36-1-91	Technical and Managerial Reference for Motor Vehicle Maintenance
	TO 37A1-101	USAF Fuel, Water, and Lubricant Dispensing System
	TO 42B-1-1	Quality Control of Fuels and Lubricants

3.9.16.2 Guidance

	MIL-STD-1839C	Calibration and Measurement Requirements
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	AFI 21-101	Aircraft and Equipment Maintenance Management
	AFI 23-204	Materiel Management
	AFI 23-502	Recoverable and Unusable Liquid Petroleum Products
	AFI 31-601	Industrial Security Program Management
	AFI 91-203	AF Consolidated Occupational Safety Instruction
	AFMAN 23-110	Materiel Management USAF Supply Manual
	TO 00-20-1	Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures
	TO 37-1-1	General Operation and Inspection of Installed Fuel Storage
	UFC 3-460-03F	Maintenance of Petroleum Systems
	UFC 3-570-06	Cathodic Protection

3.10 Machining / Fabrication and Chemical / Material Analysis

This section includes the objectives for safe, efficient, and effective machining and fabrication, support and analysis of chemicals and materials for support of test and base operations and sustainment. Work includes but is not limited to machining, fabrication, maintenance, installation, removal, certifications, testing, inspections, and analyses using AEDC Standards and the latest published methods including those published by the Environmental Protection Agency (EPA), National Institute for Occupational Safety and Health (NIOSH), ASTM International, American Society of Mechanical Engineers (ASME), American Welding Society (AWS), Aerospace Material Specifications (AMS), and American Water Works Association (AWWA). Work may range from simple tasks performed in a shop or lab requiring less than one man-hour to major on-site activities involving several hundred man-hours. Available assets at AEDC Arnold AFB include a machine shop, valve repair shop, fabrication shops, and dimensional measurement, chemical, metallurgical, and x-ray laboratories (including x-ray film processing) for performing this work but field work outside the shops and labs is also required to support operations and maintenance activities. In addition, there is a machine shop at AEDC White Oak. At AEDC Moffett Field, machining / fabrication are typically completed using the NASA ARC machine shop.

Requirements 3.10.3 and 3.10.4 do not apply to AEDC Moffett Field or AEDC White Oak.

3.10.1 The Contractor shall perform fabrication processes in support of testing, maintenance, capital improvements, and overall base support.

Work shall be IAW applicable AEDC-ENGR-T-STDs and may involve field activities such as demolition, removal, modification, on-site fabrication / assembly, and installation of components and assemblies.

Deliverables

OT-2014-30032 Monthly Machine and Fabrication Report

3.10.2 The Contractor shall analyze and document chemical and material properties for various samples.

Materials and chemicals include but are not limited to components and assemblies, welds, fuels, oils, soil, drinking water, wastewater, groundwater, fish tissue samples, air, and other gases, liquids, and metals. Analysis methods include but are not limited to radiographic inspections, magnetic particle inspections, liquid penetrant inspections, helium mass spectrometer leak testing, ultrasonic inspections, trace metal, wet chemistry, and organic chemistry. This requirement applies only to AEDC Arnold AFB. Analysis services shall be provided to AEDC White Oak and AEDC Moffett Field as needed.

Deliverables

OT-2014-30031 Monthly Chemistry Laboratory Report

OT-2014-30033 Monthly Material Testing and Welding Report

3.10.3 The Contractor shall store and maintain inspection documentation and certification records in an electronic database for samples analyzed.

3.10.4 The Contractor shall maintain the following accreditations for performing analyses: American Industrial Hygiene Association (AIHA) for solvents, metals, bulk asbestos, and asbestos fibers; State of Tennessee Department of Environment and Conservation (TDEC) Drinking Water Laboratory Accreditations Program for trace metals, wet chemistry, and organic chemistry; DoD Joint Oil Analysis Program (JOAP) for new and used oils.

Performance Standards

a) STD: No work performed without the required accreditation

3.10.5 The Contractor shall perform / document material testing, in-process and final weld inspections, develop / document processes and procedures for welding of materials, and conduct / document a welder qualification program IAW AEDC- ENGR-STDs T-1, T-2, T-3, and T-5.

At AEDC Moffett Field, welding requirements are also covered by the AF / NASA ARC lease agreement. Welding requirements shall meet both the AEDC T-Stds as well as the lease agreement at AEDC Moffett Field.

Performance Standards

a) STD: 100% of welds performed by documented qualified welders

Deliverables

OT-2014-30033 Monthly Material Testing and Welding Report

3.10.6 Applicable Documents (Mandatory)

	AEDC- ENGR-STD-T-1	AEDC Standard Pressure Vessels
	AEDC- ENGR-STD- T-2	AEDC Standard Pressure Piping
	AEDC- ENGR-STD- T-3	AEDC Standard Engineering Drawing and Drafting Practices
	AEDC- ENGR-STD- T-5	AEDC Standard Welding Practices

3.11 Operations and Lifecycle Sustainment of AEDC Base Support Assets

A comprehensive base support asset operations and lifecycle sustainment program is required for facilities (buildings, structures, fixed cranes, etc.), linear infrastructure (railroads, roads, fences), bridges, Elk River Dam, Woods Reservoir, AEDC landfill, and base support utilities (potable water, wastewater). These assets are listed in Appendices B, C, and D. The Contractor shall use AF instructions, directives, memoranda, and other DoD, AF, GSA, and NASA regulations as applicable to operate and maintain base support assets.

Guidance is provided in AFPD 32-10, AFI 32-1001, AFPAM 32-1004, Vol 3, AFH 32-1084, UFC 3-401-01, AFI 32-1051, UFC 3-601-02, AFI 48-144, and AFI 10-246.

3.11.1 The Contractor shall operate and maintain base support utilities owned by the Government IAW federal, state, and local regulations and meet industry standards.

Government-owned base support utilities include the Potable Water Plant and Distribution System, and the Wastewater Treatment Plant and wastewater collection system. The Natural gas supply and distribution system is a privatized utility, owned and operated by Elk River Public Utility District (ERPUD).

Requirement 3.11.1 does not apply to AEDC White Oak or AEDC Moffett Field.

3.11.2 The Contractor shall develop long range plans for sustainment, restoration, and modernization (SRM) of base support assets.

The timeframe for long range plans is defined as the FYDP plus two additional years.

Requirement 3.11.2 does not apply to AEDC White Oak or AEDC Moffett Field.

Deliverables

OT-2014-30056 Base Support Asset Sustainment Program Plan

3.11.3 The Contractor shall perform lifecycle sustainment of base support assets.

Requirement 3.11.3 and its subparagraphs do not apply to AEDC White Oak or AEDC Moffett Field.

3.11.3.1 The Contractor shall execute preventive and corrective maintenance and routine and emergency work for AEDC base support assets.

The Contractor shall respond to all Emergency Work Requests immediately with emergency close-out within 24 hrs.

Note: Emergency close-out indicates that the issue is no longer an emergency, even though the final repair may not have been made. (typical examples: Stopped water overflowing onto floor, temporarily restored HVAC to a building, temporary electrical repair to restore office lights).

Performance Standards

a) STD: 100% of preventive maintenance completed by required completion date

AQL: 90% of preventive maintenance completed by required completion data

b) STD: 100% of Emergency Work Requests responded to and closed out within 24 hours

Deliverables

OT-2014-30046 Maintenance Management Information

3.11.3.2 The Contractor shall provide and operate a 24-hour, seven-day-per week maintenance service call program.

The maintenance service call program provides a means for building maintenance requirements to be managed efficiently and effectively to provide building occupants with a functional environment in which to perform their duties. The service program will receive calls, document the maintenance task, and make the necessary communication to dispatch maintenance personnel to resolve issues in a timely manner. The program will provide comprehensive coverage including, but not limited to: HVAC, electrical systems, roof leaks, restrooms / break rooms, lighting, and many other general facility-type issues.

3.11.3.3 The Contractor shall administer, document, and track maintenance and repair activities in the CMMS.

Performance Standards

a) STD: Database is updated within one business day of data availability and is 100% accurate

AQL: Database is updated within three business days of data availability and is 98% accurate

Deliverables

OT-2014-30046 Maintenance Management Information

3.11.3.4 The Contractor shall execute and document a predictive maintenance (PdM) program for Base Support and Real Property Installed Equipment (RPIE) utilizing CMMS to administer.

The Air Force requires predictive maintenance programs for base support assets in order to effectively and efficiently control maintenance costs. One of the Air Force Civil Engineer's Transformation goals is to "Build Sustainable Installations" using asset management principles to reduce the risk to mission. These goals also put more emphasis on preventive maintenance. Commercial best practices are critical to implement this program, but the following Air Force guidance will be utilized:

- Air Force Memorandum, Timothy Byers; Maj Gen, USAF, The Civil Engineer, 14 June 2013 "Policy to Implement Work Prioritization Model"
- Air Force Civil Engineer Center (AFCEC) publication "Work Prioritization Implementation Plan" Version 1
- AFCEC publication "Bridging Strategy; From Recurring work Program (RWP) to Preventative Maintenance, Version 3-06232013, June 2013

3.11.3.5 The Contractor shall identify and submit to the Government requests for approval of deferrals and waivers of preventive maintenance.

Performance Standards

a) STD: Timely - Minimum of five working days prior to preventive maintenance' required completion date

AQL: One day prior to preventive maintenance' required completion date

3.11.4 The Contractor shall perform and document facility and infrastructure condition health assessments for base support assets.

These infrastructure condition health assessments will support long range budgeting and planning for SRM project requirements utilizing the ERDC-CERL developed Sustainment Management System (SMS) suite of decision-support software and support tools as the facility and infrastructure condition assessment methodology for the DoD.

The Base Support Asset condition data validation cycle will be performed on no less than a 5 year cycle or as required due to completion of SRM activities that change the asset condition.

Requirement 3.11.4 does not apply to AEDC White Oak or AEDC Moffett Field.

3.11.5 Pest Control Services Program

The Contractor is required to provide a comprehensive pest management program while complying with all state / federal (EPA) regulations to ensure a safe environment for residents and employees at AEDC. DoD Instruction 4150.7 and AFI 32-1053 are applicable guidance documents.

Requirement 3.11.5 and its subparagraphs do not apply to AEDC White Oak or AEDC Moffett Field.

3.11.5.1 The Contractor shall provide a Pest Control and Management Plan for AEDC.

Deliverables

OT-2014-30055 Integrated Pest Management Plan

3.11.5.2 The Contractor shall execute a pest control program IAW applicable Federal, State, and EPA directives, and the Government-approved "Integrated Pest Management Plan". The Contractor shall notify TSD-SG (Industrial Health (IH) / Occupational Health (OH) office) prior to applying pest control chemicals inside buildings.

Performance Standards

a) STD: No more than two validated service complaints per year

AQL: No more than five validated service complaints per year

Deliverables

DI-MISC-80228 Pest Control Summary Report

3.11.6 Energy Management Program

This requirement describes the assistance required by Base Civil Engineering in the planning, execution, and continuous improvement of AEDC's Energy Management Program. Tasks include providing inputs to and providing support for a comprehensive/integrated execution of the Energy Management Plan. Contractor support includes, but is not limited to, energy related data collection, information request, review / update of the AEDC Energy Plan as well as participation in Energy Action Month and Energy Working Groups. Guidance is provided in AFI 32-1061, AFPD 23-3, Engineering Technical Letter (ETL) 11-6, Energy Management Policy Memorandum: AEDC Commander Col. Toth, 10 May 2013: Energy Program Governance, Energy Policy Act (EPA) of 2005, and the Energy Independence and Security Act (EISA) of 2007.

3.11.6.1 The Contractor shall support AEDC's Energy Management Program.

Assistance includes supporting the Government in performing energy evaluations as described in the Energy Independence and Security Act of 2007.

3.11.6.2 The Contractor shall identify and develop energy conservation opportunities.

3.11.6.3 The Contractor shall develop, plan, program, and execute energy conservation projects, technologies, retrofits, etc., that reduce facility utility and water consumption and provide documentation to the Government demonstrating

the savings and methodologies used to accomplish the goals. This shall include Building Life Cycle Cost (BLCC) analysis.

3.11.7 The Contractor shall develop and execute a Key Control and Facility / Secure Container Lock Program.

The Key Control Program includes a strategy to establish positive control of all keys issued to all personnel.

The Key Control and Facility / Secure Container Lock Program are not required at AEDC White Oak.

At AEDC Moffett Field, the program includes management / assignment of proximity cards and cypher lock access to secure areas.

3.11.7.1 The Contractor shall provide a trained and appropriately cleared locksmith to provide services including supervising and changing combinations, instructing personnel in changing combinations, making keys, opening locked containers and vaults, and preparing items for reuse without degrading protection.

3.11.8 Applicable Documents (Guidance)

	DoDI 4150.7	DoD Pest Management Program
	AFI 10-246	Food and Water Protection Program
	AFI 32-1001	Operations Management
	AFI 32-1051	Roof Systems Management
	AFI 32-1053	Integrated Pest Management Program
	AFI 32-1061	Providing Utilities to U.S. Air Force Installations
	AFI 48-144	Drinking Water Surveillance Program
	AFH 32-1084	Facility Requirements
	AFPAM 32-1004, Vol 3	Working in Operations Flight – Facility Management

	AFPD 23-3	Energy Management
	AFPD 32-10	Installations and Facilities
	EISA 2007	Energy Independence and Security Act of 2007
	EPAAct 2005	Energy Policy Act of 2005
	ETL 11-6	Utilities Reporting for Air Force Facilities
	UFC 3-401-01	Mechanical Engineering
	UFC 3-601-02	Operation and Maintenance: Inspection, Testing and Maintenance of Fire Protection Systems

3.12 Utilities General Support

This PWS element describes the requirement for the Contractor to provide general support for utilities at AEDC, including both Test Support Utilities (Raw Water, Electric, Steam) and Base Support Utilities (Potable Water, Waste / Storm Water). Natural gas supply at AEDC is privatized (up to the point of demarcation) and the Contractor will provide general support as needed. The specific requirements for utilities operation and sustainment are found in sections 3.3 and 3.5 for test support utilities, and 3.11 for base support utilities. The utility support assets are listed in Appendices A and C.

3.12.1 The Contractor shall provide general utilities support.

Support includes, but is not limited to, supporting the Government utilities manager in contract acquisition of supplied utilities (electricity, natural gas, fuels, and water), recommending changes to utility contracts to optimize utility and test operations, maintaining registration of AEDC Arnold AFB as a liaison member of the Tennessee Valley Industrial Committee (TVIC), maintaining liaison with NASA Ames Power Manager and High Pressure Air Manager at AEDC Moffett Field, and maintaining liaison with GSA at AEDC White Oak.

3.12.2 The Contractor shall provide support for utilities data collection and reporting.

Installations and major commands (MAJCOM) must track the cost and consumption of utilities, water, and renewable energy sources for all facilities.

Additional support of the Contractor is required to:

- Evaluate utility provider rates;
- Read meters, validate meter data, and report meter readings;
- Develop utility pool rates (per AEDCI 65-105 and AFMCI 65-602);
- Validate electrical, natural gas, and other (if required) utility bills;
- Report utility usage at metering points and what the utility usage is billed to.

Guidance is provided in Engineering Technical Letter (ETL) 11-6: Utilities Reporting for Air Force Facilities, AFI 32-1061: Providing Utilities to U.S. Air Force Installations, UFC 3-470-01: Lonworks Utility Monitoring & Control Systems (UMCS); AFI 10-246: Food and Water Protection Program.

3.12.3 The Contractor shall provide technical support for privatized utility services or supplied utilities.

Utility Privatization is a DoD initiative to privatize military base utilities when it makes sense to do so. At Arnold AFB, the Natural Gas distribution system is privatized and others are undergoing the privatization review process to determine feasibility.

Requirement 3.12.3 does not apply to AEDC White Oak or AEDC Moffett Field.

3.12.4 The Contractor shall provide forecasts for utility requirements.

Utility providers include but may not be limited to TVA (electrical power) and ERPUD (natural gas) for AEDC Arnold AFB. The utility forecast at AEDC Moffett Field shall be reported to NASA ARC. AEDC White Oak coordinates with local utilities and their host organization.

Deliverables

OT-2014-30054 Utility Forecast

3.12.5 Applicable Documents

3.12.5.1 Mandatory

	AFMCI 65-602	Uniform Reimbursement and Pricing Procedures
	AEDCI 65-105	Project Level Financial Management

3.12.5.2 Guidance

	AFI 10-246	Food and Water Protection Program
	AFI 32-1061	Providing Utilities to U.S. Air Force Installations
	ETL 11-6	Utilities Reporting for Air Force Facilities
	UFC 3-470-01	Lonworks Utility Monitoring & Control

3.13 Data and Documentation for AEDC Configuration Items

This section includes the specific objectives for developing and maintaining complete, current, and accurate data and documentation for AEDC configuration items as defined in AEDC-STD-CM-1, Configuration Management.

3.13.1 The Contractor shall provide configuration identification, configuration change management, configuration status accounting, and configuration verification for AEDC Configuration Items.

Deliverables

OT-2014-30046 Maintenance Management Information

3.13.2 The Contractor shall maintain asset management information for AEDC configuration items IAW AEDC-STD-CM-1, Configuration Management.

This requirement includes maintaining asset hierarchy, sustainment status, configuration status, and other asset management fields in the CMMS.

Deliverables

OT-2014-30046 Maintenance Management Information

3.13.3 The Contractor shall develop, document, maintain, and use operations and maintenance work instructions (procedures).

Deliverables

OT-2014-30018 Operations and Maintenance Procedures

3.13.4 The Contractor shall provide data in the Computerized Maintenance Management System for maintenance actions.

Deliverables

OT-2014-30046 Maintenance Management Information

3.13.5 The Contractor shall create and maintain drawings for AEDC configuration items IAW AEDC-STD-T-3 and AEDC-STD-CM-1.

Deliverables

OT-2014-30002 As-built Documentation

3.13.6 The Contractor shall develop and maintain operational performance maps and models for AEDC Test Units and major test support assets identified by the Government.

Specific requirements for models or maps will vary by test unit.

3.13.7 Applicable Documents (Mandatory)

	AEDC- ENGR-STD-T-3	AEDC Standard Engineering Drawing and Drafting Practices
	AEDC-STD-CM-1	Configuration Management

3.14 AEDC Ground, Weapons and System Safety Programs

The Ground, Weapons and System Safety programs are administered by the Government, with assistance from the FSS Contractor, and implemented by TOS, within TOS. The Safety program shall follow OSHA, AEDC Safety, Health and Environmental (SHE) Standards and other applicable safety standards, i.e. NIOSH, NFPA, ANSI.

Deliverables

OT-2014-30111 Safety Program Management Plan

3.14.1 The Contractor shall implement the AEDC Contractor mishap prevention program.

Performance Standards

- a) STD: Zero Class A or B injury or chargeable property mishaps
- b) STD: Zero chargeable Class C/D/E Property Damage Mishaps
- c) STD: Injury rates at or below TRIR and DART per NAICS code assigned
- d) STD: Measure and record injury statistics. Conduct trend analysis and recommend corrective action to eliminate / reduce reoccurrence

Deliverables

OT-2014-30041 Injury Mishap Report

3.14.2 The Contractor shall support and execute the AEDC System Safety Program IAW AEDC-SHE-STD-A4, MIL-STD-882, AFTCI 91-203, AFI 91-202, and AFMC Supplement to AFI 91-202.

Performance Standards

- a) STD: No property damage or injury mishaps caused by the ineffective execution of the system safety process

3.14.2.1 The Contractor shall identify system safety life cycle phases and apply system safety principles, tools, and techniques from the conceptual to the disposal phase for each asset.

3.14.2.2 The Contractor shall conduct job safety analyses for applicable day-to-day operations IAW AEDC-SHE-STD-A10.

3.14.3 The Contractor shall support and execute the AEDC Weapons Safety Program which incorporates AFMAN 91-201, Explosives Safety Standards.

Execute the TOS portion of the program including explosives/rocket motor movement from storage facilities to test facilities and conduct explosives test-related tasks. Duties do not include completing explosive site plans.

Performance Standards

- a) STD: Zero explosive mishaps
- b) STD: At least one member of TOS must have completed the USAF Weapons Safety Officer School or equivalent.

Deliverables

OT-2014-30109 Pre-task Checklist

3.14.4 The Contractor shall support the FSS Safety Office with the Semi-Annual Environmental, Safety and Occupational Health Council (ESOHC).

The ESOHC is currently required semi-annually. The TOS Contractor is required to support FSS with information to brief the ESOHC. The ESOHC is mandated by AFI 90-801 and is chaired by AEDC/CC. Topics include trends identified and remediated, inspections completed, issues that require the council's direction, traffic issues, safety program status, etc. See AFI 90-801 for a detailed list.

Performance Standards

- a) STD: All information required by AFI 90-801 is supplied to the FSS Contractor when required

3.14.5 The Contractor shall ensure applicable OSHA safety training is identified, conducted, tracked, and documented.

Contractor personnel at AEDC Moffett Field must also complete NASA ARC safety training.

Performance Standards

- a) STD: All affected personnel must be OSHA trained to the level required by their position or tasks

AQL: 95% personnel trained. If not trained, those employees will not operate equipment.

3.14.6 The Contractor shall provide input to AEDC Safety, Health and Environmental Standards reviews to the FSS Contractor.

FSS Contractor has the lead on the SHE Standards review process but all other AEDC Contractors will have an opportunity for input.

Performance Standards

- a) STD: Deliverables are complete IAW schedule

3.14.7 The Contractor shall provide support to safety inspection agencies, i.e. FSS Contractor, Air Force, and OSHA.

The FSS Contractor will conduct annual and spot inspections of TOS facilities. Air Force and OSHA may arrive at any time to conduct unannounced inspections. A TOS point of contact (POC) shall accompany inspectors when the FSS Contractor is conducting annual inspections.

Performance Standards

a) STD: A TOS POC shall be available within 15 minutes to support unannounced inspections

3.14.8 The Contractor shall support Air Force or FSS Safety with property damage mishap investigations to prevent reoccurrence.

The FSS Contractor will investigate Class D and E mishaps and near misses / close calls. TOS Contractor is responsible for TOS personnel injury-type mishap investigations when property damage is not involved.

3.14.8.1 The Contractor shall conduct mishap investigations when TOS Contractor injuries have occurred to prevent reoccurrence.

Performance Standards

a) STD: Present mishap injury summary with actions taken / planned to prevent reoccurrence to AEDC/SE within 15 work days

3.14.9 The Contractor shall implement and manage a Confined Space program IAW AFI 91-203, Air Force Consolidated Occupational Safety Instruction, Chapter 23.

3.14.10 The Contractor shall implement and manage a Lock Out / Tag Out program IAW AFI 91-203, Air Force Consolidated Occupational Safety Instruction, Chapter 21.

3.14.11 Applicable Documents

3.14.11.1 Mandatory

	AFI 90-801	Environment, Safety, and Occupational Health Councils
	AFI 91-203	Air Force Consolidated Occupational Safety Instruction, Chapters 21 and 23
	AFMAN 91-201	Explosives Safety Standards
	T.C.A. 68-23-101	Rules of Department of Environment and Conservation, Division of Radiological Health, Chapter 1200-2-9
	All AEDC-SHE-STDs	Safety, Health, and Environmental Standards

3.14.11.2 Guidance

	MIL-STD-882	Air Force Occupational Safety and Health Standards
	AFI 91-202	The US Air Force Mishap Prevention Program
	AFI 91-204	Investigating and Reporting US Air Force Mishaps

3.15 Sensitive Compartmented Information (SCI) Security and associated SCI Information Assurance (IA) Support

This section defines requirements for supporting the management, administration, and sustainment of an SCI security program and an SCI IA Program. The Contractor shall coordinate with other Government offices and contractors to ensure security support services such as security forces, intrusion detection systems, and information technology services meet SCI security policy.

3.15.1 The Contractor shall provide SCI Security support to the Government Special Security Office in managing, administering, and sustaining all aspects of an SCI security program compliant with all applicable DoD, AF, and Director of National Intelligence (DNI) directives.

The Contractor shall provide security support, physical security, information security, operations security, and provide SCI security education and training. The Contractor shall ensure qualified and experienced security personnel are available to meet the day-to-day AEDC SCI security requirements including after-duty hours support as necessary.

These tasks will be accomplished at AEDC White Oak and AEDC Moffett Field through coordination with representatives from the AEDC Arnold AFB Special Security Office.

Performance Standards

a) STD: Receive an average rating of 4.5 on the AEDC Government SCI Security Office evaluation criteria with no single rating less than 3.0

Deliverables

OT-2014-30034 SCI/SAP Accredited Area Standard Operating Procedure
OT-2014-30036 SCI/SAP Accreditation Package
OT-2014-30037 SCI/SAP Test Security Plan

3.15.2 The Contractor shall provide IA support, technical support, and system administration support to the Government SCI IA Office in managing, administering, and sustaining an SCI IA Program compliant with all applicable DoD, AF, and DNI requirements.

The Contractor shall provide IA support for test IT requirements, configuration management, lifecycle sustainment and budgeting, system accreditation, and day-to-day system administration including hardware and software requisition, installation, and maintenance. The Contractor shall ensure qualified and experienced IA personnel meeting DoD 8570 certification requirements are available to meet the day-to-day AEDC SCI IA and system administration requirements including after-duty hours support as necessary.

These tasks will be accomplished at AEDC White Oak and AEDC Moffett Field through coordination with representatives from the AEDC Arnold AFB Special Security Office.

Performance Standards

a) STD: Receive an average rating of 4.5 on the AEDC Government SCI IA Office evaluation criteria with no single rating less than 3.0

Deliverables

OT-2014-30035 SCI/SAP Certification and Accreditation package

3.15.3 Applicable Documents (Mandatory)

	DoDD 5205.07	Special Access Program (SAP) Policy
	DoDM 5205.07, Vol. 4	Special Access Program (SAP) Security Manual: Marking
	DoDI 5205.11	Management, Administration, and Oversight of DoD Special Access Programs (SAPs)
	DoD 5105.21, Volume 1	Sensitive Compartmented Information (SCI) Administrative Security Manual: Administration of Information and Information Systems Security
	DoD 5105.21, Volume 2	Sensitive Compartmented Information (SCI) Administrative Security Manual: Administration of Physical Security, Visitor Control, and Technical Security
	DoD 5105.21, Volume 3	Sensitive Compartmented Information (SCI) Administrative Security Manual: Administration of Personnel Security, Industrial Security, and Special Activities
	DoD Intelligence Information System (DoDIIS)	Joint Security Implementation Guide (DJSIG)
		DoD Joint Special Access Program (SAP) Implementation Guide
	AFI 16-701	Special Access Programs
	AFMAN 14-304	The Security, Use, and Dissemination of Sensitive Compartmented Information
	Intelligence Community Directive Number 701	Security Policy Directive for Unauthorized Disclosures of Classified Information
	Intelligence Community Directive Number 503	Intelligence Community Information Systems Security Risk Management, Certification, and Accreditation
	Intelligence Community Directive Number 700	Protection of National Intelligence
	Intelligence Community	Technical Surveillance Countermeasures

	Directive Number 702	
	Intelligence Community Directive Number 704	Personnel Security Standards and Procedures Governing Eligibility for Access to Sensitive Compartmented Information and Other Controlled Access Program Information
	Intelligence Community Directive Number 710	Classification and Control Marking System
	Intelligence Community Policy Guidance Number 704.1	Personnel Security Investigation Standards and Procedures Governing Eligibility for Access to Sensitive Compartmented Information and Other Controlled Assess Program Information
	Intelligence Community Policy Guidance Number 704.2	Personnel Security Adjudicative Guidelines for Determining Eligibility for Access to Sensitive Compartmented Information and Other Controlled Access Program Information
	Intelligence Community Policy Guidance Number 704.3	Denial and Revocation of Access to Sensitive Compartmented Information, Other Controlled Access Program Information, and Appeals Processes
	Intelligence Community Policy Guidance Number 704.4	Reciprocity of Personnel Security Clearance and Access Determinations
	Intelligence Community Directive Number 705	Sensitive Compartmented Information Facilities
	Intelligence Community Standard Number 705-1	Physical and Technical Security Standards for Sensitive Compartmented Information Facilities
	Intelligence Community Standard Number 705-2	Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information
		Joint Security Implementation Guide (JSIG)
	CNSSAM TEMPEST/1-13	Red/black Installation Guidance
	ICD 503	Intelligence Community Information Technology Systems Security Risk Management, Certification, and Accreditation
		Technical Specifications for Construction and Management of Sensitive Compartmented

		Information Facilities, Version 1.2
	National Institute of Standards of Technology Special Publication 800-37	Guide for Applying the Risk Management Framework to Federal Information Systems
		Sensitive Compartmented Information Facility Accreditation Documentation Security Classification Guide
		Security Classification Guides as required for AEDC mission requirements

3.16 Financial Management

The Contractor shall perform financial management consistent with applicable regulations and upload to or directly input to the Government-provided Management Information System (MIS). Financial management must be executed in a manner that is auditable consistent with Generally Accepted Accounting Principles, applicable regulations, and local policies and instructions. The number of individual projects will vary from year to year depending on actual workload. On average, expect about 400-500 projects per year and 5-6 formal contract revisions per year. Each formal revision may include re-allocation of resources from one project to another, increases or decreases in work effort within projects, fund code changes based on Government direction, and other miscellaneous project changes as directed by the Government.

3.16.1 The Contractor shall track budget, authorization, and cost information either by using or by uploading financial data to the Government-provided enterprise-wide MIS for all projects and activities.

Projects and activities are populated, tracked, managed, and reported in the enterprise financial management system. Provide tracking of billable costs, actual costs and expenditures by the key appropriation data elements (contract budget year, fund code, program element code, Element of Expense Identification Code (EEIC), Work Breakdown Structure (WBS), capability, Government fiscal year, and job order number). Provide data on an accrual, cash, and Governmental appropriated basis for budgeting, general accounting, payroll accounting, cost accounting, cost estimating, customer billing, workload planning, analysis and reporting, contract management, and contract vouchering. Time-phased workload (budget) and actual labor, materials, and consumables (Commitments, Obligations, Payables, and Expenditures) shall be uploaded or directly input to the Government-provided financial system. Account for project cost consistently with the basis used in estimating the SOC or project plan and identify and allocate all overhead and indirect costs to specific projects. Coordinate with Government

financial management personnel on closing schedule for monthly and end of year accounting periods. Provide data to the Government for loading into Job Order Cost Accounting System (JOCAS) II (see JOCAS II Data Item Description for format). To ensure accurate reporting, Contractor shall immediately notify the Government of any material errors that impact work or costs reported in a given period and coordinate with Government financial management personnel on the closing schedule for monthly and end of year accounting periods in the MIS NLT 3rd business day of each month.

Performance Standards

- a) STD: Data will be provided for loading into JOCAS II NLT 3rd business day of each month
- b) STD: Labor updates weekly and non-labor costs updated daily

Deliverables

OT-2014-30008 JOCAS Contractor Upload
OT-2014-30043 Financial Management Reports

3.16.2 The Contractor shall develop and propose Allocation Rates for application throughout the enterprise.

As part of the annual workload process, the Contractor shall develop and propose allocation rates for various items including utilities, labor fringe, material surcharge, and others as required. Allocation rates envisioned here may include TOS Contractor costs and in some cases, Government costs, but will not include any components from other operating contracts. Guidance is provided in AEDCI 65-105 and AFMCI 65-602.

3.16.3 The Contractor shall provide an annual assessment of the effectiveness of accounting processes and internal control procedures of both the financial system and organizational management controls.

Annual report results to the Government, certifying in writing that necessary measures to provide reasonable assurance have been taken.

Deliverables

OT-2014-30024 Annual Statement of Assurance

3.16.4 Applicable Documents (Guidance)

	AFMCI 65-602	Uniform Reimbursement and Pricing Procedures
	AEDCI 65-105	Project Level Financial Management
	OMB Cir A-123	Management's Responsibility for Internal Control

3.17 Acquisition of Supplies, Services, and Equipment

The Contractor shall acquire supplies, services, and equipment for all authorized Complex operations including tenant operations.

3.17.1 The Contractor shall maintain a Government-approved purchasing system IAW FAR 44.3

Performance Standards

a) STD: Available 100% of the time

3.17.2 The Contractor shall use best value commercial practices.

3.17.3 The Contractor shall meet small business subcontracting plan goals IAW FAR 52.219-9, Small Business Subcontracting Plan.

Performance Standards

a) STD: Meets goals 100% of the time

3.17.4 The Contractor shall coordinate on-site product demonstrations with the Government, AEDC using organizations, and appropriate vendors.

3.17.5 The Contractor shall purchase special approval items as specified in Air Force or Complex regulations or procedures.

Special approval items include hazardous items, computer items, etc.

3.17.6 The Contractor shall not purchase or contract for research and development services, Military Construction Projects (MILCON), utilities, fuels (including coal, gasoline, fuel oil, kerosene, and diesel), supplies and services to support the Air Force Commissary, education services for Air Force personnel, rental, lease, or purchase of automated data processing equipment exceeding \$25,000 per purchase, and any group of items for which the estimated value of the single purchase exceeds \$25,000, except items for which a stock level is maintained in economic order quantities exceeding \$25,000, without approval of the Contracting Officer.

Performance Standards

a) STD: Authorized procurements 100% of the time

3.17.7 The Contractor shall manage Government property IAW FAR 45.

The Contractor shall control, protect, preserve, and maintain the Government property inventory, whether acquired during performance of this contract or transferred from the incumbent contractor. The Contractor shall track property inventory either by using or by uploading property data to the Government-provided MIS for all Government inventory.

Performance Standards

a) STD: Inventory accuracy rate of 98%

3.17.8 The Contractor shall receive, inspect, and process serviceable materials and supplies.

3.17.8.1 The Contractor shall maintain receiving and shipping documentation and provide a point of contact for inquiries on receipt status for Air Force procurements.

The Contractor shall resolve shipping discrepancies, research and resolve problems associated with nonconforming materiel, and submit nonconforming material and technical receiving inspection report summaries to the Government.

3.17.9 Applicable Documents (Mandatory)

	FAR 44.3	Subcontracting Policies and Procedures
	FAR 45	Government Property
	FAR 52.219-9	Small Business Subcontracting Plan

3.18 Interface Management

This section covers specific interface requirements between the TOS Contractor and other AEDC Contractors and the Government.

3.18.1 The Contractor shall communicate and coordinate resource and support requirements with other AEDC Contractors and the Government.

3.18.2 The Contractor shall provide requirements, specifications, and other required information for materiel procurements and contracted services.

Requirements and specifications are needed in order for purchasing to acquire the correct materiel and services in support of operations and sustainment activities.

3.18.3 The Contractor shall establish and communicate to the FSS Contractor spare part and materiel stock level requirements.

This requirement only applies to items under FSS Contractor inventory responsibility. Potential sources for spare part identification are FMEAs, maintenance strategies, preventive maintenance work instructions, or other spare part identification documents. The Contractor shall input their requirements into the AEDC supply system for the FSS to maintain the requested stock levels.

Requirement 3.18.3 does not apply to AEDC Moffett Field or AEDC White Oak.

3.18.4 The Contractor shall communicate operational status, incidents, and other required information to the Operations Center for required activities.

Information may include but is not limited to Foreign Object Damage (FOD) events, accidents, mishaps, security incidents, test activities / results, test schedule coordination / modifications / cancelations / additions, utility curtailments / warnings, and etc. Information may be used to provide support for all scheduled / unscheduled tests, checkouts, maintenance actions for testing, and all after action reporting to on / off base agencies.

3.18.5 The Contractor shall support and participate in the AEDC Exercise Program IAW AFI 90-201 THE AIR FORCE INSPECTION SYSTEM, Air Force Material Command (AFMC) Supplement 90-201, and local requirements.

3.18.6 The Contractor shall manage their Fire Protection and Prevention program IAW AFI 91-203 AIR FORCE CONSOLIDATED OCCUPATIONAL SAFETY INSTRUCTION, Chapter 6 FIRE PROTECTION AND PREVENTION.

At AEDC Moffett Field, the Contractor shall also follow the NARA ARC Fire Marshall requirements.

3.18.7 The Contractor shall manage the TOS Unit Emergency Management (EM) Program IAW AFI 10-2501, Air Force EM Program Planning and Operations, to include Unit EM Representatives, Emergency Operations Center (EOC) Representatives, Crisis Action Team (CAT) Members, Disaster Response Force (DRF) Members, and other specialized teams as required.

3.18.8 The Contractor shall assist the Government and the FSS Contractor with implementing specific test security requirements as identified in the test security or program protection plan(s).

3.18.9 The Contractor shall coordinate access to TOS managed areas for other Contractors providing work and services to AEDC.

3.18.10 Industrial Security and Information Protection:

This section defines requirements for managing, administering, and sustaining an effective Information Protection and Industrial Security Program to prevent the compromise, loss,

unauthorized access / disclosure, destruction, distortion or non-accessibility of information, regardless of physical form or characteristic, over the life cycle of the information, including actions to regulate access to sensitive information, controlled unclassified information and classified information produced by, entrusted to or under the control of the United States Government. The Contractor shall work closely with all AEDC functions, to include the Information Protection Office, FSS Contractor and the Government Program Manager, to ensure control of classified, competition sensitive, and proprietary operations, as required by the National Industrial Security Program Operating Manual (NISPOM) and AEDC Installation Security directives.

3.18.10.1 The Contractor shall implement an effective Information Protection and Industrial Security Program IAW DoDM 5220.22-M, NISPOM, requirements of the solicitation as noted on the DD Form 254, *DoD Contract Security Classification Specification* and respective Contractor Visitor Group Security Agreements (VGSA).

Performance Standards

- a) STD: Obtain and maintain a current Top Secret Facility Clearance (FCL)
- b) STD: No loss of classified and no security violations that result in a compromise
- c) STD: Achieve no less than a Satisfactory rating on all security reviews, inspections, audits, and vulnerability assessments.
- d) STD: No test delays resulting from ineffective security

3.18.10.2 The Contractor shall ensure all subcontractors enter into a separate VGSA with the AEDC Commander, as determined by the Servicing Security Activity.

Performance Standards

- a) STD: VGSA's appropriately documented, coordinated and signed as required by AFI 31-601, and supplements
- b) STD: Sub-contractors achieve no less than a Satisfactory rating on all security reviews, inspections, audits, and vulnerability assessments
- c) STD: No loss of classified and no security violations that result in a compromise

3.18.10.3 The Contractor shall designate a Facility Security Officer (FSO), cleared commensurate with and concurrent with the issuance of the FCL. Ensure the FSO authority to manage and enforce all Industrial Security programs for the company; if the FSO is not located on site, the Contractor shall provide qualified personnel to serve as the security representative to monitor and facilitate all security requirements at AEDC.

The FSO serves as a security POC. The FSO is responsible for administering the requirements of the Industrial Security Program within his or her facility, i.e., ensuring that proper levels of protection are provided to prevent unacceptable, adverse impact on national security or on the health and safety of DOE and contractor employees, the public, or the environment. In serving as the site's POC, the FSO directs the implementation of security measures and is responsible for coordinating implementation of a security program with the prime Contractor or DoD. The FSO is instrumental in making sure that personnel are aware of good security procedures and practice them, regardless of whether they have access to classified information or other DoD/AF security interests. FSOs see that the organization's employees know their responsibilities regarding security procedures of the Government or prime Contractor. Additional security requirements are identified on the approved Contract Security Classification Specification (DD FM 254) form and communicated to the FSO under separate cover.

Performance Standards

- a) STD: The designated FSO, or those otherwise performing security duties shall complete required security training and briefings considered appropriate by the CSA; obtain and maintain required professional certifications
- b) STD: The FSO must obtain and maintain a Top Secret Personal Clearance (PCL)
- c) STD: Training must meet NISPOM and Defense Security Service requirements and curriculum for FSO Program Management for Possessing Facilities and Local AEDC Training as determined by the Servicing Security Activity
- d) STD: FSO or alternate shall be available to meet day to day with the Government on all security issues upon request; but no later than the next duty day

3.18.10.3.1 The Contractor shall ensure all events that have an impact on the status of the FCL, that impact the status of an employee's PCL, that affect proper safeguarding of classified information, or that indicate classified information has been lost or compromised are promptly reported.

Performance Standards

- a) STD: Internal procedures established as necessary to ensure that cleared employees are aware of their responsibilities for reporting pertinent information to the FSO, the Federal Bureau

of Investigation (FBI), the Servicing Security Activity (SSA), or other Federal authorities as required by the NISPOM, the terms of a classified contract, and U.S. law

b) STD: Adverse information or other NISP reporting obligations reports submitted in a timely manner and recorded, if appropriate, as an incident report in the Joint Personnel Adjudication System (JPAS)

c) STD: Maintain a disciplinary action database regarding adverse information reporting in accordance pursuant to NISPOM 1-302 a

3.18.10.3.2 The Contractor shall process required documentation through the Defense Security Service (DSS) and the Office of Personnel Management to obtain security clearances and credentials for Contractor personnel. Maintain records of clearance data, as required.

Performance Standards

a) STD: Employees cleared at the appropriate level, as required for the position

b) STD: Investigations current and all re-investigation requests submitted at the required intervals

3.18.10.3.3 The Contractor shall process required documentation through the AEDC Information Protection Office for background checks and interim approval for access to unclassified U.S. Government computers. This documentation is required for all new AEDC contractor personnel who do not have a U.S. security clearance or other required background investigation, and is required to support test customers who work for uncleared companies.

Performance Standards

a) STD: Employees vetted at the appropriate level, as required for the position

b) STD: Records maintained as required

3.18.10.3.4 The Contractor shall ensure all employees, including those outside the United States, are briefed on their individual responsibility for safeguarding classified information.

Performance Standards

a) STD: Initial briefings, refresher briefings, and debriefings provided as required,

commensurate with their involvement with classified information and as required by the NISPOM.

b) STD: Training records maintained as required

3.18.10.4. The Contractor shall assist the Government and work with the FSS Contractor to provide security control of classified, competition sensitive, proprietary operations, and other controlled unclassified information (CUI) as required by the NISPOM and the installation Operations Security (OPSEC) program.

3.18.10.4.1 The Contractor shall assist the Government and work with the FSS Contractor to implement specific Test Security and / or Program Protection requirements as identified in the Test Security or Program Protection Plans.

Performance Standards

a) STD: Required Test Security or Program Protection Plan security measures completed within required time frames

b) STD: No security violations resulting in a compromise

c) STD: No validated test customer complaints

3.18.10.4.2 The Contractor shall assign personnel and operate “Closed and Restricted” areas IAW with the NISPOM and guidance provided by the FSS Contractor FSO.

Procedures must be developed to ensure the structural integrity of closed areas above false ceilings and below raised floors. All work orders involving closed areas must be approved by the TOS and FSS FSOs. Coordinate with the FSS FSO the purchase, installation, and repair of physical barriers used for security purposes (doors, fences, gates, alarms, automated access control systems, etc.), security signs / notices and security-lock hardware / keys.

Performance Standards

a) STD: No security violations or unauthorized access to controlled areas

b) STD: An area custodian or a responsible “cleared” person appointed and trained

c) STD: Closed Area constructed in accordance and access controlled to preclude unauthorized access IAW section 8 of the NISPOM

3.18.10.4.3 The Contractor shall accomplish administrative tasks and coordinate a daily schedule of activities and general correspondence required to support the FSS security program requirements, and in the administration of day-to-day security requirements.

Performance Standards

- a) STD: No test delays or security incidents
- b) STD: No validated complaints

3.18.10.5 The Contractor shall use specific Program Security Classification Guides (SCG) for all classification management decisions.

Performance Standards

- a) STD: Appropriate SCGs on hand and used
- b) STD: No security violations resulting in a compromise

3.18.10.6 The Contractor shall nominate an appropriate number of qualified personnel, as defined by applicable DoD / Air Force requirements, to serve as Derivative Classifiers / Declassifiers and Unclassified Controlled Nuclear Information Reviewing Officials IAW the applicable DoD / Air Force requirements.

Performance Standards

- a) STD: Appropriate number of personnel appointed and trained, as required
- b) STD: Documents and Reports must meet security marking requirements
- c) STD: No security violations resulting in a compromise

3.18.10.7 The Contractor shall conduct, participate, or support security investigations, preliminary inquiries, and other actions required for resolution of security incidents IAW DoD 5220.22-M, JAFAN 6/0, AFI 31-601, and supplements.

3.18.10.7.1 The Contractor shall provide a copy of all adverse information reports submitted to DSS pursuant to NISPOM 1-300, 301, 302, and 304 to the installation

Commander via the SSA. Incident reports shall also be entered in the JPAS. Reports required to be submitted to the FBI, IAW NISPOM 1-301, shall also be reported to the local detachment of the Air Force Office of Special Investigations (OSI). The Contractor shall report all adverse information concerning Special Access Program briefed personnel to the Program Security Officer IAW JAFAN6/0. Report all adverse information concerning SCI indoctrinated personnel to the AEDC Special Security Officer.

Performance Standards

- a) STD: No programmatic impacts from personnel suitability issues
- b) STD: Score / Achieve no less than a Satisfactory rating on inspections.

3.18.10.8 The Contractor shall attend security and other program meetings, integrated product team (IPT) meetings, test concept meetings, working group meetings, counter-intelligence support meetings, and participate in the development of solutions to items of concern or action items related to test.

Performance Standards

- a) STD: Meeting attended as required
- b) STD: No validated customer complaints

3.18.10.9 The Contractor shall provide a qualified person as a POC with overall OPSEC responsibilities and maintain awareness of foreign intelligence collection capabilities, limitations, methods, and practices.

Familiarize all new employees and conduct refresher sessions as needed in the areas of Counterintelligence (DoDI 5240.6, Counterintelligence (CI) Awareness and Briefing Program, paragraph 6.2, Awareness and Briefing Requirements), Operations Security (DLAI 5200.13, DLA Operations Security (OPSEC) Program, Enclosure 3, OPSEC Planning Guidance), and Classified Material / Clearance (DLAI 5200.12, Information Security Program, Chapter 11, Standards for Storage and Handling Classified Material).

Performance Standards

- a) STD: Responsible person, appointed and trained
- b) STD: Program consistent with mandatory directives in the contract
- c) STD: Training conducted and documented as required

d) STD: Achieve no less than a Satisfactory rating on all security reviews, inspections, audits, and vulnerability assessments

3.18.10.10 The Contractor shall ensure appropriate personnel receive OPSEC training; conduct and document OPSEC self assessments; and identify new, or changes in, projects, activities, or facilities that will require an OPSEC assessment and communicate that to the FSS Contractor.

Performance Standards

a) STD: Training conducted and documented, as required

3.18.10.11 The Contractor shall integrate OPSEC into all organization planning and operational processes. Integrate OPSEC into all acquisition programs and contractor support documents.

Recognizing that sub-contractors vary in size, resources, and length of subcontract, OPSEC programs implemented for subcontractors should be designed to afford at least a minimum level of OPSEC protection and understanding for all subcontracts with increasing levels of OPSEC protection and understanding for more sensitive subcontracts.

Performance Standards

a) STD: OPSEC requirements considered and implemented as required

3.18.10.12 The Contractor shall comply with the OPSEC requirements imposed by any program supported.

OPSEC is a structured process that identifies critical information, analyzes friendly actions, integrates threat analysis and risk assessments, then helps personnel apply protective measures to mitigate unacceptable risk. Organizations and personnel supporting customers may have OPSEC requirements associated with their activities and support. The following standard expectations are included in all work.

Performance Standards

a) STD: Specific event-oriented activities supported when directed by the supported program, or comply with the program's OPSEC Plan / Annex

b) STD: OPSEC Awareness Education and Duty-Related Training as deemed necessary by the Government or program supported provided to personnel assigned

c) STD: OPSEC protective measures (countermeasures) applied as directed by Government or program sponsors

3.18.11 Resource Protection: The Contractor shall implement an effective Resource Protection Program in support of Protection Level 4 Resources IAW AFI 31-101, and supplements.

3.18.12 The Contractor shall determine acceptance inspection requirements for procured items and shall coordinate the requirements with the FSS Contractor and PMEL Contractor.

Requirement 3.18.12 does not apply for items procured for and delivered to AEDC White Oak or AEDC Moffett Field.

3.18.13 The Contractor shall submit technical releases to the Government for determination of appropriate distribution statements IAW AEDCOI 99-10 using the workflow manager software system provided by the Information Technology Support Contractor.

This effort includes properly marking all project documentation prior to release.

3.18.14 The Contractor shall provide a building manager program to identify and input maintenance needs and to assist in maintenance of assigned facilities.

3.18.15 The Contractor shall communicate and coordinate all base communications and base Information Technology resource, infrastructure and support requirements with AEDC/TSDI.

3.18.16 The Contractor shall coordinate with the AEDC Geo-Integration Office (GIO) whenever mapping, surveying, or cartography activities are anticipated and provide geo-spatial products as required. Contractor produced geo-spatial services and products shall comply with the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) data model. All Contractor-created

geo-spatial products shall be provided in digital form to the AEDC-GIO for storage and ad hoc access.

The Government serves as the primary POC for base-level geo-spatial activities through the AEDC-GIO. The AEDC-GIO maintains, manages, exposes, and protects the Arnold AFB Common Installation Picture (CIP) and Mission Data Sets (MDS) integrated through the GeoBase Program and ensures compliance with the GeoBase Enterprise Architecture. The AEDC-GIO provides data standards and projection parameters to support interoperability of Contractor services to the Arnold AFB Geographic Information System (GIS).

Requirement 3.18.16 does not apply to AEDC Moffett Field or AEDC White Oak.

3.18.17 Applicable Documents

3.18.17.1 Mandatory

	E.O. 12829	National Industrial Security Program
	E.O. 13526	Classified National Security Information
	E.O. 13556	Controlled Unclassified Information
	E.O. 13467	Reforming Process relating to Suitability for Government Employment, Fitness for Contractor Employees, and Eligibility for Access to Classified National security Information
	E.O. 13587	Structural Reforms To Improve the Security of Classified Networks and the Responsible Sharing and Safeguarding of Classified Information
	T.O. 00-20F-2	Inspection and Preventative Maintenance Procedures for Classified Security Containers
	USSAN 1-69	United States Implementation of NATO Security Procedures
	DoDD 5100.55	United States Security Authority for North Atlantic Treaty Organization Affairs
	DoDD 5200.02	DoD Personnel Security Program
	DoDD 5230.11	Disclosure of Classified Military Information to Foreign Governments and International

		Organizations
	DoDI 5210.01	Access to and Dissemination of Restricted Data and Formerly Restricted Data
	DoDI 5210.83	DoD Unclassified Controlled Nuclear Information (UCNI)
	DoDI 5220.22	National Industrial Security Program (NISP)
	DoD 5230.24	Distribution Statements on Technical Documents
	DoDI 5230.29	Security and Policy Review of DoD Information for Public Release
	DoDI 5240.6	Counterintelligence (CI) Awareness and Briefing Program
	DoDM 5200.45	Instructions for Developing Security Classification Guides
	DoDM 5220.22	National Industrial Security Program (NISP) Operating Manual
	DoDR 5200.1	Information Security Program
	DoDR 5200.08	Physical Security Program (Sections that apply to the protection of classified material)
	DoDR 5220.22	Industrial Security Regulation
	DoDR 5400.7	DoD Freedom of Information Act Program
	JAFAN 6/0	Special Access Program Security Manual
	AFI 10-701	Operations Security (OPSEC) (and supplements)
	AFI 10-2501	Air Force Emergency Management Planning and Operations
	AFI 31-601	Industrial Security Program Management (and supplements)
	AFI 61-204	Disseminating Scientific and Technical Information

	AFI 61-205	Sponsoring or Co-Sponsoring, Conducting, and Presenting DoD-Related Scientific Papers at Unclassified and Classified Conferences, Symposia, and Other Similar Meetings
	AFI 90-201	The Air Force Inspection System
	AFI 91-203	Air Force Consolidated Occupational Safety Instruction
	AFMC SUP 90-201	The Air Force Inspection System
	AEDCOI 99-10	Technical Reporting

3.18.17.2 Guidance

	Joint Pub 3-54	Joint Doctrine for Operations Security
	DoDD 3000.09	Autonomy in Weapon Systems
	DoDD 5000.01	The Defense Acquisition System
	DoDD 5230.09	Clearance of DoD Information for Public Release
	DoDD 5230.25	Withholding of Unclassified Technical Data from Public Disclosure
	DoDD O-5240.02	Counterintelligence
	DoDD 5240.06	Counterintelligence Awareness and Reporting (CIAR)
	DoDD 5530.03	International Agreements
	DoDD 8500.01E	Information Assurance (IA)
	DoDH 5200.1	DoD Handbook For Writing Security Classification Guidance
	DoDI 2040.02	International Transfers of Technology, Articles, and Services
	DoDI 3020.46	The Military Critical Technologies List (MCTL)

	DoDI 3200.12	DoD Scientific and Technical Information Program (STIP)
	DoDI 3200.20	Scientific and Engineering Integrity
	DoDI 4140.01	DoD Supply Chain Materiel Management Policy
	DoDI 5000.02 (Interim)	Operation of the Defense Acquisition System
	DoDI 5030.55	DoD Procedures for Joint DoD-DOE Nuclear Weapons Life-Cycle Activities
	DoDI 5200.33	Defense Courier Operation
	DoDI 5200.39	Critical Program Information (CPI) Protection Within the Department of Defense
	DoDI 5200.44	Protection of Mission Critical Functions to Achieve Trusted Systems and Networks (TSN)
	DoDI 5205.11	Management, Administration, and Oversight of DoD Special Access Programs (SAPs)
	DoDI 5205.13	Defense Industrial Base (DIB) Cyber Security/Information Assurance (CS/IA) Activities
	DoDI 5240.04	Counterintelligence (CI) Investigations
	DoDI O-5240.24	Counterintelligence (CI) Activities Supporting Research, Development, and Acquisition (RDA)
	DoDI 5240.26	Countering Espionage, International Terrorism, and the Counterintelligence (CI) Insider Threat
	DoDI 8320.04	Item Unique Identification (IUID) Standards for Tangible Personal Property
	DoDI 8500.2	Information Assurance (IA) Implementation
	DoDI 8580.1	Information Assurance (IA) in the Defense Acquisition System
	DoDI 8582.01	Security of Unclassified DoD Information on Non-DoD Information
	DoDM 4160.21	Defense Material Disposition Manual

DoDM 5010.12	Procedures for the Acquisition and Management of Technical Data
DoDM 5200.01, Vol 1	DoD Information Security Program: Overview, Classification, and Declassification
DoDM 5200.01, Vol 2	DoD Information Security Program: Marking of Classified Information
DoDM 5200.01, Vol 3	DoD Information Security Program: Protection of Classified Information
DoDM 5200.01, Vol 4	DoD Information Security Program: Controlled Unclassified Information (CUI)
DoDM 5200.1	Acquisition Systems Protection Program
DoDM 5205.02	DoD Operations Security (OPSEC) Program Manual
DoDM O-5205.13	Defense Industrial Base (DIB) Cyber Security and Information Assurance (CS/IA) Program Security Classification Manual (SCM)
DoDM 5230.30	DoD Mandatory Declassification Review (MDR) Program
AFI 31-101	Integrated Defense (FOUO)
AFI 31-406	Applying North Atlantic Treaty Organization (NATO) Protection Standards
AFI 31-501	Personnel Security Program
AFI 33-200	Information Assurance (IA) Management
AFI 33-210	Air Force Certification and Accreditation (C&A) Program (AFCAP)
AFI 51-1101	The Air Force Procurement Fraud Remedies Program
AFI 63-101/20-101_AFGM01	Integrated Life Cycle Management
AFI 63-103	Joint Air Force-National Nuclear Security Administration (AF-NNSA) Nuclear Weapons Life Cycle Management

	AFI 63-114	Quick Reaction Capability Process
	AFI 63-131	Modification Management
	AFI 71-101	Criminal Investigations Program(Vol 1), (Sections that apply to Suspicious Activity Reporting,
	AFI 71-104V4	Counterintelligence
	AFI 99-103	Capabilities-Based Test and Evaluation
	AFMAN 33-363	Management of Records
	AFP 63-113	Program Protection Planning For Life Cycle Management
	AFPAM 63-113	Program Protection Planning for Life Cycle Management
	AFPD 71-1	Criminal Investigations and Counterintelligence
	DTM 09-019	Policy Guidance for Foreign Ownership, Control, or Influence (FOCI)
	MIL-STD-881C	Work Breakdown Structures for Defense Materiel Items
	MIL-STD-3018	Parts Management
	MIL-HDBK-1785	System Security Engineering Program Management Requirements
	NSTISSP No. 11	National Information Assurance Acquisition Policy
	SAE Aerospace Standard (AS) 5553	Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition
	SAE Aerospace Standard (AS) 5553A	Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition
	CJCSI 3170.01H	Joint Capabilities Integration and Development System (JCIDS)
	AF 847	Recommendation for Change of Publication
		Risk Management Guide for DoD Acquisition, 6 th Addition (Version 1.0)

3.19 General Management

This section highlights requirements that apply across multiple sections of the PWS.

3.19.1 The Contractor shall provide a clean and orderly environment for workers.

Work areas shall be maintained in a neat, clean, and orderly manner. Workers shall clean up their workspace upon completion or suspension of a job.

3.19.2 The Contractor shall provide janitorial services and refuse collection at AEDC Moffett Field.

3.19.3 The Contractor shall develop, document, and implement critical skills training, qualification, and certification for designated operators and maintainers.

All positions designated will be recommended by the Contractor and approved by the Government. Designated operators shall be those craft and / or engineering positions that are critical to hands-on operations of test unit, plants, and utility systems. Selection factors for designation include: level of control of the test process and / or test article during live operations, level of responsibility, amount of systems knowledge required, and position responsibility during emergency situations. Operator qualification will consist of formal documented training requirements, a Qualification Exam and a Performance Evaluation.

Designated maintainer positions shall be those positions that warrant documentation of qualification / certification. Examples include, as a minimum, but may not be limited to welders, TMDE User-calibration, and engine borescope.

Performance Standards

a) STD: No designated position duties performed without documented qualification / certification

AQL: Personnel can, on a limited basis, perform duties prior to completing all aspects of the training / qualification plan if the member has been formally waived by the Contractor's management and approved by the Government

Deliverables

OT-2014-30016 Qualification / Certification report

3.19.4 The Contractor shall implement and manage a tool control program for designated areas IAW AEDCI 21-3 Tool Control.

a) STD: 100% pass rate on tool stewardship audits performed by the Government

No more than one major discrepancy allowed and no more than two minor discrepancies per 50 tools allowed for a pass on a tool stewardship audit as documented on AEDC Form 822.

AQL: 95% pass rate

b) STD: No unauthorized tools found

3.19.5 The Contractor shall execute and manage a FOD Prevention Program for designated FOD critical areas IAW AEDCOI 21-1, Foreign Object Damage Prevention Program.

Performance Standards

a) STD: Zero preventable FOD events

3.19.6 The Contractor shall execute impoundment actions for test systems, test support systems, and test articles IAW AEDCOI 21-2, Hold and Impoundment.

3.19.7 The Contractor shall perform welding IAW AEDC-ENGR-STD-T-5, AEDC Standard Welding Practices.

3.19.8 The Contractor shall design, fabricate, assemble, erect, and inspect all new pressure vessels and evaluate, repair, alter, define limits for safe operation, and certify used pressure vessels for operation at AEDC in compliance with AEDC-ENGR-STD-T-1, AEDC Standard Pressure Vessels.

3.19.9 The Contractor shall design, fabricate, assemble, erect, and inspect all new pressure piping and evaluate, repair, alter, define limits for safe operation, and certify used pressure piping for operation at AEDC in compliance with AEDC-ENGR-STD-T-2, AEDC Standard Pressure Piping.

3.19.10 The Contractor shall perform engineering design and drafting IAW AEDC-ENGR-STD-T-3, AEDC Standard Engineering Drawing and Drafting Practices.

3.19.11 The Contractor shall prepare procurement documentation IAW AEDC-ENGR-STD-T-4, AEDC Standard for Procurement Documentation.

3.19.12 The Contractor shall include at a minimum, a spill control plan for each hazardous material or system they intend to use that has the potential, if a spill or release of the hazardous material should occur, to cause an adverse effect on human health or the environment, or is otherwise required by law, regulation or AFI.

This plan shall comply with the AEDC spill response plan IAW the AEDC Spill Prevention Control and Countermeasure Plan. If initial spill response capability of the TOS is not adequate to control the release, then the "spill response team" shall be notified for additional support. Notification to the Ops Center is required for all spills, regardless of quantity. Also, at AEDC Moffett Field, the Contractor shall comply with the NASA ARC spill response requirements.

3.19.13 The Contractor shall comply with AF Environmental Management System (EMS) requirements. This includes providing a designated team member(s) to the EMS Cross Functional Team for review of processes and environmental aspects, and compliance with AFI 32-7001. Provide EMS awareness training to all employees.

3.19.14 The Contractor shall, for activities that generate Hazardous or Regulated wastes, have adequately trained personnel, and maintain compliance with the AEDC Hazardous Waste Permit, AFIs 32-7001/7042 as well as the AEDC Hazardous Waste Compliance, Management, and Minimization Plans and appropriate AEDC procedures.

3.19.15 The Contractor shall use standard AF system EESOH-MIS to track acquisition, approval, use, and disposal of all hazardous materials. Any use or storage of hazardous materials must be approved per AFI 32-7086, AEDC Hazardous Materials Management Plan, and managed in order to minimize the

potential for release, spill, or discharge to the environment and threat to human health.

3.19.16 The Contractor shall monitor emissions to the environment for all Contractor-owned or operated processes, equipment, or facilities that have the potential to emit an air pollutant as listed on the AEDC Title V Air Permit.

The Contractor shall designate a source owner/manager who must certify that the source is in compliance at least semi-annually. Any change to a listed source requires approval per the permit and applicable regulations.

3.19.17 The Contractor shall comply with the AEDC Wastewater Compliance Plan and AEDC National Pollution Discharge Elimination System permit conditions for all Contractor-owned or operated processes or facilities that discharge water, wastewater, or any other substance to the AEDC industrial water system (or to any environment within AEDC that may impact the IWS).

If a new or changed non-temporary discharge is required, a permit modification may be required. Owners of permitted discharges are required to test and submit test results to the FSS Contractor according to permit requirements.

Requirement 3.19.17 does not apply to AEDC Moffett Field or AEDC White Oak.

3.19.18 The Contractor shall coordinate all software license purchases and renewals with the Government Configuration Management / Software License management office IAW AFI 33-114 Software Management.

3.19.19 The Contractor shall implement Air Force IA requirements as identified in: AFPD 33-2, Information Assurance Program, AFI 33-200, Information Assurance Management including all tasks and directives identified therein including, but not limited to; AFSSI 300 Series – COMSEC Equipment, AFSSI 400 Series – COMSEC Operation, AFSSI 700 Series EMSEC, and 8500 Series – IA Implementation or their replacements on all test systems and networks. This includes all applicable TOs. National and DoD level documents shall be used as mandatory directives in lieu of, or in addition to AF directives, as appropriate. This includes:

- Coordinate with FSS Contractor on COMSEC/EMSEC/IA issues and implement IA controls as required.
- Participate in base level COMSEC/EMSEC/IA level programs.
- Appoint IA Managers as appropriate.
- Design and implement secure IA architecture on test systems and networks. Ensure IA architect holds IA Workforce Systems Architect and Engineer (IASAE) certification.
- Ensure all personnel performing IA functions meet the requirements identified in DoD 8570. The contractors must comply with DFARS 252.239.7001
- Track and maintain all FISMA reporting requirements for the Contract, and provide status to the AF
- Be responsible for vulnerability scanning and correcting vulnerabilities on test systems.
- Provide IA artifacts to the Information Technology Support Contractor sufficient to ensure appropriate level of approval to operate (Certification & Accreditation).
- Implement IA controls on all test IT systems, networks and applications.
- Operate and maintain test systems and applications IAW DOD/AF IA principles.
- Ensure all users of IT systems and services comply with IA directives.
- Accomplish TCNO and IAVA implementation, tracking and reporting.

Performance Standards

a) STD: Zero compromises

b) STD: 99% of systems in use must have an approved Authority to Operate (ATO)

3.19.20 In coordination with the base records management office, the Contractor shall store, retrieve, collect, archive, protect, and maintain a records management program, IAW disposition instructions (AFI 33-360, AFI 33-322, AFMAN 33-363, and AFMAN 33-364).

3.19.21 If deviation from any mandatory technical or process requirement of this contract is deemed by the Contractor to be advantageous to the Government, the Contractor shall request the deviation from the cognizant Government POC and receive approval in writing.

3.19.22 The Contractor shall comply with all United States laws and regulations including the International Traffic in Arms Regulation (ITAR) for export of defense articles, defense services, and technical data.

3.19.22.1 The Contractor shall notify the Contracting Officer prior to engaging in direct discussions with foreign nationals or engaging in other actions which would constitute an export as described in the ITAR.

3.19.23 The Contractor shall route all Scientific and Technical Information (STINFO) through the STINFO office.

3.19.24 The Contractor shall provide technical assistance the Government in the evaluation of proposals as required.

3.19.25 The Contractor shall apply Life Cycle Management methodology to all AEDC assets IAW AEDC instructions.

AEDCI 63-3733 Organizational Systems Engineering, AEDCI 63-100 Investment Planning, AEDC System Engineering Handbook, and AEDC–STD-CM-1 are the governing instructions for life cycle management of AEDC RDT&E assets.

3.19.26 The Contractor shall comply with the AF / NASA ARC lease agreement at AEDC Moffett Field and the AF / GSA lease agreement at AEDC White Oak.

3.19.27 Applicable Documents

3.19.27.1 Mandatory

	DFARS 252.239.7001	Information Assurance Contractor Training and Certification
	DoD 4140.25M	DoD Management of Bulk Petroleum Products and Dispensing Systems
	DoD 8570	Information Assurance Training, Certification, and Workforce Management
	AFI 32-1068	Heating Systems and Unfired Pressure Vessels

	AFI 32-7001	Environmental Budgeting
	AFI 32-7042	Waste Management
	AFI 32-7086	Hazardous Materials Management Plan
	AFI 33-114	Software Management
	AFI 33-200	Information Assurance Management
	AFI 33-322	Records Management Program
	AFI 33-360	Publications and Forms Management
	AFMAN 33-363	Management of Records
	AFMAN 33-364	Records Disposition Procedures and Responsibilities
	AFPD 33-2	Information Assurance Program
	AFSSI 300 Series	COMSEC Equipment
	AFSSI 400 Series	COMSEC Operation
	AFSSI 700 Series	EMSEC
	AFSSI 8500 Series	IA Implementation
	AF TO 00-20-14	Air Force Metrology Calibration Program
	AEDC- ENGR-STD-T-1	AEDC Standard Pressure Vessels
	AEDC- ENGR-STD- T-2	AEDC Standard Pressure Piping
	AEDC- ENGR-STD- T-3	AEDC Standard Engineering Drawing and Drafting Practices
	AEDC- ENGR-STD- T-4	AEDC Standard for Procurement Documentation
	AEDC- ENGR-STD- T-5	AEDC Standard Welding Practices
	AEDC-STD-CM-1	Configuration Management
	AEDCI 21-3	Tool Control
	AEDCI 63-100	Investment Planning

	AEDCI 63-3733	Organizational Systems Engineering
	AEDCOI 21-1	Foreign Object Damage Prevention Program
	AEDCOI 21-2	Hold and Impoundment
		AEDC System Engineering Handbook

3.19.27.2 Guidance

		AF / GSA Lease Agreement
		AF / NASA ARC Lease Agreement

3.20 Strategic Planning

This section defines support to the Government in development of strategic plans.

3.20.1 The Contractor shall support and participate in workshops and meetings for the development of the AEDC Strategic Plan as required / requested.

3.20.2 The Contractor shall provide technical analysis, documentation, and recommend solutions to assist the Government in the development of the RDT&E Facility Investment Plan that covers the period of the FYDP.

The Facility Investment Plan should provide a holistic view of a solution set including the risks and probable impacts to existing AEDC test assets.

Deliverables

OT-2014-30025 RDTE Facility Investment Plan Data

3.20.2.1 The Contractor shall provide technical analysis, documentation, and recommended solutions to assist the Government in management of the requirements development and validation process.

3.20.2.2 The Contractor shall provide technical analysis to assist the Government in documenting, determining, and validating capability gaps for current and future capabilities.

3.20.2.3 The Contractor shall recommend solutions for meeting future AEDC infrastructure needs.

Proposed solutions should include conducting comparative studies of existing AEDC facilities and capabilities with those of other providers, identifying all Government actions required to enable the proposed solution, performing an economic analysis of identified solutions, developing programming justification and supporting technical documentation, and determining the operational characteristics and acceptance requirements for integrating the solution into AEDC infrastructure.

3.20.3 The Contractor shall assist the Government in future year (FYDP) planning IAW AEDCI 90-700 for the requirements for which they are responsible.

Specific activities in the AEDCI which the Contractor will assist in / perform include but are not limited to: recommending projects and activities to meet future requirements, development of resource requirements for said projects, and assessing the overall executability of the entire program.

3.20.4 Applicable Documents (Mandatory)

	AEDCI 90-700	Capabilities Based Planning
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3.21 Foreign Technology

The requirements defined in Section 3.21 and subparagraphs do not apply to AEDC White Oak or AEDC Moffett Field.

3.21.1 The Contractor shall analyze and compare foreign scientific and technical capabilities using all-source (Top Secret / Sensitive Compartmentalized Information (TS/SCI)) data IAW customer or AEDC Statement of Work.

Performance Standards

a) STD: The Technical Report shall meet security marking standards, receive an average of 4.5 on AEDC/XP2 product compliance reports, and be delivered by the due date defined by AEDC/XP2

Deliverables

DI-MISC-80711A Foreign Technology Technical Report

3.21.1.1 The Contractor shall evaluate available information to determine function, design, and performance characteristics for foreign environmental test facilities, other military, and terrorist related infrastructure IAW customer or AEDC Statements of Work.

3.21.1.2 The Contractor shall research foreign weapon development throughout the lifecycle IAW customer or AEDC Statements of Work.

3.21.1.3 The Contractor shall determine the role and forecast trends of environmental facilities for foreign system development and acquisition cycle IAW customer or AEDC Statements of Work.

3.21.1.4 The Contractor shall provide analysis, evaluation, and reporting for foreign chemical weapon capabilities IAW customer or AEDC Statement of Work.

3.21.1.5 The Contractor shall evaluate possible AEDC use of foreign facility test techniques and concepts IAW customer or AEDC Statement of Work.

3.21.2 The Contractor shall maintain knowledge and update AEDC/XP2 databases of foreign RDT&E capabilities using all-source TS/SCI data.

Deliverables

OT-2014-30029 Foreign Technology Test Facility Database

3.21.3 The Contractor shall maintain knowledge of Intelligence, Surveillance, and Reconnaissance (ISR) threats to AEDC operations using all-source data up to the TS/SCI level.

Deliverables

DI-MISC-80711A Foreign Technology Technical Report

OT-2014-30029 Foreign Technology Test Facility Database

3.21.4 The Contractor shall provide day-to-day administrative support to the Foreign Technology program and its TS/SCI security requirements, including, but not limited to, security reviews, document reviews, research support, clearance requirements, transmittal of classified information to include use of Defense Courier Service, and document destruction.

3.22 Public Affairs

Public Affairs (PA) communicates timely, accurate, and useful information about Air Force activities to DoD, Air Force, and domestic audiences; builds, maintains and strengthens Airman (military / civilian / contractor) morale and readiness; enhances public trust and support; informs decision makers and communicates requirements, capabilities, actions, and achievements; analyzes effectiveness of communication efforts and adjusts as necessary. Additionally, PA manages the Visual Information functions which provide visual products (photos, videos, and graphics) to support Air Force communication objectives and historical documentation by producing high-quality products. PA is the steward of the Air Force's visual history. Efforts at AEDC are conducted in consultation with the Air Force Chief of PA; however, at AEDC White Oak and AEDC Moffett Field these tasks will be accomplished through coordination with each location's Government Branch Chief.

3.22.1 The Contractor shall acquire, edit, produce, and distribute photos, videos, graphics, and news articles to communicate the activities, capabilities, mission, and accomplishments of AEDC to various audiences.

All tests and significant events at AEDC will be visually documented for historic and / or investigative purposes and to achieve Air Force communication objectives. PA products cleared for public release will be distributed in a timely manner to maintain newsworthiness. Use AFI 35-101, AFI 35-109 & AFI 35-113 as reference.

3.22.2 The Contractor shall seek public release clearance for AEDC-specific information prior to distribution and archival.

AEDC-specific information bound for public release must be reviewed by Air Force PA. Release of information products not cleared for public release may result in an information security incident. Contractor's process must be auditable. Use AFI35-102 as a reference.

3.22.3 The Contractor shall ensure the High Mach (base newspaper) is published twice each month and is widely available at AEDC Arnold AFB at no cost to the Government (civilian enterprise), and arnold.af.mil website content is kept current.

Use DoDI 5120.4 Enclosure 4, AFI 35-101, AFI 35-113, AFI 35-107, Associated Press Stylebook and Air Force Style Guide as reference.

Performance Standards

a) STD: Complies with Associated Press Stylebook and Air Force Style Guide

b) STD: Update website bi-weekly

AQL: Monthly updates

c) STD: Current High Mach available to workforce in paper racks throughout AEDC Arnold AFB twice per month.

3.22.4 The Contractor shall maintain searchable archive for news clips and all cleared photos, videos, graphics, and information releases created by AEDC employees.

Use AFI 35-109, AFMAN 33-363, AFI 33-360, and AFI 33-332 as reference. The archive includes all cleared imagery, videos, graphics, news releases and a secure archive of non-cleared products for which clearance was sought.

Performance Standards

a) STD: Update databases as material is approved or disapproved for public release

AQL: Monthly updates

3.22.5 The Contractor shall provide support to AEDC/PA staff during major events and emergency situations facilitating effective communication with the workforce and general public.

Use AFI 35-104 and AFI 35-105 as reference. Major events include but are not limited to banquets, open houses, air shows, Science, Technology, Engineering, and Mathematics (STEM) and other Commander initiatives. Activities include, but are not limited to manning EOCs; on-scene escorting of media personnel; alert photo and video documentation; establishing and staffing media operations centers.

3.22.6 The Contractor shall coordinate, organize, and conduct a tour program consistent with the Commander's community relations program.

Increase public awareness and understanding; support Air Force & STEM recruiting by inspiring youth; maintain a reputation as a good neighbor. Use AFI 35-105 as a reference. Tour content should be appropriate to the audience, comprehensive and accurate.

Performance Standards

a) STD: Zero security or safety incidents

3.22.7 The Contractor shall provide professional visual information products and services, including photography, video, graphics, and other products for documenting all test programs, supporting public affairs requirements, supporting historical interests, and facilitating monthly submissions to the AF Media Center.

Use AFI 35-109 as reference. PA manages the Visual Information functions which provide visual products (photos, videos & graphics) to support Air Force communication objectives and historical documentation by producing high-quality products. Alert photo & video services supporting security forces, AF OSI, civil engineering, safety office, and other emergency response agencies in addition to day to day support of the Arnold AFB command section, PA office, and history office. PA is the steward of the Air Force's visual history. These tasks will be accomplished at AEDC White Oak and AEDC Moffett Field through coordination with each location's Government Branch Chief.

3.22.8 The Contractor shall administer and organize an environmental public affairs program to inform and involve the general public in environmental, occupational health programs, and safety.

Use AFI 35-108 as a reference.

3.22.9 Applicable Documents (Guidance)

	DoDI 5120.4 Enclosure 4	DoD Newspaper, Magazines, and Civilian Enterprise Publications
	AFI 33-332	Air Force Privacy and Civil Liberties Program
	AFI 33-360	Publications and Forms Management
	AFI 35-101	Public Affairs Policies and Procedures
	AFI 35-102	Security and Policy Review Process
	AFI 35-104	Media Operations
	AFI 35-105	Community Relations
	AFI 35-107	Public Web Communications
	AFI 35-108	Environmental Public Affairs
	AFI 35-109	Visual Information
	AFI 35-113	Internal Information
	AFMAN 33-363	Management of Records
		Associated Press Stylebook
		Air Force Style Guide

3.23 Real Property Management and Accountability Services

The Contractor shall plan and execute a Real Property Management program for AEDC Arnold AFB, using the Automated Civil Engineer System Real Property Module (ACES-RP), that maintains compliance with federal, DoD, and AF directives. The real property management program shall use current AFI's, AF directives, executive orders. Guidance is provided in AFI 32-9001 - Acquisition of Real Property, AFI 32-9002 - Use of Real Property Facilities, AFI 32-9003 - Granting Temporary Use of Air Force Real Property, AFI 32-9004 - Disposal of Real Property, AFI 32-9005 - Real Property Accountability and Reporting, AFH 32-9007 - Managing Air Force Real Property. The requirements defined in Section 3.23 and subparagraphs do not apply to AEDC White Oak or AEDC Moffett Field.

3.23.1 The Contractor shall capitalize all construction, maintenance, or repair improvements affecting real property accomplished through a capital improvement project or in-house work order above the capitalization threshold (currently \$20,000).

Deliverables

OT-2014-30007 Transfer and Acceptance of Military Real Property

3.23.2 The Contractor shall develop and document a real property inventory plan.

The plan must ensure that for the life of the contract, 20% of all assets identified in ACES-Real Property are inventoried annually and that 33% of all cultural / historical assets identified in ACES-RP are inventoried annually.

The real property inventory plan must also ensure that all real property (land, facility, and RPIE) assets are inventoried within five years and all cultural / historical assets are inventoried within three years.

Deliverables

OT-2014-30052 Real Property Inventory

3.23.3 The Contractor shall execute the inventory plan including both real property and cultural / historical assets.

Deliverables

OT-2014-30052 Real Property Inventory

3.23.4 The Contractor shall conduct annual installation boundary inspections.

The Contractor shall conduct inspections annually of the external boundaries of the AEDC reservation to prevent unauthorized use of federal property:

- Identify all encroachments;
- Inspect all markers and signage where permanent markers (survey monuments, pins, etc.) are not in place;
- Document the location and extent of encroachment violations;
- Record and maintain current geographic information to provide computer-aided mapping of the full external boundary.

3.23.5 The Contractor shall perform a compliance inspection for all outgranted real property annually.

The Contractor shall conduct inspections annually to ensure grantees comply with outgrant terms and conditions and document the results of these inspections in ACES-RP and in the Real Estate Records.

3.23.6 Applicable Documents (Guidance)

	AFI 32-9001	Acquisition of Real Property
	AFI 32-9002	Use of Real Property Facilities
	AFI 32-9003	Granting Temporary Use of Air Force Real Property
	AFI 32-9004	Disposal of Real Property
	AFI 32-9005	Real Property Accountability and Reporting
	AFH 32-9007	Managing Air Force Real Property

3.24 Continuous Improvement Program

3.24.1 The Contractor shall administer, deliver, and utilize documented, disciplined, mature, and continuously improving processes for key AEDC functions.

3.24.1.1 The Contractor shall use a documented, disciplined, and mature life cycle management process for appropriate base-wide activities.

3.24.1.2 The Contractor shall make recommendations to the Government for tailoring, implementation, and improvement of AEDC-STD-SE-1 for the technical management of AEDC assets in all PWS elements.

3.24.1.3 The Contractor shall instill a culture of continuous process improvement for the AEDC workforce.

Goals are a culture to reduce costs, improve quality, and reduce cycle time

3.24.2 Applicable Documents (Mandatory)

	AEDC-STD-SE-1	Systems Engineering
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3.25 Integrated Performance Management Program

The Contractor shall utilize an integrated performance management program for all PWS elements. This program is to verify and measure performance in order to ensure delivery of proposed results, support management and decision making, facilitate communications, and motivate high performance through use of key performance measures.

3.25.1 The Contractor shall measure and validate results and account for fluctuating workloads.

3.25.2 The Contractor shall measure effectiveness of response actions to validate performance improvement.

3.25.3 The Contractor shall provide an earned value management system.

The Contractor shall provide Earned Value Management Data. While the requirement to perform EVM on the entire contract has been deviated, the Government still requires EVM on selected projects. The EVM data shall be provided for both multiple year and fiscal year tracking and include data for trend analysis

Deliverables

DI-MGMT-81861 Integrated Program Management Report

3.25.4 The Contractor shall provide access to their performance management system to the Government, to include real-time access to their performance measures.

3.25.5 The Contractor shall maintain a Quality Control Program to ensure services are performed IAW this PWS.

The Contractor shall develop and implement processes and procedures to prevent delivery of defective services. In addition, the Contractor shall develop a methodology to measure performance of the Contractor's tasks, processes, and output as well as drive and measure continuous improvement.

Deliverables

OT-2014-30107 Quality Program Plan

4 Special Requirements

This section describes the special requirements for this effort. The following subparagraphs provide details of various considerations on this effort.

4.1 Government Furnished Materials

Covered in Clause H111

4.2 Transition

The Contractor shall follow the transition plan submitted as part of the proposal and keep the Government fully informed of status throughout the transition period. Throughout the phase-in / phase-out periods, it is essential that attention be given to minimize interruptions or delays to work in progress that would impact the mission. The Contractor must plan for the transfer of work control, delineating the method for processing and assigning tasks during the phase-in / phase-out periods.

4.3 Applicable Directives

Covered in Clause H100

5 Acronyms

ACES-PM	Automated Civil Engineer System-Project Management
ACES-RP	Automated Civil Engineer System-Real Property
AEDC	Arnold Engineering Development Complex
AEDCI	AEDC Instruction
AEDCOI	AEDC Operating Instruction
AFI	Air Force Instruction
AFTC	Air Force Test Center
AMS	Aerospace Material Specifications
AQL	Acceptable Quality Level
ARC	Ames Research Center
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATO	Authority to Operate
AWWA	American Water Works Association
BLCC	Building Life Cycle Cost
CAT	Crisis Action Team
CIP	Common Installation Picture
CMMS	Computerized Maintenance Management System
CMS	Calibration and Measurement Summary
CPMP	Comprehensive Program Management Plan
CTEIP	Centralized Test and Evaluation Improvement Program
CUI	Controlled Unclassified Information
DaVE	Developing and Versioning Environment
DJSIG	Joint Security Implementation Guide
DLA	Defense Logistics Agency
DLA-E	Defense Logistics Agency – Energy
DNI	Director of National Intelligence
DoD	Department of Defense
DoDIIS	DoD Intelligence Information System
DRF	Disaster Response Force
DSS	Defense Security Service

EEIC	Element of Expense Identification Code
EM	Emergency Management
EMS	Environmental Management System
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ERPUD	Elk River Public Utility District
ESOHC	Environmental, Safety, and Occupational Health Council
ETL	Engineering Technical Letter
FBI	Federal Bureau of Investigation
FCL	Facility Clearance
FMEA	Failure Modes and Effects Analysis
FMFIA	Federal Managers' Financial Integrity Act
FOD	Foreign Object Damage
FPA	Fuels Property Administrator
FSC	Fuels Service Center
FSO	Facility Security Officer
FSS	Facility Support Services
FTE	Full-Time Equivalent
FYDP	Future Years Defense Program
GFE	Government Furnished Equipment
GIO	Geo-Integration Office
GIS	Geographic Information System
GSU	Geographically Separated Unit
HMI	Human Machine Interface
I&M	Improvement and Modernization
IA	Information Assurance
IAW	In Accordance With
ID&C	Instrumentation, Data, and Controls
IH	Industrial Health
IPT	Integrated Product Team
ISR	Intelligence, Surveillance and Reconnaissance
ITAR	International Traffic in Arms Regulations
ITIP	Integrated Technology Investment Plan
JAFAN	Joint Air Force – Army – Navy

JCS REPOL	Joint Chiefs of Staff Petroleum Damage Deficiency Report
JOAP	Joint Oil Analysis Program
JOCAS	Job Order Cost Accounting System
JPAS	Joint Personnel Adjudication System
LIN	Liquid Nitrogen
LOX	Liquid Oxygen
LOTO	Lock Out / Tag Out
LTT	Lost Test Time
MAJCOM	Major Command
MDS	Mission Data Sets
MIS	Management Information System
MRTFB	Major Range and Test Facility Base
NASA	National Aeronautics and Space Administration
NFAC	National Full Scale Aerodynamics Complex
NIOSH	National Institute for Occupational Safety and Health
NISP	National Industrial Security Program
NISPOM	National Industrial Security Program Operating Manual
NIST	National Institute of Standards and Technology
NLT	Not Later Than
NSMS	Non-contact Stress Measurement System
OEM	Original Equipment Manufacturer
OH	Occupational Health
OMB	Office of Management and Budget
OMIMS	Operations, Maintenance, Information Management, and Support
OPSEC	Operations Security
OSI	Office of Special Investigations
PA	Public Affairs
PCL	Personal Clearance
PdM	Predictive Maintenance
PHMS	Pressure and Hazardous Material System
PMEL	Precision Measurement Equipment Laboratory
POC	Point of Contact
PPE	Personal Protective Equipment

PRF	Propulsion Research Facility
PTT	Productive Test Time
PWS	Performance Work Statement
RAMP	Requirements and Analysis Management Plan
RDT&E	Research, Development, Test, and Evaluation
ROM	Rough Order of Magnitude
RPIE	Real Property Installed Equipment
SBIR	Small Business Innovative Research
SCG	Security Classification Guide
SCI	Sensitive Compartmented Information
SDSFIE	Spatial Data Standards for Facilities, Infrastructure, and Environment
SEI	Special Experience Identifier
SHE	Safety, Health, and Environmental
SIPRNet	Secret Internet Protocol Router Network
SMS	Sustainment Management System
SOC	Statement of Capability
SRM	Sustainment, Restoration, and Modernization
SSA	Servicing Security Activity
STEM	Scientific, Technical, Engineering, and Mathematics
T&E	Test and Evaluation
TDEC	Tennessee Department of Environment and Conservation
TM	Terminal Manager
TMDE	Test, Measurement, and Diagnostic Equipment
TO	Technical Order
TOS	Test Operations and Sustainment
TRIR	Technical Receiving Inspection Report
TRR	Test Readiness Review
TS/SCI	Top Secret / Sensitive Compartmented Information
TVIC	Tennessee Valley Industrial Committee
UMCS	Utility Monitoring & Control Systems
UTSI	University of Tennessee Space Institute
VGSA	Visitor Group Security Agreements
WBS	Work Breakdown Structure

6 Deliverables

The Contractor shall provide deliverables as described. Deliverables are specified by the Government. Format and delivery schedule for deliverables are outlined in CDRLs.

Identifier	Name	Description
DI-MISC-80228	Pest Control Summary Report	Report consists of information on the Pest Management Program and pesticide use
DI-MISC-80711A	Foreign Technology Technical Report	Report comparing foreign systems based on all-source classified data
DI-MGMT-81861	Integrated Program Management Report	Monthly, Hours and Dollars, Selected Individual Projects at Government Direction. Both multi-year and fiscal year reports / analysis required for selected projects.
DI-NDTI-80566A	Test Plan	Outlines the plans and performance objectives at every level of testing on systems or equipment
DI-QCIC-80278B	Calibration Measurement Summary	Identifies and validates the adequacy of TMDE and the need for calibration standards and equipment
OT-2014-30000	Personnel Strength Report	This report will be used by the Government to track hiring and termination trends, personnel employed by pay category and organization, and payroll additions/deletions
OT-2014-30001	Wage and Salary Management Plan	This report will be used by the Government to ensure the Contractor maintains a qualified work force able to perform the broad spectrum of functions necessary to operate, support, maintain,

		and improve AEDC
OT-2014-30002	As-built Documentation	This document is used to establish the as-built configuration of AEDC assets installed or modified as identified by the project plan
OT-2014-30003	Construction Inspection Record	This record documents the results of construction project inspections performed on site during the project's execution phase
OT-2014-30004	Project Change Agreement	This document submits proposed changes in scope for a project prior to execution of the new or revised scope
OT-2014-30005	Project Review Comments	Obtains information for review, evaluation, and management of individual projects and programs
OT-2014-30006	Technical Data Package	Defines a complete plan of work to be accomplished in performance of an authorized project or program
OT-2014-30007	Transfer and Acceptance of Military Real Property	Notifies the Government that a specific project is complete and that Military Real Property is ready for transfer to Government records
OT-2014-30008	JOCAS Contractor Upload	Provides financial information to the Government for management of Arnold AFB
OT-2014-30011	Technical Manuals	Consists of the information created or obtained during a capital improvement or maintenance project that is required for maintenance, repair, operation or use of the facility or equipment
OT-2014-30012	RDT&E Program and Project Management Plan Data	Describes the cost, schedule and technical performance requirements for successful project completion

OT-2014-30013	Schedule deviation report	Electronic report listing all deviations between the approved 2-week integrated schedule and actual test operations for the same week
OT-2014-30015	90-day Outage Report	Report forecasting all scheduled / approved outages for a rolling 90-day period
OT-2014-30016	Qualification / Certification report	Electronic Operator / maintainer qualification report
OT-2014-30018	Operations and Maintenance Procedures	Documents the procedures the Contractor uses to operate and maintain AEDC assets
OT-2014-30019	SIBR topic candidate list	Identifies SBIR topic candidates
OT-2014-30020	Integrated Schedule	This schedule incorporates a daily, 2-week, 90-day, annual and strategic (5-7 year) outlook. It includes all work activities: test, maintenance, capital improvements, and other support activities such as Base Civil engineering.
OT-2014-30021	Daily Operating Time Log	Documents the activities that occurred in a scheduled test unit
OT-2014-30022	PHMS Deficiencies Correction Report	Documents TOS Contractor response to deficiencies noted in PHMS Evaluation report
OT-2014-30023	ITIP Candidate Topic List	Provides a long-term plan for technology investment topics
OT-2014-30024	Annual Statement of Assurance	Annual Statement of Assurance of the adequacy of internal controls
OT-2014-30025	RDTE Facility Investment Plan Data	Used to develop a six-year projection of work requirements so that appropriate planning and programming can be performed to quantify future funding and manpower requirements for RDT&E assets

OT-2014-30026	Technology Progress Report	Used to inform AEDC management of the technology developments and accomplishments from the previous period
OT-2014-30027	Rough Order of Magnitude Estimate	Provides the assumptions, estimated project duration or start and end dates, cost by category (e.g. labor, utilities, materials, etc.)
OT-2014-30028	Asset Condition Assessment	Provides data regarding the health of RDT&E assets to assist in the identification of sustainment needs
OT-2014-30029	Foreign Technology Test Facility Database	Contains the characteristics and capabilities of worldwide test facilities and is maintained at the Top Secret/SCI level
OT-2014-30031	Monthly Chemistry Laboratory Report	Provides data on the performance and progress of the work performed in the Chemistry Laboratory
OT-2014-30032	Monthly Shop Report	Provides data on the performance and progress of the work performed in the machine and fabrication areas
OT-2014-30033	Monthly Material Testing and Welding Report	Provides data on analyses performed
OT-2014-30034	SCI/SAP Accredited Area Standard Operating Procedure	SCI/SAP Security Standard Operating Procedures for each SCI/SAP accredited area
OT-2014-30035	SCI/SAP Certification and Accreditation Package	Certification and Accreditation package for each SCI/SAP system
OT-2014-30036	SCI/SAP Accreditation package	Accreditation package for each SCI/SAP accredited area, including TEMPEST
OT-2014-30037	SCI/SAP Test Security Plan	SCI/SAP Test Security Plan for each SCI/SAP test
OT-2014-30038	Shop and Laboratory Management	Provides the information necessary to plan and

	Plan	execute machine/fabrication, and laboratory lifecycle sustainment
OT-2014-30039	Test Unit Status Log	Provides a real-time status of work activities that affect the operational capability and readiness of the test unit
OT-2014-30040	TMDE Report	Provides data on the performance and progress of the work performed in the management of TMDE
OT-2014-30041	Injury Mishap Report	Injury / Property Damage Summary
OT-2014-30043	Financial Management Reports	Provides the ability to manage contract cost. Production of these reports relies on the Contractor's ability to populate data on the Government-Provided Management Information System.
OT-2014-30044	Technical Reports	AEDC technical reports for the following types: Quick Look Report, Letter Report and Technical Report IAW AEDCOI 90-10
OT-2014-30045	Test Period Run Plan	Outlines the required facility simulation requirement, test article configuration and setting, data acquisition systems requirements, and estimates for consumables required to conduct a test period
OT-2014-30046	Maintenance Management Information	Provides information to facilitate maintenance management including: work management, asset management, inventory management, configuration management, purchasing, and financial accounting
OT-2014-30047	Title V Major Source Operations Log	Used to maintain current AEDC Air Program data in the

APIMS

OT-2014-30048	Test project SOC	Describes the report format for cost, schedule, and technical performance requirements necessary to complete a test project at the project phase level
OT-2014-30049	Test and Analysis Project Plan	Provides detailed information on all the resource requirements necessary to accomplish a test project
OT-2014-30050	RDT&E Asset Sustainment Program Analysis Report	Provides the Government with data analysis on the performance and progress of the Sustainment program
OT-2014-30051	RDT&E Asset Sustainment Status Report	Report that documents scheduling effectiveness, backlog, costs, findings, actions taken, etc.
OT-2014-30052	Real Property Inventory	Used to establish a record and validate the use of all Real Property and RPIE
OT-2014-30053	Test Article Activity Log	Provides a real-time status and history of work activities that affect the readiness of test articles and test article support system interfaces
OT-2014-30054	Utility Forecast	Used to notify local companies of the utility requirements needed to support Test and Base operations
OT-2014-30055	Pest Management Plan	Provides a five-year integrated pest management plan for AEDC facilities
OT-2014-30056	Base Support Asset Sustainment Program Plan	Used to establish a seven-year projection of work requirements (FYDP+2)
OT-2014-30057	Military Construction Project Data	Used to plan and execute MILCON and Test Facility Acquisition Programs
OT-2014-30058	Requirements and Analysis Management Plan (RAMP)	Provides the project construction plan for Military

OT-2014-30059	Requirements Document	<p>Construction projects</p> <p>Provides technical, management, schedule, and cost data for the construction requirements for Military Construction projects</p>
OT-2014-30060	Integrated RDT&E Asset Management Plan	<p>Provides the information necessary to plan and execute the lifecycle operation and sustainment of AEDC's RDT&E assets</p>
OT-2014-30107	Quality Program Plan	<p>This plan is used to provide a methodology prevent delivery of defective services and to measure performance of the Contractor's tasks, processes, and output</p>
OT-2014-30109	Pre-Task Checklist	<p>Documents the Weapons Safety Program and provides the minimum requirements to establish and maintain a limited Weapons Safety Program</p>
OT-2014-30111	Safety Program Management Plan	<p>This plan is used to establish a baseline of expectations for work and Contractor performance for the reporting period</p>

Performance Requirements Summary (PRS)

Statements	Standards/AQLs	Method of Performance Assessment
3.1 Test and Evaluation	a) STD: At least 98% of validated customer feedback responses indicate TOS Contractor has met or exceeded expectations	Review customer feedback responses
3.1.5 The Contractor shall provide test and analysis project management support and direction for tests	a) STD: Complete the project within SOC cost and schedule proposals +/- 10% without contingency or +0%/-10% with contingency	Periodic review of the database(s)
3.1.5.5 The Contractor shall identify and document project scope changes IAW AEDCI 65-105. The Contractor shall incorporate approved scope changes and project deviations.	a) STD: No out of scope work performed during project execution	Review Project Change Agreements and project records
3.1.6 The Contractor shall prepare and deliver data packages and technical reports for tests.	a) STD: Meets security safeguards provided by customer b) STD: Uncertainty analysis traceable to test data and calibration information, graphs accurate with correct units include success thresholds as appropriate. All test objectives addressed.	Review Technical Reports
3.2.2 The Contractor shall assure the transition of technology products to the intended environment with operational and maintenance activities identified, as required	a) STD: Transition technology products IAW project plan	Monitor transition activities and project progress
3.2.3 The Contractor shall conduct advanced measurement and troubleshooting services	a) STD: At least 98% of validated customer feedback responses indicate TOS Contractor has met or exceeded expectations	Review customer feedback responses

<p>3.2.5 The Contractor shall effectively execute and track progress of test technology projects</p>	<p>a) STD: Execution of projects within cost, schedule and performance as documented in the ROM or SOC documents. Tracking data is acquired, stored, and available as required for evaluation of project execution.</p>	<p>Periodic review of the database(s)</p>
<p>3.3.2 The Contractor shall deliver specified productive test time (PTT) for test and test support operations</p>	<p>a) STD: Meet or exceed PTT goals specified in Table 3.3-1 AQL: 5% below specified goal</p>	<p>Review logs, records, and reports</p>
<p>3.4.1 The Contractor shall manage the integrated scheduling process for test, maintenance, and all support activities IAW AEDCI 21-205</p>	<p>a) STD: Ninety (90) per cent or greater Test Scheduling Effectiveness measured as: (Total Test Events scheduled) minus (Total chargeable deviations) divided by (Total Test Events scheduled) times 100, measured weekly. Chargeable deviations are those that, in the judgment of the Government, were within the Contractor's responsibility and control. Chargeable deviations include activities, regardless of duration, that were added or deleted from the approved schedule and activities that fail to start or stop on-time.</p> <p>b) STD: Ninety (90) per cent or greater outage scheduling effectiveness measured as: (Total Outages Scheduled) minus (Total Chargeable Deviations) divided by (Total Outages Scheduled) times 100, measured monthly. Chargeable deviations are those that in the judgment of the Government were within the Contractor's responsibility and control. Chargeable deviations include activities, regardless of</p>	<p>Review Schedule Deviation Report and approved schedule</p>

		duration, that were added or deleted from the approved schedule and activities that fail to start or stop on-time. On-time equals +/- 4 hours with no impact to other activities. Late equals failure to stop/start as scheduled with any impact to other activities.	
3.6.2	The Contractor shall document, manage, and maintain ALL existing, newly developed, and revised / re-engineered AEDC software using the Government provided version control system, Developing and Versioning Environment (DaVE)	a) STD: 100% of software used in production systems is under configuration control in DaVE, or has a documented and Government-approved waiver	Random audit of software repository
3.6.4	The Contractor shall input and track to completion ALL bug tracking and modifications to ID&C software using the Government provided tracking system "Trac"	a) STD: 100% of all submitted bugs and modifications are documented in Trac b) STD: Emergency changes are documented in Trac no later than next business day after the change has been made AQL: Emergency changes are documented in Trac no later than 3 business days after the change has been made	Random audit of Trac database
3.6.5	The Contractor shall maintain and modify as required a system allowing the entry, coordination, revision, archival, and retrieval of test ID&C system requirements	a) STD: 100% of ID&C System configurations used in production are documented and approved AQL: ID&C configuration changes are documented NLT 3 business days after changes	Random audit of production configurations
3.7.4	The Contractor shall notify the PMEL Contractor and the Government of any data quality issues or delays which result from	a) STD: Notification to the local Government within one workday of determination / discovery	Review notification for timeliness upon receipt

	the services provided by the PMEL Contractor	AQL: Notification to the local Government no later than two workdays after determination / discovery	
3.7.5	The Contractor shall perform and document in-place calibrations and repairs designated as USER responsibility in TO 33K-1-100-2 or any applicable Calibration Measurement Summary using approved technical data and PMEL Contractor certified TMDE	a) STD: No test data acquired using improperly USER calibrated TMDE and no lost test time attributed to improperly calibrated TMDE	Review of data and records
3.8.1.3	The Contractor shall execute or support execution for capital improvement programs or projects	a) STD: Meet all negotiated milestone and delivery dates	Random inspections
3.9.3	The Contractor shall ensure the fuels accountant / alternate uses the most current accounting program provided by Defense Logistics Agency- Energy (DLA-E) for the distribution and tracking of fuel issues, accounting of fuel transactions, inventories and daily account reconciliation with BSM-E	a) STD: Accounts must remain within established tolerances. Deviations must be investigated and errors corrected.	Periodic review of database
3.9.5	The Contractor shall ensure that sufficient aviation fuel, ground products, Liquid Nitrogen (LIN) and Liquid Oxygen (LOX) is on hand, on order, or in transit to meet demands	a) STD: Zero delays in service requests	Monitor inventory levels and service requests
3.9.6	The Contractor shall administer the Fuels Quality Control & Inspection Program IAW TO 42B-1-1 and all other applicable American Society for Testing and	a) STD: 100% compliance with standards	Random review of database

	Materials (ASTM) methods		
3.9.13	The Contractor shall ensure that only task-qualified personnel with AFSC 2F051 qualifications graduating from the AF Fuels Apprentice Course J3ABR2F031 00AB or sister service equivalent, IAW AFI 23-201 Chapter 5, are permitted to perform local fuels operational functions	a) STD: Employee training and qualifications meet Air Force Specialty Code 2F0x1 Career Field Education and Training Plan requirements for each duty position	Audit training records
3.10.4	The Contractor shall maintain the following accreditations for performing analyses: American Industrial Hygiene Association (AIHA) for solvents, metals, bulk asbestos, and asbestos fibers. State of Tennessee Department of Environment and Conservation (TDEC) Drinking Water Laboratory Accreditations Program for trace metals, wet chemistry, and organic chemistry. DoD Joint Oil Analysis Program (JOAP) for new and used oils.	a) STD: No work performed without the required accreditation	Periodic review of accreditation records
3.10.5	The Contractor shall perform / document material testing, in-process and final weld inspections, develop / document processes and procedures for welding of materials, and conduct / document a welder qualification program IAW AEDC-ENGR-STDs T-1, T-2, T-3, and T-5	a) STD: 100% of welds performed by documented qualified workers	Random audit of qualification documentation
3.11.3.1	The Contractor shall execute preventive and corrective maintenance and routine and	a) STD: 100% of preventive maintenance completed by	Periodic review of Maintenance Management Information

emergency work for AEDC base support assets	<p>required completion date</p> <p>AQL: 90% of preventive maintenance completed by required completion date</p> <p>b) STD: 100% of Emergency Work Requests responded to and closed out within 24 hours</p>	
3.11.3.3 The Contractor shall administer, document, and track maintenance and repair activities in the CMMS	<p>a) STD: Database is updated within one business day of data availability and is 100% accurate</p> <p>AQL: Database is updated within three business days of data availability and is 98% accurate</p>	Random sample of maintenance records
3.11.3.5 The Contractor shall identify and submit to the Government requests for approval of deferrals and waivers of preventive maintenance	<p>a) STD: Timely - Minimum of five working days prior to preventive maintenance required completion date</p> <p>AQL: One day prior to preventive maintenance required completion date</p>	Review notification for timeliness upon receipt
3.11.5.2 The Contractor shall execute a pest control program IAW applicable Federal, State, and EPA directives, and the Government-approved "Integrated Pest Management Plan". The Contractor shall notify TSD-SG (Industrial Health (IH) / Occupational Health (OH) office) prior to applying pest control chemicals inside buildings.	<p>a) STD: No more than two validated service complaints per year</p> <p>AQL: No more than five validated service complaints per year</p>	Review Pest Control Summary Report and review / validate customer complaints
3.14.1 The Contractor shall implement the AEDC mishap prevention program administered by the FSS Contractor	<p>a) STD: Zero Class A or B injury or chargeable property mishaps</p> <p>b) STD: Zero chargeable Class C/D/E Property Damage Mishaps</p> <p>c) STD: Injury rates at or below TRIR and DART per NAICS code</p>	Review Injury Mishap Report

		assigned d) STD: Measure and record injury statistics. Conduct trend analysis and recommend corrective action to eliminate/reduce reoccurrence.	
3.14.2	The Contractor shall support and execute the AEDC System Safety Program administered by the FSS Contractor	a) STD: No property damage or injury mishaps caused by the ineffective execution of the system safety process	Periodic review of records and metrics
3.14.3	The Contractor shall support and execute the AEDC Weapons Safety Program administered by the FSS Contractor which incorporates AFMAN 91-201, Explosives Safety Standards	a) STD: Zero explosive mishaps	Periodic audit of qualification documentation and review of weapon safety program
3.14.4	The Contractor shall support the FSS Safety Office with the Semi-Annual Environmental, Safety and Occupational Health Council (ESOHC)	a) STD: All information required by AFI 90-801 is supplied to the FSS Contractor when required	Semi-annual review of ESOHC submission
3.14.5	The Contractor shall ensure applicable OSHA safety training is identified, conducted, tracked and documented	a) STD: All affected personnel must be OSHA trained to the level required by their position or tasks AQL: 95% personnel trained. If not trained, those employees will not operate equipment.	Periodic review of training records
3.14.6	The Contractor shall provide input to AEDC Safety, Health and Environmental Standards reviews to the FSS Contractor	a) STD: Deliverables are complete IAW schedule	Review input submitted to FSS Contractor
3.14.7	The Contractor shall provide support to safety inspection agencies, i.e. FSS Contractor, Air Force and OSHA	a) STD: A TOS POC shall be available within 15 minutes to support unannounced inspections	Validate POC availability through inspection reports
3.14.8.1	The Contractor shall conduct mishap	a) STD: Present mishap injury summary with actions taken /	Review mishap injury summary

	investigations when TOS Contractor injuries have occurred to prevent reoccurrence	planned to prevent reoccurrence to AEDC/SE within 15 work days	submissions
3.15.1	The Contractor shall provide SCI Security support to the Government Special Security Office in managing, administering, and sustaining all aspects of an SCI security program compliant with all applicable DoD, AF, and DNI directives	a) STD: Receive an average rating of 4.5 on the AEDC Government SCI Security Office evaluation criteria with no single rating less than 3.0	Review Government SCI Security Office evaluations
3.15.2	The Contractor shall provide IA support, technical support, and system administration support to the Government SCI IA Office in managing, administering, and sustaining an SCI IA Program compliant with all applicable DoD, AF, and DNI requirements	a) STD: Receive an average rating of 4.5 on the AEDC Government SAP Security Office evaluation criteria with no single rating less than 3.0	Review Government SCI Security Office evaluations
3.15.3	The Contractor shall provide IA support, technical support, and system administration support to the Government SCI IA Office in managing, administering, and sustaining an SCI IA Program compliant with all applicable DoD, AF, and DNI requirements.	a) STD: Receive an average rating of 4.5 on the AEDC Government SCI IA Office evaluation criteria with no single rating less than 3.0	Review Government SCI Security Office evaluations
3.16.1	The Contractor shall track budget, authorization, and cost information either by using or by uploading financial data to the Government-provided enterprise-wide MIS for all projects and activities	a) STD: Data will be provided for loading into JOCAS II NLT 3 rd business day of each month b) STD: Labor updates weekly and non-labor costs updated daily	Review Contractor Financial Management Reports and JOCAS Contractor Upload
3.17.1	The Contractor shall maintain a Government-approved purchasing system IAW FAR 44.3	a) STD: Available 100% of the time	Random audits of database
3.17.3	The Contractor shall meet	a) STD: Meets goals 100% of	Random audits of

<p>small business subcontracting plan goals IAW FAR 52.219-9, Small Business Subcontracting Plan</p>	<p>the time</p>	<p>records and reports</p>
<p>3.17.6 The Contractor shall not purchase or contract for research and development services, Military Construction Projects (MILCON), utilities, fuels (including coal, gasoline, fuel oil, kerosene, and diesel), supplies and services to support the Air Force Commissary, education services for Air Force personnel, rental, lease, or purchase of automated data processing equipment exceeding \$25,000 per purchase, and any group of items for which the estimated value of the single purchase exceeds \$25,000, except items for which a stock level is maintained in economic order quantities exceeding \$25,000, without approval of the Contracting Officer</p>	<p>a) STD: Authorized procurements 100% of the time</p>	<p>Random sampling of Contractor procurements and evaluation of Contractor procurement process</p>
<p>3.17.7 The Contractor shall manage Government property IAW FAR 45</p>	<p>a) STD: Inventory accuracy rate of 98%</p>	<p>Random sampling of Government property inventory database</p>
<p>3.18.10.1 The Contractor shall implement an effective Information Protection and Industrial Security Program IAW DoDM 5220.22-M, The National Industrial Security Program Operating Manual (NISPOM), requirements of the solicitation as noted on the DD Form 254, DoD Contract Security Classification</p>	<p>a) Obtain and maintain a current Top Secret Facility Clearance (FCL)</p> <p>b) No loss of classified and no security violations that result in a compromise</p> <p>c) Achieve no less than a</p>	<p>a) Review of FCL status in the Defense Security Services Industrial Security Facilities Database</p> <p>b) Review of security inquiry and/or investigative reports</p> <p>c) Annual Inspections</p>

<p>Specification and respective Contractor Visitor Group Security Agreements (VGSA)</p>	<p>Satisfactory rating on all security reviews, inspections, audits, and vulnerability assessments.</p> <p>d) No test delays resulting from ineffective security</p>	<p>d) Review LTT and Integrated Schedule reports</p>
<p>3.18.10.2 The Contractor shall ensure all subcontractors enter into a separate VGSA with the AEDC Commander, as determined by the Servicing Security Activity</p>	<p>a) VGSA's appropriately documented, coordinated and signed as required by AFI 31-601, and supplements</p> <p>b) Sub-contractors achieve no less than a Satisfactory rating on all security reviews, inspections, audits, and vulnerability assessments</p> <p>c) No loss of classified and no security violations that result in a compromise</p>	<p>a) Random audits of Agreements</p> <p>b) Periodic Inspection</p> <p>c) Review of security inquiry and/or investigative reports</p>
<p>3.18.10.3 The Contractor shall designate a Facility Security Officer (FSO), cleared commensurate with and concurrent with the issuance of the FCL. Ensure the FSO authority to manage and enforce all Industrial Security programs for the company; if the FSO is not located on site, the Contractor shall provide qualified personnel to serve as the security representative to monitor and facilitate all security requirements at AEDC.</p>	<p>a) STD: The designated FSO, or those otherwise performing security duties shall complete required security training and briefings considered appropriate by the CSA; obtain and maintain required professional certifications</p> <p>b) STD: The FSO must obtain and maintain a Top Secret Personal Clearance (PCL)</p> <p>c) STD: Training must meets NISPOM and Defense Security Service requirements and curriculum for FSO Program Management for Possessing Facilities and Local AEDC Training as determined by the Servicing Security Activity</p>	<p>a) Review of records and annual inspection</p> <p>b) Annual inspection</p> <p>c) Periodic review of training records/ Annual inspection</p> <p>d) Review of</p>

	d) STD: FSO or alternate shall be available to meet day to day with the Government on all security issues upon request; but no later than the next duty day	records and customer feedback responses	
3.18.10.3.1	<p>The Contractor shall ensure all events that have an impact on the status of the FCL, that impact the status of an employee's PCL, that affect proper safeguarding of classified information, or that indicate classified information has been lost or compromised are promptly reported</p>	<p>a) STD: Internal procedures established as necessary to ensure that cleared employees are aware of their responsibilities for reporting pertinent information to the FSO, the Federal Bureau of Investigation (FBI), The SSA, or other Federal authorities as required by the NISPOM, the terms of a classified contract, and U.S. law</p> <p>b) STD: Adverse information or other NISP reporting obligations reports submitted in a timely manner and recorded, if appropriate, as an incident report in the Joint Personnel Adjudication System (JPAS)</p> <p>c) STD: Maintain a disciplinary action database regarding adverse information reporting in accordance pursuant to NISPOM 1-302 a</p>	<p>a) Periodic review of records</p> <p>b) Periodic review of records</p> <p>c) Periodic review of database</p>
3.18.10.3.2	<p>The Contractor shall process required documentation through the DSS and the Office of Personnel Management to obtain security clearances and credentials for Contractor personnel. Maintain records of clearance data, as required.</p>	<p>a) STD: Employees cleared at the appropriate level, as required for the position</p> <p>b) STD: Investigations current and all re-investigation requests submitted at the required intervals</p>	<p>a) Periodic review of clearance records</p> <p>b) Annual Inspection</p>
3.18.10.3.3	<p>The Contractor shall process required documentation through</p>	<p>a) STD: Employees vetted at the appropriate level, as required for the position</p>	<p>a) Periodic review of clearance records</p>

	the AEDC Information Protection Office for background checks and interim approval for access to unclassified U.S. Government computers. This documentation is required for all new AEDC Contractor personnel who do not have a U.S. security clearance or other required background investigation, and is required to support test customers who work for uncleared companies.	b) STD: Records maintained as required	b) Annual Inspection
3.18.10.3 .4	The Contractor shall ensure all employees, including those outside the United States, are briefed on their individual responsibility for safeguarding classified information	a) STD: Initial briefings, refresher briefings, and debriefings provided as required, commensurate with their involvement with classified information and as required by the NISPOM b) STD: Training records maintained as required	a) Periodic review of training b) Annual Inspection
3.18.10.4 .1	The Contractor shall assist the Government and the FSS Contractor with implementing specific Test Security and / or Program Protection requirements as identified in the test security or program protection plans	a) STD: Required Test Security or Program Protection Plan security measures completed within required time frames b) STD: No security violations resulting in a compromise c) STD: No validated test customer complaints	a) Periodic review of clearance records b) Annual Inspection c) Review of records and customer feedback responses
3.18.10.4 .2	The Contractor shall assign personnel to operate all "Closed and Restricted" areas IAW with the NISPOM and guidance provided by the FSS Contractor FSO	a) STD: No security violations or unauthorized access to controlled areas b) STD: An area custodians or a responsible "cleared" person	a) Review of records and customer feedback responses b) Periodic review of records

	appointed and trained	
	c) STD: Closed Area constructed in accordance and access controlled to preclude unauthorized access IAW section 8 of the NISPOM	c) Review of security inquiry and/or investigative reports
3.18.10.4 .3	The Contractor shall accomplish administrative tasks and coordinate a daily schedule of activities and general correspondence required to support the FSS security program requirements, and in the administration of day-to-day security requirements	a) STD: No test delays or security incidents b) STD: No validated complaints
		Review of records and customer feedback responses
3.18.10.5	The Contractor shall use specific Program Security Classification Guides (SCG) for all classification management decisions	a) STD: Appropriate SCGs on hand and used b) STD: No security violations resulting in a compromise
		a) Periodic review of records b) Annual Inspection
3.18.10.6	The Contractor shall nominate an appropriate number of qualified personnel, as defined by applicable DoD / Air Force requirements, to serve as Derivative Classifiers / Declassifiers and Unclassified Controlled Nuclear Information Reviewing Officials IAW the applicable DoD / Air Force requirements	a) STD: Appropriate number of personnel appointed and trained, as required. b) STD: Documents and Reports must meet security marking requirements c) STD: No security violations resulting in a compromise
		a) Periodic review of records b) Review of security inquiry and/or investigative reports c) Review of violation reports
3.18.10.7 .1	The Contractor shall provide a copy of all adverse information reports submitted to DSS pursuant to NISPOM 1-300, 301, 302, and 304 to the installation Commander	a) STD: No programmatic impacts from personnel suitability issues b) STD: Score / Achieve no less than a Satisfactory rating on inspections.
		a) Periodic review of records and annual inspection b) Review Security Office evaluations

<p>via the SSA. Incident reports shall also be entered in the JPAS. Reports required to be submitted to the FBI, IAW NISPOM 1-301, shall also be reported to the local detachment of the Air Force Office of Special Investigations (OSI). The Contractor shall report all adverse information concerning Special Access Program briefed personnel to the Program Security Officer IAW JAFAN6/0. Report all adverse information concerning SCI indoctrinated personnel to the AEDC Special Security Officer.</p>		
<p>3.18.10.8 The Contractor shall attend security and other program meetings, integrated product team (IPT) meetings, test concept meetings, working group meetings, counter-intelligence support meetings, and participate in the development of solutions to items of concern or action items related to test</p>	<p>a) STD: Meeting attended as required</p> <p>b) STD: No validated customer complaints</p>	<p>Review of records and customer feedback responses</p>
<p>3.18.10.9 The Contractor shall provide a qualified person as a POC with overall OPSEC responsibilities and maintain awareness of foreign intelligence collection capabilities, limitations, methods, and practices</p>	<p>a) STD: Responsible person, appointed and trained</p> <p>b) STD: Program consistent with mandatory directives in the contract</p> <p>c) STD: Training conducted and documented as required</p> <p>d) STD: Achieve no less than a Satisfactory rating on all security reviews, inspections, audits, and</p>	<p>a) Periodic review of training records</p> <p>b) Annual Inspection</p> <p>c) Periodic review of training records</p> <p>d) Review of inspection, audit, and vulnerability assessment results</p>

		vulnerability assessments	
3.18.10.10	The Contractor shall ensure appropriate personnel receive OPSEC training; conduct and document OPSEC self assessments; and identify new, or changes in, projects, activities, or facilities that will require an OPSEC assessment and communicate that to the FSS Contractor	a) STD: Training conducted and documented, as required	Periodic review of records and annual inspection
3.18.10.11	The Contractor shall integrate OPSEC into all organization planning and operational processes. Integrate OPSEC into all acquisition programs and Contractor support documents.	a) STD: OPSEC requirements considered and implemented as required	Periodic review of records and annual inspection
3.18.10.12	The Contractor shall comply with the OPSEC requirements imposed by any program supported	<p>a) STD: Specific event-oriented activities supported when directed by the supported program, or comply with the program's OPSEC Plan / Annex</p> <p>b) STD: OPSEC Awareness Education and Duty-Related Training as deemed necessary by the Government or program supported provided to personnel assigned</p> <p>c) STD: OPSEC protective measures (countermeasures) applied as directed by Government or program sponsors</p>	<p>a) Review of records and customer feedback responses</p> <p>b) Periodic review of records and annual inspection</p> <p>c) Inspection of countermeasure application</p>
3.19.3	The Contractor shall develop, document, and implement critical skills training, qualification, and certification for designated operators and maintainers	<p>a) STD: No designated position duties performed without documented qualification / certification</p> <p>AQL: Personnel can, on a limited</p>	Audit training records

		basis, perform duties prior to completing all aspects of the training / qualification plan if the member has been formally waived by the Contractor's management and approved by the Government	
3.19.4	The Contractor shall implement and manage a tool control program for designated areas IAW AEDCI 21-3 Tool Control	a) STD: 100% pass rate on tool stewardship audits performed by the Government AQL: 95% pass rate b) STD: No unauthorized tools found	Random tool audits
3.19.5	The Contractor shall execute and manage a FOD Prevention Program for designated FOD critical areas IAW AEDCOI 21-2, Foreign Object Damage Prevention Program	a) STD: Zero preventable FOD events	Review logs and records
3.19.19	The Contractor shall implement Air Force IA requirements as identified in: AFPD 33-2, Information Assurance Program, AFI 33-200, Information Assurance Management including all tasks and directives identified therein including, but not limited to; AFSSI 300 Series – COMSEC Equipment, AFSSI 400 Series – COMSEC Operation, AFSSI 700 Series EMSEC, and 8500 Series – IA Implementation or their replacements on all test systems and networks. This includes all applicable TOs. National and DoD level documents shall be used as mandatory directives in	a) STD: Zero compromises b) STD: 99% of systems in use must have an approved Authority to Operate (ATO)	

	lieu of, or in addition to AF directives, as appropriate.		
3.21.1	The Contractor shall analyze and compare foreign scientific and technical capabilities using all-source (Top Secret/Sensitive Compartmentalized Information (TS/SCI)) data IAW customer or AEDC Statement of Work.	a) STD: The Technical Report shall meet security marking standards, receive an average of 4.5 on AEDC/XP2 product compliance reports, and be delivered by the due date defined by AEDC/XP2	Review Technical Reports and compliance reports
3.22.3	The Contractor shall ensure High Mach is published twice each month and is widely available on base at no cost to the Government (civilian enterprise), and arnold.af.mil website content is kept current	a) STD: Complies with Associated Press Stylebook and Air Force Style Guide b) STD: Update website bi-weekly AQL: Monthly updates c) STD: Current High Mach available to workforce in paper racks throughout base twice per month	Review High Mach publication, random review of website content, and random inspection of High Mach paper distribution sites
3.22.4	The Contractor shall maintain searchable archive for news clips; and all photos, videos, graphics, and information releases created by AEDC employees	a) STD: Update databases as material is approved or disapproved for public release AQL: Monthly updates	Periodic review of database
3.22.6	The Contractor shall coordinate and organize a tour program consistent with the Commander's community relations program	a) STD: Zero security or safety incidents	Review incident reports

APPENDICES

APPENDIX A TEST ASSETS

The AEDC test assets are described below. They include the test cells and their associated support systems, process air plants, and test utilities. The test asset descriptions include identification of the associated Processes that form the AEDC asset hierarchy. Each of these Processes consists of lower level assets (systems, sub-systems, etc.) that constitute the Process.

Specific details on Test Instrumentation, Data Acquisition, and Control (ID&C) assets are located at the end of this appendix.

DoDI 3200.18, Management and Operation of the Major Range and Test Facility Base (MRTFB), requires a test asset to be in one of the four following Facility Sustainment Status states:

- Active. The T&E facility is performing testing or is ready to perform testing.
- Standby. The T&E facility is being maintained in a near-ready state through preventative maintenance, but is not currently active. Depending on the facility or range, it could take a relatively short period of time and moderate cost to reinstate a facility or range in a standby status to an active status.
- Mothballed. The T&E facility is in a reduced state of maintenance. It can be brought to an active status by a series of actions, which will include expenditure of resources. Depending on the facility or range, it could take a relatively significant amount of time and cost to reinstate a mothballed facility or range to an active status.
- Closed. The T&E facility is not in use, no maintenance is being performed, and there is no plan to reinstate the facility or range.

Active or Standby Test Assets

The following test assets are either in Active or Standby Facility Sustainment Status. Although the Process level asset is in Active or Standby status, individual systems or sub-systems that are part of the Process may be in Mothball or Closed status.

Many of the test units share plants and other resources and cannot be operated simultaneously. Some of the plants are interconnected and at times require support from other plants to achieve desired test conditions in test units. Examples of these interconnections are high pressure air, exhaust scavenging, and exhaust supplement.

Propulsion Wind Tunnels (PWT): (Processes: 16T, 4T, PWT SUPPORT, PWT MAIN DRIVE, PES)

- **16T:** The 16 ft. transonic tunnel is a continuous-flow, closed-circuit tunnel that can be operated at Mach (M) numbers from 0.06 to 1.60. The entire test section and supporting structure is constructed as a separate unit called the test cart, and is removable from the tunnel circuit. In some cases, test unit preparation, restoration, and cart installation may be done in one cart while testing in the tunnel is conducted on another cart. Model preparation, assembly, and installation are conducted on the test carts in the Model Installation Building. Tunnels 16T and 16S share the PWT main compressor drive system for primary airflow, and the two tunnels cannot be operated simultaneously. The Plenum Evacuation System (PES) removes part of the tunnel main airflow through the test cart perforated walls to alleviate wall interference effects. The PES also provides tunnel pressure level control. The scavenging of combustion products for engine tests is provided by the ETF B Exhaust Plant.
- **4T:** 4T is a four-foot continuous-flow, closed-circuit wind tunnel that can be operated from M 0.1 to 2.5. Approximately 80 percent of the 4T work can be done independently of 16T and 16S through the use of the Independent Drive System (IDS) which provides a Mach range from 0.2 to 1.3. For M >1.3, airflow is provided by the PES compressors. Plenum evacuation is normally provided by F-unit, a second increment compressor. Both increments are required to support operations above M = 1.3.
- **PWT Plant:** The PWT main drive compressor drive system consists of four synchronous motors. Disconnect couplings permit the four motors to be operated with either the Tunnel 16T compressor or Tunnel 16S compressor. The Tunnel 16T compressor is a three-stage, axial-flow machine having a 30 ft. tip diameter and a hub-to-tip ratio of 0.6. The inlet guide vanes and the three interstage stator rows of the compressor are remotely controllable through an angle range that satisfies the range of volume flow requirements.
- **PES:** The PES is composed of two identical groupings or increments of compressors, drive equipment, and associated ducts and valves. Each increment has five Allis-Chalmers VA-1409 compressors, which are nine-stage axial-flow machines, and one Allis-Chalmers VA-1107, which is a seven-stage axial-flow machine. The arrangement of the ducts and valves of each increment permits the compressors to be operated in one-, two-, or three-stage compressor configurations.
- **IDS:** The IDS supports low-speed 4T operations, and consists of a three-stage, axial flow machine and a 20,000 hp synchronous compressor drive motor with variable speed control.

Von Kármán Facility (VKF) Wind Tunnels: (Processes: TUNNEL A, TUNNEL B, TUNNEL C, VKF PLANT, VKF SUPPORT, HPA NETWORK)

- **Tunnel A:** Tunnel A is a 40- by 40-in., continuous flow, closed-circuit, variable-density, supersonic wind tunnel with a Mach range of 1.5 to 5.5. Continuous-curvature nozzle contours are obtained by flexible top and bottom walls mounted on electrically driven screw jacks. The side walls of the nozzle are plane and parallel. The tunnel is served by a main compressor system that provides a wide range of mass flows and stagnation pressures up to a maximum of 200 psia.

- **Tunnels B/C:** The 50-in. hypersonic tunnels are Tunnel B for Mach 6 and 8 and Tunnel C for Mach 4, 8, and 10. Both tunnels are closed circuit with axisymmetric contoured nozzles, and may be operated continuously over a range of pressure levels with air supplied by the main compressor system. Tunnels A/B/C are not operated simultaneously. Test unit preparation, restoration, and test article installation may be done in one tunnel while testing is conducted in one of the other tunnels.
- **VKF Plant:** The main compressor system for continuous operation is comprised of six axial and seven centrifugal compressors arranged in nine stages. The compressors are interconnected by a duct and piping system which includes intercoolers and valves whereby one to five stages are used to deliver air to Tunnel A for operation between Mach 1.5 and 5.5. Five stages are used to deliver air to Tunnel B for operation at Mach 6, seven stages for Tunnel B Mach 8 operation, and 7 or 8 stages are used to deliver air to Tunnel C for operation at Mach 8 or 10. Either seven or nine stages are used for Aerothermal Tunnel C at Mach 4, depending on the required temperature and pressure.

The VKF Plant also constitutes the main high-pressure air (HPA) supply and storage system for the Complex. Air is stored in a 22,200 ft.³ storage system. A dedicated HPA compressor system consisting of two JM3 machines is capable of charging the storage system at the rate of 6.0 lbm/sec. In addition to this system, a two-compressor system comprising the tenth and eleventh stages of the main plant can be used in conjunction with main plant compressors to charge the storage reservoirs at the rate of 84 lbm/sec.

High-Enthalpy Ablation Test Cells: (Processes: H1, H2, H3 ARCS SUPPORT). The arc heater test units are high-pressure facilities providing high-enthalpy test conditions simulating aeroheating environments consistent with reentry / endoatmospheric flight at velocities from 5,000 ft/sec up to and exceeding 20,000 ft/sec. The test units share utilities, including a power supply, raw water systems, a demineralized water system, and an air supply provided by the VKF HPA storage and supply network.

- **H1:** The H1 test unit is a segmented arc heater that provides high-pressure, high-enthalpy test conditions for qualification of thermal protection materials, nose tips, and / or electromagnetic apertures and structures for hypersonic missiles, space access systems, and entry / reentry vehicles.
- **H2:** The H2 is a Huels-type arc heater that provides conditions suitable for aerothermal simulations of hypersonic flight. Unlike H1 and H3 that exhaust to atmosphere, the H2 is exhausted to either the PES or B-Exhaust Plant to provide altitude simulation.
- **H3:** H3 is a larger, 3-inch bore segmented arc heater with operational performance up to 150 atmospheres and is designed to provide proportionately larger high-enthalpy flows for testing of materials, aerothermal structures, and hypersonic propulsion components.
- **ARCS Support:** This Process consists of a 4000 psig high pressure air system, 1500 psig demineralized water system, 2500 psig raw water system, 70MW DC power supply system, data acquisition system and other minor shared support systems that are common to all the HTL arc facilities

Ballistic Range Test Cells: (Processes: RANGE G, RANGE I, RANGE S1, RANGE S3, RANGE SUPPORT)

- **Range G:** Range G consists of a two-stage light-gas gun, a 305-m long test chamber with projectile guidance capability (track), and a projectile recovery system. Three gun configurations are available for use (84-mm, 102-mm, or 203-mm) and the 64-mm Range I can be installed as well. Range G can be converted from the free-flight, impact configuration to the track configuration by swinging the track assembly into place. Range G shares the same building and some systems with Range I, and these test units are not operated simultaneously.
- **Range I:** Range I consists of a 64-mm two-stage light-gas gun and a 10-m long target tank, and is primarily used to perform impact and lethality tests. Range I can also be converted to a Free Piston Shock Tunnel (FPST) to perform real-gas testing for CFD code validation. The launch tube of the 64-mm two-stage light-gas gun is replaced with a shock tube, nozzle, and test section. Range I shares the same building and some systems with Range G, and these test units are not operated simultaneously.
- **Range S1:** The S1 is primarily used for conducting research and is equipped with a two-stage, 0.75-in diam., light-gas launcher, which accelerates the projectile to the desired test velocity. The range has a blast chamber into which muzzle gases expand and in which the projectile is separated from the sabot which adapts it to the bore of the launch tube; a connecting tube, along which instrumentation can be located; and the three target chambers, where impact occurs. Range S1 and Range S3 are located in the same building and are not operated simultaneously.
- **Range S3:** The S3 is a test unit used primarily for testing aircraft components to determine their reaction to bird impacts. It consists of a gas launcher that accelerates the projectile to the desired launch velocity and a covered concrete test pad where the target and its associated instrumentation are housed. Range S1 and Range S3 are located in the same building and are not operated simultaneously.
- **Range Support:** This process covers approximately 60 separate support assets that are common to the Range G and S test complex. A few of the major assets are Range G x-ray shadowgraph, GI gas analyzer system, Range test data system, GI AC Distribution System, GI N2 Supply, GI Vacuum system and other shared assets.

Space Environmental Test Cells: (Processes: 7V TEST UNIT, 10V TEST UNIT, 12V TEST UNIT, STAT TEST UNIT, RES CHAMBERS, MBS TEST UNIT, CHAMBER SUPPORT, DECADE SUPPORT)

The space environmental simulation chambers and supporting infrastructure are housed within three adjacent buildings, Building 1077 (7V, 10V, 12V, CCOSE, Research Chambers), Building 1075 (Mark 1), and Building 1088 (8V, MBS).

- **7V Test Unit:** The 7V thermal vacuum chamber provides a test capability for calibration and performance characterization of infrared surveillance sensors and interceptor seeker sensors against space backgrounds. The chamber systems include the vacuum

chamber, sensor antechamber, the vibration isolation system, the optical bench, and the cryogenic liner. The vacuum chamber is a horizontal stainless-steel, cylindrical shell 7 ft. in diameter by 23 ft. long with a 7 ft. diameter by 7 ft.-long antechamber on one end, and is contained within a cleanroom. 7V shares many systems with 10V and they are not operated simultaneously.

- **8V Test Unit:** The 8V thermal vacuum chamber (a.k.a. Space Threat Assessment Testbed (STAT)) is used to test satellite subsystems and microsatellite systems in real time in a realistic operational space environment. The chamber has ten source simulators which emulate conditions that exist at various orbits, and operates independently from the other space chambers.
- **10V Test Unit:** The Aerospace Chamber 10V provides complete ground test support to the sensor community for large aperture surveillance sensors and kinetic kill interceptors. The 10V Chamber is a horizontal cylinder, 10 ft. in diameter and 24 ft. long and is contained within a cleanroom. 10V shares many systems with 7V and they are not operated simultaneously.
- **12V Test Unit:** The Aerospace Chamber 12V is 12 ft. in diameter and 35 ft. high thermal vacuum test unit, and provides a space environmental test capability for electric propulsion systems. It has also been used as a vacuum vessel to support testing in the 7V Chamber.
- **Research Chambers:** The Research Chambers consist of several different small thermal vacuum chambers for conducting research or component tests. The 4V chamber (a.k.a. Characterization of Combined Orbital Surface Effect (CCOSE)) is a 4 ft. by 10 ft. research chamber designed to simulate a combination of environmental effects that occur in space.
- **Chambers Plant:** The Space Environmental Test Cells are supported by an infrastructure that includes liquid nitrogen and gaseous / liquid helium supply systems, and vacuum systems. The helium refrigeration system is made up of a 3-kw refrigerator, a 1-kw refrigerator / liquefier, and a 0.5- kw helium liquefier. The refrigerators and liquefaction systems are integrated to provide operating flexibility. Test chambers and helium refrigerators are connected to the closed-loop, high-pressure helium distribution system. The 3-kw refrigerator supplies the chambers with gaseous helium. The 0.5-kw gaseous helium refrigerator primarily provides liquid helium and supports the Research Chambers. The 1-kw refrigerator is used to supplement the 3-kw refrigerator.
- **MBS:** The Modular Bremsstrahlung Source (MBS) is a small X-ray simulator that provides nuclear effects testing on cables and small satellite components.

Rocket Test Cell J6: (Processes: J6 TEST CELL, ROCKET PREP, ROCKET SUPPORT, HP STEAM)

- **J6:** J6 is a horizontally arranged test cell designed for static testing of large solid-propellant rocket motors with up to 500,000-lbf thrust at simulated pressure altitudes of 100,000 ft. via pumping from the ETF A/B Exhaust Plants and a steam ejector connected to a high-pressure steam plant. The Steam Plant C consists of one boiler producing 740 PSI Steam (37,500 lbf/hr) and six 376,000 lbf (H₂O) capacity accumulators and is provided basic steam from the main steam plant.

Advanced Missile Signature Center (AMSC): (Process: AMSC)

- The Advanced Missile Signature Center (AMSC) supports the Missile Defense Agency (MDA), Defense Intelligence Agencies (DIA) and other DoD programs with signature measurements, analysis, modeling, archiving and distribution. State-of-the-art instrumentation and infrastructure are used to collect temporal, spectral and spatial signatures during static, launch, sled and free flight tests on test ranges in and outside the USA. Archives include target, threat and battlespace environment signatures for missiles and other vehicles.

Aerodynamic and Propulsion Test Unit (APTU): (Process: APTU)

- **APTU:** APTU is a blow-down test facility for testing air-breathing propulsion systems, aerodynamic systems, and materials while simulating flight conditions at supersonic and hypersonic velocities. Air for the high-pressure air storage system in APTU is provided by the VKF plant and operation of APTU is directly related to the availability of the VKF plant for support.

Turbine Engine Test Cells: (Processes: SL1 TEST CELL, SL2 TEST CELL, SL3 TEST CELL, SL2/3 SUPPORT, T3 TEST CELL, J1 TEST CELL, J2 TEST CELL, C1 TEST CELL, C2 TEST CELL, ETF SUPPORT, A PLANT AIRSIDE, A PLANT EXHAUST, B PLANT AIRSIDE, B PLANT EXHAUST, C PLANT AIRSIDE, C PLANT EXHAUST, ETF SUPPORT)

- **SL1:** SL1 is a standard USAF T-9 (Large Turbofan Engine Noise Suppression System) sea level turbine engine test unit hush house configuration with a modified fuel supply capacity. This test unit provides a means of testing turbojet, turbofan, turboshaft, and turboprop engines under sea level (local altitude) ambient conditions.
- **SL2 & SL3:** Test Cells SL2 & SL3 are sea level turbine test units capable of operating at either sea level ambient conditions, variable-temperature, ram inlet conditions, or heated inlet sea level conditions without ram and to rapidly transition between these test configurations. Additionally, the test units can accomplish corrosion tests simulating operation in a sea-based marine environment. The SL2 / SL3 test cells are capable of testing up to 50,000 lbf thrust engines at ram conditions of up to M 1.25 and temperatures ranging from minus 65° F to 350° F
- **T3:** Test Cell T3 is 12 ft. in diameter and 15 ft. in length. The cell is a high-temperature, high-pressure, small air-breathing propulsion test cell. T-3 is designed for the direct-connect testing of small air-breathing engines over a Mach range from 0 to 4.0.
- **J1:** Test Cell J1 is 16 ft. in diameter and 65 ft. long. This test cell is used primarily for direct-connect performance and stability testing of large air-breathing propulsion

systems. This engine inlet air can be conditioned from -65° to 750°F. Simulated pressure altitudes up to 80,000 ft. can be provided in the test cell by the facility exhaust compressors. Ejector-diffusers can be used to simulate higher altitudes in the test cell. Using the heated air inlet source, true simulated flight conditions can be provided over the entire flight envelope of most turbojet engines up to M 3.2 and 80,000 ft.

- **J2:** Test Cell J2 is 20 ft. in diameter and 67.3 ft. long. This test cell is used primarily for direct-connect performance and stability testing of large air-breathing-type propulsion systems. The engine inlet air can be conditioned from -65° to 650°F. Simulated pressure altitudes up to 80,000 ft. can be provided in the test cell by the facility exhaust compressors. Higher simulated altitudes may be attained in the test cell by the use of ejector-diffusers. True simulated flight conditions can be provided over the entire flight envelope of most turbine-type engines up to M 3.0 and 80,000 ft. altitude.
- **C1:** Test Cell C1 is designed for performance and operability testing of large augmented turbofan engines, although free-jet testing can be accommodated. The cell is 28 ft. in diameter and 50 ft. long. The engine inlet air can be conditioned from -100° to 650°F. True simulated flight conditions can be provided over the entire flight envelope of most turbine-type engines up to M 2.1 and 60,000 ft. altitude. Ejector-diffusers can be used to simulate higher altitudes in the test cell.
- **C2:** Test Cell C2 is designed for performance testing of large high bypass turbofan engines. The cell is 28 ft. in diameter and 50 ft. long. The engine inlet air can be conditioned from -100° to 650°F. C2 can be configured to run large augmented turbofan engines with capability similar to C1.
- **Engine Test Facility (ETF) Plant:** The ETF consists of three plants identified as B (Basic) Plant, A (Addition) Plant, and C (Aeropropulsion Systems Test Facility (ASTF)) Plant.

The three ETF A Plant air supply compressors and four ETF B Plant air supply compressors are Mothballed. The ETF C Plant air supply provides conditioned air to the Aeropropulsion T-Cells, J1, J2, C1, and C2 and to SL2 and SL3 when running RAM conditions. The ETF C plant air supply system is comprised of six axial-flow air supply compressors - four first stage and two second stage compressors.

The ETF-B plant exhaust system consists of six centrifugal-flow exhaust compressors. Exhaust capacity for J1 and J2 are provided by the ETF-A exhaust system or by the ETF-A and ETF-B systems in series. Exhaust capacity for the T-Cells is provided by the ETF-B exhaust system. Special interconnecting ducting to the Propulsion Wind Tunnel exhaust compressors permits exhaust capability augmentation for ETF-A and ETF-B test cells. The ducting and valve arrangement in the exhaust systems provides many different compressor configurations necessary to establish the required test cell conditions.

The ETF-C exhaust system is comprised of 12 identical axial-flow exhaust compressors. The exhaust compressors are arranged in stages such that there are eight first stage axial flow compressors, three second stage axial flow compressors, and one third stage axial flow compressor. Refrigeration is used to condition the process air supply.

Hypervelocity Wind Tunnel 9:

Tunnel 9 is located at AEDC White Oak near Silver Spring, Maryland. It is the primary high Mach number and high Reynolds number wind tunnel for hypersonic ground testing and the validation of computational simulations for the USAF and DoD. The facility is capable of simulating speeds of Mach 8, 10, and 14 and Reynolds numbers of 0.05-48 million/ft.

The National Full-Scale Aerodynamics Complex (NFAC):

AEDC Moffett Field contains the NFAC and is located at NASA's Ames Research Center at Mountain View, California. This facility is composed of two large test sections and a common, six-fan drive system. The 40 by 80 ft. wind tunnel circuit is capable of providing test velocities up to 300 knots and Reynolds numbers up to 3 million/ft. The 80 by 120 ft. test section is capable of testing a full-size aircraft at velocities up to 100 knots at nominal unit Reynolds numbers of 1.1 million/ft. A system of moveable vanes can be positioned so that air is either drawn through the 80- by 120 ft. test section and exhausted into the atmosphere, or driven around the closed circuit through the 40- by 80 ft. test section.

Technology Labs:

The following labs are used for development purposes and risk reduction demonstrations:

- **Heat Flux Gage Development and Fabrication:** Inventing and developing heat flux gages for use in the aerodynamic wind-tunnel models in tunnels 4T, A, B and Tunnel 9.
- **Lab 934:** Laser Lab, Shock Tube, and small wind tunnel used for development of flow-field diagnostics, such as shock wave visualization.
- **Lab 936:** Signatures lab in support of signature customers, Non-contact Stress Measurement (NSMS) lab and electronics buildup.
- **Lab 938:** Optics and Camera electronics, combustion laser diagnostics, and advanced imaging techniques.
- **RPA4 (Rocket Prep Area 4):** High-speed fan facility used for development of exhaust plume simulations and testing plume detection products.
- **Propulsion Research Facility (PRF / UTSI J85):** Collaborative effort with University of Tennessee Space Institute to demonstrate technology developments using a J85 engine as heat and flow source. Provides for risk reduction testing on SBIR products, combustion probes, and provides test environment for customer tests.

Steam System: (Process: STEAM MP)

Steam Plant A and the steam distribution system provide building heat, freeze protection, and low pressure steam for test operations. The system consists of:

- Four Boilers producing 200 pounds per square inch (PSI) Steam
- One 35,000 lbm/hr

- Three 60,000 lbm/hr
- Four 273,000 lbm (H2O) capacity accumulators
- Three 376,000 lbm (H2O) capacity accumulators
- Approximately 175,000 feet of steam distribution lines ranging in size from ½ to 14 inches

Electrical Supply and Distribution: (Process: ELECTRICAL, CATHODIC PROT)

The Electrical Supply and Distribution system provides electrical power to base and test assets. Electrical power is received from the Tennessee Valley Authority (TVA) and is distributed through the following systems:

- Nine 161KV Switchyards
- Twenty-nine 161KV Transformers
- Twenty 161KV Circuit Breakers
- Approximately 13,000 LF of 161KV cables and protective piping systems
- Approximately 375,000 LF of overhead and underground 13.8 and 6.9KV lines
- 61 Unit Substations
- Cathodic Protection System
- Meters and power measuring equipment

Raw / Cooling Water: (Process: RAW WATER)

The Raw / Cooling Water Supply and distribution system provides cooling water to support testing and consists of the following:

- Primary Pumping Station
 - Six 25,000 GPM Pumps; six 2,000 HP, 4.16 KV motors
 - Valves and Electrical Equipment
- Secondary Pumping Station
 - Eight 25,000 GPM Pumps; eight 1,750 HP, 4.16 KV motors
 - One 10,000 GPM Pump, one 900 HP, 4.16 KV motor
 - Three 3,300 GPM Pumps; three 250 HP, 480 V motors
 - Valves and Electrical Equipment
- 57 Million Gallon Secondary Reservoir
- ASTF Cooling Water System
- 2 Million Gallon Reservoir
- Twelve Cooling Towers
 - 983,000-Gallon Storage
 - One 5,000 gallons per minute (GPM) Pump; one 400 HP, 2.4 KV motor
 - One 10,000 GPM Pump; one 800 HP, 6.9 KV motor
 - One 15,000 GPM Pump; one 1,250 HP, 6.9 KV motor
 - One 25,000 GPM Pump; one 2,000 HP, 6.9 KV motor
 - Three 50,000 GPM Pumps; three 4,000 HP, 6.9 KV motors
 - Twelve Cooling Fans; eight 150 HP, 2.4 KV motors
- Return Basin
 - 1,300,000-Gallon Storage
 - One 5,000 GPM Pump; one 200 HP, 480 V motor
 - One 10,000 GPM Pump; one 450 HP, 480 V motor

- One 15,000 GPM Pump; one 700 HP, 6.9 KV motor
- One 25,000 GPM Pump; one 1,000 HP, 6.9 KV motor
- Three 50,000 GPM Pumps; three 2,250 HP, 6.9 KV motors
- Rowland Creek Pump Station
 - Four 25,000 GPM Pumps; four 2,000 HP, 4 KV motors
 - Two 12,500 GPM Pumps; two 1,000 HP, 4 KV motors
 - 3,500 LF of 72-inch Steel Water Piping
- Bradley Creek Pump Station -- Three 1,000 GPM Pumps
- Brumalow Creek Pump Station -- Two 1,000 GPM Pumps
- Meters and water measuring equipment

Fuel System: (Process: FUEL FARMS)

- Test and Bulk Fuel Farms and Distribution Systems
 - 12 Tanks with total capacity of 312,600 gallons in the test fuel farm
 - 5 Tanks with total capacity of 1,682,000 gallons in the bulk fuel farm
 - 1 Tank with total capacity of 200,000 gallons at Steam Plant A
 - Pumps, Meters, Valves, Gauges, Strainers, Filter Separators, Static
 - Grounds, And Fill Stands
- Meters and fuel measuring equipment

Machine & Fabrication Shop: (Process: MODEL SHOP)

The Machine & Fabrication Shop, commonly referred to as the Model Shop, has the capability to provide machining, hardware / electrical fabrication, installation, and maintenance services.

Chemical Laboratory: (Process: CHEM LAB)

The Chemical Laboratory has the capability to provide a full-range of chemical analysis and measurements.

Metallurgical and Non-Destructive Examination (Met / NDE) Laboratory: (Process: MET LAB)

The Met / NDE laboratory has the capability to provide comprehensive support in the areas of mechanical testing, failure analysis, scanning electron microscopy, metallography, and materials selection and processing.

Technology Labs:

The following labs are used for development purposes and risk reduction demonstrations:

- Heat Flux Gage Development and Fabrication: Inventing and developing heat flux gages for use in the aerodynamic wind-tunnel models in tunnels 4T, A, B and Tunnel 9.
- Lab 934: Laser Lab, Shock Tube, and small wind tunnel used for development of flow-field diagnostics, such as shock wave visualization.

- Lab 936: Signatures lab in support of signature customers, Non-contact Stress Measurement (NSMS) lab and electronics buildup.
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- Propulsion Research Facility (PRF / UTSI J85): Collaborative effort with University of Tennessee Space Institute to demonstrate technology developments using a J85 engine as heat and flow source. Provides for risk reduction testing on SBIR products, combustion probes, and provides test environment for customer tests.

Mothballed or Closed Test Assets

The following test assets are either in Mothball or Closed Facility Sustainment Status. Although the Process level test asset may be in Mothball or Closed status, individual systems and subsystems that are part of the Process may be in Active or Standby status in order to support other test assets or provide other support and must be operated and maintained.

Mothballed

- **16S:** (Process: 16S): The 16S is a 16 ft., supersonic, continuous-flow, closed-circuit tunnel that can be operated at M 1.50 to 4.50.
- **ACL:** (Process: ACL): The Airflow Calibration Laboratory (ACL) is a continuous supersonic / hypersonic tunnel used for small model testing and test probe calibrations. The ACL can be run simultaneously with tunnels A or B provided the secondary mass flow system is not being utilized by those facilities. The ACL cannot be run simultaneously with Tunnel C.
- **Mark 1:** (Process: MARK 1): The Mark 1 Space Environmental Chamber consists of a large cylindrical vacuum tank 42 ft. diam. by 82 ft. high, pumping systems, thermal environment systems, vehicle support and attitude control equipment, controls, and instrumentation suitable for conducting tests on large space vehicles and a variety of space subsystems.
- **T1:** (Process: T1 TEST CELL): Airbreathing propulsion test cell T1 is 12.3 ft. in diameter with length variable to approximately 57 ft.
- **T2:** (Process: T2 TEST CELL): Airbreathing propulsion test cell T2 is 12.3 ft. in diameter with length variable to approximately 50.5 ft.
- **T-4:** (Process: T4 TEST CELL): Airbreathing propulsion test cell T-4 is 12.3 ft. in diameter with a length variable to approximately 47.8 ft.
- **T11:** (Process: T11 TEST CELL): Airbreathing propulsion test cell T11 is 10 ft. by 10 ft. by 17 ft. long.

- **T12:** (Process: T12 TEST CELL): Airbreathing propulsion test cell T12 is 10 ft. in diameter with a length of 20 ft. This test unit is designed for the testing of air-breathing turbo-prop and turboshaft engines.
- **J2A:** (Process J2A): Rocket development test cell J2A is an 18 ft. diameter by 32 ft. long cryogenically cooled liner inside of a 20 ft. diameter duct.
- **J3:** (Process: J3 TEST CELL): Test cell J3 is a vertical rocket motor test cell consisting of two test capsules.
- **J4:** (Process: J4 TEST CELL): J4 is a vertically oriented test complex designed for the static testing of large liquid- and solid-propellant rocket engines and entire propulsion systems at simulated altitudes. J4 is connected to the ETF A/B Exhaust Plant and is supported with high pressure steam by Steam Plant B.
- **J5:** (Process: J5 TEST CELL): J5 is a horizontally arranged test cell designed primarily for static testing of large solid-propellant rockets.

Closed

- **1T:** (Process: 1T): 1T is a transonic wind tunnel with a 1 ft. test section.
- **ETF Research Cells:** (Process: R1D TEST CELL, R1E TEST CELL, R1A1 TEST CELL, R2A2 TEST CELL, R2H TEST CELL): These research facilities have typically been used to support development efforts in propulsion, aerodynamics, and space simulation requirements for a variety of environmental conditions and system operational modes.
- **T5:** (Process: T5 TEST CELL): Airbreathing propulsion test cell T5 is 7 ft. in diameter by 17 ft. long.
- **T7:** (Process: T7 TEST CELL): Airbreathing propulsion test cell T7 is 7 ft. in diameter and 9 ft. in length.

Instrumentation, Data Systems, and Controls (ID&C)

Overview

Approximately 52,000 devices are used to acquire test data, control facility and test article systems, and provide monitoring to operations personnel. These instruments are contained in the test and plant assets listed within this appendix. The devices in the test and plant assets have been categorized as instrumentation, information systems, data acquisition and processing, and controls and are defined below:

- **Instrumentation:** equipment used to measure, transmit, and / or display physical phenomena such as pressure, force, temperature, vibration, position, etc. Examples include measurement sensors such as accelerometers, transducers, thermocouples,

load cells, flow meters, gages, meters, signal conditioners, filters, analog-to-digital converters, voltage scanners, pressure scanners, temperature scanners, etc.

- **Information Systems:** Equipment and software (GFE and COTS) used in the storage, manipulation, management, movement, control, display, transmission, switching, or reception of data or information. Examples include servers, computers, switches, routers, intercoms, building page systems, monitors, video distribution systems, and storage systems;
- **Data Acquisition and Processing:** Equipment and software (GFE and COTS) used in the setup, configuration, acquisition, recording, playback, processing, transmission, and display of data. These are heavily customized systems that integrate multiple instrumentation data sources to form a general-purpose data system that is able to be scaled and configured as needed to meet test requirements. Examples include EDAPS (Engine Data Acquisition and Processing System), PDPAS (Propulsion Data Processing and Analysis System), TestVIEW, Test SLATE®, PyDataMine, CADDMAS (Computer Aided Dynamic Data Measurement and Analysis System), ARLIS (Arnold Remote Link Information System), Argus, and the subsystems contained within these and others;
- **Controls:** Equipment and software (GFE and COTS) used to control and monitor (1) test article and test cell operation and (2) plant operations and equipment. Examples of test cell control systems include TACS (Test Area Control System), TAPS (Test Article Positioning System), Throttle, and TCS (Test Control Sequencer). Examples of plant control systems include MCM (Machine Condition Monitoring), ECS (Engine Test Facility Control System), PES (Plenum Evacuation System), fuel control systems, and process controls.

Table A-1 provides an approximation of the number of the devices assigned to each of the ID&C categories listed above. While actual numbers vary depending on test work load and system configuration changes, the purpose of this list is to give a representative order of magnitude for the scope of ID&C.

TABLE A-1

PROCESS	Instrumentation	Information Systems	Data Acquisition and Processing	Controls	Grand Total
AMSC	25	460	2		487
APTU	220	57	612	72	961
Chamber 10V	44	23	19	18	104
Chamber 12V	11	1	4	5	21
Chamber 7V	87	60	42	55	244
Chambers Research	128	107	124	52	411
Chambers Support	459		101	158	718
DECADE	238	153	157	5	553
ETF Test Support	2870	337	1432	1417	6056
GN2 NETWORK	4			6	10
HPA NETWORK	4			14	18
HTL	700	72	1220	87	2079
INSTR AND DIAG	1222		297	48	1567
Instrument Crib	486	66	90	43	685
JP FUEL NETWORK	56		4	69	129
MARK 1	35	160	2	4	201
MET LAB	132			35	167
MODEL SHOP	277	184	1	136	598
PC LAN	73	2367			2440
Plant A/B	495	15		1838	2348
Plant C	352	2	2	2186	2542
Plant P	31	5		414	450
Plant V	36			887	923
PWT Support	681	452	40	854	2027
R Cells	116	16	425	144	701
Range G	579	185	247	30	1041
Range S1	24		15		39
Rocket Cell J3	36	2	528	85	651
Rocket Cell J4	186	21	851	299	1357
Rocket Cell J5	55	25	348	106	534
Rocket Cell J6	1085	35	1179	453	2752
Technology	42	523	1	8	574
Tunnel 16S	356	135	162	138	791
Tunnel 16T	658	60	414	229	1361
Tunnel 1T	41	14	43	6	104
Tunnel 4T	115	90	220	114	539
Tunnel 9	77	373	9	1	460
Tunnels A/B/C	619	539	497	244	1899
Turbine Cell C1	494	403	1068	343	2308
Turbine Cell C2	123	70	834	119	1146
Turbine Cell J1	155	21	1684	135	1995
Turbine Cell J2	168	14	1052	107	1341
Turbine Cell SL2	182	93	333	56	664
Turbine Cell SL3	76	89	188	12	365
Turbine Cell T1	103	31	563	69	766
Turbine Cell T11	163	53	140	46	402
Turbine Cell T12	49	33	83	29	194
Turbine Cell T2	69	21	295	50	435
Turbine Cell T3	196	32	555	72	855
Turbine Cell T4	241	101	1320	136	1798
Turbine Cell T5	25	14	230	36	305
Turbine Cell T7	30	25	370	29	454
VKF SUPPORT	340		37	112	489
Grand Total	15069	7539	17840	11611	52059

APPENDIX B

COMMON ASSETS

Steam System

- J6 Steam Plant
- One Boiler Producing 740 PSI Steam (37,500 lb/hr)
- Six 376,000 lb (H₂O) capacity accumulators
- Steam Plant B (Mothballed)

Refrigeration, Cooling, and Ventilation Systems

- Four Test Cell Conditioning Systems (Located at T-3, J-4, J-5 and J-6)
- Two Test Article Conditioning Systems (Located at Rocket Prep Areas 2 and 3)
- Two Small Environmental Chambers (Located at PMEL)

Propane Storage and Distribution System

- Various sites at AEDC

Natural Gas System

- Piping and components downstream of the Points of Demarcation of the Privatized Natural Gas System

Fire Suppression System

- Six pressure vessels and associated piping and devices supplying carbon dioxide for Test Cell fire suppression

APPENDIX C

BASE SUPPORT UTILITY ASSETS

Electrical Supply

The Electrical Supply and Distribution system provides electrical power to base and test assets. Electrical power is received from the Tennessee Valley Authority (TVA) and is distributed through the following base support systems:

- 45 medium voltage transformers
- 110 medium voltage switchgear lineups
- 393 medium voltage circuit breakers
- Twenty-seven miles of underground 161, 13.8 and 6.9 kV cables
- Twenty-nine miles of overhead lines
- Meters and power measuring equipment

Raw Water

The Raw / Cooling Water Supply and distribution system provides raw water to base support assets and consists of the following:

- Rowland Creek Pump Station
 - Four 25,000 GPM Pumps; four 2,000 HP, 4 KV motors
 - Two 12,500 GPM Pumps; two 1,000 HP, 4 KV motors
 - 3,500 LF of 72-inch Steel Water Piping
- Elk River Dam
 - Three tainter gates
 - Two sluice gates
 - One leaf gate
- FAMCAMP
 - One well and pump rated at 30 GPM
 - 450 Ft of distribution lines
- AEDC Golf Course (One well and pump rated at 14 GPM)
- Meters and water measuring equipment

Potable Water System

- One 2,250,000 GPD Treatment Plant
- Two 1,000 GPM pumps
- One 500 GPM pump
- One 2,000 GPM Emergency Pump
- Two 250,000 Gal Clear Wells (for storage)
- One 250,000 Gal Elevated Tank
- 148,400 Ft of Distribution Lines

- Estill Springs Water Distribution System (Services Wingo Inn, Lakeside Club, Military Family Housing, Gossick Leadership Center, AEDC Recreation Area, FAMCAMP,
 - Approximately 12,500 Ft of Distribution Lines
 - One Well and Pump Rated at 60 GPM
- AEDC Airfield (One well and pump rated at 10 GPM)
- AEDC Golf Course (One well and pump rated at 14 GPM)
- Backflow preventers, valves, gauges and associated equipment
- Meters and water measuring equipment

Waste Water System

- One Retention Reservoir
- Two Oil Skimming Ponds
- Two Oil Skimmers
- Discharge Control Gates and Diversion Canals
- Sanitary Sewer System
 - One digester (5,900 cubic feet)
- Three sludge drying beds (1,728 square feet)
 - Trickling filter (5,500 square feet)
 - Primary settling tank (19,750 gal)
 - Secondary settling tank (17,962 gal)
 - Collection system (Six miles with fifteen lift stations)
 - One equalization basin (100,000 gallons)
- Off-site wastewater facilities to include:

<u>UNIT</u>	<u>LOCATION</u>	<u>CAPACITY</u>
Septic Tank (ST)	Primary Pumping Station	750 gallons per day (GPD)
Lift Station & ST	Gossick Leadership Center	750 GPD
Lift Station & ST	Arnold Lakeside Club	16,000 GPD
Lift Station	Arnold Lakeside Club Beach	1,500 GPD
ST	Golf Course	500 GPD
Two STs	Main Recreation Area	2,700 GPD
Package-type Waste Plant	Family Housing and VOQ	30,000 GPD
ST	FAMCAMP	1,200 GPD
ST	Hobby Shop	500 GPD
Wastewater Lines	Golf Course	252 linear feet (LF)
Wastewater Lines	Family Housing	3,018 LF

- Septic tanks at other various locations
 - 30 tanks
 - 3 privies

- Storm Sewer System
 - 8.6 miles of various size mains and open ditches
 - 96 manholes
 - 472 drop inlets
- Separators and Traps
 - 27 oil-water separators
 - 8 grease traps
 - 7 oil traps / siphon dams
- Meters and wastewater measuring equipment

APPENDIX D BASE SUPPORT ASSETS

Assets to be maintained and repaired include:

Structures and Facilities

- 290 facilities with approximately 2.8 million square feet
- Test facility and support buildings, administrative office space, warehouses, repair shops, machine shop, laboratories

Refrigeration, Cooling, Heating, and Ventilation Systems

- Approximately 450 AC units ranging in size from 1/4 to 400 tons
- 172 window units
- Several hundred small appliances, refrigerators, and water coolers

Electrical Support System

- 38 electric generators ranging from 2 - 1000KW
- Grounding and lightning protection systems
- 32,500 feet of streetlights on three circuits
- Electric machines and appliances
- Control circuits to operate and monitor electrical systems and equipment
- Fire and intrusion detection systems

Cranes

- 81 Overhead Cranes
 - 60 overhead cranes with capacities \geq 10 tons
 - 21 overhead cranes with capacities $<$ 10 tons
- 8 Mobile Cranes capacities ranging from 8.5 ton to 140 ton
- 324 Hoists
 - 6 Hatch Hoists with capacities \geq 20 tons
 - 2 Valve Hoists with capacities of 30 tons each
 - 316 Misc. Hoists with capacities \leq 20 tons

Energy Management and Control Systems (EMCS)

- 60 building monitoring systems
- Over 2,100 monitoring points
- One central EMCS computer in Building 1525

- Four EMCS color terminals in Buildings 1507, 1525, 1478, and 1099
- Three black and white terminals in Buildings 350 and 1525
- Data transmission cables, field devices, sensors, controls, cards, computers, and terminals

Pavements and Appurtenances

- 52,667 SY Primary Road Concrete
- 493,028 SY Primary Road Asphalt
- 13,059 SY Secondary Road Concrete
- 70,637 SY Secondary Road Asphalt
- 69,903 SY Tertiary Road Concrete
- 186,004 SY Tertiary Road Asphalt
- 287,031 SY Tertiary Road Crushed Rock
- 115 Miles Total Road Pavement Length
- 17,784 SY Parking Area Concrete
- 213,677 SY Parking Area Asphalt
- 47,390 SY Parking Area Crushed Rock
- 122,925 LF of Curbs and Gutters
- Guard rails, road bed slopes and ditches, back-slopes, culverts, trestles, grade crossings, signals and markings