

# 2017

## **Air Force Civil Engineer Utility Energy Service Contract (UESC) Playbook**





**Table of Contents**

**Chapter 1 Introduction – Utility Energy Service Contract (UESC) .....4**

**Chapter 2 UESC Background, Authority, Financing and Funding .....5**

2.1 Background..... 5

2.2 Authority..... 5

2.3 Financing UESCs..... 6

    2.3.1 Energy Cost Savings..... 6

    2.3.2 Guaranteed Savings ..... 7

    2.3.3 Energy Costs..... 7

    2.3.4 Maintenance Responsibilities ..... 7

    2.3.5 Annual Reconciliation ..... 7

    2.3.6 Buy-down ..... 8

2.4 Funding Requirements ..... 8

    2.4.1 Funding UESC Projects ..... 8

    2.4.2 Additional Funding Rules ..... 8

**Chapter 3 UESC Roles and Responsibilities .....10**

3.1 AFCEC/CND Roles and Responsibilities ..... 10

3.2 BEM Roles and Responsibilities ..... 10

3.3 CO Roles and Responsibilities..... 10

3.4 COTR Roles and Responsibilities..... 11

3.5 Utility Contractor Roles and Responsibilities ..... 11

**Chapter 4 Types of UESC Contracts .....12**

4.1 GSA AWC ..... 12

4.2 BOA..... 13

4.3 Interagency Agreement..... 13

4.4. Stand Alone Contract..... 13

**Chapter 5 UESC Contracting Processes .....14**

5.1 Installation Contracting Process..... 14

    5.1.1 Phase 1: Project and Acquisition Process..... 14

    5.1.2 Phase 2: Project Development..... 16

    5.1.3 Phase 3: Final Design and Construction/Installation ..... 19

    5.1.4 Phase 4: Post Project Installation..... 20

**Chapter 6 UESC Business Practices .....21**

6.1 Baseline Development..... 21

6.2 Performance Tests..... 21

6.3 Energy Savings Validation..... 22

6.4 Annual Reconciliation Plan (Audit of Savings)..... 23

6.5 Maintenance Related to the TO ..... 23

6.6 Pricing of TO Work..... 23

6.7 Equipment Ownership..... 24

**Appendix A - Acronym List .....25**

**Appendix B - References and Master List of Links.....27**

**Appendix C - Job Aids.....32**

    UESC Planning Checklist..... 32

    Risk/Responsibility Checklist ..... 34

**Appendix D - Guidance.....37**

    AFCEC Guide to Annual M&V Activities..... 37

    UESC Considerations for the BEM ..... 38



JUSTIFICATION AND APPROVAL..... 40

EMSA/MODEL AGREEMENT ..... 45

Basic Statement of Work (SOW) for the “Letter of Interest” ..... 62

UESC Task Order (TO) Sample..... 63

AFGM 2017-32-01..... 75

Engineering Technical Letter (ETL) 11-1: Civil Engineer Industrial Control System Information Assurance Compliance ..... 88

**Table of Figures**

Figure 1 Procurement Mechanisms ..... 12

Figure 2 Phase 1: Project and Acquisition Process ..... 14

Figure 3 Phase 2: Project Development..... 16

Figure 4 Phase 3: Final Design and Construction/Installation ..... 19

Figure 5 Phase 4: Post Project Installation..... 20

**Table of Tables**

Table 1 Authority Documents Mandating the AF UESC Program ..... 5



## Chapter 1 Introduction – Utility Energy Service Contract (UESC)

The objective of the UESC Playbook is to provide the parameters and guidance for implementing a UESC, replacing Engineering Technical Letter (ETL) 12-10: Utility Energy Service Contract (UESC) dated 3 April 2012. This Playbook contains a basic history of the UESC program, primary roles and responsibilities, step-by-step instructions, job aids, and reference documents to ensure UESC procedures are followed. This Playbook applies to all Air Force Installations considering using a UESC including, but not limited to, General Services Administration (GSA), Energy Management Service Agreements (EMSA), and individual installation contracts. Any deviations require written approval from the Energy Savings Performance Contract (ESPC)/UESC Program Manager, Air Force Civil Engineer Center (AFCEC/CND).

Job Aids, resources and reference materials are provided digitally in [Links](#) and can be modified as required by AFCEC/CND.

Limitations: This Playbook does not replace, supersede, or circumvent existing Department of Defense (DoD) or Air Force (AF) policy.

Applicability: This Playbook is written for the following personnel: AFCEC/CND, Base Civil Engineers (BCE), Base Energy Managers (BEM), Base Financial Managers (BFM), and installation Contracting Officers (CO).

Note: Must comply with [AFGM2017-32-01, Air Force Guidance Memorandum \(AFGM\) Civil Engineer Control Systems Cybersecurity \(2 Feb 2017\)](#). The AFGM supersedes [ETL 11-1, Civil Engineer Industrial Control System Information Assurance Compliance \(30 Mar 2011\)](#). However, the AFGM (12 pages) does not address all items included in ETL 11-1 (32 pages). Therefore, those ETL 11-1 items not addressed in the AFGM, are still in effect.



## Chapter 2 UESC Background, Authority, Financing and Funding

### 2.1 Background

A UESC is a contract that allows utilities to provide their government customers with energy and water efficiency improvements and demand-reduction services. UESCs leverage third-party funds to identify and implement energy conservation measures (ECMs) for a financing term of up to 25 years by statute [10 United States Code \(U.S.C.\) 2913](#). AFCEC limits the financing term to the cost effectiveness of the included ECMs. The AF can use UESCs for all buildings, excluding leased buildings (unless leased from another Federal agency), where the AF pays the utility bill.

UESCs are typically considered to increase facility energy efficiency through improvements to installation infrastructure, buildings, and building systems. Under a UESC, a serving or franchised utility company identifies energy savings strategies that yield an economic return on the investment. UESCs are used for the following:

1. Reducing energy use
2. Reducing water use
3. Installing high efficiency equipment and/or control systems
4. Re-commissioning or retro-commissioning energy consuming systems

The utility designs and installs the equipment. The capital costs can be paid with appropriated funds or financed by the utility company. A UESC should be implemented with assurance that the energy savings can be validated for the term of the UESC and meet the legal intent of the UESC. Used effectively, a UESC can reduce energy consumption and improve facility infrastructure.

### 2.2 Authority

The following table lists the Executive Orders (E.O.), directives, and policies that mandate and support the AF UESC program:

Authority Documents Mandating the AF UESC Program
<a href="#">10 U.S.C. 2911-13, Energy Performance Goals and Plans for Department of Defense</a>
<a href="#">E.O. 13423, Strengthening Federal Environmental, Energy, and Transportation Management</a> (revoked in 2015). Replaced by: <a href="#">E.O. 13693, Planning for Federal Sustainability in the Next Decade</a>
<a href="#">E.O. 13514, Federal Leadership in Environmental, Energy, and Economic Performance</a> (revoked in 2015). Replaced by: <a href="#">13693, Planning for Federal Sustainability in the Next Decade</a>
<a href="#">Public Law (P.L.) 109-58, Energy Policy Act of 2005</a>
<a href="#">10 Code of Federal Regulations (CFR) 436, Federal Energy Management and Planning Programs (10 CFR 436.18-19)</a>
<a href="#">Energy Independence and Security Act (EISA) of 2007</a>
<a href="#">10 U.S.C. 2866, Water Conservation at Military Installations</a>
<a href="#">Air Force Policy Directive (AFPD) 32-10, Installations and Facilities</a>

Table 1 Authority Documents Mandating the AF UESC Program



[10 U.S.C. 2913](#) states that:

1. The Secretary of Defense may authorize the Secretary of a military department having jurisdiction over a military installation to enter into agreements with gas or electric utilities to design and implement cost-effective demand and conservation incentive programs (including energy management services, facilities alterations, and the installation and maintenance of energy saving devices and technologies by the utilities) to address the requirements and circumstances of the installation.
2. If an agreement under this subsection provides for a utility to advance financing costs for the design or implementation of a program referred to in that paragraph to be repaid by the United States, the cost of such advance may be recovered by the utility under terms no less favorable than those applicable to its most favored customer.
3. Subject to the availability of appropriations, repayment of costs advanced under paragraph (2) shall be made from funds available to a military department for the purchase of utility services.
4. An agreement under this subsection shall provide that title to any energy-saving device or technology installed at a military installation pursuant to the agreement vest in the United States. Such title may vest at such time during the term of the agreement, or upon expiration of the agreement, as determined to be in the best interests of the United States.

## 2.3 Financing UESCs

UESC projects, funded or financed, must produce financial savings that are equal to or greater than the cost of implementation, including the cost of financing. All UESC costs, including mid-contract replacement of capital equipment, must be funded out of the UESC savings they generate, unless funded using appropriated funds. An installation's post-UESC utility costs, such as energy and Operations and Maintenance (O&M), plus the cost of the UESC project cannot exceed the utility costs prior to the implementation of the UESC project. If the project is financed, the energy cost savings are used to pay the utility.

### 2.3.1 Energy Cost Savings

Energy cost savings are annual recurring savings, including:

1. Recurring reductions in expenses (other than energy costs) related to energy-consuming equipment, including costs associated with waste disposal.
2. One-time energy-related cost savings resulting from avoided expenditures because of the UESC project.
3. Demand-related savings, such as peak shaving.
4. One-time utility rebates.

The utility contractor is responsible for the design, acquisition, installation, and measurement and verification (M&V) of the project equipment or systems that produce the savings is required. Refer to [2.3.5 Annual Reconciliation](#) for more information. Refer to the [GSA Utility Contractors List](#) to view approved contractors.



Certain risks are associated with implementing a UESC for the AF. It is essential the AF does not assume any of the utility contractor's risk, such as ECM performance. AF risks include utility rates and mission changes.

Refer to the [Risk/Responsibility Checklist](#) job aid for guidance.

### **2.3.2 Guaranteed Savings**

There are no guaranteed savings in a UESC contract. The equipment installed is guaranteed to perform for one year and provisions shall be made for the labor, supplies, parts, and materials to maintain the Energy Conservation Project (ECP) for the term of the Task Order (TO). However, annual verification of energy savings must be accomplished. This requirement includes an approved M&V plan (see 2.3.5).

As an exception, guaranteed savings can be negotiated into a TO if the local utility provider offers it. If part of the TO, the utility company provides a guarantee of savings to the AF and establishes payment schedules reflecting the guarantee.

The payment to the utility is based on an agreed upon percentage of the calculated savings. These awarded TOs, like utility bills, are "must-pay" requirements and are programmed into the annual utility budget process. Refer to [42 U.S.C. 8287, Section 801\(a\)\(2\)\(A\)](#).

### **2.3.3 Energy Costs**

Annual payments by the AF under a UESC cannot exceed the value of energy and O&M savings relative to costs prior to the UESC. Refer to [42 U.S.C. 8287; Section 801\(a\)\(2\)\(B\)](#).

Forecasted energy costs and the discount rate (present value of future cash flows) are major factors in determining UESC savings. [10 CFR 436, Federal Energy Management and Planning Programs](#), provides detailed instructions for UESCs, including the calculation of life cycle costs. For example, [10 CFR 436.14](#) mandates the use of the annual supplement to [Life Cycle Costing Manual for the Federal Energy Management Program \(National Institute of Standards and Technology \[NIST\] 85-3273\)](#) to determine the discount rate and forecasted energy costs. UESCs must use the NIST-published "implied long-term average rate of inflation" with the appropriate regional fuel price indices. AF installations are considered "industrial" for the purpose of calculating the NIST utility escalation rate. The provisions in [10 CFR 436.14](#) are mandatory and failure to comply results in the contract being found legally insufficient.

### **2.3.4 Maintenance Responsibilities**

The installation is responsible for TO-required maintenance and repair. Maintenance and repair are critical to sustain an ECM's performance throughout the life of the TO. Ensure provisions are made for the labor, supplies, parts, and materials to maintain the ECP for the term of the TO. Refer to section [6.5 Maintenance Related to the TO](#) for more information.

### **2.3.5 Annual Reconciliation**

An annual reconciliation is required for a UESC. A verification of energy savings reconciliation must be accomplished for each awarded TO annually. This requirement includes an approved M&V plan using at a minimum the current International Performance Measurement and Verification Protocol (IPMVP) at the time the TO is awarded. Measured



savings are required when using options B or option C metered savings, where a minimum of one third savings are measured. During the annual reconciliation, the utility contractor confirms the adequacy of maintenance. Refer to [paragraph \(a\)\(2\)\(A\) of 42 U.S.C. 8287](#). The BEM validates the utility company's annual reconciliation follows the agreed upon M&V plan.

### **2.3.6 Buy-down**

UESC costs may be funded with installation funds used to buy down part of the TO, such as end-of-year fallout funds. These one-time funds can be identified in the payment schedule to the utility company upon acceptance of the ECM and commencement of the performance period. This allows for a lower financed amount and shorter term, thereby reducing interest costs over the term. Buy-down schedules are recommended for projects with payment periods greater than 5 years. If, after award, O&M funds are used to buy down a portion of the TO, several steps are necessary:

1. Use of these funds must be identified as soon as possible to the utility company.
2. Economics must be considered.
3. Prepayment penalties must be identified by the utility company.

## **2.4 Funding Requirements**

### **2.4.1 Funding UESC Projects**

[Title 10 USC § 2913\(d\)\(3\)](#) specifies that repayment of financed costs be made from funds available to a military department for the purchase of utility services. UESC savings must be real and verifiable so the installation doesn't run the risk of a savings shortfall. Work that encompasses O&M-type savings or other savings that do not eliminate actual costs or produce actual savings versus avoided costs should not be included. Civilian personnel costs are not allowed unless positions are deleted from manpower documents.

Use caution if applying anticipated cost avoidance to the UESC due to major repair/replacement that may not be needed because of the UESC. Historical data may not be able to back up expenditures, but the costs may be justified as a future expense; for example, as an engineering analysis or as life cycle predictions. If these major expenditures are included as captured savings, they become a "must-pay" bill from O&M funds. Before these funds are included in a UESC, the installation and AFCEC/CND must agree to the funding source and create a record of decision to justify the action and agreement.

### **2.4.2 Additional Funding Rules**

Facilities under a UESC may require a buyout before non-UESC work is performed. Government actions (post award) on a building that will impact, alter, or dismantle UESC material or equipment, rendering that part of the UESC contract invalid, should buyout the applicable portion of the contract. Examples include demolition, upgrades, construction and privatization.

When possible, buyout funds should be programmed with the same fund source as the project itself. Any demolition, upgrades, construction, or privatization shall be identified to the CO for evaluating and determining appropriate contract action.



The following additional funding rules apply:

1. Military Construction (MILCON) funds cannot be applied to a UESC. MILCON projects cannot be accomplished under a UESC. Use of MILCON funds for a purpose outside appropriated use would result in a violation of the [Purpose Act \(31 U.S.C. 1301\)](#).
2. Non-appropriated Fund (NAF) functions may be authorized to use appropriated O&M funds. NAF Category C ECPs must use savings only from other NAF ECPs to avoid subsidizing or being subsidized by funds other than NAF-funded sources. All actions affecting funding must be coordinated with the NAF funds manager.
3. Military Family Housing (MFH) funds are appropriated separately and used specifically for MFH purposes. MFH ECPs must use savings only from other MFH ECPs to avoid subsidizing or being subsidized by funds other than MFH-funded sources. Use of MFH funds for a purpose outside their appropriated use would result in a violation of the [Purpose Act \(31 U.S.C. 1301\)](#).
4. Reimbursable customers require separate accounting procedures to ensure that adequate payments are being applied to their accounts. Reimbursable customers must agree to a memorandum of agreement or equal to provide payments for the term of the contract.



## Chapter 3 UESC Roles and Responsibilities

This chapter provides an in-depth explanation of the roles and responsibilities associated with the UESC process.

### 3.1 AFCEC/CND Roles and Responsibilities

- a. Serves as the UESC Program Management Office (PMO) and centrally manages all UESCs. Provides initial vetting, approves each stage of project development, manages the evaluation process, and assists installations in the development of the UESC project through completion of the TO term. Provides technical review and approval of all UESC projects.
- b. Coordinates and supports the contracting office, as needed.
- c. Develops UESC procedures/guidance and provides UESC training to appropriate installation personnel, following the Department of Energy (DoE) Federal Energy Management Program (FEMP) UESC guidelines.
- d. Acts as the center of expertise for UESC contracts. Provides tools and expertise to assist in implementing a UESC. Acts as a clearinghouse for UESC lessons learned.
- e. Maintains oversight and compliance with AF policies and interprets guidance for the installation's UESC program.

### 3.2 BEM Roles and Responsibilities

- a. The Defense Logistics Agency-Energy (DLA-Energy) is the execution contracting office for all AF UESC Projects. Installation BCE and the local CO may submit a waiver request to AFCEC/CND PMO to execute locally. AFCEC, in conjunction with the installation makes the final determination for the office of execution.
- b. Works with the CO to implement the UESC program. Compiles and provides required project documentation, including site data packages and evaluation criteria to the CO. Performs an analysis on all construction costs and provides a statement to the CO that all costs are realistic for the work performed. Refer to [Considerations for the BEM](#) for more information.
- c. Completes UESC training before implementing a UESC program and ensures that assigned personnel associated with the UESC program receive this training for the term of the UESC.
- d. Assists the CO in ensuring the utility company complies with all requirements for the term of the TO.
- e. Determines if other funding sources such as Sustainment, Restoration and Modernization (SRM) and the Energy Conservation Investment Program (ECIP) are available and more cost-effective.
- f. Ensures the CO is notified of mission changes, facility modifications, or demolition.

### 3.3 CO Roles and Responsibilities

- a. Overall responsibility to ensure that ESPC projects serve the best interests of the AF and are consistent with the terms and conditions of the ESPC contracts, legislation, and regulations.



- b. Awards and administers all issued UESC TOs following AFCEC/CND technical review and approval.
- c. Assembles the UESC team and serves as chairperson for all meetings with the utility company.
- d. Evaluates and documents mission changes, facility modifications, and demolition for appropriate contract action.
- e. Appoints a Contracting Officer Technical Representative (COTR) to act as a liaison between the utility contractor and the CO.
- f. Provides the total contract cost for each phase of a UESC and a final signed copy of the TO to AFCEC/CND.

### **3.4 COTR Roles and Responsibilities**

- a. Acts as technical representative for CO.
- b. Identifies and supports project goals and development efforts.
- c. Reviews all deliverables.
- d. Provides oversight during construction and installation.
- e. Reviews and approves technical aspects of the annual M&V reports, when applicable.

### **3.5 Utility Contractor Roles and Responsibilities**

- a. Develops and submits a Preliminary Assessment (PA) and Feasibility Study (FS).
- b. Documents the baseline data and ensures the data adequately supports the baseline. Simulation models are not acceptable baselining tools.
- c. Provides funding for energy reduction project(s).
- d. Implements the UESC project, including purchasing equipment, installing equipment, and overseeing and completing construction during projects.
- e. Performs metering and data collection to ensure energy reduction and provides the M&V report.



## Chapter 4 Types of UESC Contracts

The AF has several types of UESC contracts available to them, including, GSA Area-wide Contracts (AWCs), Interagency Agreements and EMSAs. Basic Ordering Agreements (BOA) are not contracts, but establish general terms and conditions for future TO or Delivery Order (DO). Agencies not covered by such agreements may enter contracts with their servicing utility. If an AWC exists with a utility, AFCEC/CND must approve the use of other procurement mechanisms. EMSAs serve as a template for agencies to use in establishing UESC's or as a Master Agreement Exhibit "C" within an AWC, EMSAs can be used as a standalone contracting vehicle.

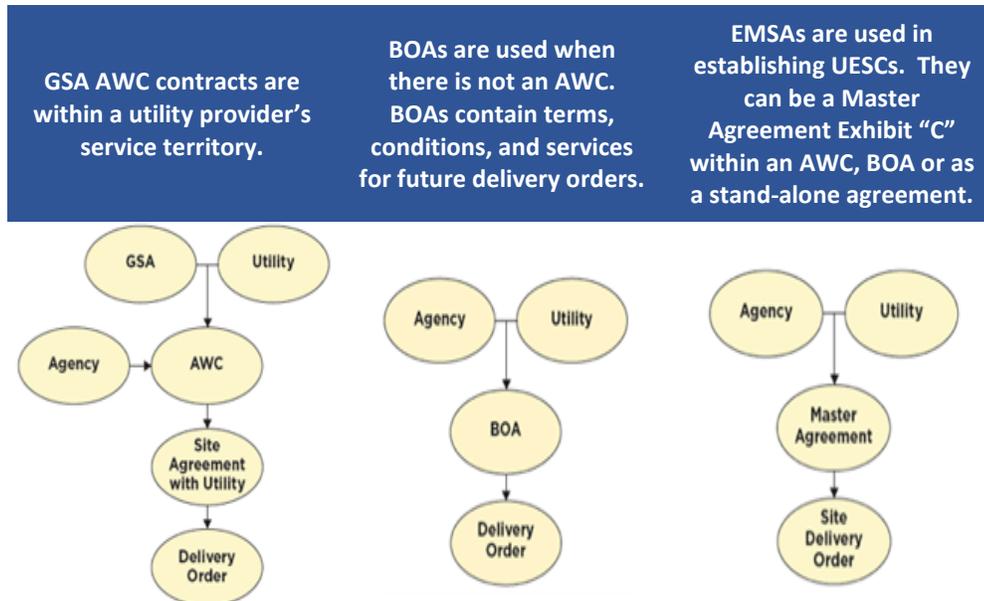


Figure 1 Procurement Mechanisms

### 4.1 GSA AWC

Utility services can include electricity, natural or manufactured gas, water, sewage, thermal energy, chilled water, steam, hot water, and high-temperature hot water. AWCs outline general terms and conditions and authorize any agency in a utility’s franchised service territory to place TOs for utility services and utility energy services offered under the contract. Refer to the [GSA Utility Contractors list](#) to view the servicing area utility contractors.

The GSA has numerous active utility AWCs to procure energy, water, and renewable energy systems projects. Installations develop an EMSA, which is provided as an attachment to the existing GSA AWC. If more than one utility company can offer energy management services the AF provides a fair opportunity and selects the one that provides the best value. If only one utility is available, the CO prepares a justification and approval (J&A), prior to having negotiations that lead to an award without full and open competition [Federal Acquisition Regulations \(FAR\) 6.302.5](#). Refer to the [Justification and Approval for Other Than Full and Open Competition](#) sample document.

Note: Financing is an option for Federal facilities.



## 4.2 BOA

A BOA is an agreement between the utility and the installation to establish general terms and conditions that are incorporated into future firm fixed-price TOs and may be used when an AWC does not exist. A federal agency can establish a BOA with their utility when specific items, quantities, and prices are not known, but a substantial number of requirements are anticipated and there is potential for more than one UESC TO. A TO placed under a BOA constitutes the contract and details the services to be delivered.

A BOA does not guarantee future TOs to the utility and is not used to restrict competition if more than one utility supports an installation. The agreement is reviewed annually and revised, as necessary, to meet the requirements of the [FAR 16.703](#). A modification to the agreement itself does not retroactively affect any individual TOs issued under it.

The CO establishes the BOA with the utility employing normal contracting procedures in accordance with [FAR 16.703](#), [DFARS 216.703](#), and [Procedures, Guidance and Information \(PGI\) 217.703\(d\)](#).

## 4.3 Interagency Agreement

Bonneville Power Administration (BPA) – Provides energy management services to their customers within their service territory.

## 4.4. Stand Alone Contract

For installations where the utility does not have an AWC, an [EMSA](#) may be used as a template for terms and conditions and award is made to the utility under the authority of [10 U.S.C. 2913](#).



## Chapter 5 UESC Contracting Processes

### 5.1 Installation Contracting Process

#### 5.1.1 Phase 1: Project and Acquisition Process

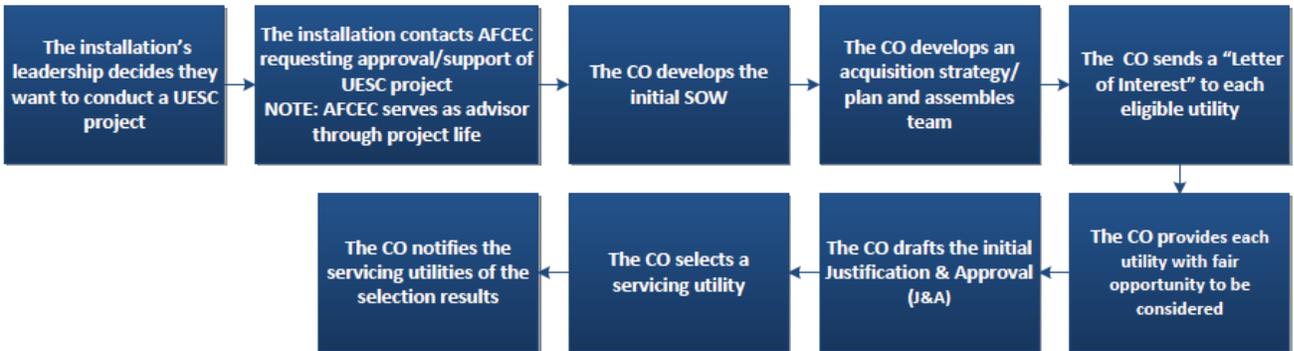


Figure 2 Phase 1: Project and Acquisition Process

#### Steps 1 & 2: Installation leadership decides to conduct a UESC project and requests AFCEC/CND approval.

Prior to engaging with a utility, the CO and the BEM/BCE prepare a summary of the type of ECMs being considered and relevant baseline information and submits them to AFCEC/CND for initial vetting. AFCEC/CND works with the CO and BEM/BCE to determine if the UESC is an appropriate choice for execution. Note: AFCEC serves as advisor through project life. Refer to the [UESC Planning Checklist](#) job aid for guidance.

#### Steps 3 & 4: The CO develops the Statement of Work (SOW) and the acquisition strategy.

DLA-Energy is the execution contracting office for all AF UESC projects.

The CO and BEM review the utility agreement (AWC) to ensure it allows for energy and demand-side management services. Refer to [Considerations for the BEM](#) for guidance on implementing a successful UESC. The Energy Team is assembled and a date and time is coordinated for an on-site meeting or teleconference with AFCEC/CND to explore potential opportunities, develop the UESC criteria, and determine the acquisition strategy. The Energy Team ensures the UESC contract adheres to appropriate, and confirms the scope and pricing of the project are in the best interest of the AF. The key activities of an acquisition strategy are:

1. Developing a clear scope with schedule.
2. Planning a sound and equitable business arrangement.
3. Managing risk of concurrent development/production.
4. Planning to support installed systems/equipment.
5. Ensuring competition.
6. Obtaining resources to award and administer the contract.
7. Developing the SOW. For an example, refer to the [Sample SOW](#).



**Steps 5 & 6: The CO sends a “Letter of Interest” to each eligible utility and provides each utility with a fair opportunity to be considered.**

The CO contacts each serving utility to determine interest in providing a UESC. The letter should:

1. Clarify agency intention to use UESC to meet energy goals.
2. Describe the initial project scope.
3. Inform the serving utilities of the opportunity for consideration to all.
4. Provide evaluation method and criteria.

Refer to the [GSA Utility Contractors list](#) to view the servicing area utility contractors.

**Step 7: The CO drafts the initial J&A.**

The J&A is to be executed prior to negotiations leading to TO award without full and open competition. J&As use guidance provided in the following regulations:

1. [FAR 6.302-5](#)
2. [10 USC 2304\(c\)\(5\)](#)
3. [Competition in Contracting Act \(CICA\)](#)

J&As are initiated during acquisition planning and establishes the contractor meets the definition of a utility. The J&A describes services offered by the utility and why performance by the utility is required, indicating the agreement will be cost effective, fair, and reasonable. J&As are finalized before awarding the TO.

Refer to the [Justification and Approval for Other Than Full and Open Competition](#) form for an example.

Note: If more than one utility company can offer energy management services, all must be provided a fair opportunity to participate and select the one that provides the best value; no J&A required. However, if only one utility is available, the CO must prepare a J&A prior to negotiations, leading to an award without full and open competition.

**Steps 8 & 9: The CO notifies the servicing utilities of the selection results.**

In selecting a utility, the following evaluation factors may be used:

1. Is this a multi-year project with multiple TOs or will this have a single TO?
2. What experience does the utility have doing UESC projects?
3. What types of projects has the utility done in the past?
  - a. How complex were previous projects compared to current project?
  - b. What was the size and scope of the previous projects?
  - c. How was their past performance?
  - d. What are their staff qualifications?



4. Is their pricing clear?
  - a. Do they provide an explanation of fees and markups?
  - b. Do they provide expectation of payment and cost recovery for assessments?
  - c. Do they have the ability to secure financing at reasonable terms?
5. What is the AF's history and experience with the utility?

### 5.1.2 Phase 2: Project Development

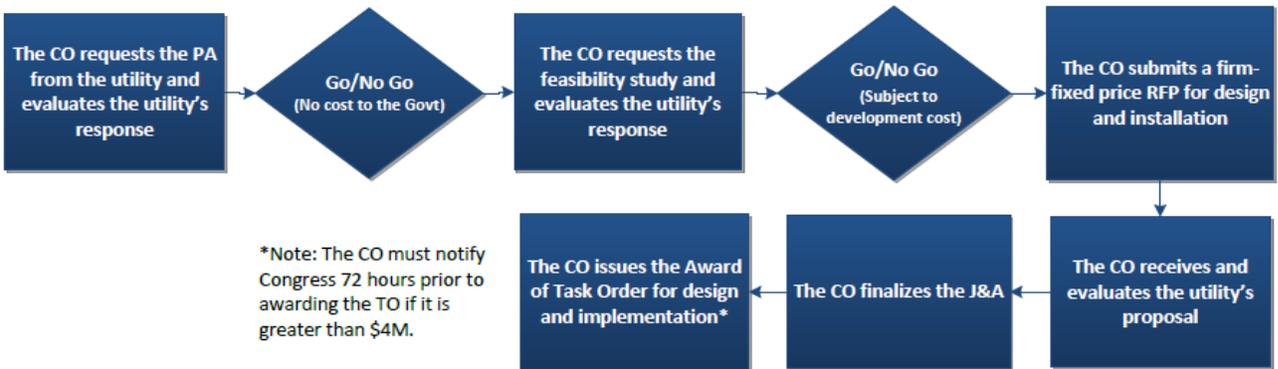


Figure 3 Phase 2: Project Development

#### Step 10: The CO requests a PA from the utility and evaluates the utility's response.

The PA is a high-level assessment that:

1. Provides a baseline for existing conditions.
2. Identifies potential water and energy efficiency and renewable energy opportunities.
3. Estimates the cost to implement the opportunities.

The CO develops a Master Agreement Exhibit "C", checks the appropriate box and provides details of specific base requirements. The Master Agreement Exhibit "C" must be signed by the utility representative and CO. Typically, a PA is at no cost to the government. If there is a cost to the government, the cost should be negotiated with the utility and included in the Master Agreement Exhibit "C".

Note: If a long-term project or multiple projects are anticipated, use the [EMSA](#). The EMSA is a template for developing a Master Agreement Exhibit "C" and contains terms and conditions essential to a UESC. It can be used to issue single or multiple TOs for the four phases:

1. Preliminary Audit
2. Feasibility Study
3. Engineering/Design
4. Construction/Implementation

If the EMSA is not used, each phase will have a separate Master Agreement Exhibit "C".



Once the utility completes the PA and delivers a proposal, the Energy Team reviews the proposal and provides written comments to the CO. A government-only meeting and/or teleconference is held to discuss the comments and determine if recommended measures will be pursued in a FS. The CO ensures all parties have reviewed the proposal. Once AFCEC/CND approves, the CO prepares authorization for the utility to begin an FS.

Note: If the government decides to terminate at this point and the PA costs were negotiated, the CO documents the decision and provides an invoice to pay the utility.

**Step 11: The CO requests the FS and evaluates the utility's response.**

Unless the EMSA was used at the PA, the CO develops a Master Agreement Exhibit "C" and checks the appropriate box for the FS. The CO clarifies the ECMs from the PA to be included and negotiates the development cost of the FS prior to obtaining signatures. If financing, the cost is rolled into the next phase. The CO may require that the development cost of the FS be obligated before proceeding to that step.

The FS is a detailed analysis that:

1. Identifies and describes a technically viable and cost-effective project scope.
2. Develops a baseline of energy and water consumption, equipment inventory and conditions, and operational schedules.
3. Provides a plan for training, O&M, and performance assurance.
4. Provides a project design sufficient to support a firm-fixed price for design and implementation (D&I).

The utility should provide a detailed, open-book cost estimate with the FS.

Note: The FS is commonly referred to as an "Investment Grade Audit" (IGA).

The utility completes an in-depth FS of the selected ECMs and delivers a feasibility proposal to the Energy Team. The Energy Team reviews the proposal and provides written comments to the CO to consolidate. Prior to sending comments to the utility, a government-only meeting and/or teleconference is held to discuss the consolidated comments and determine if recommended measures will advance to the Engineering/Design phase. The CO ensures all parties have reviewed the proposal. Once AFCEC/CND approves, the CO prepares authorization for the utility to begin an engineering/design study.

Note: If the government decides to terminate the FS at this point, the CO documents the decision and provides invoice to pay the negotiated FS costs.

Note: If the installation requests to cancel the project after the completion of the FS, the installation must provide a letter of cancellation to the AFCEC/CND Program Manager on the installations letterhead detailing the reason for the requested termination of the project. The letter is required to be signed by the BCE and can be transmitted electronically.

**Steps 12 & 13: The CO submits a firm-fixed price Request for Proposal (RFP) for design and Energy Team evaluates the utility's proposal.**



The CO sends a letter requesting a firm-fixed price for D&I. The utility responds with the following information:

1. A letter showing the firm-fixed price offer.
2. An updated design schedule.
3. An updated installation schedule.
4. Finalized financing terms.

**Step 14: The installation CO finalizes the J&A.**

Refer to the [Justification and Approval for Other Than Full and Open Competition](#) form for an example.

**Step 15: The installation CO issues the Award of Task Order for design and implementation.**

The award letter:

1. States the TO executes a contract under the AWC.
2. Provides authorization to proceed with the project.
3. Lists attachments, which include:
  - a. Scope of work, specifications, and performance standards.
  - b. Terms and conditions.
  - c. Agency-specific clauses not in AWC or Master Agreement Exhibit "C".
  - d. Templates for invoicing, price schedule and termination schedule.
4. Requests confirmation or update of schedule for D&I.
5. Sets time and location for kick-off meeting.
6. Provides name and contact information of the CO and the COTR.

Refer to the [Task Order Sample](#) for an example TO.

UESCs are subject to the requirements of part 17.1 of the FAR, which requires federal agencies to notify Congress at least 30 days prior to the award of certain proposed multiyear contracts. FAR part 17.1 establishes the Congressional notification requirement for multiyear contracts that include a cancellation ceiling in excess of \$125 million. See 48 C.F.R. § 17.108(b). The Congressional notification requirement need not be burdensome or result in undue delay. Notification can be provided when a reasonable estimate of the underlying project's cancellation ceiling is obtained, which generally occurs well in advance of contract award. Such early notification may also be provided on a periodic basis (e.g., semiannually, quarterly, etc.) and for multiple UESCs.



### 5.1.3 Phase 3: Final Design and Construction/Installation

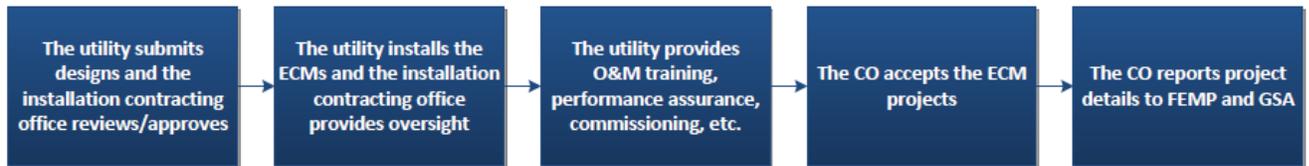


Figure 4 Phase 3: Final Design and Construction/Installation

#### **Step 16: The utility submits engineering designs and the CO reviews/approves.**

The CO develops the Master Agreement Exhibit “C” and checks the appropriate box for ECP Engineering/Design Study and clarifies the ECMs from the FS proposal. The CO directs the use of all appropriate AF design and construction standards and negotiates the development cost for engineering/design prior to obtaining signatures. If financing, the development costs are rolled into the TO.

The utility provides the final design, plans, and specifications with detailed pricing consistent with the FS and provides a final proposal to the Energy Team. The Energy Team reviews the final proposal and provides written comments to the CO to consolidate. Prior to sending comments to the utility, a government-only meeting and/or teleconference is held to discuss consolidated comments and determine if recommended measures will progress to the construction/installation phase. The utility addresses the consolidated comments. The Energy Team reviews the comments and determines if a TO should be issued for the construction phase. The CO negotiates any revisions and prepares internal documentation required prior to award.

The utility submits a final proposal with all negotiated changes and the final financing schedule. Once internal approval is obtained, the CO awards the TO and provides copies to AFCEC/CND. The CO provides a copy of the TO award with the executed Master Agreement Exhibit “C” to the GSA regional office within 30 days after execution.

#### **Steps 17 & 18: The utility constructs/installs the ECMs and the installation CO and COTR provides oversight. The utility provides O&M training, performance assurance, commissioning, etc.**

During construction/installation, AF oversight is critical. Due diligence requires the AF to trust and verify to ensure the installed ECMs meet design and performance requirements.

The utility begins construction/installation in accordance with (IAW) the TO. Once the utility performs the work, prior to government acceptance, the utility will provide:

1. ECM training
2. O&M manuals
3. As-built drawings/specifications
4. Testing of each ECM IAW the commissioning plan.

The BEM or COTR witnesses the utility’s commissioning activities.



Note: If no award is made, the CO documents the decision and provides an invoice to pay the negotiated engineering/design costs.

**Steps 19 & 20: The CO accepts the ECM projects and reports project details to FEMP and GSA.**

After all of the ECMs are installed, tested, and commissioned and all deliverables are received, the CO signs a Certificate of Completion that includes a checklist and statement allowing payments to begin.

**5.1.4 Phase 4: Post Project Installation**

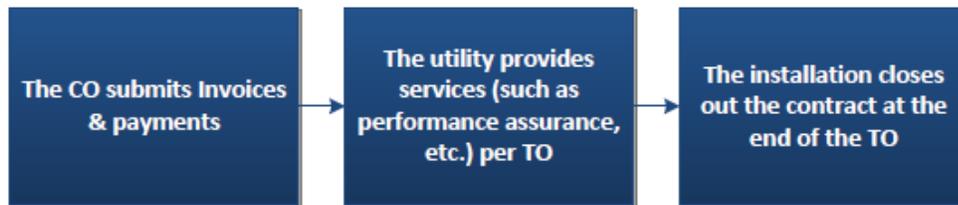


Figure 5 Phase 4: Post Project Installation

**Step 21: The CO submits invoices & payments.**

Timely payment to the utility is critical. Payment frequency is defined in the TO. Invoices can be paid as part of the utility bill. Payments should be made using proper accounting, budgeting, and invoicing procedures.

**Step 22: The utility provides services (such as performance assurance, etc.) per the TO.**

The performance assurance plan prescribes the post-acceptance activities, i.e., AF responsibilities and utility responsibilities.

Reporting should be done IAW the performance assurance plan and FEMP/GSA guidelines. GSA and FEMP must be notified of the TO award. The notification includes:

1. Report on the use of AWC and service agreements including the Authorization for Energy Management Services.
2. FEMP UESC Data Collection.
3. Annual Agency reports include UESC project information.

**Step 23: The installation closes out the contract at the end of the TO.**

Note: AFCEC/CND reserves the right to use the Defense Logistics Agency-Energy (DLA-Energy) as the contracting office for UESC projects.



## Chapter 6 UESC Business Practices

The following business practices help the installation implement a UESC, translate the legislative requirements, and apply the lessons learned to achieve a successful ECM. Each TO includes mutually agreed upon procedures defining how to verify ECM performance post-installation.

### 6.1 Baseline Development

An energy baseline is the amount of energy that would have been used if no energy conservation equipment had been installed. The utility contractor must clearly document the baseline data.

M&V is part of a UESC contract, metering and data collection are performed by the utility contractor and verified by the installation to ensure the baseline reflects realistic energy consumption upon which the savings calculations are based. Data collection requirements vary by ECP and M&V method, but metered data is required for weather-impacted ECPs. Existing meters should be used as much as possible to collect this data. The M&V plan must be measurement-based. If the utility contractor and AFCEC/CND determine that model by simulation is the only valid methodology, the models must be validated/calibrated by the utility contractor and verified by installation personnel. Refer to the [AFCEC Guide to M&V Activities](#) for more information on M&V requirements.

Note: It is important that equipment controlled by ambient temperature devices have valid measurements. Savings validation and future baseline adjustments will require this data before modifications can be applied to the existing baseline.

All assumptions made in the preliminary audit should be validated in the FS by the utility contractor. Validation includes documenting all pertinent data and formulas used to compute the energy savings so the BEM can easily explain these savings in the future. AFCEC/CND review and endorsement of the baseline is required.

### 6.2 Performance Tests

A performance test is a process for achieving, verifying, and documenting the performance of equipment installed or modified as part of an ECP. This process begins in the FS phase with the development and approval of a performance test plan that is implemented after the TO award. Performance tests are completed post construction to certify that all equipment is functioning and operating properly. The results are approved by AFCEC/CND before conducting the energy savings verification tests.

A performance test plan is developed as part of the FS phase and is prepared for each ECP. The performance test plan describes all aspects of the test process, including:

1. Schedules
2. Responsibilities
3. Documentation requirements
4. Functional performance test requirements

The functional performance tests describe:

1. The conditions or loads the tests are performed.



2. The location of test sensors.
3. The frequency of measurements.
4. The type of test equipment.
5. The test methods.
6. The acceptable range of results.

The level of detail depends on the complexity of the ECP. The performance test plan is detailed enough so the installation knows exactly what tests will be performed, prior to signing the TO award.

The final acceptance report is submitted after all functional performance tests are completed. The final acceptance report is submitted for approval in writing to the CO and BEM. The final acceptance report includes:

1. The executive summary.
2. ECP descriptions.
3. The performance plan.
4. Test results.

The CO approves the performance test results after coordination and verification of results by the BEM.

### **6.3 Energy Savings Validation**

A formal set of test procedures with the acceptable range of results are developed to validate energy savings. These test procedures are submitted by the utility contractor during the FS and approved before awarding the TO. The test procedures describe:

1. The conditions or loads for the tests being performed.
2. The location of test sensors.
3. The frequency of measurements.
4. The type of test equipment used.
5. Test methods.
6. The acceptable range of test results.

The test procedures shall verify all energy savings intended under the ECP/ECM.

After the BEM/CO approves the performance test results for each ECP, the utility contractor performs the approved energy savings test procedures to validate the energy savings for each ECP.

Once the validated energy savings have been approved for all ECPs, the utility contractor submits an invoice for payment the first full month after acceptance of the ECM.



## 6.4 Annual Reconciliation Plan (Audit of Savings)

Each ECM in the TO has, at a minimum, a detailed annual reconciliation plan approved before the TO award. The plan describes:

1. A formal set of test procedures.
2. An acceptable range of results.
3. A schedule of how reconciliation payments will be assessed if savings fall below the guarantee.
4. A certification by the utility that all O&M requirements and conditions have been met for each ECP in the TO.

The procedures should be similar to those developed to validate energy savings. The purpose is to test, validate, and document the energy savings. The CO must approve the annual reconciliation of savings after coordination and verification of savings by the BEM.

## 6.5 Maintenance Related to the TO

Maintenance is the responsibility of the BCE. Similar to a construction contract, the Utility is responsible for a 1-year warranty period, unless other conditions are negotiated. Refer to section [2.3.4 Maintenance Responsibilities](#) for more information.

## 6.6 Pricing of TO Work

The BEM/CO requests that the utility company provide detailed documentation needed to determine the reasonableness of the price. Utility company estimates for each ECP identify all major costs, including:

- a. Equipment
- b. Labor
- c. Design
- d. Maintenance
- e. Repair
- f. Parts
- g. Overhead and profit
- h. Travel
- i. M&V, as required in the ECP

The government prepares an independent government estimate (IGE).

Ancillary savings are any savings attributable to the project other than energy savings, such as manpower, materials, or eliminating contract-operated functions. Maintenance, repair, or operations costs for tasks currently being performed by the government or government contractor are ancillary savings if the utility:

1. Assumes the tasks
2. Reduces the tasks
3. Eliminates the tasks.



Savings must be real and verifiable. The BEM determines whether a utility-proposed task elimination or reduction would be considered an ancillary savings available for sharing. The AF provides the dollar value of the ancillary savings.

Government civilian positions must be deleted from the official manpower rosters before related savings are added to the UESC proposal. The BEM/CO must work the request through AFCEC/CND and Air Staff so the funds can be reprogrammed to the UESC account. A provision is included in the package to capture the lost manning in at least one Program Objective Memorandum (POM) cycle prior to the end of the UESC TO.

Note: O&M funds may need to be expended to pay the utility until the reprogramming action is completed.

The final negotiated savings shall be applied to the UESC contract. The cost of elimination contract-operated functions are not negotiated until after TO award. These costs are estimated and added into the TO.

## **6.7 Equipment Ownership**

Generally, the AF owns the equipment post-construction and must update real property records to show ownership of the utility installed equipment. The utility is required to provide to the AF, prior to contract completion, O&M manuals, maintenance training, and the Material Inspection and Receiving Report (DD-250 Form). However, due to taxes and/or rebates, occasionally the utility retains ownership post-construction. In either case, the ownership determination is defined and agreed upon within the TO.



## Appendix A - Acronym List

Acronym	Definition
AF	Air Force
AFCEC/CND	Air Force Civil Engineer Center, Energy Program Development Division
AFPD	Air Force Policy Directive
AWC	Area-wide Contract
BCE	Base Civil Engineer
BEM	Base Energy Manager
BFM	Base Financial Managers
BOA	Basic Ordering Agreements
BPA	Bonneville Power Administration
CE	Civil Engineer
CFR	Code of Federal Regulations
CICA	Competition in Contracting Act
CO	Contracting Officer
COTR	Contracting Officer Technical Representative
D&I	Design and Implementation
DLA	Defense Logistics Agency
DO	Delivery Order
DoD	Department of Defense
DoE	Department of Energy
ECIP	Energy Conservation Investment Program
ECM	Energy Conservation Measure
ECP	Energy Conservation Project
EISA	Energy Independence and Security Act
EMSA	Energy Management Service Contract
EO	Executive Order
ESCO	Energy Services Company
ES&H	Environmental, Safety & Health
ESPC	Energy Savings Performance Contract
ETL	Engineering Technical Letter
FAR	Federal Acquisition Regulation
FEMP	Federal Energy Management Program
FFP	Firm Fixed Price
FIO	Facilities Improvements Office
FS	Feasibility Study
GHG	Greenhouse Gas
GSA	General Services Administration
HAZMAT	Hazardous Material
HMI	Human Machine Interface
IAW	In Accordance With
IES	Illuminating Engineering Society
IGA	Investment Grade Audit
IGE	Independent Government Estimate
IPMVP	International Performance Measurement and Verification Protocol
J&A	Justification and Approval
JB	Joint Base
M&O	Maintenance and Operations
M&V	Measurement and Verification
MFH	Military Family Housing
MILCON	Military Construction
NAF	Non-appropriated Fund
NIST	National Institute of Standards and Technology
O&M	Operations and Maintenance



Acronym	Definition
ODC	Ozone Depleting
ORCA	Online Representation and Certifications Application
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PGI	Procedures, Guidance and Information
P.L.	Public Law
PLC	Programmable Logic Controller
PMO	Project Management Office
POM	Program Objective Memorandum
QAE	Quality Assurance Evaluator
RFP	Request for Proposal
SOW	Statement of Work
SRM	Sustainment, Restoration and Modernization
TO	Task Order
U.S.C.	United States Code
UESC	Utility Energy Service Contracts



## Appendix B - References and Master List of Links

Section	Type	Name of Item Linked	Link
Chapter 2, 4, Justification and Approval for Other Than Full and Open Competition	External	10 U.S.C. 2913	<a href="https://www.gpo.gov/fdsys/pkg/USCODE-2010-title10/pdf/USCODE-2010-title10-subtitleA-partIV-chap173-subchapl-sec2913.pdf">https://www.gpo.gov/fdsys/pkg/USCODE-2010-title10/pdf/USCODE-2010-title10-subtitleA-partIV-chap173-subchapl-sec2913.pdf</a>
Chapter 2	External	10 United States Code (U.S.C.) 2911-13, Energy Performance Goals and Plans for Department of Defense	<a href="https://www.gpo.gov/fdsys/granule/USCODE-2010-title10/USCODE-2010-title10-subtitleA-partIV-chap173-subchapl-sec2911">https://www.gpo.gov/fdsys/granule/USCODE-2010-title10/USCODE-2010-title10-subtitleA-partIV-chap173-subchapl-sec2911</a>
Chapter 2	External	E.O. 13423, Strengthening Federal Environmental, Energy, and Transportation Management	<a href="https://www.fedcenter.gov/programs/eo13423/">https://www.fedcenter.gov/programs/eo13423/</a>
Chapter 2, Justification and Approval for Other Than Full and Open Competition	External	E.O. 13693, Planning for Federal Sustainability in the Next Decade	<a href="https://energy.gov/lm/downloads/executive-order-13693-planning-federal-sustainability-next-decade">https://energy.gov/lm/downloads/executive-order-13693-planning-federal-sustainability-next-decade</a>
Chapter 2	External	E.O. 13514, Federal Leadership in Environmental, Energy, and Economic Performance	<a href="https://www.fedcenter.gov/programs/eo13514/">https://www.fedcenter.gov/programs/eo13514/</a>
Chapter 2, Justification and Approval for Other Than Full and Open Competition	External	Public Law (P.L.) 109-58, Energy Policy Act of 2005	<a href="https://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf">https://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf</a>
Chapter 2	External	10 Code of Federal Regulations (CFR) 436, Federal Energy Management and Planning Programs (10 CFR 436.18-19)	<a href="https://www.gpo.gov/fdsys/search/pagedetails.action?collectionCode=CFR&amp;rowsePath=Title+10%2FChapter+II%2FSubchapter+D%2FPart+436%2FSubpart+A%2FSection+436.18&amp;granuleId=CFR-2002-title10-vol3-sec436-18&amp;packageId=CFR-2002-title10-vol3&amp;collapse=true&amp;fromBrowse=true">https://www.gpo.gov/fdsys/search/pagedetails.action?collectionCode=CFR&amp;rowsePath=Title+10%2FChapter+II%2FSubchapter+D%2FPart+436%2FSubpart+A%2FSection+436.18&amp;granuleId=CFR-2002-title10-vol3-sec436-18&amp;packageId=CFR-2002-title10-vol3&amp;collapse=true&amp;fromBrowse=true</a>
Chapter 2	External	Energy Independence and Security Act (EISA) of 2007	<a href="https://www.gpo.gov/fdsys/pkg/PLAW-110publ140/pdf/PLAW-110publ140.pdf">https://www.gpo.gov/fdsys/pkg/PLAW-110publ140/pdf/PLAW-110publ140.pdf</a>



Section	Type	Name of Item Linked	Link
Chapter 2, Justification and Approval for Other Than Full and Open Competition	External	10 U.S.C. 2866, Water Conservation at Military Installations	<a href="https://www.law.cornell.edu/uscode/text/10/2866">https://www.law.cornell.edu/uscode/text/10/2866</a>
Chapter 2	External	Air Force Policy Directive (AFPD) 32-10, Installations and Facilities	<a href="http://static.e-publishing.af.mil/production/1/af_a4_7/publication/afpd32-10/afpd32-10.pdf">http://static.e-publishing.af.mil/production/1/af_a4_7/publication/afpd32-10/afpd32-10.pdf</a>
Chapter 2	Bookmark	2.3.5 Annual Reconciliation	Bookmarked to Section 2.3.5 Annual Reconciliation
Chapter 2, 4, 5	Internal	GSA Utility Contractors list	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/GSA%20Utility%20Contractors%20List.doc">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/GSA%20Utility%20Contractors%20List.doc</a>
Chapter 2	Bookmark	Risk/Responsibility Checklist	Bookmarked to the Risk/Responsibility Checklist
Chapter 2	External	42 U.S.C. 8287, Section 801(a)(2)(A)	<a href="https://www.gpo.gov/fdsys/pkg/USCODE-2010-title42/html/USCODE-2010-title42-chap91-subchapVII.htm">https://www.gpo.gov/fdsys/pkg/USCODE-2010-title42/html/USCODE-2010-title42-chap91-subchapVII.htm</a>
Chapter 2	External	42 U.S.C. 8287; Section 801(a)(2)(B)	<a href="https://www.gpo.gov/fdsys/pkg/USCODE-2010-title42/html/USCODE-2010-title42-chap91-subchapVII.htm">https://www.gpo.gov/fdsys/pkg/USCODE-2010-title42/html/USCODE-2010-title42-chap91-subchapVII.htm</a>
Chapter 2	External	10 CFR 436, Federal Energy Management and Planning Programs	<a href="https://www.gpo.gov/fdsys/granule/CFR-1999-title10-vol3/CFR-1999-title10-vol3-part436">https://www.gpo.gov/fdsys/granule/CFR-1999-title10-vol3/CFR-1999-title10-vol3-part436</a>
Chapter 2	External	10 CFR 436.14	<a href="https://www.gpo.gov/fdsys/granule/CFR-2011-title10-vol3/CFR-2011-title10-vol3-sec436-14">https://www.gpo.gov/fdsys/granule/CFR-2011-title10-vol3/CFR-2011-title10-vol3-sec436-14</a>
Chapter 2	External	Life Cycle Costing Manual for the Federal Energy Management Program (National Institute of Standards and Technology [NIST] 85-3273)	<a href="https://energy.gov/eere/femp/building-life-cycle-cost-programs">https://energy.gov/eere/femp/building-life-cycle-cost-programs</a>
Chapter 2	Bookmark	6.5 Maintenance Related to the TO	Bookmarked to Section 6.5 Maintenance Related to the TO
Chapter 2	External	Title 10 USC § 2913(d)(3)	<a href="http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title10-section2913&amp;num=0&amp;edition=prelim">http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title10-section2913&amp;num=0&amp;edition=prelim</a>
Chapter 2	External	Purpose Act (31 U.S.C. 1301)	<a href="https://www.gpo.gov/fdsys/granule/USCODE-2010-title31/USCODE-2010-title31-subtitleI-chap13-subchapl-sec1301">https://www.gpo.gov/fdsys/granule/USCODE-2010-title31/USCODE-2010-title31-subtitleI-chap13-subchapl-sec1301</a>
Chapter 3, 5	Internal	Considerations for the BEM	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/UESC%20Considerations%20for%20the%20BEM.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/UESC%20Considerations%20for%20the%20BEM.docx</a>
Chapter 4, 5	External	FAR 6.302.5	<a href="http://www.farmaster.com/farmaster/data/idx/FAR84/0603020005.htm">http://www.farmaster.com/farmaster/data/idx/FAR84/0603020005.htm</a>
Chapter 4, 5	Internal	Justification and Approval for Other Than Full and Open Competition	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/JandA%20Form.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/JandA%20Form.docx</a>



Section	Type	Name of Item Linked	Link
Chapter 4, Justification and Approval for Other Than Full and Open Competition	External	FAR 16.703	<a href="https://www.acquisition.gov/far/html/Subpart%2016_7.html">https://www.acquisition.gov/far/html/Subpart%2016_7.html</a>
Chapter 4	External	DFARS 216.703	<a href="http://www.acq.osd.mil/dpap/dars/dfars/html/current/216_7.htm">http://www.acq.osd.mil/dpap/dars/dfars/html/current/216_7.htm</a>
Chapter 4	External	Procedures, Guidance and Information (PGI) 217.703(d)	<a href="http://www.acq.osd.mil/dpap/dars/dfars/html/current/216_7.htm">http://www.acq.osd.mil/dpap/dars/dfars/html/current/216_7.htm</a>
Chapter 4, 5	Internal	EMSA	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/MODEL%20AGREEMENT.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/MODEL%20AGREEMENT.docx</a>
Chapter 4	Bookmark	UESC Planning Checklist	Bookmarked to the UESC Planning Checklist
Chapter 5	Internal	Sample SOW	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/Sample_SO_W.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/Sample_SO_W.docx</a>
Chapter 5	External	10 USC 2304(c)(5)	<a href="http://uscode.house.gov/view.xhtml?req=10+USC+2304%28c%29%285%29&amp;f=treesort&amp;fq=true&amp;num=22&amp;hl=true&amp;edition=prelim&amp;granuleId=USC-prelim-title10-section2304c">http://uscode.house.gov/view.xhtml?req=10+USC+2304%28c%29%285%29&amp;f=treesort&amp;fq=true&amp;num=22&amp;hl=true&amp;edition=prelim&amp;granuleId=USC-prelim-title10-section2304c</a>
Chapter 5	External	Competition in Contracting Act (CICA)	<a href="http://www.cohenseglias.com/federal-contracting-database/competition-in-the-contracting-act">http://www.cohenseglias.com/federal-contracting-database/competition-in-the-contracting-act</a>
Chapter 5	Internal	Task Order Sample	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/UESC%20Task%20Order%20Sample.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/UESC%20Task%20Order%20Sample.docx</a>
Chapter 6	Internal	AFCEC Guide to M&V Activities	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/AFCEC%20Guide%20to%20MandV%20Activities.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/AFCEC%20Guide%20to%20MandV%20Activities.docx</a>
Chapter 6	Bookmark	2.3.4 Maintenance Responsibilities	Bookmarked to Section 2.3.4 Maintenance Responsibilities
AFCEC Guide to Annual M&V Activities	External	Guide to Government Witnessing and Review of Post-Installation and Annual M&V Activities	<a href="https://www.energy.gov/eere/femp/downloads/guide-government-witnessing-and-review-measurement-and-verification-activities">https://www.energy.gov/eere/femp/downloads/guide-government-witnessing-and-review-measurement-and-verification-activities</a>
AFCEC Guide to Annual M&V Activities	External	Reviewing Post-Installation and Annual Reports for Federal ESPC Projects	<a href="https://energy.gov/eere/femp/downloads/reviewing-post-installation-and-annual-reports-federal-espc-projects">https://energy.gov/eere/femp/downloads/reviewing-post-installation-and-annual-reports-federal-espc-projects</a>
AFCEC Guide to Annual M&V Activities	External	FEMP webpage	<a href="https://energy.gov/eere/femp/federal-energy-management-program">https://energy.gov/eere/femp/federal-energy-management-program</a>
UESC Considerations for the BEM	Internal	AFCEC Guide to M&V Activities	<a href="https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/AFCEC%20Guide%20to%20MandV%20Activities.docx">https://cs2.eis.af.mil/sites/10041/CEPlaybooks/UESC/References/AFCEC%20Guide%20to%20MandV%20Activities.docx</a>
Justification and Approval for Other Than Full and Open Competition	External	10 U.S.C. 2913 (D)(3)	<a href="https://www.gpo.gov/fdsys/pkg/USCODE-2010-title10/pdf/USCODE-2010-title10-subtitleA-partIV-chap173-subchapl-sec2913.pdf">https://www.gpo.gov/fdsys/pkg/USCODE-2010-title10/pdf/USCODE-2010-title10-subtitleA-partIV-chap173-subchapl-sec2913.pdf</a>



Section	Type	Name of Item Linked	Link
EMSA/Model Agreement	External	48 CFR 9.404	<a href="https://www.law.cornell.edu/cfr/text/48/9.404">https://www.law.cornell.edu/cfr/text/48/9.404</a>
EMSA/Model Agreement	External	FAR, Part 36, Subpart 36.511	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2036_5.html">https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2036_5.html</a>
EMSA/Model Agreement	External	FAR, Part 52, Subpart 52.301	<a href="https://www.gpo.gov/fdsys/granule/CFR-2011-title48-vol2/CFR-2011-title48-vol2-sec52-301">https://www.gpo.gov/fdsys/granule/CFR-2011-title48-vol2/CFR-2011-title48-vol2-sec52-301</a>
EMSA/Model Agreement	External	Energy Prices and Discount Factors for Life-Cycle-Cost Analysis	<a href="http://nvlpubs.nist.gov/nistpubs/ir/2017/NIST.IR.85-3273-32.pdf">http://nvlpubs.nist.gov/nistpubs/ir/2017/NIST.IR.85-3273-32.pdf</a>
EMSA/Model Agreement	External	FAR 52.203-3, Gratuities	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_200_206.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_200_206.html</a>
EMSA/Model Agreement	External	FAR 52.203-5, Covenant Against Contingent Fees	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_200_206.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_200_206.html</a>
EMSA/Model Agreement	External	FAR 52.203-7, Anti-Kickback Procedures	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_200_206.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_200_206.html</a>
EMSA/Model Agreement	External	FAR 52.222-3, Convict Labor	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_222.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_222.html</a>
EMSA/Model Agreement	External	FAR 52.222-25, Affirmative Action Compliance	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_222.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_222.html</a>
EMSA/Model Agreement	External	FAR 52.222-26, Equal Opportunity	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_222.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_222.html</a>
EMSA/Model Agreement	External	FAR 52.223-6, Drug Free Workplace	<a href="https://www.law.cornell.edu/cfr/text/48/52.223-6">https://www.law.cornell.edu/cfr/text/48/52.223-6</a>
EMSA/Model Agreement	External	FAR 52.233-1, Disputes	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_233_240.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_233_240.html</a>
EMSA/Model Agreement	External	FAR Part 52, Subpart 52.246-20	<a href="https://www.govregs.com/regulations/title48_chapter1_part52_subpart52.2_section52.246-20">https://www.govregs.com/regulations/title48_chapter1_part52_subpart52.2_section52.246-20</a>
EMSA/Model Agreement	External	FAR Part 32, Subpart 32.903	<a href="http://federal.elaws.us/cfr/title48.part32.section32.903">http://federal.elaws.us/cfr/title48.part32.section32.903</a>
EMSA/Model Agreement	External	FAR Part 32, Subpart 32.907	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2032_9.html#wp1033041">https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2032_9.html#wp1033041</a>
EMSA/Model Agreement	External	FAR Part 33, Subpart 33.2	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2033_2.html">https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2033_2.html</a>
EMSA/Model Agreement	External	FAR Part 36, Subpart 36.502	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2036_5.html#wp1076711">https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2036_5.html#wp1076711</a>
EMSA/Model Agreement	External	FAR Part 42, Subpart 42.13	<a href="https://www.law.cornell.edu/cfr/text/48/part-42/subpart-42.13">https://www.law.cornell.edu/cfr/text/48/part-42/subpart-42.13</a>
EMSA/Model Agreement	External	10 USC Section 2912	<a href="https://www.law.cornell.edu/uscode/text/10/2912">https://www.law.cornell.edu/uscode/text/10/2912</a>
EMSA/Model Agreement, UESC Task Order (TO) Sample	External	FAR Part 17	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/FARTOCP17.html">https://www.acquisition.gov/sites/default/files/current/far/html/FARTOCP17.html</a>
EMSA/Model Agreement, UESC Task Order (TO) Sample	External	FAR Part 52, Subpart 52.249-2	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_248_253.html">https://www.acquisition.gov/sites/default/files/current/far/html/52_248_253.html</a>



Section	Type	Name of Item Linked	Link
EMSA/Model Agreement, UESC Task Order (TO) Sample	External	FAR Part 52, Subpart 52.232.23	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_232.html#wp1152984">https://www.acquisition.gov/sites/default/files/current/far/html/52_232.html#wp1152984</a>
EMSA/Model Agreement, UESC Task Order (TO) Sample	External	FAR Part 32, Subpart 32.8	<a href="https://www.law.cornell.edu/cfr/text/48/part-32/subpart-32.8">https://www.law.cornell.edu/cfr/text/48/part-32/subpart-32.8</a>
EMSA/Model Agreement	External	FAR Part 42, Subpart 42.12	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2042_12.html">https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2042_12.html</a>
EMSA/Model Agreement	External	FAR Part 42, Subpart 42.1204	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2042_12.html">https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2042_12.html</a>
EMSA/Model Agreement	External	42 U.S.C. §9601	<a href="https://www.law.cornell.edu/uscode/text/42/9601">https://www.law.cornell.edu/uscode/text/42/9601</a>
EMSA/Model Agreement	External	49 CFR Part 172	<a href="https://www.gpo.gov/fdsys/pkg/CFR-1998-title49-vol2/xml/CFR-1998-title49-vol2-part172.xml">https://www.gpo.gov/fdsys/pkg/CFR-1998-title49-vol2/xml/CFR-1998-title49-vol2-part172.xml</a>
EMSA/Model Agreement	External	FAR Part 52, Subparts 52.236-2	<a href="https://www.acquisition.gov/far/html/52_233_240.html#wp1113365">https://www.acquisition.gov/far/html/52_233_240.html#wp1113365</a>
EMSA/Model Agreement	External	52.236-3	<a href="https://www.acquisition.gov/sites/default/files/current/far/html/52_233_240.html#wp1113375">https://www.acquisition.gov/sites/default/files/current/far/html/52_233_240.html#wp1113375</a>
UESC Task Order (TO) Sample	External	10 CFR 851	<a href="https://www.gpo.gov/fdsys/granule/CFR-2012-title10-vol4/CFR-2012-title10-vol4-part851">https://www.gpo.gov/fdsys/granule/CFR-2012-title10-vol4/CFR-2012-title10-vol4-part851</a>
UESC Task Order (TO) Sample	External	FAR 52.246-21	<a href="http://www.farmaster.com/farmaster/data/idx/FAR84/52024600211.htm">http://www.farmaster.com/farmaster/data/idx/FAR84/52024600211.htm</a>
UESC Task Order (TO) Sample	External	FAR 52.236-13	<a href="https://www.gpo.gov/fdsys/pkg/CFR-2010-title48-vol2/pdf/CFR-2010-title48-vol2-sec52-236-13.pdf">https://www.gpo.gov/fdsys/pkg/CFR-2010-title48-vol2/pdf/CFR-2010-title48-vol2-sec52-236-13.pdf</a>
UESC Task Order (TO) Sample	External	FAR 52.228-5	<a href="http://farmaster.com/farmaster/data/idx/FAR84/5202280005.htm">http://farmaster.com/farmaster/data/idx/FAR84/5202280005.htm</a>



## Appendix C - Job Aids

### UESC Planning Checklist

UESC Planning and Document Development Checklist				
	Process Step/Resource Name	Type	Objective	
Step 1 Acquisition Planning	Agency (e.g., installation) develops initial SOW and submits all proposed UESC projects to AFCEC/CND as PMO for initial vetting prior to any UESC engagement with the utility provider.	Sample	<input type="checkbox"/> Ensure the Agency obtains AFCEC approval to start an UESC prior to any UESC engagement with the utility provider.	
	Acquisition Strategy/Planning <input type="checkbox"/> Limited Acquisition Plan	Template	<input type="checkbox"/> Establishes the agency's strategy for the acquisition of the project.	
	Survey interest of eligible Utilities <input type="checkbox"/> Letter of Interest	Template	<input type="checkbox"/> Used to determine which servicing utilities are interested and capable.	
	Provide fair consideration to interested utilities <input type="checkbox"/> Utility Selection Evaluation Factors	Sample	<input type="checkbox"/> Detailed utility selection sample for a \$60M UESC Project.	
	Draft Initial J&A <input type="checkbox"/> J&A	Sample	<input type="checkbox"/> A sample justification to use a "limited source" contract.	
	Agency selects utility and notifies all utilities of selection <input type="checkbox"/> Utility Selection Letter	Template	<input type="checkbox"/> Notifies all serving utilities of the selection.	
Step 2 Project Development	Preliminary Assessment 2 - 4 Weeks	EMSA for PA <input type="checkbox"/> EMSA <input type="checkbox"/> Letter of Request for PA <input type="checkbox"/> PA SOW	Sample Template Template	<input type="checkbox"/> Establishes bilateral agreement for PA. <input type="checkbox"/> Cover letter for EMSA or may replace EMSA when no cost PA is offered. <input type="checkbox"/> Provides site information and expectations for PA.
		Utility Conducts PA/Agency supports and evaluates		
	Feasibility Study 4 - 8 Weeks	EMSA for FS <input type="checkbox"/> EMSA <input type="checkbox"/> Letter of Request for FS <input type="checkbox"/> FS SOW <input type="checkbox"/> Performance Assurance Plan <input type="checkbox"/> Notice to Proceed to FS <input type="checkbox"/> FAR Clauses for UESC not in AWC <input type="checkbox"/> AWC <input type="checkbox"/> EMSA under AWC <input type="checkbox"/> EMSA/Model Agreement <input type="checkbox"/> UESC Task Order	Sample Template Template Sample Sample Sample Sample	<input type="checkbox"/> Establishes bilateral agreement for FS. <input type="checkbox"/> Cover letter for EMSA. <input type="checkbox"/> Describes requirements for in-depth analysis of selected ECMs. <input type="checkbox"/> Provide to utility an attachment the FS SOW. <input type="checkbox"/> Provides instructions, contracts, and official notice to proceed with FS. <input type="checkbox"/> Lists FAR Clauses included by reference in the AWC. <input type="checkbox"/> Lists FAR clauses included in the sample EMSA. <input type="checkbox"/> Lists FAR Clauses included in the EMSA/Model Agreement. <input type="checkbox"/> Shows examples of FAR Clauses listed in sample TO.
		Utility Conducts FS/Agency Supports and evaluates		
		Agency requests FFP for D&I. <input type="checkbox"/> Letter Requesting an FFP Offer for D&I.	Template	<input type="checkbox"/> CO requests FFP offer for D&I of selected ECMs.
		Finalize J&A <input type="checkbox"/> Business Clearance Memorandum	Sample	<input type="checkbox"/> Gives recommendation for contract award with supporting documentation
		Notify Congress 72 hours before awarding TOs > \$4M		
	Award for Design and Installation 1 - 3 Weeks	Award D&I TO <input type="checkbox"/> Standard Form 26 <input type="checkbox"/> TO for D&I <input type="checkbox"/> EMSA	Sample Sample Sample	<input type="checkbox"/> FAR calls out Form 26; use form to award the contract. <input type="checkbox"/> A group of documents that make up the TO. <input type="checkbox"/> Establish bilateral agreement for D&I.



UESC Planning and Document Development Checklist				
	Process Step/Resource Name		Type	Objective
Step 3 Project Implementation	Design	3 - 8 Weeks		
	Installation	4 - 8 Weeks	Utility submits designs. Agency reviews and approves  Utility installs ECMs/Agency Monitors Utility performs/Agency receives O&M training, commissioning, etc. <input type="checkbox"/> ECM Performance Verification Checklist. Utility proves ECM Performance Agency accepts project <input type="checkbox"/> Letter of Final Acceptance. Report project details to FEMP and GSA <input type="checkbox"/> UESC Project Reporting	Sample <input type="checkbox"/> Lists items to ensure installation/performance meets design intent.  Template <input type="checkbox"/> Agency approves work performed by Utility under contract.  Template <input type="checkbox"/> Shares project details with FEMP.
Step 4 Post Acceptance	Term of the Contract	Invoices and Payments <input type="checkbox"/> Invoice Approval/Payment Process <input type="checkbox"/> UESC Invoice <input type="checkbox"/> Agency Project Announcement Implement performance assurance plan and report annual ECM savings. Close out contract at end of term.	Template Sample Sample	<input type="checkbox"/> Agency approves and pays invoice. <input type="checkbox"/> UESC sample invoice. <input type="checkbox"/> Announce project success.



### Risk/Responsibility Checklist

Risk/Responsibility Checklist				
		Risk/Responsibility Description	Does the utility have an acceptable approach to deal with the risk/responsibility?	Has AFCEC/CND assessed the utility's approach?
Financial	Interest Rates	Neither the utility nor the AF has significant control over prevailing interest rates. Interest rates will change with market conditions during all phases of the project. Higher interest rates will increase project cost, financing/project term, or both. The timing of the delivery order signing may impact the available interest rate and project cost. Clarify when the interest rate is locked in, and if it is a fixed or variable rate.		
	Energy Prices	Neither the utility nor the AF has significant control over actual energy prices. For calculating savings, the value of the saved energy may either be constant, change at a fixed inflation rate, or float with market conditions. If the value changes with the market, falling energy prices place the utility company at risk of failing to meet cost savings guarantees. If energy prices rise, there is a small risk to the AF that energy-saving goals might not be met while the financial goals are. If the value of saved energy is fixed (either constant or escalated), the AF risks making payments in excess of actual energy cost savings.		
	Construction Costs	The utility is responsible for determining construction costs and defining a budget. In a fixed-price design/build contract, the AF assumes little responsibility for cost overruns. If construction estimates are significantly greater than originally assumed, however, the utility company may find that the project or measure is no longer viable and drop it. In any design/build contract, the AF loses some design control. Clarify design standards and the design approval process (including changes) and how costs will be reviewed.		
	M&V Costs	The AF assumes the financial responsibility for M&V costs directly or through the utility. If the AF wishes to reduce M&V costs, it may do so by accepting less-rigorous M&V activities with more uncertainty in the savings estimates. Clarify what performance is being guaranteed (equipment performance, operational factors, energy cost savings) and that the M&V plan is detailed enough to satisfactorily verify it. Note: This only applies if M&V is required.		
	Delays	Both the utility and the AF can cause delays. Failure to implement a viable project in a timely manner costs the agency in the form of lost savings, and can add costs to the project. Clarify the schedule and how delays will be handled.		
	Major Changes in Facility	The AF (or Congress) controls major changes in facility use, including closure. Clarify responsibilities in the event of a premature facility closure, loss of funding, or other major change.		



**Risk/Responsibility Checklist**

		Responsibility Description	Does the utility have an acceptable approach to deal with the risk/responsibility?	Has AFCEC/CND assessed the utility's approach?
<b>Operational</b>	<b>Operating Hours</b>	The AF generally has control over the operating hours. Increases and decreases in operating hours can show up as increases or decreases in "savings," depending on the M&V method (e.g., operating hours, improved efficiency of equipment vs. whole building, utility analysis). Clarify if operating hours are to be measured or stipulated and what the impact will be if they change. If the equipment loads are stipulated, the baseline should be carefully documented and agreed to by both parties.		
	<b>Load</b>	Equipment loads can change over time. The AF generally has control over hours of operation, conditioned floor area, and intensity of use (e.g., changes in occupancy or level of automation). Changes in load can show up as increases or decreases in "savings," depending on the M&V method. Clarify if equipment loads are to be measured or stipulated and the impact if they change. If the equipment loads are stipulated, the baseline should be carefully documented and agreed to by both parties.		
	<b>Weather</b>	A number of energy efficiency measures are affected by weather. Changes in weather can increase or decrease "savings" depending on the M&V method (e.g., equipment run hours x efficiency improvement vs. whole building utility analysis). If weather is "normalized," actual savings could be less than payments for a given year but will "average out" over the long run. Weather corrections to the baseline or ongoing performance should be clearly specified and understood.		
	<b>User Participation</b>	Many energy conservation measures require user participation to generate savings (e.g., control settings). The savings can be variable and the utility may be unwilling to invest in these measures. Clarify what degree of user participation is needed and utilize monitoring and training to mitigate risk. If performance is stipulated, document and review assumptions carefully and consider M&V to confirm the capacity to save.		



**Risk/Responsibility Checklist**

		<b>Responsibility Description</b>	<b>Does the utility have an acceptable approach to deal with the risk/responsibility?</b>	<b>Has AFCEC/CND assessed the utility's approach?</b>
<b>Performance</b>	<b>Equipment Performance</b>	Generally, the utility has control over the selection of equipment and is responsible for its proper installation and performance. The utility also has overall responsibility to demonstrate that the new improvements meet expected performance levels, including standards of service and efficiency. Clarify who is responsible for initial and long-term performance, how performance will be verified, and what will be done if performance does not meet expectations.		
	<b>Operations</b>	Responsibility for operations is negotiable, and it can impact performance. Clarify how proper operation will be assured. Clarify responsibility for operations and the implications of taking on the operation of the equipment.		
	<b>Maintenance and Repair</b>	Responsibility for maintenance and repair is negotiable; however, it is often tied to performance. Clarify how long-term maintenance and repair will be assured, especially if the party responsible for long-term performance is not responsible for maintenance. Clarify who is responsible for ECM overhaul and component or equipment repair required to maintain operational performance throughout the contract term.		
	<b>Equipment Replacement</b>	Responsibility for replacement of contractor-installed equipment is negotiable; however, it is often tied to ECM performance. Clarify who is responsible for replacing failed components or equipment throughout the term of the contract. Specifically address potential impacts on performance due to equipment failure. Life of equipment is critical to ECM performance during the contract term. Specify equipment life expected for all installed equipment and specify warranties proposed for the installed ECMs.		



## Appendix D - Guidance

### AFCEC Guide to Annual M&V Activities

1. The BEM and/or COTR witness the utility contractor's M&V activities. This requires a thorough understanding of the awarded M&V plan to ensure the utility contractor is following the agreed upon contractual methods, procedures, calculations, and other elements of the approved M&V plan.
2. FEMP has written guidance, [Guide to Government Witnessing and Review of Post-Installation and Annual M&V Activities](#), which is required when using a DoE UESC contract. The document addresses:
  - a. Witnessing baseline metering and data collection.
  - b. Post-installation M&V activities.
  - c. First-year M&V inspections and analysis.
  - d. Annual M&V inspections and analysis.
  - e. Commissioning of installed energy conservation projects/measures (ECP/ECM) by a utility.

In addition, it recommends agencies designate an individual(s) to observe these inspections, review the resulting M&V reports, and certify, in writing, that the reports are acceptable and validate the actual savings. This guidance may help the installation pass an audit.

3. FEMP has published [Reviewing Post-Installation and Annual Reports for Federal ESPC Projects](#) to assist agencies when reviewing post-installation and annual M&V reports received from the utility contractor.
4. Refer to the [FEMP webpage](#) for more information.



## UESC Considerations for the BEM

The following considerations can help the BEM implement a successful UESC project.

1. The BEM submits all proposed UESC projects to AFCEC/CND for initial vetting. Projects will only be considered when they make good business sense and are necessary to achieve energy goals. AFCEC/CND approves each stage of the project and assists in awarding and administering the TO.
2. Though the utility company brings technical energy expertise to the installation's energy program, the BEM should have a plan to improve the energy efficiency of the buildings, and determine how to most efficiently plan and schedule the work to be accomplished. Ask local facility managers and operations staff for ideas on improving their building's operational characteristics. The local staff often knows what equipment is failing or not operating properly due to design defects, age, or other factors. Keep in mind the overall energy goals. UESCs are not meant to be used as "wish lists" for building managers, nor are they opportunities for contractors to only choose the most profitable projects, leaving the less-economical work for others. If that happens, the other work will never be completed, and installations will be saddled with undesirable systems in their present condition.
  - a. The utility company's costs and overhead will be greater for widely-scattered buildings than it will be for facilities that are clustered together. Structure packages of buildings to take maximum advantage of project economics. Include the less-desirable projects with the more attractive projects, and ensure that the utility company takes them as a package. Use the attractive savings from rapid payback projects, such as lighting retrofits, to help support and subsidize the less-economical work, such as chiller and cooling tower replacement.
  - b. Do not accept a preliminary report that addresses only technology that the utility company elected to consider. If the BEM is interested in the viability of a specific technology, and the UESC contractor states that the proposed technology is not economical, request the contractor explain why in writing.
3. Use a multidisciplinary team to evaluate proposals. Consider the cost of maintenance and repairs after equipment is installed and items such as the equipment's noise level. Each ECP should be evaluated on a life-cycle cost basis and energy-efficient or "Energy Star" equipment should be used in the project where possible.
4. Where practicable, consider having building energy management or advance pulse interval metering and load profile data recording devices installed as part of the contract. It is often difficult to assign energy savings value to such equipment, so be prepared for these issues. The importance of having advanced metering technology available for obtaining the best energy procurement prices cannot be overstated.
5. Ensure a clear understanding with the UESC contractor regarding expectations and goals.
6. Keep the terms and provisions of the UESC TO as straightforward and clear as possible, without, for example, all sorts of added O&M savings or escalators for cost of fuel and services. Look at each ECM and determine how it contributes to the overall project, including its length of payoff and the impact of its removal or inclusion on the overall project economics. Make the appropriate business trade-offs and establish an optimal scope of work for the project. A project



may be modified later to include some O&M savings to accomplish a desired goal; however, before making this kind of modification, make sure the O&M savings are real and can be demonstrated to be obtainable.

7. Obtain load profiles and tour the building during peak energy use and make observations about the operation of energy-using equipment. Determine if any equipment use or power loads can be shifted to a non-peak period of energy use. If not, explore peak shaving, thermal load shifting, and other means of saving energy and costs that could be used to cut expenses. Consider using automated building management systems and timed-out electronic locks on non-essential equipment so it cannot be operated during periods of peak demand.
8. The importance of coordination cannot be overstated. Pay attention to detail and follow-up on everything. Be sure to involve installation engineering, AFCEC/CND, construction, contracting, finance, and legal functions before awarding the TO.
9. Coordinate with the local utility service providers. If you are considering a project that would allow you to go from a firm natural gas service rate to an interruptible service rate, check first to make sure an interruptible service rate is available or that one can be obtained from another service provider.
10. A common area of contention is the contract language addressing M&V issues. Make sure there is a clear understanding and clear contract language addressing how much M&V is to be performed, if required by the contract. Become familiar with the latest version of the IPMVP and make use of the M&V protocols in your contract. The [AFCEC Guide to M&V Activities](#) provides guidance and links to additional guidance on witnessing baseline, post-installation, first-year, and annual M&V inspections and analyses, as well as commissioning installed equipment. After construction completion and acceptance, the BEM and/or COTR will provide the date of construction acceptance to AFCEC/CND.
11. All MFH ECPs should be thoroughly evaluated against future MFH renovations or new housing initiatives for possible reduction or elimination of projected UESC savings. When ECM savings are eliminated or greatly reduced, a buyout may be required. The installation programming function should include the cost of the ECP buyout on DoD form (DD) 1391, Military Construction Project Data. Before proceeding with any UESC project in MFH, coordinate with the installation housing office and the Office of the Civil Engineer, Housing Division (A7/A7CH) to identify and eliminate any potential conflict with current or planned MFH projects.



## JUSTIFICATION AND APPROVAL FOR OTHER THAN FULL AND OPEN COMPETITION

1. **Contracting Activity:** (FACILITY NAME), ATTN: \_\_\_\_\_  
(LOCATION) \_\_\_\_\_
2. **Description of Action:** This action will establish a new Basic Ordering Agreement (BOA) between the (SITE NAME AND UTILITY NAME) and will establish terms and conditions to receive energy management services by issuing separate task orders or contracts. The task orders will be funded by (FUNDS Account). The task orders will each be fixed- price type contracts.
3. **Description of Supplies/Services:** The (UTILITY NAME) will provide energy and water conservation and demand side management type projects and services to reduce energy consumption, directly or indirectly reduce the peak period demand, and provide energy related operations, maintenance, and repair services for natural gas, steam, electric power, water, or waste water at (SITE NAME) facilities. The energy conservation projects will be amortized for a term not to exceed 10 years and the monthly payment will be included on the utility bill. The energy conservation projects will be required to show a net overall savings and thus the cost of the projects will be covered by the utility savings.
4. **Authority Cited:**
  - a. [Energy Policy Act of 2005 \(Public Law 109-58 109th Congress\)](#)— Legislation regarding energy-savings goals, directives and regulations.
  - b. [Energy Savings Contracts and Activities \(10 U.S.C. Section 2913\)](#) — Legislation regarding energy-saving goals and plans at military facilities.
  - c. [Water Conservation at Military Installations \(10 U.S.C. Section 2866\)](#) — Legislation regarding water-saving goals and plans at military facilities.
  - d. [Federal Acquisition Regulations \(FAR\) 6.302-5](#)—FAR, Subpart 6.3 – Other than Full and Open Competition.
  - e. [Executive Order 13693: Planning for Federal Sustainability in the Next Decade](#) — Legislation regarding greenhouse gas emissions reduction.

### 5. Reason for Authority Cited

[Energy Policy Act of 2005 \(Public Law 109-58 109th Congress\)](#) directed the Architect of the Capitol to develop and implement a cost-effective energy conservation and management plan for all facilities administered by Congress. Agencies are authorized and encouraged to participate in programs to increase energy efficiency and for water conservation or the management of electricity demand conducted by gas, water, or electric utilities and generally available to customers of such utilities.

The Energy Savings Contracts and Activities ([10 U.S.C. Section 2913](#)) states that The Secretary of Defense shall permit and encourage each military department, Defense Agency, and other instrumentality of the DoD to participate in programs conducted by any gas or electric utility for the management of electricity demand or for energy conservation or by any utility for water conservation activities.



The Water Conservation at Military Installations ([10 USC Section 2866](#)) states that The Secretary of Defense shall permit and encourage each military department, Defense Agency, and other instrumentality of the DoD to participate in programs conducted by a utility for the management of water demand or for water conservation.

The Federal Acquisition Regulation (FAR) 6.302-5 provides that full and open competition is not required where a statute; i.e., [10 U.S.C. 2913 \(D\) \(3\)](#), expressly authorizes that an acquisition be made from a specified source; i.e., the servicing gas or electric utility.

[Executive Order 13693](#) states that agencies shall increase efficiency and improve their environmental performance and encourages the use of utility energy-efficiency service contracts to meet the goals set out in the order.

- 6. **Efforts to Obtain Competition:** Not applicable. Per authorities cited above, these types of agreements are limited to either the servicing gas or electric utilities, or both.
- 7. **Actions to Increase Competition:** Not applicable. Per authorities cited above, these types of agreements are limited to either the servicing gas or electric utilities, or both.
- 8. **Market Research:** Not applicable. Per authorities cited above, these types of agreements are limited to either the servicing gas or electric utilities, or both.
- 9. **Interested Sources:** Not applicable. Per authorities cited above, these types of agreements are limited to either the servicing gas or electric utilities, or both.

**10. Other Facts:**

**11. Technical Certification:** I certify that the supporting data under my cognizance which are included in the justification are accurate and complete to the best of my knowledge and belief.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Title

Signature: \_\_\_\_\_

**12. Requirements Certification:** I certify that the supporting data under my cognizance which are included in the justification are accurate and complete to the best of my knowledge and belief.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Title

Signature: \_\_\_\_\_

**13. Fair and Reasonable Cost Determination:** I hereby determine that the anticipated cost to the Government for contracts issued under this BOA action will be fair and reasonable. The basis for this determination is \_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Title

Signature: \_\_\_\_\_



**14. Contracting Officer Certification:** I certify that this justification is accurate and complete to the best of my knowledge and belief.

Name: \_\_\_\_\_ Signature: \_\_\_\_\_  
Title

**Approval**

Based on the foregoing justification, I hereby approve the establishment of the BOA with (Utility name) authority for energy and water conservation and demand side management services on another than full and open competition basis, pursuant to the authority of [10 U.S.C. 2913](#), and the [Energy Policy Act of 2005 \(Public Law 109-58 109th Congress\)](#), subject to the availability of funds, and provided that the services herein described have otherwise been authorized for acquisition.

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Title

Signature: \_\_\_\_\_



### Master Agreement Exhibit "C"

Contractor's ID # \_\_\_\_\_ (Optional)

Ordering Agency's ID # \_\_\_\_\_ (Optional)

**Authorization for Energy Management Services Contract # \_\_\_\_\_**

Ordering: \_\_\_\_\_

Agency: \_\_\_\_\_

Address: \_\_\_\_\_

Pursuant to Contract # \_\_\_\_\_ between the Contractor and the United States Government and subject to all the provisions thereof, service to the United States Government under such contract shall be rendered or modified as hereinafter stated. Contract Articles 2 and 4 shall be followed for the initiation of service under this contract.

Premises to be served: \_\_\_\_\_

Service Address: \_\_\_\_\_

**Nature of Service:**

- Preliminary Energy Audit
- Energy Conservation Project (ECP) Installation
- ECP Feasibility Study
- Other (See below)
- ECP Engineering & Design Study
- Demand Side Management (DSM) Project
- Special Facilities

SERVICE HEREUNDER shall be provided consistent with the Contractor's applicable tariffs, rates, rules, regulations, riders, practices, and/or terms and conditions of service, as modified, amended or supplemented by the Contractor and approved, to the extent required, by the Commission. (See Article 5 of this contract.)

Estimated Project Cost:           \$ \_\_\_\_\_

Capital Cost:                       \$ \_\_\_\_\_

Percentage of Cost               \_\_\_\_\_ %  
Financed:

Rebate Amount (If               \$ \_\_\_\_\_  
Applicable):

Simple Payback (Years)       \_\_\_\_\_ Years

Accounting and Appropriation Data: \_\_\_\_\_



Energy Conservation Measures:

- Mechanical Systems Upgrades
- Steam Systems Upgrades
- Controls
- Cogeneration
- Lighting
- Renewables
- Water Conservation
- Others

List of Attachments:

- General Conditions
- Facility Site Plans
- Design Drawing
- Payments Provisions
- Historical Data
- Design Specifications
- Special Requirements
- Utility Usage History
- Certifications
- Economic Analysis
- ECP Feasibility Study
- Commission Schedules

Remarks: \_\_\_\_\_  
\_\_\_\_\_

Accepted:

\_\_\_\_\_

(Ordering Agency)

\_\_\_\_\_

(Contractor)

By: \_\_\_\_\_

By: \_\_\_\_\_

(Authorized Signature)

(Authorized Signature)

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

NOTE: A fully executed copy of this Authorization shall be transmitted by the Contracting Officer to General Services Administration, WPE, Washington, DC 20407.



## EMSA/MODEL AGREEMENT

### AGREEMENT FOR ENERGY CONSERVATION AND DEMAND SIDE MANAGEMENT SERVICES BETWEEN THE UNITED STATES OF AMERICA AND \_\_\_\_\_ UTILITY COMPANY

This Agreement for implementation of Energy Conservation Measures (ECMs) is entered into this day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_ Utility Company (Utility) and the United States of America (Government), represented by the Contracting Officer executing this Agreement. The signatories to this Agreement will be sometimes collectively referred to as the “Parties” and individually as a “Party”. This Agreement (when signed by the Parties), any Task Orders (TO) executed pursuant to this Agreement, and any other associated agreements shall constitute the entire Contract between the Parties with respect to a particular ECM. A term or condition contained in this Agreement may be amended at any time by mutual written agreement of the Parties. However, termination, modification, or expiration of a term or condition shall not retroactively affect TOs previously entered into under this Agreement. The Parties agree to the following principles, concepts and procedures.

### GENERAL CONDITIONS

#### GC.1 Purpose

The Government desires assistance in accomplishing ECMs at an Installation (may substitute at all Installations within the Utility Company’s service area, to include [list the installations by name] (hereinafter, Installations). The purpose of this Agreement is to facilitate the implementation of ECMs through TOs. This Agreement sets forth the terms and conditions under which subsequent TOs may be entered into between the Parties.

#### GC.2 Definitions

Terms used in this Agreement shall have the following definitions:

- a. Acceptance: Written acceptance by the authorized representative of the Government of an individual Phase or completed ECM pursuant to a TO.
- b. Carrying Charge: For the purpose of this Agreement, Carrying Charge shall be an interest rate applied to all ECM Costs incurred by the Utility until permanent financing is put in place or the Government pays the ECM Cost. Accrued interest shall be considered an ECM Cost.
- c. Contracting Officer: A Government official authorized to enter into, administer, and/or terminate a contract on behalf of the Government, and who is authorized to make related determinations and findings within the limits established pursuant to Government regulations.
- d. Contracting Officer Representative (COR) or Contracting Officer Technical Representative (COTR): A local or project site representative of the Contracting Officer delegated specific limited authority, as set forth in a formal delegation letter signed by the Contracting Officer, for a given TO, including the feasibility study, engineering and design, operation and maintenance, and/or implementation of one or more ECPs.
- e. Energy Conservation Measure Cost (ECM Cost): The total cost may include, but is not limited to the Work, finance charges and overhead and profit, for the feasibility study, engineering and design, implementation and operation and maintenance of an ECM, less any financial incentive or rebates, if provided by the Utility. Payment for completed ECMs



shall be calculated based upon the ECM Cost.

- f. Energy Conservation Project (ECP): A specific project intended and designed to provide any of the following: energy savings, demand reduction, efficiency improvements and water conservation. ECPs are described in more detail in Section GC 17.
- g. Occupied Period: Hours during which a facility or building is occupied or used in the normal course of business.
- h. Quality Assurance Evaluator (QAE): A functionally qualified person who evaluates or inspects the contractor's performance of service in accordance with the quality assurance surveillance plan written specifically for the contracted service to be evaluated. The QAE performs technical monitoring of contractor actions, is responsible for requesting products and services through a government contract, and manages the day-to-day tasks of the contract.
- i. Quality Control: A management function whereby control of quality of raw or produced material is exercised for the purpose of preventing production of defective material. For purposes of this Agreement, quality control is those actions taken by a contractor to control the production of outputs to ensure that they conform to the contract requirements.
- j. Possession: When the Government takes beneficial occupancy of an ECP (Possession of an ECP) or an ECM (Possession of an ECM).
- k. Subcontractor: Any corporation, partnership or individual hired directly by the Utility to perform a service or provide a product under this Agreement and TOs resulting from this Agreement.
- l. Task Order (TO): A binding contractual action entered into under this Agreement for the feasibility study, engineering and design, implementation, and/or operation and maintenance of, or any activity related to, an ECM. (A TO can also be identified as a Delivery Order [D.O].)
- m. Termination Schedule: A schedule developed for each financed ECM specifying the lump sum payment necessary at any time during the contract period following the initial Government payment for the complete repayment of the ECM costs, including any finance costs accrued to that point.
- n. Work: All labor, materials, tools, equipment, services, transportation and/or other items required for the completion of the ECM.

### **GC.3 Term**

This Agreement shall have a term of years. This Agreement may be terminated in its entirety by either Party upon 30 days' written notice to the other Party. Thereafter, no new TOs shall be entered into under this Agreement. Termination, modification or expiration of this Agreement shall not affect in any way TOs previously entered into under this Agreement. This Agreement shall be effective from the date it is signed by both Parties. In the event the Parties sign this Agreement on different dates, then the effective date shall be the latter of the two dates.



#### **GC.4 Services to be Provided by the Utility**

The Utility shall provide preliminary audits, feasibility studies, engineering and design studies, and all initial capital, labor, material, supplies and equipment to the Agreement. These services may be ordered individually, as a group or in any combination under a single TO.

#### **GC.5 Information**

Subject to national security constraints and unless otherwise prohibited by law, the Government shall provide the Utility with any information requested by the Utility to comply with regulatory commission requirements.

#### **GC.6 Relationship of Parties**

The Government acknowledges the Utility and/or its Subcontractors shall each perform their work as independent contractors and the Government shall have no direct control and supervision of Utility or Subcontractor employees, who shall not be considered employees or agents of the Government for any purpose. The Utility, in negotiations with its Subcontractors, will ensure that the Government will be the direct beneficiary of any and all product and service guarantees and warranties.

#### **GC.7 Subcontractor Selection**

The Utility may perform some or all of the Work under a TO itself or through Subcontractors. When practical, the Utility shall competitively select Subcontractors for the purpose of determining the reasonableness of Subcontractor prices. When competition is not practical, price reasonableness may be determined by comparing proposed prices with those obtained for the same or similar work, prices published in independent cost guides, published in competitive price lists, or developed by independent sources.

Subcontractor selection shall be based on cost, experience, past performance, reliability, and such other factors as the Utility may deem appropriate, as long as such factors are practicably related to the Government's minimum needs. In no event may such services be provided by Subcontractors listed as excluded from Federal Procurement Programs, which list is maintained by GSA pursuant to [48 CFR 9.404](#). For any TO, the Utility may submit the names of proposed Subcontractors to the Government Contracting Officer to ensure they are not excluded pursuant to 48 C.F.R. 9.404.

#### **GC.8 Authority of Contracting Officer**

The Government's Contracting Officer shall be the only Government official authorized to enter into and/or modify a TO entered into under this Agreement.

#### **GC.9 Ownership of Work Product**

The Government may elect not to use the Utility to implement the ECM. If the Government so elects, it will pay for any accepted work, including any equipment, completed studies, and engineering and design work. Title to any work done by the Utility for the Government under a TO shall become the property of the Government at the time of acceptance of the work.



#### **GC.10 Responsibility for Operation and Maintenance**

The operations and maintenance of the equipment installed pursuant to any TO executed under this Agreement shall be the responsibility of the Utility during the payment term unless otherwise provided in the TO.

#### **GC.11 Government Projects**

The Government shall not be restricted from implementing equipment installation, construction projects and ECMs independent of work performed under this Agreement, including installing new energy conservation equipment, removing existing energy consuming equipment, or adding new energy consuming equipment. The Government will notify the Utility prior to implementing projects that may affect ECMs under this Agreement.

#### **GC.12 ECM Performance Verification**

Each TO shall include procedures that are mutually agreeable to the parties to verify ECM performance following installation.

#### **GC.13 Emission Credits**

All on-site Government emission credits earned by virtue of TOs entered into hereunder shall be the property of the Government.

#### **GC.14 Order of Precedence**

The Government and Utility shall determine in this Agreement or subsequent TOs the precedence given to the TO, this Agreement or other documents, exhibits and attachments, in the event an inconsistency arises among these documents.

#### **GC.15 Preliminary Audits**

At the request of the Government or the Utility and upon the mutual consent of both parties, the Utility will conduct, at no cost to the Government, an audit consisting of an on-site building investigation and evaluation for a mutually agreeable facility to determine if any significant energy conservation opportunities exist and whether further detailed energy analysis is warranted. Government buildings/facilities plans will be made available upon request. Requests for plans shall be made to the COR at least fifteen (15) calendar days in advance of the audit start date. The Utility will provide a written report of the audit to the Government, typically at no cost. The Utility will utilize historical building data, utility data, and information obtained by the Utility to identify ECPs. Using this information, the Utility will generate a prioritized list of recommendations, in sequence of implementation that are life-cycle cost-effective and can be implemented in the facility being audited. The preliminary audit, to the extent applicable, shall include, but not be limited to, the following information:

- a. Preliminary estimated energy and water savings.
- b. Preliminary estimated cost savings, including reduced maintenance costs.
- c. Current utility rates.
- d. Preliminary retrofit cost.
- e. Utility financial incentive/rebate, if any.
- f. Description of existing equipment.



- g. Description of the proposed retrofit equipment.
- h. Overview of the general environmental impact and potential hazardous wastes identified through existing facility records, if any.

#### **GC.16 ECM Proposal**

After reviewing the preliminary audit, the Government may request a proposal from the Utility, for the evaluation of an ECM. The Utility shall submit an ECM proposal, setting forth a prioritized list of the recommended ECPs within the ECM, a preliminary estimate of the cost to implement each ECP, the total costs for implementing the ECM (including estimated feasibility study, engineering and design, and implementation costs), and estimated cost savings.

#### **GC.17 Energy Conservation Projects**

The Utility may propose ECMs which include one or more ECPs. ECPs that substitute one energy type for another (e.g., natural gas in lieu of electricity) will not be considered for implementation unless a net overall energy or cost reduction can be demonstrated based on current market energy prices. Potential ECPs include, but are not limited to:

- a. Interior and exterior lighting replacement.
- b. Transformer replacement.
- c. Lighting control improvements.
- d. Motor replacement with high efficiency motor.
- e. Construction of alternative generation or cogeneration facilities.
- f. Boiler control improvements.
- g. Packaged air conditioning unit replacement.
- h. Cooling tower retrofit.
- i. Economizer installation.
- j. Energy management control system (EMCS) replacement/alteration.
- k. Occupancy sensors.
- l. LED exit sign installation.
- m. Fans and pump replacement or impeller trimming.
- n. Chiller retrofit.
- o. Upgrade of natural gas-fired boilers with new controls (low NOX burners).
- p. Solar domestic hot water system.
- q. Solar air preheating system.
- r. Steam trap maintenance and replacement.
- s. Insulation installation.
- t. Variable speed drive utilization.
- u. Weatherization.



- v. Window replacement.
- w. Window coverings and awnings.
- x. Reflective solar window tinting.
- y. Fuel cell installation.
- z. Photovoltaic system installation.
- aa. Faucet replacement (infrared sensor).
- bb. Replacement of air conditioning and heating unit with a heat pump.
- cc. Addition of liquid refrigerant pump to a reciprocating air conditioning unit.
- dd. High efficiency refrigerator replacement.
- ee. High efficiency window air conditioner replacement.
- ff. (Water conservation device installation (e.g., flow restrictors, low flow flush valves, waterless urinals, horizontal axis washing machines).
- gg. Installation, maintenance and operation of power quality and reliability measures including UPS systems, back-up generators, emergency generators.
- hh. Fuel switching technology.
- ii. Infrared heating system.
- jj. Heat pipe dehumidification.
- kk. Flash bake commercial cooking.
- ll. Thermal energy storage system.
- mm. Operation, maintenance, modification and/or extension of utility distribution and collection system.
- nn. Training that will result in reduced energy costs.
- oo. Power factor correction measures and equipment.
- pp. Installation, maintenance and operation of standby propane facility.
- qq. Installation, maintenance and operation of gas distribution system and associated equipment.
- rr. Water distribution system leak detection, and cost-effective repair.
- ss. Any other ECP that is cost effective using the then-current DoD-prescribed procedures and standards, and which encourages the use of renewable energy, reduces the Government's energy consumption or energy demand, or results in other energy infrastructure improvements.

#### **GC.17.1 ECM Restrictions**

The Government shall not consider ECMs which include:

- a. Measures which could jeopardize existing agency missions.



- b. Measures which could jeopardize the operation of, or environmental conditions of computers or computer rooms.
- c. Unless waived by the Contracting Officer, measures that would result in increased water consumption (e.g., once-through fresh water cooling systems).
- d. Measures which would violate any federal, state, or local laws or regulations.
- e. Measures which degrade performance or reliability of existing Government equipment.
- f. Unless waived by the Contracting Officer, measures that would reduce energy capacity currently reserved for future growth, mobilization needs, safety, emergency back-up, etc.
- g. Measures that violate the then-current versions of the National Electric Code, the National Electric Safety Code, the Uniform Building Code, or the Uniform Mechanical Code.
- h. Utility-financed measures that do not result in savings in the base utility expenditures sufficient to cover the project costs.

#### **GC.17.2 Facility Performance Requirements of ECMs**

ECMs proposed by the Utility shall conform to the following facility performance standards:

- a. Lighting levels shall meet the minimum requirements of the then-current Illuminating Engineering Society (IES) Lighting Handbook.
- b. Heating and cooling temperature levels shall meet Government design standards.
- c. ECMs shall permit flexible operation of energy systems for changes in occupancy levels and scheduling of facilities. In proposing an ECM, the Utility may assume the building function will remain constant unless otherwise indicated by the Government.



## **GC.18 TOs**

Following the evaluation of the ECM proposal, the Government may elect to execute a TO with the Utility for the evaluation, implementation, or operation and maintenance of the ECM. If requested by the Government, the Utility will provide or obtain financing on terms at least as good as those available to customers in a comparable service class, or with a comparable risk profile, considering the nature of the security interests to be granted, if any, and other conditions affecting the cost of financing.

The TO may have five phases; Audit (when applicable), Feasibility Study Phase, Engineering and Design Phase, Implementation Phase, and Operation and Maintenance Phase. Because the extent of all the work is unlikely to be known at the time the TO is entered into, these phases shall be line items under the TO, and shall be issued with an estimated Termination Schedule at the time the TO is executed. However, work will not commence on a particular phase unless and until a statement of work and a price for that phase have been agreed upon.

Following completion and acceptance of the Feasibility or Engineering and Design Phases, the Government may elect to (i) pay the ECM Cost for each completed Phase within thirty (30) calendar days of being invoiced; or (ii) defer payments for that Phase until the end of the next Phase, at which time the Government shall pay the ECM Cost for each completed Phase within thirty (30) calendar days of invoice; or (iii) include such amounts in the ECM Cost, if the Government elects to proceed with the Implementation Phase. If the Government elects not to proceed with the next Phase, it shall pay the Utility the ECM Cost for the prior completed Phases, plus a Carrying Charge as negotiated by the parties in the TO. A decision to proceed or not to proceed with the next Phase must be made within 60 days of receipt of a written request from the Utility. Only the Contracting Officer shall be authorized to exercise the Government's option to proceed to the next Phase, and such exercise shall be provided in writing within sixty (60) days of receipt of a statement of work and price. Government finance payments for the Implementation Phase shall begin on the date of the first Utility bill following the 30-day period after the Government takes possession of all or part of the ECM as provided in [FAR, Part 36, Subpart 36.511](#), and a satisfactory ECM Performance Verification as defined in the TO and pursuant to Section GC.12 of this Agreement. The timing and amount of Government payments of appropriated funds for the Operation and Maintenance Phase shall be determined in the TO. The TO is subject to any legally-required Federal Acquisition Regulations. Because services may vary widely from one TO to another, the Contracting Officer will insure that the appropriate FAR clauses from the FAR matrix found at [FAR, Part 52, Subpart 52.301](#), are incorporated into any contract entered into by the parties for services provided by the Utility under the TO.

## **GC.19 ECM Feasibility Study Phase**

The TO shall set forth a scope of work feasible (the Feasibility Study). The TO shall specify the terms for the completion of the Feasibility Study and establish a price for the Feasibility Study. The Government will pay the Utility the agreed-upon price for the Feasibility Study in accordance with the TO. If the Government elects to proceed with the Engineering and Design Phase as set forth below in Paragraph GC.20, the cost of the Feasibility Study shall be rolled into the Engineering and Design Phase ECM Cost. The Feasibility Study will provide, at a minimum, the following information:



Technical Factors:

- a. Audits of energy consumption of existing equipment and facilities, including estimated energy and cost savings, and proposed retrofit costs and financial incentives/rebates.
- b. Water audits of supply and utilization facilities, if specified by the Government.
- c. Equipment to be removed or replaced, and new equipment to be installed.
- d. Specifications, including catalog cuts, for new equipment. Specifications should include (as applicable): power rating, estimated energy consumption, input/output, power ratio, lighting level, and estimated equipment life.
- e. Operation and maintenance procedures required after ECM implementation (if significantly altered by the ECM).
- f. Training that will be provided for the proper operation and maintenance of ECPs, including details on how many hours of training will be provided and how many people will be trained.
- g. Electrical and mechanical sketches for all ECPs that involve changes to existing systems (sketches will not be required for ECPs involving only component replacement).
- h. Government support (e.g., minor changes in Government operation, movement of equipment) required during implementation of the ECM.
- i. Utility interruptions needed for implementation of each ECP by type (gas, electricity, water, etc.), extent (room number, entire building, etc.) and duration.
- j. Identification of potential adverse environmental effects.
- k. Any documentation required to comply with applicable environmental laws.
- l. Estimated construction time in calendar days, showing significant milestones.
- m. Estimated annual energy savings in kilowatt-hour and kilowatt demand of electricity, dekatherms of natural gas, and cubic feet of water for the life of each ECP, including all assumptions and detailed calculations showing how savings were determined.
- n. Estimated equipment life for each ECP.
- o. A proposed method to verify energy savings at the time of ECM Acceptance which shall be subject to Government approval.
- p. Documentation that each proposed ECP has been recommended and selected without regard to fuel source.

Cost Factors:

- a. Estimated annual operation costs (e.g., increased use of alternate fuel sources, replacement filters) and increased maintenance costs (e.g., re-lamping with a higher cost product).
- b. Total estimated ECM Cost to the Government.
- c. Estimated breakdown of financial incentives/rebates for each ECM (if any) in a format mutually agreeable to the Parties.



- d. Estimated cost-of-money rate (percent).
- e. Estimated annual energy and operation and maintenance cost savings including details on estimated annual savings for each area of savings, such as lighting, controls, motors and transformers.
- f. Estimated breakdown of implementation costs for each area of energy savings, such as lighting, controls, motors and transformers.
- g. Estimated costs for replacing existing components and installing new components/systems, listed separately.
- h. Estimated unit costs for major components and systems.
- i. An estimated life cycle cost analysis prepared in accordance with the then- current edition of the [Energy Prices and Discount Factors for Life-Cycle-Cost Analysis](#), published as the annual supplement to the National Institute of Standards and Technology (NIST) Handbook 135.

## **GC.20 ECM Engineering and Design Phase**

After evaluation and acceptance of the feasibility study, the Government may elect to proceed with the Engineering and Design Phase. Prior to proceeding, the Parties shall agree upon a statement of work for all engineering and design services necessary for the implementation of a particular ECM, a time frame for completion of the work, and a price or cost cap for engineering and design work for the ECM. If the Government elects to proceed with the Implementation Phase as set forth below, the cost of the engineering and design work shall be rolled into the total ECM Cost. This TO shall include an estimated amortization schedule for the ECM.

### **GC.20.1 Verification of Floor Plans**

The Utility will verify the accuracy of any floor plans provided by the Government.

### **GC.20.2 Government Design Review**

TOs shall permit adequate time for Government review of engineering and design work at 35% and 95% design completion, or at any other stage, as negotiated in the TO.

### **GC.20.3 Site Plans**

If proposed ECMs require installation outside existing buildings or structures, a site plan showing recommended siting of ECMs shall be prepared for Government review and approval. Site plans shall be submitted as part of the Utility's proposal. It is recommended that the Utility propose alternate sites for review in case the primary site is unavailable.

### **GC.20.4 ECM Implementation Proposal**

Upon completion and Acceptance of the Engineering and Design Phase, the Utility will submit to the Government an ECM implementation proposal (the "Proposal"). If requested by the Contracting Officer, the Utility will be required to present a briefing to the Government explaining the Proposal. At a minimum, the Proposal shall



include all pertinent technical and cost factors listed in paragraph GC.19 of this Agreement, plus a copy of subcontractor(s) bid(s). The Proposal shall also set forth negotiated pricing criteria that describe the method for determining the prices to be paid to the Utility for supplies or services. The Government shall evaluate the Proposal for technical soundness and price reasonableness. If the Government elects to proceed with the ECM, the Utility and Government shall agree upon a complete scope of work with specifications, time for performance, ECM Cost, source and cost of capital or financing, payment terms, amortization schedule, and final Termination Schedule. If the Contracting Officer deems it appropriate, the Utility will provide acceptable performance and payment bonds.

## **GC.21 ECM Implementation Phase**

The Utility shall perform work in accordance with the TO. The following provisions shall apply to ECM implementation work performed pursuant to TOs executed under this Agreement, unless exceptions are provided in the TO.

### **GC.21.1 Pre-Work Requirements**

Prior to commencing ECM implementation Work on a TO, the Utility shall meet with the Contracting Officer or COR at a time mutually agreeable to the Utility and the Contracting Officer, to discuss and develop mutual understandings relative to safety, scheduling, performance, obtaining necessary permits, and administration of the Implementation Phase. Prior to commencement of on-site work, written approval of the following shall be obtained from the Contracting Officer by the Utility:

- a. The utility's proposed implementation schedule, indicating the installation period and time required for delivery of equipment.
- b. Evidence that the required insurance has been obtained.

### **GC.21.2 Interruptions**

The Utility shall arrange on-site work to minimize interference with normal Government operation. All interruptions shall be made outside occupied periods whenever possible and coordinated with the Contracting Officer or COR. The Utility shall endeavor to keep the duration of utility interruptions to a minimum. Requests for utility outages shall be submitted for approval, in writing, as specified in the TO. The request shall include the approximate duration, date, time, and reason for the interruption. Utility interruptions include, but are not necessarily limited to, the following systems:

- a. electrical
- b. natural gas
- c. sewer
- d. steam
- e. water
- f. telephone
- g. computer cables



### **GC.21.3 Construction Documentation**

The Utility shall provide construction drawings and specifications, certified by a registered engineer or architect, as applicable, to ensure compliance with all applicable federal, state and local codes and regulations as required by individual TOs.

### **GC.21.4 Standardization of Materials**

All materials proposed to be installed pursuant to this Agreement shall be readily commercially available, and as similar in form, fit, and function to each other as is practicable to allow efficient provisioning of replacement parts.

### **GC.21.5 Water Conservation Measures**

The Utility will consider water conservation in all ECMs. The Utility will obtain rebates from the local water utility if available. Rebates, if any, shall be applied to the cost of the project.

### **GC.21.6 Operation and Maintenance Manuals**

At the time of Government Acceptance of a completed ECM, the Utility shall furnish, for the equipment specified, operation and maintenance manuals and recommended spare parts lists identifying components adequate for competitive supply procurement for operation and maintenance of ECM equipment. The operation and maintenance manuals shall include maintenance schedules for all equipment. The scope of each manual shall be agreed upon in the TO.

### **GC.21.7 Government Personnel Training for ECPs**

The Utility shall train Government personnel, as required, to operate, maintain, and repair ECM equipment and systems. The date and time of training shall normally be coordinated with the Contracting Officer or COR prior to Acceptance of the ECM. The cost for such training shall be included in the ECM Cost.

### **GC.21.8 As-Built Drawings**

Within 45 calendar days after Government Acceptance of each installed ECM, the Utility shall submit as-built drawings to the Contracting Officer or COR. Drawings will not be required for component replacement. Drawings shall include at a minimum:

- a. Installation (i.e., form, fit, and attachment details) of the interface between ECM equipment and existing Government equipment.
- b. Location and rating of installed equipment on building floor plans.

### **GC.21.9 Installation**

The Utility will arrange for the installation of approved ECMs and construction oversight and verify that the designed and specified energy efficiency equipment and/or system modifications are properly supplied or installed in a manner that will give the intended long term demand and energy reductions. The Utility will select Subcontractors in accordance with paragraph GC.7 above.



## **GC.22 Operation and Maintenance Phase**

The Government may elect to have the Utility perform the operation and maintenance on part or all of the ECM. Before exercising its option for this Phase, the Government and Utility shall agree upon a complete scope of work with specifications, schedules, warranties, and cost.

## **GC.23 Required FAR Clauses**

The following FAR clauses are required to be included in any contract with the Government:

[52.203-3, Gratuities](#); [52.203-5, Covenant Against Contingent Fees](#); [52.203-7, Anti-Kickback Procedures](#); [52.222-3, Convict Labor](#); [52.222-25, Affirmative Action Compliance](#); [52.222-26, Equal Opportunity](#); [52.223-6, Drug Free Workplace](#); [52.233-1, Disputes](#).

## **WARRANTIES AND REMEDIES**

### **WR.1 Warranties**

The Utility shall pass through to the Government all warranties on equipment installed pursuant to a TO. In addition, the Utility shall provide, from the date of Acceptance or Government Possession of an ECP, whichever is earlier, a one- year comprehensive wrap-around warranty guaranteeing that the equipment installed shall perform in accordance with the specifications agreed upon between Government and Utility, as set forth in the applicable TO. In the event the Utility provides O&M services, a separate warranty will be negotiated for such services, in accordance with [FAR Part 52, Subpart 52.246-20](#).

### **WR.2 No Other Warranties**

The warranties set forth in WR.1 are exclusive and in lieu of all other warranties. The Utility makes no other representations or warranties of any kind with respect to the services and products it provides pursuant to this Agreement and subsequent TOs. The Utility does not guarantee any level of energy or water savings or cost reductions.

### **WR.3 Utility Limitation of Liability**

The Utility shall not be liable for any special, incidental, indirect, or consequential damages, connected with or resulting from the performance or non-performance of work under this Agreement or subsequent TOs. In addition, the Utility shall not be liable under its warranty to the extent that damages are caused by Government negligence.

### **WR.4 Utility Default**

The Government and Utility agree that Utility default provisions will be governed by those FAR clauses applicable to specific circumstances. A determination of applicable FAR default clauses will be made by the Contracting Officer for a specific TO.

### **WR.5 Prompt Payment**

As required in [FAR, Part 32, Subpart 32.903](#), the Government shall promptly pay ECM utility bills. Late payments shall accrue interest as provided in [FAR, Part 32, Subpart 32.907](#).



## **WR.6 Disputes**

Disputes that arise under this Agreement and subsequent TOs shall be governed by the applicable dispute provisions found at [FAR, Part 33, Subpart 33.2](#).

## **WR.7 Differing Site Conditions**

In the event site conditions differ materially from those contained in the TO, additional costs incurred by the Utility due to the differing conditions shall be negotiated prior to work, and the ECM Cost shall be increased to reflect an equitable adjustment as permitted in [FAR, Part 36, Subpart 36.502](#).

## **WR.8 Suspension of Work**

In the event work is delayed, suspended, or stopped by the Government, [FAR, Part 42, Subpart 42.13](#) shall apply.

### **FINANCING AND PAYMENT PROVISIONS**

#### **FP.1 Energy Savings and Financing**

It is intended that the life-cycle energy and related savings achieved from the implementation of an ECM funded or financed in a UESC project will produce financial savings to the Government that are equal to or greater than the cost of implementing the ECM, including the cost of financing, if applicable, provided under this Agreement. The payment term shall be in accordance with Agency policy following current legislation, legal opinions, and Agency guidance.

#### **FP.2 Financial Incentives, Rebates, and Design Assistance**

The Utility will provide to the Government the same financial incentives, rebates, design review, goods, services, and/or any other assistance provided without charge that is generally available to customers of a similar rate class or size. Incentives that may be available are to be identified in the preliminary audit report provided according to paragraph GC.15 and the ECM implementation proposal provided according to paragraph GC.20.4.

If rebates are available and have been applied for by the Government and such funds have been set aside, then the Utility shall provide a separate letter of agreement clarifying timelines and responsibilities of both parties and guaranteeing rebates and other incentives from the Utility to the Government.

The Utility shall also be responsible for determining the source, value, and availability of any applicable financial incentives to the project offered by the state and other jurisdictions in which the facility is located, and if the value of the incentives exceeds the administrative costs to be incurred by the Utility or the Government in acquiring such incentives.

The Utility shall be responsible for coordinating with the Agency Contracting Officer regarding preparation of any and all documentation required to apply for any such applicable financial incentives and to effectively apply such incentives to the capital cost of the project.

Rebate disbursement options include:

Option 1: The Utility shall apply rebates to the next payment due to reduce capital cost of the project.



Option 2: Where allowable by the Public Utility Commission, the Government may assign rebate to a third party to reduce the construction costs and thereby reduce the total amount financed.

Option 3: Rebates may be accepted as a credit on the utility bill.

### **FP.3 Calculation of Payment**

Payment for accepted ECMs shall be equal to the ECM Cost amortized over a negotiated term. In accordance with [10 U.S.C. Section 2912](#), the cost of financing, if any, for any completed ECM shall be recovered under terms and conditions no less favorable than those for others in the same customer class. Monthly payments will commence on the date of the first Utility bill following the 30-day period after the date the Government takes Possession of the ECM, and after ECM Performance Verification Testing, as required by GC.12 and negotiated in the TO, is satisfactorily completed.

### **FP.4 Buydown**

The Government reserves the right at any time following Acceptance, but prior to final payment, to buy down the outstanding TO payments without penalty by giving thirty (30) days' written notice to the Utility. Upon such buydown, the Government shall pay to the Utility a negotiated amount to include an additional finance charge based on an indexed formula, which reduces the financier's risk and reduces the cost of buydown to the Agency, or provide a termination schedule. Monthly payments will continue at the same level, but the term of ECM financing will be shortened to reflect the amount of the buydown payments.

### **FP.5 Pre-Acceptance Buyout**

If the Government desires to terminate a TO for any reason (including, without limitation, for convenience) prior to Acceptance, the Government may do so by giving written notice to the Utility thirty (30) days prior to the effective date of such termination. The Government shall pay to the Utility a negotiated amount to include an additional finance charge based on an indexed formula, which reduces the financier's risk and reduces the cost of buyout to the Agency, or provide a termination schedule which will be described in Attachment A of the TO. If a termination occurs for the convenience of the Government, the amount payable pursuant to this paragraph shall be deemed as an allowable cost under [FAR Part 17](#) and [FAR Part 52, Subpart 52.249-2](#).

### **FP.6 Post-Acceptance Buyout**

In the event the Government desires to terminate a TO for any reason (including, without limitation, for convenience) after Acceptance, the Government may do so by giving written notice to the Utility 30 days prior to the effective date of such termination. The Government shall pay to the Utility a negotiated amount to include an additional finance charge based on an indexed formula, which reduces the financier's risk and reduces the cost of buyout to the Agency, or provide a termination schedule which will be described in Attachment B of the TO. If a termination occurs for the convenience of the Government, the amount payable pursuant to this paragraph shall be deemed as an allowable cost under [FAR Part 17](#) and [FAR Part 52, Subpart 52.249-2](#).



### **FP.7 Assignment of Claims**

Government payments under each TO executed pursuant to this Agreement may be assigned pursuant to [FAR Part 52, Subpart 52.232.23](#), "Assignment of Claims". Any bank, trust company, or other financing institution that participates in financing an ECM shall not be considered a Subcontractor of the Utility. Any "Assignment of Claims" must comply with the provisions of [FAR Part 32, Subpart 32.8](#).

### **FP.8 Novation**

The Parties agree that if, subsequent to the execution of this Agreement, it should become necessary, or desirable, to execute a "Novation Agreement", said Novation Agreement will comply with the provisions of [FAR Part 42, Subpart 42.12](#) and will be in the form as provided at [FAR Part 42, Subpart 42.1204](#).

## **SPECIAL REQUIREMENTS**

### **SR.1 Environmental Protection**

The Utility shall comply with all applicable federal, state, and local laws, regulations, and standards regarding environmental protection ("Environmental Laws"). All environmental protection matters shall be coordinated with the Contracting Officer or designated representative. The Utility shall immediately notify the Contracting Officer of, and immediately clean up, in accordance with all federal, state and local laws and regulations, all oil spills, hazardous wastes (as defined at [42 U.S.C. §9601](#)), and hazardous materials (as defined at [49 CFR Part 172](#)), collectively referred to as Hazardous Materials", resulting from its operation on Government property in connection with the implementation of ECMs. The Utility shall comply with the instructions of the Government with respect to avoidance of conditions that create a nuisance or create conditions that may be hazardous to the health of military or civilian personnel.

### **SR.2 Environmental Permits**

Unless otherwise specified, the Utility shall provide, at its expense, all required environmental permits and/or permit applications necessary to comply with all applicable federal, state, and local requirements prior to implementing any ECM in the performance of a TO executed pursuant to this Agreement. If any such permit or permit application requires the signature or other cooperation of the Government as owner/operator of the property, the Government agrees to cooperate with the Utility in obtaining the necessary permit or permit application.

### **SR.3 Handling and Disposal of Hazardous Materials**

Notwithstanding the provisions of the [FAR Part 52, Subparts 52.236-2](#) "Differing Site Conditions" and [52.236-3](#) "Site Investigations and Conditions Affecting Work," the Government understands and agrees that (i) the Utility has not inspected, and will not inspect, the project site in connection with a proposed ECM for the purpose of detecting the presence of pre-existing Hazardous Materials that relate to an ECM or any project site; and (ii) the Government shall retain sole responsibility for the proper identification, removal, transport, and disposal of any fixtures, components thereof, or other equipment or substances incidentally containing pre-existing Hazardous Materials, except as specifically agreed to by the Utility pursuant to paragraphs SR.4 and SR.5 (below).



If the Utility, during performance of the work under a TO executed pursuant to this Agreement, has reason to believe that it has encountered or detected the presence of pre-existing Hazardous Materials, the Utility shall stop work and shall notify the Government. The Government will evaluate the site conditions and notify the contractor of the results of this evaluation. The Utility shall not be required to recommence work until this situation has been resolved. Any delay resulting therefrom shall be grounds to request an increase in the ECM Cost to the extent that such delay increases ECM costs.

#### **SR.4 Asbestos and Lead-Based Paint**

To the extent provided for in a TO executed pursuant to this Agreement, in connection with the implementation of any ECM, the Utility may agree to remove pre-existing asbestos-containing material or lead-based paint, incidental to implementation of an ECM. However, unless the Utility explicitly agrees in said TO to perform any portion of the testing, removal, or abatement of the pre-existing asbestos or lead-based paint as part of the scope of work for any ECM, and unless the TO specifically references this paragraph SR.4, the Government shall be deemed to be solely responsible as provided for in paragraph SR.3.

If the Utility, in the course of ECM implementation, disturbs suspected lead-based paint or asbestos-containing material, the Utility may propose to the Government that the Utility will perform any portion of the testing, removal, or abatement of the lead-based paint or asbestos-containing material. Said proposal will include the requested increase in the ECM cost on account of such additional work. The Utility will not commence work involving additional cost without approval of the Contracting Officer. Provisions of paragraph SR.3 shall apply in the absence of an agreement to the contrary. If the Utility agrees to include any portion of the testing, removal, or abatement of the asbestos within the scope of work for an ECM implemented as described previously in this section, the hazardous waste manifests or other shipping papers shall identify the Government as the sole generator of the Hazardous Materials.

#### **SR.5 Refrigerants, Fluorescent Tubes, and Ballasts**

To the extent provided for in a TO executed pursuant to this Agreement in connection with the implementation of any ECM, the Utility shall remove and/or dispose of all ozone-depleting refrigerants, fluorescent tubes, and fluorescent magnetic core and coil ballasts incidental to an ECM to the Hazardous Materials (HAZMAT) disposal site on the installation. If there is no HAZMAT disposal site on the installation, the above HAZMAT will be disposed of in accordance with all applicable federal, state, and local laws and regulations, provided however, that the hazardous waste manifests or other shipping papers shall identify the Government as the sole generator of the Hazardous Materials.

#### **SR.6 Ozone-Depleting Refrigerants**

All ozone-depleting (ODC) refrigerants will remain the property of the installation. The Contractor will collect all ODCs and provide them to the installation in accordance with the procedures in the TO.



## Sample - Basic Statement of Work (SOW) for the “Letter of Interest”

The SOW for the “Letter of Interest” should be a broad overview and not specific. We want the Utility to draw on their experience and expertise to review and analyze the current energy situation at your location and provide an overview of all ECMs they recommend to improve energy conservation. The utility will provide specifics in the Preliminary Analysis and the Investment Grade Audit or Feasibility Study. Provide general areas you wish to explore and let the experts at the utility analyze the situation and recommend a course of action. You can drop an ECM or ask the utility to add something at this stage.

### SOW

Joint Base (JB) Outstanding intends to enter into a UESC contract for energy conservation measures (ECMs) which enhances or improves the bases energy usage. Various upgrades or improvements of all types are being considered. Among them we are looking at controls, heating, ventilating and air conditioning upgrades, high efficiency motors, piping insulation upgrade, lighting controls and water conservation measures.

These upgrades will result in energy cost savings to JB Outstanding. In accordance with UESC procedures, the utility will arrange for third party financing to be paid back within 10 years with the energy savings.

**Insulation:** Furnish and install insulating jackets on domestic hot water heaters (electric and natural gas fired units). Repair damaged or missing insulation on heating hot water and chilled water lines. Insulation shall be rotary glass fiber insulation with a service jacket. Repair damaged or missing insulation on refrigerant lines. Insulation shall be a minimum of 1.5 inches thick expanded closed cell foam with vapor barrier and service jacket.

**Condenser Coil Improvements:** Furnish and apply protective corrosion inhibitor on air-cooled condensers. The material shall be Adsil Microguard or an approved equivalent. The material shall be installed in accordance with manufacturer’s recommendations.

**Controls:** Furnish and install programmable thermostats. The new thermostat shall be internet compatible and integrated with all currently installed EMCS. Furnish and install an air quality sensor to establish demand controlled ventilation.

**HVAC Upgrades:** Furnish and install new split system and roof mounted heating and cooling units to replace aging units. The new units shall match existing capacities and have minimum efficiencies of 12.1 EER and 13.4 EER for the split systems and roof mounted units respectively. Furnish and install new variable frequency drives on pump motors. Furnish and install new air-cooled condensing units.

**High Efficiency Motors:** Furnish and install new premium efficiency, inverter rated motors on air handler fan motors.

**Lighting and Lighting Controls:** Furnish and install new linear fluorescent light and electronic ballasts replacing existing incandescent and aging fluorescent lighting. Furnish and install new high bay fluorescent T5 lamps replacing high intensity discharge lighting in the main shop area. Furnish and install new wall and ceiling mounted occupancy sensors.



## UESC Task Order (TO) Sample

TO # \_\_\_\_\_

GSA Area Wide GS-xxx

This TO is entered into by and between \_\_\_\_\_ (Utility) and \_\_\_\_\_ (Agency) for implementation of certain Energy Conservation Measures (ECMs) as described herein at \_\_\_\_\_ (installation/site).

All terms and conditions of the GSA Areawide Public Utility Contract apply to this TO, unless modified by the paragraphs below. In the event of a conflict between the requirements of the GSA Areawide Public Utility Contract and those of this TO, the requirements of this TO shall prevail.

### 1. Purpose (Note: change as required to cover your project purpose)

The intent of this project is to meet the objective of \_\_\_\_\_ (Agency) energy goals and missions by increasing lighting efficiency, replacing and enhancing outdated building controls, and reducing chilled water costs including the cost of fuel used to produce chilled water. It is anticipated that energy will be optimized in each covered building to achieve \_\_\_\_\_ reduction in \_\_\_\_\_ and \_\_\_\_\_ reduction in energy intensity and advanced metering.

### 2. Scope of Work (Note: Add your scope here. This is a sample SOW)

The Contractor shall arrange for all initial capital for third-party financing for this project. The Contractor shall provide all labor, material, equipment, and supervision to implement the ECMs described below. The project work includes interfacing and connecting to existing facilities and systems. Upon completion, inspection, and acceptance of Line Items 1, 2, and 3, including testing, training, and delivery of all O&M manuals as required herein, \_\_\_\_\_ (Agency) agrees to purchase the work described in this TO.

The Contractor shall provide Performance Assurance of all work associated with this TO for the first 12 months after acceptance of all Line Items.

All work for Line Items 1 and 2 described below shall be performed in accordance with Attachment TO-1 – “Agency/Site/M&O Guidance.”



**Line Item 1: Lighting Upgrades**

Provide design and installation services to complete lighting upgrades in the following buildings:

ECM	Building #	Building location/name
ECM-1		
ECM-2		
ECM-3		
ECM-4		
ECM-6		
ECM-8		
ECM-9		
ECM-10		
ECM-11		
ECM-12		

This work described in the following documents:

- Attachment TO-2 Lighting Statement of Work
- Attachment TO-3 Lighting Equipment Specifications

**Line Item 2: Controls Upgrades**

Provide design and installation services to complete controls upgrades in the following buildings:

ECM #	Building #	Building Name
ECM X	Building X	Ipsium
ECM X	Building X	Ipsium
ECM X	Building X	Ipsium
ECM X	Building X	Ipsium

This work is described in the following documents:

- Attachment TO-4 Controls Statement of Work
- Attachment TO-5 Controls Equipment Specifications

**Line Item 3: Chiller Plant Upgrade**

Provide installation services to complete the Chiller Plant Upgrade (ECM X). This work is described in the following documents:

- Attachment TO-6 Specifications for Chiller Plant
- Attachment TO-7 Construction Drawings (Bid Package X)

The Operations and Maintenance (O&M) contractor will provide Human Machine Interface (HMI) screen modifications and additions, Programmable Logic Controller (PLC) and HMI programming, including loading, debugging and checkout of the control programs, subsequent to the Contractor’s completion of installation and confirmation of control wiring continuity. Control Panels as shown on drawings \_\_\_\_\_ through \_\_\_\_\_ are existing, except as noted on the drawings. ControlNet and redundancy connections to the panels are by the Contractor.



#### Line Item 4: Performance Assurance

A Performance Assurance Plan will be implemented to verify that the new equipment is operating to specified operational standards and generating savings when compared to the existing systems that were replaced. The Performance Assurance Plan is provided in Attachment TO-8. The Performance Assurance process shall commence as specified in Attachment TO-8 for a period of 12 months after final acceptance by \_\_\_\_\_ (Agency) of Line Items 1, 2 and 3. At that point, the Performance Assurance process will be turned over to the Agency.

Performance Assurance for Line Item 1: Lighting Upgrades, shall be based on the Calculation Methodology included in Attachment 2. This work is described in Attachment 8: Performance Assurance under *Detailed Procedures – Lighting Upgrade*.

Performance Assurance for Line Item 2: Controls Upgrades, shall be based on the Calculation Methodology included in Attachment 4. This work is described in Attachment 8: Performance Assurance, under *Detailed Procedures – Energy Management System* and Attachment 9: ECM Calculations.

Performance Assurance for Line Item 3: Chiller Plant Upgrade, shall be performed in accordance with Attachment 8: Performance Assurance, under *Detailed Procedures – Chiller Plant Upgrade*.

It is anticipated that energy will be optimized in each covered building to achieve 29% reduction in Greenhouse Gas (GHG) and 31% reduction in energy intensity and advanced metering. However, the Contractor does not guarantee that the ECMs installed pursuant to this TO will result in energy savings to the Government, and the Government expressly recognizes and agrees that unrealized energy savings are not a basis for failing to make payment as required by Paragraph 6.D.

### 3. SUBMITTALS

Required submittals are described in Attachment TO-14.

### 4. TERM

This TO shall be effective from the date that the Award document is signed by both Parties. In the event the Parties sign this TO on different dates, the effective date shall be the latter of the two dates.

This TO shall have a term of 10 years, consisting of an anticipated 18 month design and construction period and a 9 year payment period. The term, not including the construction period, may not exceed 10 years.

#### A. Notice to Proceed

The Contractor shall not commence work on the \_\_\_\_\_ (installation/site) until \_\_\_\_\_ (Agency) issues a Notice to Proceed. The Notice to Proceed is issued on receipt of all required bonds and insurance documents and on approval of the Contractor's Worker Safety & Health Program under [10 CFR 851](#) and the Contractor's Health & Safety Plan.

(Note: The Agency may want to specify in the TO the number of days allowed for submittal of Performance and Payment bonds and the Certificate of Insurance, typically between 10 to 15 days after the date of award. The number of days allowed for submittal of the Safety documents could be specified as well.)



The “Notice to Proceed” is issued with an “Agency/Site/M&O Safety Management” Form which must be completed by every Subcontractor to be used in performance of this TO and submitted to \_\_\_\_\_ (Agency) in accordance with Attachment TO-14, Agency Reporting & Submittal Requirements.

Within 15 days after the Contractor receives the “Notice to Proceed,” the Contractor will commence work. Prior to receipt of the “Notice to Proceed” the Contractor may prepare and submit required submissions and may order materials and equipment that do not require prior Agency approval.

#### **B. Performance Schedule**

The detailed performance schedule is contained in Attachment 15.

### **5. ACCEPTANCE**

The Contractor shall request an inspection by the Agency as the Contractor completes Line Items 1, 2 and 3. The \_\_\_\_\_ (Agency) will inspect the work within 14 calendar days of the request, and complete a “Certificate of Substantial Completion” for each Line Item. “Substantial completion” means that the facilities are usable and the greater majority of the work is installed and acceptable.

Any discrepancies or “punch list” items shall be described in writing. If the \_\_\_\_\_ (Agency) indicates acceptance, takes possession of the equipment, or uses the equipment for beneficial use, this shall be construed as acceptance of the work that is completed, with the items on the punch list representing work that is not accepted. The Contractor shall complete or correct all items on the punch list within 30 calendar days and shall present the Agency with documentation indicating completion. The Agency will indicate final acceptance in writing within 14 calendar days after completion of the punch list items. If the Agency fails to accept or reject the completed punch list items within 14 calendar days after written notice from the Contractor indicating completion, then the Agency shall be deemed to have accepted the work. Following Agency acceptance of the work, the Contractor shall not be liable to the Agency for any liability, loss or damage caused or alleged to be caused directly or indirectly by the equipment or by any inadequacy thereof or deficiency or defect therein, except as provided in [FAR 52.246-21](#), Warranty (see Attachment A-1, FAR Clauses).

### **6. PRICE, BILLING, FINANCING, AND PAYMENT**

#### **A. Price**

The total firm fixed price for execution of the project defined above is \$xx,xxx,xxx.

#### **B. Financing**

\_\_\_\_\_ (Agency) will not spend capital investment dollars. The Contractor will finance the entire project price. The Contractor shall make all arrangements necessary to deliver the project as described above and will arrange for financing during the design and construction period. The total financed amount, including construction financing and financing fees, will be \$xx,xxx,xxx. Repayment will commence with the initial invoice submitted in \_\_\_\_\_ (Month) \_\_\_\_\_ (Year) and payment due in \_\_\_\_\_ (Month) \_\_\_\_\_ (Year) as described in Paragraph D below.



### C. Financial Incentives, Rebates, and Design Assistance

Note: The *Agency* may want to consider discussing incentives and rebates with the Utility and negotiate taking any available rebates as a reduction in TO price, or having the amount of the rebates identified and applied as a reduction to the installation's Utility bill.

The Contractor will provide to the *Agency* the same financial incentives, rebates, design review, goods, services, and/or any other assistance provided without charge, that is generally available to customers of a similar rate class or size.

If rebates are available and have been applied for by the *Agency* and such funds have been set aside, then the Contractor shall provide a separate letter clarifying timelines and responsibilities of both parties and guaranteeing rebates and other incentives from the Contractor to the *Agency*.

The Contractor, through its Subcontractor(s), is responsible for determining the source, value, and availability of any applicable financial incentives to the project offered by the state and others in which the \_\_\_\_\_ (installation/site) is located, and if the value of the incentives exceeds the administrative costs to be incurred by the Contractor or \_\_\_\_\_ (Agency) in acquiring such incentives.

The Contractor, through its Subcontractor(s), is responsible for coordinating with the CO for the preparation of all documentations required to apply for any such applicable financial incentives.

The preferred method for applying financial rebates/incentives is to have the rebates/incentives disbursed directly to the ESCO and applied to reduce the total price. If this is not possible an alternative process must be considered in accordance with current Government policy.

### D. Payment

Following final acceptance of Line Items 1, 2, and 3 by \_\_\_\_\_ (Agency), payments will be made annually in accordance with the Payment and Termination Schedule (Attachment 16). The Contractor or its designee will submit an invoice for the first payment, which will be due and payable within 30 days from final acceptance of Line Items 1, 2, and 3. The Contractor will submit invoices annually thereafter. Each successive annual payment will be due on the anniversary of the due date of the first payment.

It is the Contractor's responsibility to arrange for an adjustment to the due date for the first payment in the event of Contractor-caused delays in final acceptance of Line Items 1, 2, and 3. There shall be no additional cost to the Government or deviation from the dollar amount or number of payments in the TO. Delays by \_\_\_\_\_ (Agency) that prevent final acceptance and payment by the billing date will result in adjustment of the financing cost of the project. Following the *Agency's* acceptance, the *Agency's* obligation to pay all of the payments due hereunder is absolute and unconditional, and will not be entitled to any abatement, reduction, set-off, counterclaim, defense, interruption, deferment, recoupment, or deduction with respect to any payments due hereunder, including without limitation any reduction for unrealized energy savings.

The Contractor enters into this TO as the franchised natural gas supplier to \_\_\_\_\_ (Agency). If the *Agency* terminates the natural gas service



agreement with the Contractor prior to the date of completing repayment for this project, they will either continue to make the annual payment in accordance with the Payment and Termination Liability Schedule or shall pay the Termination Amount identified in such Payment and Termination Liability Schedule.

Upon final payment, the Contractor shall execute a release of all claims against the *Agency* under this TO.

**E. Buydown**

\_\_\_\_\_ (Agency) retains the right, at any time following final acceptance of Line Items 1, 2, and 3, but prior to final payment, to buy down the outstanding TO payments without penalty by giving the Contractor 30 days prior written notice. Upon such buydown, the *Agency* will pay to the Contractor the pro rata termination amount specified in the Payment and Termination Liability Schedule (Attachment 16). Payments will continue at the same level but the term of ECM financing will be shortened to reflect the amount of the buydown payments. Any such additional sums shall be used to reduce the outstanding Termination Amount, maintaining the payments and shortening the payback period. Each time an additional payment is made, the Payment and Termination Liability Schedule will be recalculated to show the new payback period. \_\_\_\_\_ (Agency) acknowledges and agrees that the payment of such amounts are reasonable and allowable costs with respect to the TO.

**F. Pre-Acceptance Buyout**

In the event that \_\_\_\_\_ (Agency) desires to terminate this TO for any reason (including, without limitation, for convenience) prior to final acceptance of Line Items 1, 2 and 3, they may do so by giving written notice to the Contractor 30 days prior to the effective date of such termination. \_\_\_\_\_ (Agency) will pay to the Contractor an amount negotiated between the *Agency* and the Contractor that is equal to the value of work verified as completed at the time of termination, plus allowable costs related to such work. If a termination occurs for the convenience of the Government, the amount payable pursuant to this paragraph shall be deemed as an allowable cost under [FAR Part 17](#) and [Part 52, Subpart 52.249-2](#).

Note: The *Agency* should be aware that the terms in E and F above have in some cases caused the lender to increase the interest rate or the termination liability amount to cover the risk of such buydowns and buyouts.

**G. Post-Acceptance Buyout**

In the event that \_\_\_\_\_ (Agency) desires to terminate this TO for any reason (including, without limitation, for convenience) after final acceptance of Line Items 1, 2 and 3, the *Agency* may do so by giving written notice to the Contractor 30 days prior to the effective date of such termination. The *Agency* shall pay to the Contractor a termination amount in accordance with the Payment and Termination Liability Schedule (Attachment 16).

**7. ASSIGNMENT OF CLAIMS**

The Contractor may assign payments due from \_\_\_\_\_ (Agency) under this TO pursuant to [FAR 52.232-23](#), *Assignment of Claims*. The *Agency* agrees to complete any necessary



forms which acknowledge that assignment. Any bank, trust company or other financing institution that participates in financing an ECM shall not be considered a Subcontractor of the Utility. Any assignment of claims must comply with the provisions of [FAR Part 32, Subpart 32.8](#).

## 8. WAGE RATES AND LABOR STANDARDS

The attached wage determination from the U.S. Secretary of Labor shall be implemented in accordance with the statutes for labor standards requirements for contracts over \$2,000.00 involving construction. (Attachment B– U.S. Department of Labor General Decision)

The following labor standards provisions apply to work performed under this TO as if they were set forth herein in their entirety. For more information on clauses incorporated by reference see Attachment A-1 – Terms and Conditions.

FAR Ref	Title	Date
52.222-6	Davis-Bacon Act	Jul 2005
52.222-7	Withholding of Funds	Feb 1988
52.222-8	Payrolls and Basic Records	Jun 2010
52.222-9	Apprentices and Trainees	Jul 2005
52.222-10	Compliance with Copeland Act Requirements	Feb 1988
52.222-11	Subcontracts (Labor Standards)	Jul 2005
52.222-12	Contract Termination – Debarment	Feb 1988
52.222-13	Compliance with Davis-Bacon and Related Act Regulations	Feb 1988
52.222-14	Disputes Concerning Labor Standards	Feb 1988
52.222-15	Certification of Eligibility	Feb 1988
52.222-23	Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity for Construction*	Feb 1999
52.222-27	Affirmative Action Compliance Requirements for Construction	Feb 1999

Note: Ensure all FAR clauses/references are reviewed and included in the TO.

Note: For purposes of the Notice, the “covered area” is \_\_\_\_\_ (County, State). The goals for minority and female participation, expressed in percentage terms for the Contractor’s aggregate workforce in each trade on all construction work in the covered area are as follows:

1. Goals for Minority Participation for Each Trade 5.8%
2. Goals for Female Participation for Each Trade 6.9%

These goals are applicable to all of the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

## 9. SAFETY REQUIREMENTS

All work under this TO shall be conducted in a safe manner and shall comply with the requirements of Agency requirements. Furthermore, in performing work under this TO, the Contractor will



perform work in a manner that ensures adequate protection for employees, the public, and the environment, and will be accountable for the safe performance of the work. The Contractor will exercise a degree of care proportionate with the work and the associated hazards. The Contractor will ensure that management of environment, safety and health (ES&H) functions and activities is an integral and visible part of its planning and execution processes while performing work at the site.

With respect to performance of any portion of the work under this TO that is performed on the \_\_\_\_\_ (installation/site), the Contractor agrees to comply with all State and Federal ES&H regulations, and with all ES&H requirements of M&O, the site operating contractor. *Agency* requirements include, but are not limited to, compliance with all OSHA standards, as well as with any other ES&H reporting requirements that the CO may require.

Other specific requirements relative to safety are as follows:

- A. Prior to commencing work, the Contractor shall meet with the COR's to agree on administration of the safety program.
- B. The Contractor's workplace may be inspected periodically for OSHA violations. Abatement of violations is the Contractor's responsibility. The Contractor will provide assistance to *Agency* and Federal/State OSHA inspectors if a complaint is filed. Any fines levied on the Contractor due to safety/health violations shall be paid promptly by the Contractor.
- C. In accordance with [FAR 52.236-13](#), *Accident Prevention*, as set forth in Paragraph 12 herein, "Additional Provisions", the Contractor is required to report to the CO all accidents within 24 hours of occurrence.
- D. In accordance with [FAR 52.236-13](#), *Accident Prevention*, as set forth in Paragraph 12 herein, "Additional Provisions", the Contractor shall submit to the COR a full report of damage to Government property and equipment by Contractor employees or subcontractors, at any tier within 24 hours of occurrence.

## 10. BONDS

Bonds are typically required within 15 days after award of the task order, since the contract price will have been negotiated.

- A. Within 30 days of TO award or acceptance of the Design and Construction Package, whichever is later, the Contractor will furnish a certified copy and duplicate of a performance bond (SF 25), with the project financier as co-beneficiary along with the *Agency*. The performance bond shall be in a penal sum equal to 100% of the total firm fixed price for all ECMs. The Contractor will furnish a payment bond (SF25A) in duplicate. The payment bond shall be in a penal sum equal to 100% of the total firm fixed for all ECMs.
- B. The performance and payment bonds will remain in effect during the total implementation period for all ECMs. The ECM implementation period shall include all time required for installation, testing, measuring initial performance, and *Agency* acceptance of all contractor-installed ECMs. The payment bond shall be released upon receipt of satisfactory evidence that all subcontractors, laborers, etc., have been paid in full.
- C. The Contractor will not file any mechanics liens against the *Agency* for the TO projects and this requirement shall flow down to all subcontractors. Therefore, the payment bond will



secure the Contractor's obligations for payment of laborers, suppliers, and all subcontractors.

## 11. INSURANCE

In accordance with [FAR 52.228-5](#), "Insurance – Work on a Government Installation", which is incorporated herein by reference, the Contractor will, at no cost to the Government, maintain policies providing the following insurance protection, which insurance will apply to all operations of the Contractor hereunder and employees of the Contractor engaged therein.

- A. Worker's Compensation Coverage, as provided in the Worker's Compensation Law of the State having jurisdiction, including occupational disease coverage for limits of \$1,000,000 per person in any one case and additional Employees Liability of \$1,000,000 per occurrence.
- B. General Liability Insurance, with limits of \$1,000,000/\$2,000,000 for bodily injury liability and \$100,000 for property damage liability in the comprehensive liability form.
- C. Automobile Liability Insurance, with limits of \$250,000/500,000 for bodily injury liability and \$50,000 for property damage liability in the comprehensive policy form.

The Contractor will provide an endorsement to its liability policies naming the U.S. Government and "Agency/Site/M&O" as additional insureds.

The Contractor will furnish the CO a certificate of insurance to show compliance with this paragraph. The insurance certificate will be submitted within 14 days after award and prior to issuance of a "Notice to Proceed". The Contractor will also ensure that the certificate states that the insurance carrier(s) will give \_\_\_\_\_ (Agency) 30 days prior written notice if there is any cancellation or material change in such policies. The Contractor will ensure that the certificates are kept up to date during the period of contract performance.

The Contractor agrees to insert the substance of this clause in all subcontracts hereunder at any tier where work will be performed on the \_\_\_\_\_ (installation/site).

The Contractor may purchase such additional or other insurance protection, as it may deem necessary, at its own expense.

Nothing herein shall relieve the Contractor of or limit the Contractor's liability for losses and damages to person or property as a result of its operations. The Contractor will indemnify, and hold \_\_\_\_\_ (Agency), and any person acting on behalf of the Agency, harmless from any and all liability, including attorneys' fees and legal costs, associated with or resulting from the Contractor's operations under this TO.

## 12. CONTRACT ADMINISTRATION

The Contracting Officer (CO) is:

Name:

Email:

Telephone:

Fax:



The CO is the primary point of contact for all matters regarding this TO except technical/project matters.

The Contracting Officer Representative (COR) is:

Name:

Email:

Telephone:

Fax:

The COR is the focal point for all technical/project matters related to this Task Order.

### 13. JOB COORDINATION

Note: Only use this M&O verbiage if you have an M&O contractor performing maintenance on any affected equipment/ECM. The paragraph can be modified to include the authority section for the CO, COR, Safety Officer.

\_\_\_\_\_ (M&O Contractor) operates the \_\_\_\_\_ (installation/site) under Contract # \_\_\_\_\_ with \_\_\_\_\_ (Agency). Job coordination for installation of the ECMs on the *installation/site* will be done through M&O's Facilities Improvements Office (FIO). After the "Notice to Proceed" as described in Paragraph 4.A above, all day-to-day coordination regarding construction management from the M&O to the Contractor will come from FIO in writing.

The *Agency* Contracting Office is the sole entity that can modify the TO or initiate change orders. All direction to the Contractor must come from the *Agency* CO. The *Agency* COR will provide answers for questions and/or issues involving construction only and has no authority to make any changes whatsoever to the TO. The Safety Officer shall provide answers for questions and/or issues involving safety only and has no authority to make any changes whatsoever to the TO. All correspondence, including but not limited to: notifications, changes, or direction referred to in this TO or other documents between the Contractor, *Agency* and M&O will be in writing. All correspondence from the Contractor is to be addressed to the *Agency* CO; with copies to the *Agency* COR and the M&O FIO.

The M&O FIO is responsible for documenting and reporting the daily monitoring and inspection of all work activities at the site to the *Agency* COR. These responsibilities include and are not limited to:

- A. The assurance that all installed materials and systems meet the level of quality as defined in the TO.
- B. Ensuring that all work is completed in accordance with the Contractor's ES&H program and the ES&H provisions of this TO.

FIO is the first line of contact with the Contractor's field organization on matters involving safety and interface with *installation/site* operations. The *Agency* CO is responsible for all contracting matters. The *Agency* Contracting Officer Technical Representative (COTR) is the first line of contact between the *Agency* and the Contractor for all technical matters. The Contractor is to take direction from no other sources within the *Agency* or M&O organization.



**14. REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS**

The Representations, Certifications, and Other Statements of Offerors completed by the Contractor and certified in the Online Representation and Certifications Application (ORCA) System, are hereby incorporated by reference.

**15. SMALL BUSINESS SUBCONTRACTING PLAN**

The Small Business Subcontracting Plan submitted and filed by Contractor and incorporated in the Areawide Contract, including any annual plans, are hereby incorporated by reference.

**16. TITLE TO, AND RESPONSIBILITY FOR, CONTRACTOR-INSTALLED EQUIPMENT**

Title to all equipment installed by the Contractor will be vested in the Government after acceptance by the Government, and will not relieve the Contractor’s responsibility for ECM performance.

**17. CONTRACTOR’S RESPONSIBILITIES**

The Contractor is responsible for all damages to persons or property that occur as a result of the Contractor’s fault or negligence. The Contractor is responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work, which may have been accepted under this TO. The Contractor’s responsibility applies to activities of the Contractor, its agents, lower-tier subcontractors, and employees.

**18. GENERAL PROVISIONS**

The following general provisions are incorporated in and made a part of this TO:

Attachment	Title
A-1	Terms and Conditions – Federal Acquisition Regulation Clauses
A-2	Terms and Conditions – <i>Agency</i> Clauses
A-3	Terms and Conditions – Site-Specific Clauses
B	Wage Determination (ref)
C	ETL 13-10

**19. LIST OF REFERENCED ATTACHMENTS (add or delete as desired by installation)**

The following attachments referenced herein are incorporated in and made a part of this TO:

Attachment #	Description
TO-1	<u>Agency/site/M&amp;O guidance</u>
TO-2	Lighting Statement of Work
TO-3	Lighting Specifications
TO-4	Controls Statement of Work
TO-5	Controls Specifications
TO-6	Specifications for Chiller Plant Upgrade – <u>Identification of Specifications &amp; Bid Package</u>
TO-7	Chiller Construction Drawings
TO-8	Performance Assurance Plan



TO-9	ECM Calculations
TO-10	Lighting Calculation Spreadsheets
TO-11	Controls Calculation Spreadsheets
TO-12	Chiller Calculation Spreadsheet
TO-13	Measurement & Verification
TO-14	<u>Agency</u> Reporting & Submittal Requirements
TO-15	Performance Schedule (TBD)
TO-16	Payment & Termination Liability Schedule (TBD)



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE  
WASHINGTON, DC

Air Force Civil Engineer  
UESC Playbook



AFGM2017-32-01

2 February 2017

MEMORANDUM FOR DISTRIBUTION C  
MAJCOMs/FOAs/DRUs

FROM: AF/A4C  
1800 Air Force Pentagon Washington  
DC 20330-1800

SUBJECT: Air Force Guidance Memorandum, *Civil Engineer Control Systems Cybersecurity*

ACCESSIBILITY: Publication is available for downloading on the e-Publishing web site at  
[www.e-Publishing.af.mil](http://www.e-Publishing.af.mil).

RELEASABILITY: There are no releasability restrictions on this publication.

By Order of the Secretary of the Air Force, this Air Force Guidance Memorandum (AFGM) immediately establishes cybersecurity policy for civil engineer (CE)-owned or operated control systems (CS). This Memorandum details the unique operational characteristics of Air Force (AF) CS, outlines roles and responsibilities for managing risk under the Risk Management Framework, and implements guidance and policy for securing and mitigating risk to AF CE CS.

This Guidance Memorandum supersedes *Engineering Technical Letter 11-1* and applies to all military and civilian Air Force personnel, the Air Force Reserve and the Air National Guard. Compliance with this Memorandum is mandatory. To the extent its directions are inconsistent with other Air Force (AF) publications, the information herein prevails, IAW [AFI 33-360, Publications and Forms Management](#).

Ensure all records created as a result of processes prescribed in this publication are maintained IAW [AFMAN 33-363, Management of Records](#), and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). This Memorandum becomes void after one year from the date of this Memorandum, or upon the publication of a new Instruction permanently establishing this guidance, whichever is earlier.

JOHN B. COOPER, Lieutenant General, USAF  
DCS/Logistics, Engineering & Force Protection

2 Attachments:

1. [Control Systems Background](#)
2. [Cybersecurity Policy for Civil Engineer Control Systems](#)

**BREAKING BARRIERS...SINCE 1947**



## Attachment 1

### CONTROL SYSTEMS BACKGROUND

#### A1.1. Control Systems Overview.

A1.1.1. Control systems are integrated hardware and software designed to monitor, or monitor and control, the operation of equipment, infrastructure, or associated devices. Control Air Force Civil Engineer UESC Playbook

systems consist of a combination of technology (computers, human-machine interfaces (HMI)) and control components (electrical switches, mechanical actuators, environmental sensors) that act together upon underlying mechanical or electrical equipment to achieve a physical objective (the transport of matter or energy, control of a dynamic process, or maintenance of a secure and comfortable work environment, etc.) Generally, these special-purpose systems regulate the flow of electricity, fluids, gases, air, traffic, and even people.

CS are comprised of several sub-groups of systems including building automation systems and industrial control systems (ICS). Various categories of ICS include supervisory control and data acquisition (SCADA), distributed control systems (DCS), programmable logic controllers (PLC), intelligent HMI modules, and other dedicated CS configurations often found in the industrial sector and support critical infrastructure.

A1.1.1.1. SCADA systems are highly distributed systems used to monitor and control geographically-dispersed assets where centralized data acquisition, control, and status reporting are critical to system operation. SCADA systems are used in distribution systems such as water distribution and wastewater collection systems, oil and natural gas pipelines, electrical power grids, and railway transportation systems.

A1.1.1.2. DCS are used to control industrial processes such as electrical power generation, oil refineries, water/wastewater treatment, manufacturing production, and materiel distribution. DCS are integrated control architectures that provide supervisory-level control and integration over subsystems responsible for local process control.

A1.1.1.3. PLC are proprietary processor-based, solid-state devices found in almost all industrial equipment and processes to provide logic algorithms for connected input and output devices. They can vary in sophistication from simple, stand-alone microcontrollers to sophisticated, multi-processor controllers that provide advanced motion control, network capability, error detection, diagnostics, process recovery, and fail-safe redundancy. While PLC are components of DCS and SCADA systems, they are often the solitary control device for smaller CS configurations used to provide operational control of separate processes.

A1.1.1.4. A list of AF CE-owned CS can be referred to in [section A1.2](#).

A1.1.2. Throughout the Air Force, CS are typically used to monitor and/or control electricity; facility heating, ventilation, and air conditioning (HVAC); interior and exterior lighting; water and wastewater; natural gas distribution; certain intrusion detection systems and fire/life safety systems (such as fire alarm reporting systems and fire suppression systems). CS are a critical part of automation and are used extensively to optimize resources supporting nearly all aspects of Air Force core mission areas.



A1.1.3. Historically, CE CS were neither automated nor networked. Devices used for monitoring or control had no computing resources, and those that were digitized typically used proprietary protocols and PLCs rather than full computer control. As controllers became interconnected, they were not designed with traditional IT system and security considerations, as they were expected to operate as isolated systems running on their own dedicated network with proprietary communication protocols and specialized hardware and software. This intentional separation from AF-wide traditional IT (e.g., e-mail, web access, networked printing, or remote access) allowed CS to be easily connected, open and accessible, highly stable, and readily serviced.

Today, however, CS are designed using standard platforms, operating systems, network protocols, and access controls commonly found in traditional IT systems. The ever-increasing connectedness of CS allows for greater operational capabilities, efficiencies, and automation. However, this integration also introduces new vulnerabilities that expose both the CS and the underlying network to threats.

A1.1.4. Special precautions must be taken when introducing IT security controls and solutions to CS environments because of the unique ways CS communicate and operate. Interconnections between CS and organizational networks/business systems are a particular point of focus for security and should be carefully considered. In all cases, security solutions must be tailored to the specific CS environment and verified to ensure their impact to the CS is not detrimental to a CS's operation.

A1.1.5. CS can have long life spans (often exceeding 20 years) and can be comprised of technology that suffers rapid obsolescence. This longevity introduces several issues. Most importantly, older hardware and software may no longer be supported by the manufacturer. Companies can go out of business or terminate their support for an installed product. Because of this, patches and forward support for compatibility with new operating systems may no longer be available as new vulnerabilities are discovered.

A1.1.6. In the traditional IT domain, where data is the preeminent priority, cyber defenders often focus on preventing the disclosure of information to unauthorized individuals or processes. Consequently, confidentiality tends to be the most important attribute among the three properties of the confidentiality – integrity – availability (CIA) triad. However, with CS, it is paramount to actively manage or monitor physical processes and maintain high availability and positive control of the system. Therefore, availability and integrity of the CS take precedent over confidentiality. It is this difference in cybersecurity priorities that impacts what security controls and procedures are appropriate to implement for CS compared with those of traditional IT.

A1.1.7. The goal of securing CS components is to prevent, deter, detect, and mitigate the introduction, exposure, and propagation of malicious software to, within, and from the CS as much as possible. Therefore, security controls such as intrusion detection software, antivirus software and file integrity checking software should be utilized to the fullest extent technically feasible. However, it is also recognized that CS have unique performance and reliability requirements and often use operating systems and applications that may be considered unconventional to typical IT processes. Furthermore, the goals of safety and efficiency sometimes conflict with security in the design and operation of control systems.



A1.1.8. CS and their real-time operating systems are often resource-constrained systems that do not include typical contemporary IT security capabilities. Legacy systems are often lacking resources common on modern IT systems. Many systems may not have desired features including encryption capabilities, error logging, and password protection.

Indiscriminate use of IT security practices in CS may cause availability and timing disruptions. There may not be computing resources available on CS components to retrofit these systems with current security capabilities. Adding resources or features may not be possible.

**A1.2. Scope.** AF CE-owned CS include, but are not limited to, the following types of systems (including all points, devices, control panels, means of connectivity, software, controllers, computer workstations, servers, etc.):

A1.2.1. SCADA Systems

- A1.2.1.1. Protective relays (microprocessor-based)
- A1.2.1.2. Cathodic protection systems
- A1.2.1.3. Natural gas distribution systems
- A1.2.1.4. Power generation systems, including renewable systems
- A1.2.1.5. Water/wastewater distribution systems
- A1.2.1.6. Water/waste treatment systems

A1.2.2. Building Automation Systems (BAS)

- A1.2.2.1. Energy Management Control Systems (EMCS)
- A1.2.2.2. Advanced Meter Reading Systems (AMRS)
- A1.2.2.3. Interior/exterior lighting controls

A1.2.3. Fire/Life Safety systems

- A1.2.3.1. Fire Alarm Reporting Systems (FARS)
- A1.2.3.2. Fire Suppression Systems (FSS)
- A1.2.3.3. Facility Mass Notifications Systems

A1.2.4. Utility Monitoring and Control Systems (UMCS)

- A1.2.4.1. Electrical distribution systems
- A1.2.4.2. Generator monitoring systems

A1.2.5. Airfield Control Systems

- A1.2.5.1. Airfield Lighting Control Systems (ALCS)
- A1.2.5.2. Aircraft Arresting Systems (AAS)
- A1.2.5.3. Runway Ice Detection Systems (RIDS)
- A1.2.5.4. Bird abatement systems
- A1.2.5.5. Ramp lighting control systems

A1.2.6. Vehicle Traffic controls

- A1.2.6.1. Drop-arm barriers
- A1.2.6.2. Pop-up barriers
- A1.2.6.3. Traffic signal systems

A1.2.7. CE-maintained Intrusion Detection Systems



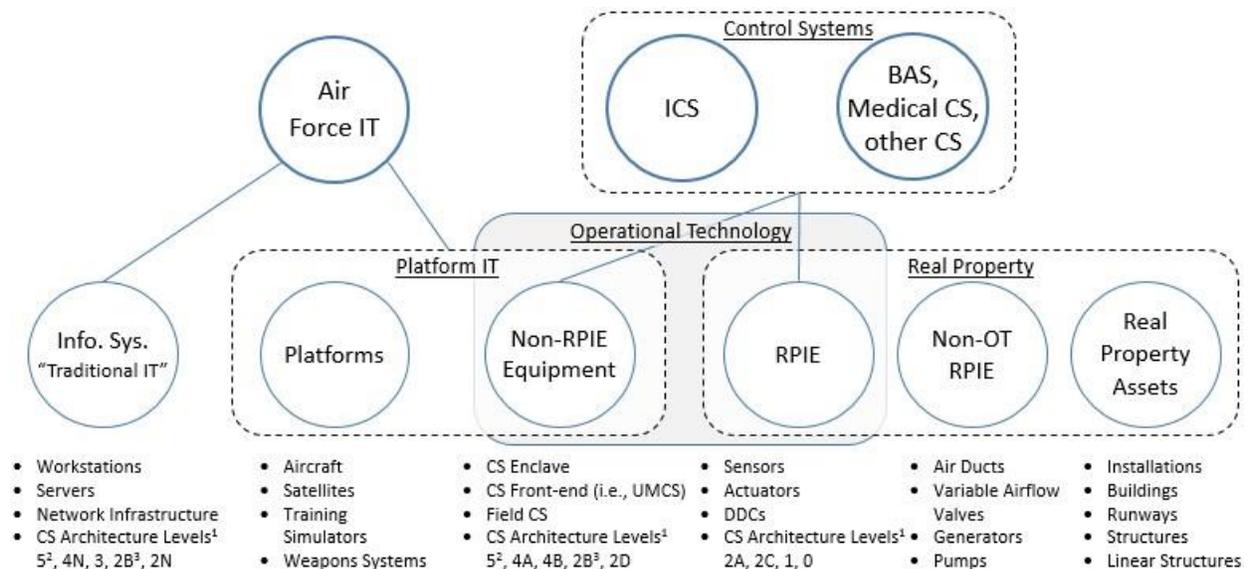
## Attachment 2

### CYBERSECURITY POLICY FOR CIVIL ENGINEER CONTROL SYSTEMS

**A2.1. Applicability.** Due to the unique nature of CS, there is a need for specific control system guidance and policies to help secure, maintain, and provide mission assurance of the critical infrastructure and missions these systems support.

A CS is considered operational technology (OT), which is IT adapted to directly monitor and/or control physical devices, processes and events where availability is the primary operational concern. Accordingly, OT is more sensitive to the application of cybersecurity measures and controls that can affect its availability. The Authorizing Official (AO) assigned to the CS boundary is responsible for managing the risk for OT and may tailor controls to balance security and availability.

Air Force CE CS consist of OT classified as either Real Property Installed Equipment (RPIE) or Non-RPIE Equipment. Figure 1 represents the elements that comprise CS in addition to OT's affiliation with the Platform IT (PIT) category of Air Force IT, defined further in AFI 17-101. Referencing AFI 17-101, Platforms and Non-RPIE Equipment would generally be classified as types of "PIT Systems" or "PIT Subsystems."



**Figure 1: Categorization of AF IT and CS**

Attachment 2 outlines some of the defensive cybersecurity policies to be adhered to throughout the life cycle of CS operating on AF installations. These policies are not meant to supersede any established Federal, Department of Defense (DoD) or AF policy, but instead are intended to supplement existing policy (such as [DoDI 8500.01](#)) and DoD's Risk Management Framework (RMF) (outlined in [DoDI 8510.01](#)) by providing guidance on security measures.

<sup>1</sup> From [Unified Facilities Criteria 4-010-06, Cybersecurity of Facility-Related Control Systems](#), Appendix E

<sup>2</sup> Equipment in CS Architecture Level 5 is considered Non-RPIE Equipment when installed as part of a CS enclave. <sup>3</sup> CS Architecture Level 2B is considered an Information System as a Base Area Network (BAN) access switch and Non-RPIE Equipment when part of a CS in Levels 0-2.



**A2.2. Standard Level of Cybersecurity Service.** At a minimum, the standard cybersecurity level of service for base CE organizations is to be compliant with this AFGM for the CE-owned, operated, or managed on-base assets supporting identified Defense Critical Infrastructure (DCI) missions and capabilities. These procedures and guidelines should also be followed in a prioritized manner for the remaining infrastructure under CE's ICS PIT AO boundary (introduced in [section A2.4.1](#)).

**A2.3. Installations' CS Inventory.** Installations will conduct and maintain accurate inventories of all CS under the purview of CE. The installations' CS inventory should provide thorough awareness of existing systems, their interconnections, and their link to the mission or function they serve. For more information on the recommended content and CS inventory specificity, see [NIST SP 800-82](#).

A2.3.1. The CS inventory at installations shall include both hardware (physical devices and systems) and software (communications platforms and applications) down to Topology Tier Level 2 at a minimum. A diagram of CS topology, its associated levels and components are defined and exemplified in [Unified Facilities Criteria 4-010-06, Cybersecurity of Facility-Related Control Systems](#), Appendix E.

A2.3.2. The inventory shall include descriptions of CS-supported assets and infrastructure, and whether the CS supports DCI as determined by A3OA or locally-derived mission critical capabilities. Actual names of critical infrastructure, Task Critical Assets (TCA), or Defense Critical Assets (DCA) should not be listed in an unclassified environment. TCA and DCA are defined as part of the Defense Critical Infrastructure Program (DCIP) detailed in [DoD Manual 3020.45, Volume 1](#).

**A2.4. Risk Management Framework.** The AF CE community shall adhere to the NIST ICS guidelines ([NIST SP 800-82](#)), DoD RMF guidance outlined in [DoDI 8510.01](#), and subsequent AF RMF policy (AFI 17-101) to the greatest extent possible in order to sufficiently manage the life cycle cybersecurity risk of CS.

**A2.4.1. RMF Roles and Responsibilities.** The transition from the DoD Information Assurance Certification and Accreditation Process (DIACAP) to RMF warrants changes in workflow, roles and responsibilities to accompany the shift from compliance-based accreditation to a risk-based approach to securing assets. To comply with RMF, the AF Chief, Information Dominance and Chief Information Officer (SAF/CIO A6) has appointed the Deputy Director of Civil Engineers (A4C-2) as the AO for CE ICS PIT. Upon appointment by the AF Chief Information Security Officer, the Air Force Civil Engineer Center (AFCEC) Operations Directorate Director will be the Security Control Assessor (SCA) for CE ICS PIT.

During the phase-in period to RMF, the role of Information System Security Manger (ISSM) will be temporarily assumed by AFCEC. The roles of the Information System Owner (ISO) and the Program Manager (PM) for CE CS will be performed, in the short- term, by the owning base's Deputy Base Civil Engineer (BCE). Funding for contract support to assume these roles and responsibilities is currently in the process of being approved through the FY18 budgeting process. The specific roles and responsibilities for performing continuous monitoring, as required by RMF, are forthcoming. See [section A2.17](#) for further details regarding FY18 funding and the transition plan to meet CS cybersecurity protocol expectations.



**A2.4.2. Preliminary Baseline Classification.** For assistance with determining the Potential Impact Values for the RMF “Step 1 - Categorize System” process, please reference the [EI&E PIT Control System Master List](#) located on the [RMF Knowledge Service](#) portal. The list provides a baseline confidentiality – integrity – availability impact rating for various AF control systems. This baseline rating is considered the minimum impact value for a given system based on its mission criticality.

**A2.5. Acquisitions.** Because a CS is related to the facility being constructed and tailored to the mission it supports, acquisition and procurement of CS is currently a decentralized process in the AF. Until there is a centralized CS Program Management Office (PMO) able to adequately conduct CS lifecycle management, the CE community needs to collaborate with the Acquisitions community to accurately define security requirements and prioritize CS acquisitions with cybersecurity measures already incorporated into the design of the asset. Additionally, it is recommended to incorporate the best practices from the Department of Homeland Security (DHS)’s [Cyber Security Procurement Language for Control Systems](#) document into all future procurement and maintenance contracts.

**A2.6. Segregated CS Network Environment.** The AFCEC Operations Directorate’s Civil Engineer Maintenance Inspection Repair Team (CEMIRT) Division will assist Base CE squadrons to establish an accredited CS enclave in order to segregate CS and CS traffic from the base area network (BAN). The enclave configuration will provide a defensible and monitored space protecting both the CS from network vulnerabilities and the network from CS vulnerabilities. CS should be operated either as stand-alone systems (no network connectivity), on an air-gapped network, or on a CS enclave. CS should not be directly connected to the Internet through either static or dial-up connections except as described in [sections A2.9](#) and [A2.16](#).

**A2.7. Information Protection and Mission Assurance.** A modified list of cybersecurity best practices to follow and frequently review is listed below. Additionally, the technical references listed in [section A2.19](#) provide comprehensive procedures to follow for information protection and mission assurance.

A2.7.1. Apply security techniques such as encryption and/or cryptographic hashes to CS data storage and communications where determined appropriate.

A2.7.2. Frequent backups of CS data should be conducted, maintained, and properly stored. It is recommended to store copies of data and “golden image” configuration backups in a secure location for business continuity and disaster recovery.

A2.7.3. When a CS is no longer required, the ISO should take appropriate action to ensure the system and its data is properly disposed IAW established procedures detailed in [NIST SP 800-53r4](#) and [NIST SP 800-82r2](#).

A2.7.4. Ensure response plans (Incident Response/Business Continuity) and recovery plans (Incident Recovery/Disaster Recovery) are in place and managed IAW [NIST SP 800-82](#).



A2.7.4.1. Response and recovery plans should contain specific tactics, techniques, and procedures (TTP) for when adversarial activity is detected. Such a plan may include disconnecting all Internet connections, running a properly scoped search for malware, disabling affected user accounts, isolating suspect systems, and an immediate 100 percent password reset. The plan may also define escalation triggers and actions, including incident response, investigation, and public affairs activities.

See [Advanced Cyber Industrial Control System Tactics, Techniques, and Procedures for Department of Defense Industrial Control Systems](#) for examples of applicable TTPs to be considered for use or tailoring to base-specific conditions.

A2.7.4.2. Response and recovery plans should frequently be tested and reviewed. Personnel should be aware of their roles and responsibilities in case of an incident.

A2.7.4.3. Have a restoration plan in place, including having “gold disks” ready to restore systems to known good states.

## A2.8. Access Control.

A2.8.1. Abide by strict access control protocols to prevent unauthorized physical access to all components of the CS (focusing on control nodes) and the unauthorized introduction of new hardware, infrastructure, and communications interfaces where feasible.

A2.8.2. Adhere to strict access control protocols for logical access to systems – limit to authorized users on an as-needed basis with permissions pertinent to the users’ role.

A2.8.3. Enforce separate authentication mechanisms and credentials for users of the CS network and the BAN (i.e., CS network accounts do not use BAN user accounts).

**A2.9. Connectivity.** All non-BAN connectivity to CS (including, but not limited to, dial-up, Internet, Bluetooth, wireless, and cellular) are considered external connections. These connections bring substantial vulnerabilities warranting additional scrutiny and cybersecurity safeguards.

A2.9.1. Any data transmitted by commercial wireless devices, services, and technologies will implement end-to-end data encryption over an assured channel (AC). The security level of data encryption shall be dictated by the sensitivity of the data and validated under the “Cryptographic Module Validation Program,” specified in [FIPS PUB 140-2](#). Per [DoDD 8100.02](#), individual exceptions to unclassified wireless encryption may be granted on a case-by-case basis after an operational risk assessment is conducted and approval is granted by the AO.

A2.9.2. CS with dial-up modem connections to the Defense Switched Network (DSN), such as direct subscriber lines (DSL), require AF Enterprise AO approval and ATC prior to use. The DSN is a primary information transfer network for the Defense Information Systems Network (DISN) and provides the worldwide non-secure voice, secure voice, data, facsimile, and video teleconferencing services for the DoD and other Federal agencies. All dial-up modem requests shall be submitted through eMASS for CE’s ICS PIT AO and the AF Enterprise AO approval. Until approved, all dial-up modem connections are immediately prohibited.



A2.9.3. A DoD Chief Information Officer (CIO) waiver is required before procuring any of the following commercial services: Internet Service Provider (ISP), networking, system hosting, satellite and cloud computing. The DoD CIO grants DoD Information Network (DODIN) (formally Global Information Grid (GIG)) waivers to use non-DISN commercial IT services when in the best interest of DoD and when Defense Information Systems Agency (DISA) services cannot support mission requirements. Requests are evaluated from a Joint Information Enterprise (JIE) perspective for efforts such as cybersecurity, information sharing, budgeting, interoperability and mission scope.

A2.9.4. Use of a commercial ISP is not authorized unless a DODIN waiver has been approved for this service. Immediately cease all unapproved commercial ISP connections. Seek a DODIN waiver from the DoD CIO. Neither the Installation Commander, Mission Support Group Commander, nor CE's ICS PIT AO have the authority to approve commercial ISP connections. Unauthorized Commercial ISP connections result in a Denial of Authorization to Operate (DATO).

A2.9.4.1. Visit the [DISA website](#) for the DODIN Waiver Process.

**A2.10. Solid State Devices and Removable Media.** As recommended by [NIST SP 800-82](#), no removable media is to be connected to a CS or CS enclave other than as described in [section A2.15.4](#). Provisions should be made to prohibit the connection of unauthorized items, including vendor-owned devices. Make any necessary adjustments to the Service Level Support Agreement or service contract with the system maintainer or vendor.

A2.10.1. In the instance Solid State Hard Drives, Thumb Drives, Dongles, DVDs, CDs, and other removable media and storage devices are connected to a CS or CS enclave, ensure compliance with requirements outlined in USCYBERCOM CTO 10-084 and AF Network Operations Center NETOPS Tasking Order 2008-323-001.

**A2.11. Switches.** The use of switches within the CS should be kept to a minimum and should use managed switches to restrict port access to the CS. These devices have Security Technical Implementation Guides applicable to them, and their configurations will be assessed during the RMF lifecycle. The use of hubs is not permitted. In instances where replacing unmanaged switches becomes an enormous cost and labor burden, the best practice is to replace unmanaged switches with managed switches at the end of the asset's life cycle, however operating unmanaged switches will be taken into account by the SCA and AO.

All switches should have physical security measures. Ensure switches are stored in a locked, secure area/cabinet, and add necessary tamper-proof features to restrict access to these devices.

**A2.12. Handheld Personal Devices.** The use of a Personal Data Assistant (PDA) to access, monitor or control CE-owned CS is not authorized. The discovery of such a connection can result in issuance of a DATO and thus disconnection from the AF Information Network (AFIN).



## A2.13. Device Security.

**A2.13.1. Operating Systems.** [NIST SP 800-82](#) notes that CS operating systems and control networks are often quite different from their IT counterparts, requiring different skill sets, experience, and levels of expertise. Control networks are typically managed by control engineers, not IT personnel. Assumptions that differences are not significant can have disastrous consequences on system operations.

A2.13.1.1. To the greatest extent practicable given acceptable levels of risk and final approval by the Lifecycle System Owners, AF CS' operating systems should be upgraded and maintained to the most current operating system and patch levels approved by the Air Force for the workstation baseline.

A2.13.1.2. In instances when the CS operating system cannot be upgraded for technical or operational reasons, the risk, mitigating actions, and a Plan of Actions and Milestones must be documented and approved through the RMF process by the appropriate approval roles.

**A2.13.2. Anti-Virus.** Use security controls such as antivirus software and file integrity checking software where technically feasible to prevent, deter, detect, and mitigate malware on CS.

A2.13.2.1. Antivirus tools only function effectively when installed, configured, run full-time, and are maintained properly against the state of known attack methods and payloads. However, while antivirus tools are common security practice in IT computer systems, their use with CS may require adopting special practices including compatibility checks, change management issues, and performance impact metrics.

These special practices should be utilized whenever new signatures or new versions of anti-virus software are installed.

A2.13.2.2. Windows, Unix, Linux systems, etc. used as consoles, engineering workstations, data historians, HMIs and general purpose SCADA and backup servers generally can be secured just like enterprise IT equipment: install push- or auto- updated antivirus and patch management software with updates distributed via an antivirus server and patch management server located inside the CS network and auto-updated from the BAN.

A2.13.2.3. Follow vendor recommendations on all other servers and computers (DCS, PLC, instruments) that have time-dependent code, modified or extended operating systems or any other change that makes it different from a standard device. Expect the vendor to make periodic maintenance releases that include security patches.

**A2.13.3. Ports / Services.** Because the specific function of dedicated CS devices should be determined and documented, it is relatively easy to identify those ports and input/output devices that are unnecessary.

A2.13.3.1. Disable all unused ports and services on CS devices after testing to ensure this will not impact the CS operation.

A2.13.3.2. Ensure that unused ports and services remain disabled.

A2.13.3.3. Uninstall any programs, applications and services not strictly necessary for operation of the control system.

**A2.14. Configuration / Patch Management.** An essential aspect of life cycle cybersecurity management is patch management to mitigate known vulnerabilities of CE-owned CS.

**Civil Engineer Control Systems Cybersecurity**

A2.14.1. Appropriate configuration change processes and procedures should be instituted and followed to ensure any changes to the baseline configuration are approved and coordinated with the ISO and Mission Owner (MO). The ISO should track any system modifications and document them in the installation's CS inventory IAW [NIST SP 800-53](#).

A2.14.2. Ideally, in order to evaluate the operational impact of installation new software prior to being applied to an operational environment, system patches and upgrades should first be assessed in a testing environment, on a backup/redundant system, or on an offline system. Then, the operational risk to the availability of the system should be weighed against the unpatched security risk to the system by the appropriate approval authority for the system or subsystem.

A2.14.3. While recognizing that an enterprise-wide CS cyber test range does not exist yet, it is recommended to work with the system vendor or manufacturer through hardware and software maintenance agreements to provide operational testing and evaluation. Bases are not expected to procure separate testbed environments for every CS.

A2.14.4. Systems should be patched or updated only with digitally-signed or hashed software from trusted authoritative sources.

A2.14.5. Procedures for on-site maintenance and patches for CS are outlined in [sections A2.15.4](#) and [A2.15.5](#).

A2.14.6. For further guidance on patch management, refer to [NSA Guidelines for Configuration / Patch Management in Industrial Control Systems](#).

**A2.15. On-site Maintenance.** System maintenance practices to be followed are listed below. Further details of these practices can be found in [NIST SP 800-82](#).

A2.15.1. To the greatest extent possible, maintenance and support should be performed on-site only (not remotely).

A2.15.2. Plan for or enforce having (if a plan exists) only government-owned computers connect to CS and CS enclaves (for maintenance or other authorized uses).

A2.15.3. Government-owned maintenance assets will be maintained by CE and must remain in government control. These maintenance assets must adhere to the following restrictions:

A2.15.3.1. Maintain the cybersecurity practices and procedures also required for NIPRNet machines.

A2.15.3.2. Uninstall any programs, applications, and services not strictly necessary.

A2.15.3.3. Disable any Wi-Fi, cameras, or microphones, preferably at the hardware or physical level.

A2.15.3.4. As stated in [NIST SP 800-46](#) procedures, when existing contracts do not allow for maintenance using government-owned assets, ensure assets used by vendors and service personnel are thoroughly scanned for viruses and malware and have anti-virus software enabled before the asset is allowed to connect to a CS enclave or related infrastructure.

A2.15.3.5. For future CS maintenance-related contracts, incorporate contracting language ensuring the use of government-owned assets for CS maintenance.

Suggested CS contracting language is detailed in DHS's [Cyber Security Procurement Language for Control Systems](#).

**Civil Engineer Control Systems Cybersecurity**

A2.15.4. CS that support Tier 1 TCAs should be on air-gapped networks and not directly connected to either a CS enclave, the NIPRNet, or the Internet. On-site maintenance and patches for DCI-supporting CS will be accomplished using the following procedures:

A2.15.4.1. Download digitally-signed or hashed software from trusted authoritative sources to a CD/DVD.

A2.15.4.2. Scan the CD/DVD on a computer having classified scanning signatures to ensure it is malware-free.

A2.15.4.3. Insert the CD/DVD into a government-owned maintenance computer (per [section A2.15.3](#)) to connect to the stand-alone system or air-gapped CS network.

A2.15.4.4. After patching or upgrading the system, destroy the CD/DVD media to ensure it cannot be used in another device.

A2.15.5. CS that do not support DCI, whether stand-alone or connected to a CS enclave, can be maintained according to defined base maintenance, configuration, and patch management processes.

A2.15.6. Ensure CS maintenance and repair is performed and logged in a timely manner with approved tools IAW this AFGM and existing policy.

**A2.16. Remote Maintenance.** When on-site maintenance and support (per [section A2.15](#)) absolutely cannot be accommodated for existing contractual or cost-effective reasons, remote maintenance access to CS is allowed as an option of last resort only for CS not supporting DCI. If remote access is employed, bases must adhere to the following recommendations and restrictions:

A2.16.1. Follow security measures recommended in [NIST SP 800-46](#), [NIST SP 800-82](#), and DHS/CPNI's [Configuring and Managing Remote Access for Industrial Control Systems](#) such as requiring encryption and token-based, multi-factor authentication.

A2.16.2. Remote access to the CS or CS enclave should be of limited duration – allowed only for the time necessary to accomplish the established maintenance task. The allotted time, initial time of access, and reason for access should be coordinated between the base and vendor in order for remote access to be enabled and monitored.

A2.16.3. Any remote access to the CS or CS enclave outside of the pre-arranged window should be blocked by disabling the modem or by other technical means.

A2.16.4. All remote access events should be logged and monitored. Access and events should be reviewed on a regular schedule. Additionally, the legitimacy and necessity of access should be verified.

A2.16.5. Remote access to CS is to be phased out. On-site maintenance requirements, cybersecurity procedures and Service Level Support Agreements are to be written into new, renewed or updated maintenance and support contracts.

A2.16.6. Other remote access to the CS or CS enclave not meeting these specifications is prohibited.

A2.16.7. Remote access to CS supporting DCI is prohibited.



**A2.17. Transition Plan.** Funding for contract support to assume these roles and responsibilities is currently in the process of being approved through the FY18 budgeting process.

A2.17.1. To alleviate the burden and to support compliance with these RMF and cybersecurity requirements, funding for contract support is in the approval process for FY18 to provide CE CS cybersecurity expertise at the base level in a prioritized manner. These full-time cybersecurity professionals will be dedicated to managing the CS cybersecurity efforts for the CE functional community, including conducting and maintaining accurate inventories, conducting mission support analysis, managing and configuring the type-accredited CS enclaves, conducting self-assessments of security controls and performing cybersecurity maintenance and lifecycle management of CE-owned CS.

A2.17.2. Inventories and the full implementation of cybersecurity controls on critical infrastructure-related CS need to be completed and in place by the end of FY19. Until bases receive dedicated manpower, bases are expected to plan for and comply with the remainder of guidance contained in this AFGM to the greatest extent possible given availability of resources and expertise.

A2.17.3. At this time, the exact roles and responsibilities for a Cybersecurity Defense Service Provider (CDSP) to provide defensive cyber operations and continuous monitoring for CE-owned CS and CS enclaves have not yet been determined.

A2.17.4. Further training material and templates are forthcoming to assist in base execution of this AFGM's requirements.

**A2.18. Technical Support.** For specific CS-related technical support and guidance, AFCEC's CEMIRT Division supports the accreditation of CE CS and guidance for implementing the enclave for CE-owned CS. CEMIRT can be reached by phone at DSN 523-6989/6929 or by e-mail at [afcec.comi.icshelpdesk@us.af.mil](mailto:afcec.comi.icshelpdesk@us.af.mil), [afcec.comi.ics@us.af.mil](mailto:afcec.comi.ics@us.af.mil).

**A2.19. Technical References.** For specific technical guidance on the policies outlined above and on additional CE CS security controls, consult the following references which detail procedures on cybersecurity best practices and on system classification for tailoring security controls.

A2.19.1. [NIST SP 800-82](#) A2.19.2.

[NIST SP 800-53](#)

A2.19.3. [NIST Framework for Industrial Control System Cybersecurity](#)

A2.19.4. [NSA Information Assurance Directorate Guidance for Industrial Control Systems](#)

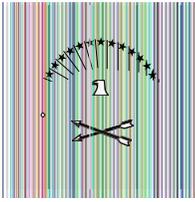
A2.19.5. [Advanced Cyber Industrial Control System Tactics, Techniques, and Procedures for Department of Defense Industrial Control Systems](#)

A2.19.6. [Federal Information Processing Standards Publications \(FIPS PUBS\)](#)

A2.19.7. [CNSSI No. 1253, Security Control Overlays for Industrial Control Systems](#)

A2.19.8. [DHS ICS-CERT Standards and References](#)

A2.19.9. [Air Force Control Systems Community](#)



**DEPARTMENT OF THE AIR FORCE**  
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

30 MAR 2011

FROM: HQ AFCESA/CEO  
139 Barnes Drive Suite 1 Tyndall AFB  
FL 32403-5319

SUBJECT: Engineering Technical Letter (ETL) 11-1: Civil Engineer Industrial Control System Information Assurance Compliance

- 1. Purpose.** This ETL provides technical guidance and criteria for information assurance (IA) of civil engineering (CE) industrial control systems (ICS). This ETL applies to all ICSs that utilize any means of connectivity to monitor and control industrial processes, including supervisory control and data acquisition (SCADA) systems, distributed control systems (DCS), and other control system configurations such as programmable logic controllers (PLC), which are often found in industrial equipment and critical infrastructures.

**Note:** The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this ETL does not imply endorsement by the Air Force.

- 2. Application.** This ETL supersedes ETL 09-11, *Civil Engineering Industrial Control System Information Assurance Compliance*, dated October 26, 2009. Requirements in this ETL are mandatory. The interpreting authority for this ETL is the Air Force Civil Engineer Support Agency, Operations and Programs Support Division, Engineer Support Branch (HQ AFCESA/CEOA).
  - 2.1. Authority:** Air Force instruction (AFI) 32-1063, *Electric Power Systems*.
  - 2.2. Effective Date:** Immediately.
  - 2.3. Intended Users:**
    - Major command (MAJCOM) engineers
    - Base civil engineers (BCE)
    - ICS information assurance managers (IAM)
  - 2.4. Coordination:**
    - MAJCOM engineers responsible for CE ICSs
    - The Air Force Civil Engineer, Resources Division, Information Technology Branch (HQ AF/A7CRT)
    - Air Force Network Integration Center, Information Assurance Directorate (AFNIC/EV) and Air Force certifying authority (CA)
    - Chief, Cyberspace Surety Division (SAF/A6OI), on behalf of Director, Cyberspace Operations (SAF/A6O) and Air Force senior information assurance officer (SIAO)

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### 3. Referenced Publications.

- 3.1. Air Force (departmental publications available at <http://www.e-publishing.af.mil/>):
- Air Force policy directive (AFPD) 16-14, *Information Protection*
  - AFI 31-401, *Information Security Program Management*
  - AFI 31-501, *Personnel Security Program Management*
  - AFI 32-1063, *Electric Power Systems*
  - AFI 33-112, *Information Technology Hardware Asset Management*
  - AFI 33-114, *Software Management*
  - AFI 33-115V1, *Network Operations (NETOPS)*
  - AFI 33-115V2, *Licensing Network Users and Certifying Network Professionals*
  - AFI 33-200, *Information Assurance (IA) Management*
  - AFI 33-210, *Air Force Certification and Accreditation (C&A) Program (AFCAP)*
  - AFI 33-230, *Information Assurance Assessment and Assistance Program*
  - AFNIC EV 2010-08, *Guide for Submission of Platform Information Technology (PIT) Determination Concurrence Requests*, 18 August 2010
  - *Information Technology Investment Policy Guidance Memorandum*, 9 June 2008, HQ USAF/A7C
- 3.2. United States Code (U.S.C.):
- Title 40 U.S.C. 1401(3), *The Clinger-Cohen Act of 1996*
- 3.3. Code of Federal Regulations (CFR):
- Title 47, CFR, Part 15, *Radio Frequency Devices*, <http://www.gpo.gov/>
- 3.4. Department of Defense (DOD):
- DOD 8570.01-M, *Information Assurance Workforce Improvement Program*, incorporating Change 2, 20 April 2010, <http://www.dtic.mil/whs/>
  - DOD Directive (DODD) 8000.01, *Management of the Department of Defense Information Enterprise*, 10 February 2009, <http://www.dtic.mil/whs/directives/corres/pdf/800001p.pdf>
  - DODD 8100.02, *Use of Commercial Wireless Devices, Services, and Technologies in the Department of Defense (DOD) Global Information Grid (GIG)*, 14 April 2004, <http://www.dtic.mil/whs/directives/corres/dir.html>
  - DODD 8500.01E, *Information Assurance (IA)*, 24 October 2002, <http://www.dtic.mil/whs/directives/corres/dir.html>
  - DOD Instruction (DODI) 5000.02, *Operation of the Defense Acquisition System*, 8 December 2008, <http://www.dtic.mil/whs/directives/>
  - DODI 8500.2, *Information Assurance (IA) Implementation*, 6 February 2003, <http://www.dtic.mil/whs/directives/corres/ins1.html>
  - DODI 8510.01, *DOD Information Assurance Certification and Accreditation Process (DIACAP)*, 28 November 2007, <http://www.dtic.mil/whs/directives/corres/ins1.html>



**3.5. National Institute of Standards and Technology (NIST):**

- Federal Information Processing Standards Publication (FIPS PUB) 140-2, *Security Requirements for Cryptographic Modules*, 25 May 2001, <http://csrc.nist.gov/>
- FIPS PUB 197, *Advanced Encryption Standard (AES)*, 26 November 2001 <http://csrc.nist.gov/>
- NIST Special Publication (SP) 800-53, *Recommended Security Controls for Federal Information Systems and Organizations*, Revision 3, August 2009, <http://csrc.nist.gov/publications/nistpubs/>
- NIST SP 800-82, *Guide to Industrial Control Systems (ICS) Security*, Final Public Draft, September 2008, <http://csrc.nist.gov/publications/drafts/>
- NIST SP 800-18, *Guide for Developing Security Plans for Federal Information Systems*, Revision 1, February 2006, <http://csrc.nist.gov/publications/nistpubs/>

**3.6. Other Government References:**

- Committee on National Security Systems Instruction (CNSSI) No. 4012, *National Information Assurance Training Standard for Senior System Managers*, June 2004, Committee on National Security Systems, [http://www.cnss.gov/Assets/pdf/cnssi\\_4012.pdf](http://www.cnss.gov/Assets/pdf/cnssi_4012.pdf)
- Federal Information Security Management Act (FISMA) of 2002, Section 301: Information Security, <http://iase.disa.mil/fisma/index.html>
- National Security Telecommunications and Information Systems Security Instruction (NSTISSI) No. 4015, *National Training Standard for System Certifiers*, December 2000, Committee on National Security Systems, [http://www.cnss.gov/Assets/pdf/nstissi\\_4015.pdf](http://www.cnss.gov/Assets/pdf/nstissi_4015.pdf)
- Office of Management and Budget (OMB) Circular A-76, *Performance of Commercial Activities*, 29 May 2003, <http://www.whitehouse.gov/>
- OMB Circular A-130, *Management of Federal Information Resources*, 28 November 2000, <http://www.whitehouse.gov/>
- National Telecommunications and Information Administration, *Manual of Regulations and Procedures for Federal Radio Frequency Management*, September 2010 Revision of the 2008 Edition, <http://www.ntia.doc.gov/>

**4. Acronyms and Terms.** See Attachment 2.

**5. Background.**

**5.1. ICS Overview.**

- 5.1.1.** Industrial control system (ICS) is a general term for several types of control systems, including SCADA systems, DCSs, and other control system configurations such as skid-mounted or panel-mounted PLCs often found in the industrial sector and critical infrastructure. ICSs are typically used in infrastructure/utility/industrial systems such as electrical, water and wastewater, oil and natural gas, chemical, transportation, pharmaceutical, pulp and paper,



food and beverage, and discrete manufacturing (e.g., automotive, aerospace, and durable goods).

**5.1.1.1.** SCADA systems are highly distributed systems used to control geographically dispersed assets, often scattered over thousands of square miles, where centralized data acquisition and control are critical to system operation. SCADA systems are used in distribution systems such as water distribution and wastewater collection systems, oil and natural gas pipelines, electrical power grids, and railway transportation systems.

**5.1.1.2.** DCSs are used to control industrial processes such as electrical power generation, oil refineries, water/wastewater treatment, and manufacturing production. DCSs are integrated as a control architecture containing a supervisory level of control overseeing multiple integrated subsystems responsible for controlling the details of a localized process.

**5.1.1.3.** PLCs are computer-based, solid-state devices controlling almost all industrial equipment and processes. While PLCs are control system components used throughout DCS and SCADA systems, PLCs are often the primary components in smaller control system configurations used to provide operational control of separate processes.

**5.1.2.** For Air Force CE, real property ICSs include, but are not limited to, the following types of systems (including all points, devices, control panels, means of connectivity, software, controllers, computer workstations, servers, etc.):

- Supervisory control and data acquisition (SCADA) systems
  - Fuel distribution systems
  - Protective relays
  - Cathodic protection systems
  - Power generation systems, including renewable systems
  - Natural gas distribution systems
- Energy management and control systems (EMCS)
- Automated meter reading (AMR)/utility systems, including water metering systems
- Fire alarm/fire suppression/mass notification systems
- Utility monitoring and control (UMAC) systems
  - Electrical distribution systems
  - Generator monitoring systems
  - Water system controls
  - Natural gas distribution systems
- Airfield control systems
  - Lighting system controls
  - Aircraft arresting system (AAS) controls
- Traffic signal controls and vehicle barriers



- CE-maintained intrusion detection systems (IDS) (by CE/Security Forces memorandum of agreement only). **Note:** IDSs are not considered real property installed equipment.

**5.1.3.** Initially, many CE ICSs had little resemblance to traditional information technology (IT) systems in that ICSs were isolated systems running proprietary control protocols using specialized hardware and software. Widely available, low cost Internet Protocol (IP) devices are now replacing proprietary solutions, which increases the possibility of cyber security vulnerabilities and incidents. As ICSs are adopting IT solutions to promote corporate business systems connectivity and remote access capabilities, and are being designed and implemented using industry standard computers, operating systems, and network protocols, ICSs are starting to resemble IT systems. This integration supports new IT capabilities, but it provides significantly less isolation for ICSs from the outside world than predecessor systems, creating a greater need to secure these new systems. While security solutions have been designed to deal with these security issues in typical IT systems, special precautions must be taken when introducing these same solutions to ICS environments. In some cases, new security solutions are needed that are tailored to the ICS environment.

**5.1.4.** Many ICS characteristics differ from those of traditional IT systems, including different risks and priorities. Some of these ICS characteristics include significant risk to the health and safety of human lives and serious damage to the environment. ICSs have different performance and reliability requirements and use operating systems and applications that may be considered unconventional to typical IT support personnel. Furthermore, the goals of safety and efficiency can sometimes conflict with security in the design and operation of control systems. For example, requiring password authentication and authorization should not hamper or interfere with emergency actions for the ICS. For additional information concerning the distinct differences between ICSs and typical IT systems, see NIST SP 800-82, *Guide to Industrial Control Systems (ICS) Security*, section 3.1.

## 5.2. Information Assurance (IA) of ICSs.

**5.2.1.** The Air Force Chief Information Officer (CIO) has issued policy guidance for the identification and IA of all legacy and future information systems (IS). For the CE community, these systems include the ICSs identified in paragraph 5.1.2 whether or not they are physically connected to the base local area network (LAN) or Air Force Global Information Grid (AF-GIG). ICSs that do **not** have a direct connection to the AF-GIG (see Attachment 2 for definition) are considered platform IT (PIT) systems. If a connection to the AF-GIG exists, that connection is considered a PIT interconnection (PITI).



## 5.2.2. Platform IT (PIT) Systems.

**5.2.2.1.** A PIT system is considered a special purpose system using computing resources (i.e., hardware, firmware, and [optionally] software) that are physically embedded in, dedicated to, or essential in real time to the mission performance of the system. A PIT system performs only (i.e., is dedicated to) the information processing assigned to the PIT system by its hosting special purpose system. Examples include, but are not limited to, SCADA-type systems, certain medical devices, training simulators, and diagnostic test and maintenance equipment.

**Note:** PIT point-to-point interconnections using an Air Force installation's backbone infrastructure for the purpose of connecting to remote sensors or to another PIT capability (within the same base/enclave) are not considered to be PITIs as long as they are logically or physically separated/isolated from the base common user infrastructure and systems (see AFNIC EV 2010-08, *Guide for Submission of Platform Information Technology (PIT) Determination Concurrence Requests*). See section 8.1.6 of this ETL for additional guidance on virtual local area networks (VLAN).

**5.2.2.2.** ICS PIT Certification and Accreditation (C&A). ICS PIT C&A is required for any new or existing ICS. ICS PIT C&A is not to be confused with the Air Force Certification and Accreditation Program (AFCAP) that utilizes the Defense Information Assurance Certification and Accreditation Process (DIACAP). The ICS PIT C&A process is illustrated in Attachment 1, with step-by-step instructions provided in section 7. New system acquisitions must incorporate security and IA requirements into the design specifications, and systems already in operation require IA controls as prescribed in current policy and guidance. PIT systems require IA risk assessment (RA) and periodic review as directed by the PIT designated accrediting authority (DAA).

## 5.2.3. Platform IT Interconnections (PITIs).

**5.2.3.1.** A PITI is the interface/connection between a PIT and the AF-GIG or any other DOD communications network. Examples of PITIs that require security considerations include, but are not limited to, PIT communications interfaces for data exchanges with the AF-GIG for mission planning or execution, remote administration, remote sensing, remote alerting (including one-way communication), and remote upgrade, query, or reconfiguration.

### 5.2.3.2. PITI C&A.

**5.2.3.2.1.** When a PIT system requires connection to the AF-GIG or any other DOD network to exchange information as part of the mission of the ICS, the IA requirements for the exchange must be explicitly addressed as part of the interconnection. These interconnections are subject to the AFCAP and



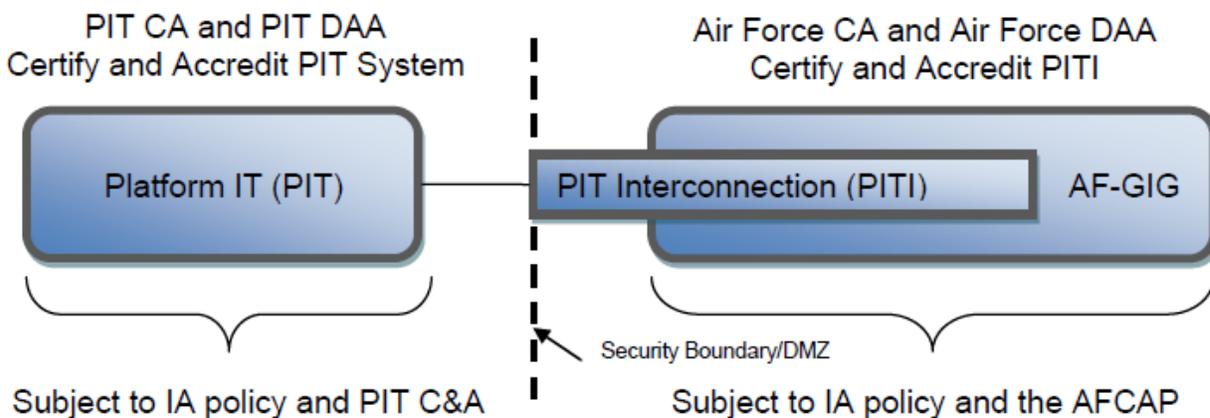
DIACAP as outlined in AFI 33-210, *Air Force Certification and Accreditation (C&A) Program (AFCAP)*, and DODI 8510.01, *DOD Information Assurance Certification and Accreditation Process (DIACAP)*, respectively.

**5.2.3.2.2.** PITI C&A requires documenting any additional measures required by the AF-GIG to extend IA services or to protect the PIT from interconnection risk. The IA controls and level of robustness must be selected as applicable and shall consider the mission assurance category (MAC) and confidentiality level of both the PIT and its interconnecting means. IA controls provide a common management language for establishing IA needs, promoting consistency for testing and validating the implemented IA solutions, reducing complexity when managing changes to the validated baseline, providing a common pivot point when negotiating interconnections, and increasing accuracy for reporting IA readiness.

**Note:** IA controls listed in DODI 8500.2, *Information Assurance (IA) Implementation*, and NIST SP 800-53, *Recommended Security Controls for Federal Information Systems and Organizations*, Appendix I (“Industrial Control Systems”), are designed to complement each other in addressing the uniqueness of PIT or PITI. When IA controls conflict, the MAC of the interconnected system will drive the security objectives of the PIT or PITI ICS.

**Note:** All IT is subject to IA policy, but PIT is excluded from the AFCAP; however, **PITIs** are specifically subject to the AFCAP, per AFI 33-210.

**5.2.4.** Figure 1 shows the applicability of IA policy for PIT systems and IA policy and the AFCAP for PITIs to the AF-GIG.



**Figure 1. AFCAP Applicability (AFI 33-210)**



## 6. Designated Personnel: General Roles, Responsibilities, and Qualifications.

6.1. Within CE are base-level ICS IAMs, MAJCOM ICS functional area managers (FAM), the ICS program manager (PM), the ICS PIT certifying authority (CA), the ICS portfolio manager (PfM), and the ICS PIT DAA. Their general roles, responsibilities, and qualifications are as follows:

6.1.1. Base-level ICS IAM. The BCE shall appoint, in writing, a primary and alternate ICS IAM for the civil engineer group (CEG) or civil engineer squadron (CES). The ICS IAMs are responsible for ensuring that base CE ICSs are certified and accredited in accordance with DOD and Air Force IA directives and instructions.

6.1.1.1. The primary ICS IAM must have Information Assurance Technical (IAT) Level II or Information Assurance Management (IAM) Level I certification in accordance with DOD 8570.01-M, *Information Assurance Workforce Improvement Program*, within six months of BCE appointment. (**Note:** Security+ certification satisfies either IAT Level II or IAM Level I certification.) If the CEG or CES has IT support personnel, it is recommended that the BCE assign an IT system administrator as the primary ICS IAM. Many Air Force CE IT specialists have IAT Level I or higher certification. In addition to the primary ICS IAM, an alternate ICS IAM must be appointed to assist the primary with the functional and technical aspects of ICSs. The alternate ICS IAM must be a qualified ICS operator/technician, and IAT/IAM certification is desired but not required. The alternate ICS IAM's primary role is to provide the necessary technical support/expertise to the primary ICS IAM to achieve ICS IA certification and accreditation. These two individuals will leverage each other's expertise to achieve IA of our ICSs.

6.1.1.2. The primary ICS IAM shall:

- Approve and manage all access privileges to ICS software and systems; validate all access privileges annually; and re-evaluate frequency requirements every three years or at any mission change, system change, or other significant change to operating requirements.
- Ensure appropriate access privileges for all individuals based on their training, qualification, and functional duties.
- Manage CE ICS access by ensuring that accounts are deactivated or activated in a controlled manner. Personnel designated to make configuration decisions and responsible for IA controls for both PIT and PITI shall be certified to IAT Level II or IAM Level I in accordance with DOD 8570.01-M.
- Have full administrative rights to install software updates/patches.
- Have access to review, modify, and edit the Enterprise Information Technology Data Repository (EITDR) entries as approved by the ICS FAM.



- Document and track system configurations for each CE-owned, -operated, and -maintained ICS throughout the system life cycle, including any Air Force CE ICSs operated and maintained by contractors. For each ICS, the ICS IAMs will assemble a PIT determination package in accordance with section 7.1.1 of this ETL and forward the package to the respective ICS FAM.
- Provide an annual report entitled “Industrial Control System Security Status Report” to the MAJCOM ICS FAM. The report will include a summary of current systems and system changes and will indicate compliance/non-compliance with IA security requirements. This report is due to the ICS FAM in October of each year.

**6.1.1.3.** The alternate ICS IAM shall:

- Document and track system configurations for each CE-owned, -operated, and -maintained ICS throughout the system life cycle, including any Air Force CE ICSs operated and maintained by contractors. For each ICS, the ICS IAMs will assemble a PIT determination package in accordance with section 7.1.1 of this ETL and forward the package to the respective ICS FAM.
- Provide an annual report entitled “Industrial Control System Security Status Report” to the MAJCOM ICS FAM. The report will include a summary of current systems and system changes and will indicate compliance/non-compliance with IA security requirements. This report is due to the ICS FAM in October of each year.

**6.1.2.** MAJCOM ICS FAM. The ICS FAM is designated in writing by the MAJCOM A7O (Operations) or equivalent. The ICS FAM is responsible for collecting the base-level PIT determination packages, reviewing them for completeness, and sending them to the ICS PM. In addition, the ICS FAM will submit an annual report entitled “Industrial Control System Security Status Report” to the ICS PfM. This report will contain a summary of current systems and system changes and will indicate compliance/non-compliance with IA security requirements. This report is due in November of each year. The ICS FAM may have access to create, modify, or delete EITDR entries as approved by the ICS PM or ICS PfM.

**6.1.3.** ICS PM. The ICS PM is designated in writing by HQ AFCESA/CEO. The ICS PM is responsible for ensuring appropriate scheduling of all IA aspects of the program to meet the ultimate goals of IA compliance. The ICS PM is also responsible to ensure that the following tasks are accomplished:

- Review and submit ICS PIT packages to Air Force CA for a PIT determination statement.
- Complete initial EITDR entries for CE ICS PITs.
- Provide updates to MAJCOM FAMs on the status of C&A activities of their respective systems.
- Establish a PIT integrated product team (IPT) of engineers, testers, etc.



- Coordinate and oversee execution of IA RAs.
- Ensure that all IA testing requirements are performed.

**6.1.4.** ICS PIT CA. The PIT CA is the technical authority for the IA aspects of a PIT system within their control. The PIT CA is responsible for ensuring clear definition of the IA requirements at the earliest stage possible. The PIT CA is then responsible for ensuring the implementation of the IA requirements to the extent possible based on program or system cost, schedule, and technical trade-offs. One of the primary functions of the PIT CA is to review the RA completed by the IPT. The ultimate goal of the RA is to mitigate or reduce remaining risks to an acceptable level. The PIT CA should agree with the RAs and help structure any mitigations for those risks not considered low. The PIT CA has the responsibility to advise the PIT DAA in making a final IA RA of the system. The PIT CA is designated in writing by the Air Force SIAO. The Air Force SIAO has designated HQ AFCESA/CEO as the ICS PIT CA.

**6.1.4.1.** The ICS PIT CA may have the following roles and responsibilities:

- Act as the focal point for the CE ICS IA compliance program and ETL.
- Coordinate CE ICS IA-related tasks with ICS PfM/ICS PIT DAA.
- Review and approve CE ICS IA strategy and implementation.
- Act as the technical authority for ICS-related IA issues.
- Certify the ICS IA design and implementation.
- Advise the ICS PIT DAA on IA-related issues.

**6.1.4.2.** Technical aspects of an ICS that may be reviewed include the following:

- ICS IA requirements
- Threat assessments
- Accreditation boundary/demilitarized zone (DMZ)
- Topology, block, and data flow diagrams
- Software, hardware, and firmware analysis
- Network connection compliance analysis
- Integrity analysis of integrated products
- Risk/vulnerability assessment results/findings
- Mitigation recommendations/techniques/shortfalls

**6.1.4.3.** Air Force SIAO-Directed Training, Certification, and Reporting Requirements:

- Maintain compliance with training and certification criteria outlined in National Security Telecommunications and Information Systems Security Instruction (NSTISSI) No. 4015, *National Training Standard for System Certifiers*, and DOD 8570.01-M.



- Submit monthly reports to SAF/A6OI providing the status of all HQ AF/A7 CE ICS certified over the specified period at [af.infoassurance@pentagon.af.mil](mailto:af.infoassurance@pentagon.af.mil).

**6.1.5.** ICS PfM. The ICS PfM has oversight responsibility for IT initiatives and systems for which they have lead funding responsibility. The ICS PfM is required to certify to the Air Force CIO annually, based on the ICS security status reports received from the ICS FAMs, that the provided IT portfolio management information is complete, accurate, and in accordance with current Air Force IT portfolio management direction as provided in budgetary documents (policy, annual planning and programming guidance, program objective memorandum preparation instructions, etc.). The ICS PM assists the ICS PfM by ensuring that all ICSs are registered in the EITDR. The ICS PfM resides at HQ AF/A7CRT and is responsible for CE portfolio management and annual reviews to maximize the value of IT investments and minimize the risk.

**6.1.6.** ICS PIT DAA. The PIT DAA is designated in writing by the Air Force CIO. The PIT DAA has a level of authority commensurate with accepting, in writing, the risk of operating all PIT systems under their jurisdiction. The PIT DAA must be independent of any particular program, but has the authority to influence programs from a global perspective. The PIT DAA consults with the PIT CA in making decisions but is not bound by the recommendation of the PIT CA. The PIT DAA takes into account the command's technical and programmatic needs in rendering a decision. The Air Force CIO has designated HQ AF/A7C-2 as the CE ICS PIT DAA. See Attachment 3.

**6.1.6.1.** ICS PIT DAA Responsibilities. The PIT DAA may have the following responsibilities:

- Ensure that IA requirements are identified and integrated into the systems engineering and acquisition processes as appropriate.
- Review/approve the accreditation decision package that includes an IA RA and mitigation approach.
- Accredit/deny systems for test or operation.
- Submit the system accreditation package to the Air Force DAA for network connection to the AF-GIG (if required) and acknowledge any PITIs in their accreditation decisions.

**6.1.6.2.** ICS PIT DAA Decisions. The PIT DAA may grant the following accreditation decisions to PIT ICSs under their purview:

1. Interim Authority to Test (IATT): Special case for authorizing testing in an operational environment or with live data for a specified time period. An IATT is for testing purposes only.
2. Interim Authority to Operate (IATO): A temporary authorization to operate under the conditions or constraints enumerated in the accreditation decision. An IATO is normally granted for up to



180 days. The DAA may not grant consecutive IATOs totaling more than 360 days.

3. Authority to Operate (ATO): Accreditation by the DAA for the system to operate without restriction. All IA risks are considered low or mitigations are in place, and the DAA agrees that any residual risk is acceptable under the circumstances. An ATO is required prior to initial operating capability (IOC). An ATO may be granted up to three years.
4. Denial of Authorization to Operate: A DAA decision that the information system cannot operate because of inadequate IA design, failure to adequately implement assigned IA requirements, or lack of adequate security.

**6.1.6.3. Air Force CIO-Directed Training, Certification, and Reporting Requirements:**

- Complete training and maintain appropriate IA certification in accordance with DOD 8570.01-M, Chapter 5, and Committee on National Security Systems Instruction (CNSSI) No. 4012, *National Information Assurance Training Standard for Senior System Managers*, prior to appointment. Proof of training (e.g., certificate) will be included as an artifact to the PIT accreditation decision package.
- Submit semi-annual reports to SAF/A6OI providing the status of all CE PIT ICSs accredited over the specified period at [af.infoassurance@pentagon.af.mil](mailto:af.infoassurance@pentagon.af.mil).

7. **CE ICS C&A Process.** The C&A process for PIT systems, with or without interconnections, commences at issuance of this ETL. The C&A process is divided into three phases: Phase 1, ICS PIT Determination; Phase 2, ICS PIT C&A; and Phase 3, PITI AFCAP. Figure 2 summarizes the CE ICS C&A process flow chart provided in Attachment 1.

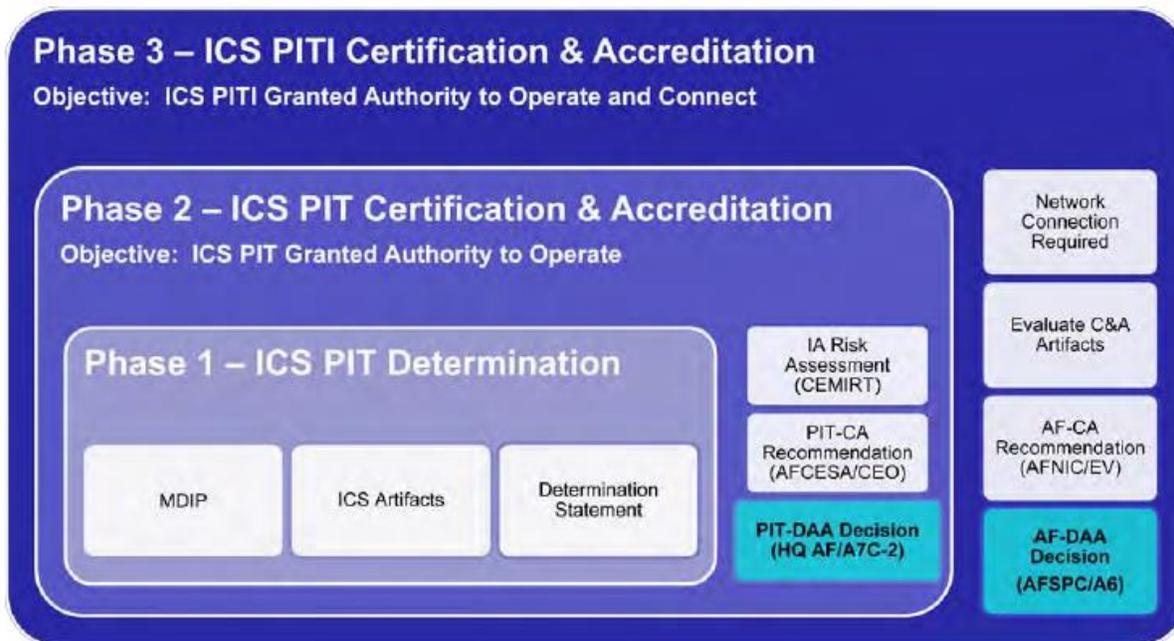


Figure 2. CE ICS C&A Process Overview

### 7.1. Phase 1: PIT Determination.

7.1.1. ICS IAMs shall document system configurations for each CE-owned, -operated and -maintained ICS, including any ICS operated and maintained by contractors. For each ICS, the ICS IAM will assemble a PIT determination package composed of the following information and forward that package to the respective ICS FAM.

7.1.1.1. Provide a single line block diagram of each type of ICS architecture. These diagrams should show the ICS network topology (i.e., its interconnections, data flow, components, and external connections).

- System connectivity
  - How the data flows
  - Where the data is coming in and out
  - Connection type(s) – wireless radio frequency (RF), Cat5, fiber, modem, etc.
  - Firewall location(s), if applicable
- System interconnectivity (i.e., other systems to which the ICS is connected, whether PIT, PITI, commercial Internet service provider, World Wide Web (WWW), GIG, LAN, etc.)
- Key components, including:
  - Make and model
  - IP address, if applicable
- Accreditation boundary (or boundaries), DMZ, or security boundary. The ICS security boundary shall be identified and well defined on all single line diagrams and network topologies for each ICS. The ICS



security boundary is the demarcation of connection to the AF-GIG or other DOD network.

- Firewalls, if applicable
  - Vendor, make, model, software version
- Cyber intrusion prevention/detection, if applicable
  - Vendor, make, model, software version
- IP addresses, if applicable. Do not use Xs. Network and ranges must be expressed correctly.

**Note:** The diagram must allow the Air Force CA to clearly understand and identify the hardware, software, and other IT components as well as the mission the platform supports.

**7.1.1.2.** Complete the Modified DIACAP Implementation Plan (MDIP) template for each ICS (see paragraph 5.1.2 for a list of common ICSs). Include any ICS architecture and installation specifications for each type of ICS architecture.

**Note:** ICS architecture and installation instructions are typically provided by the vendor and can be supported through vendor-specific literature, white papers, and/or configuration guides.

**7.1.1.3.** Complete the PIT determination checklist. This data is required by the ICS PM for input into the EITDR.

**7.1.1.4.** Describe the ICS in narrative form, and describe how, in real time, the ICS supports the operation and functionality of the special purpose system.

**7.1.1.5.** Submit the above information to the ICS FAM via a digitally signed and encrypted e-mail message.

**7.1.2.** ICS FAMs should submit the packages to the ICS PM via an encrypted and digitally signed e-mail message.

**7.1.3.** The ICS PM reviews the PIT(I) determination packages for completeness and submits them to the Air Force CA for a PIT(I) determination. The ICS PM will request in writing an Air Force CA evaluation to determine if the ICS is PIT(I). If the ICS requires the use of interconnections not connected to the AF-GIG, the ICS PM must state the justification for requesting exemption from the AFCAP, including rationale for the ICS as PIT.

**7.1.4.** The Air Force CA will evaluate the package and determine if the ICS is PIT. If the Air Force CA determines that the submission represents PIT, the PIT determination letter will indicate concurrence that the ICS meets the criteria for designation as PIT and is exempt from the formal AFCAP. Non-concurrence by the Air Force CA means the system is not a PIT system or the system has an



interconnection to the AF-GIG. The AFCAP will be required for those systems and interconnections in accordance with AFI 33-210.

**7.1.5.** The ICS PM shall receive the PIT(I) determination letter from the Air Force CA, review for changes to the original ICS architecture, recommend best security practices using, as a minimum, NIST SP 800-53, Appendix I, and provide additional instructions for Phase 2 of the CE ICS C&A process. The ICS PM will also provide system security and IA strategies.

**7.1.5.1.** If the ICS PM does not agree with the Air Force CA's PIT determination, the ICS PIT CA may appeal Air Force CA's determination to the Air Force SIAO for reconsideration. The Air Force SIAO's decision is final. If the ICS PM does not wish to appeal Air Force CA's determination, then the ICS PM will update the PIT package indicating PITI reclassification to the ICS PFM and to the ICS FAM.

**7.1.5.2.** The ICS PM will forward to the ICS FAM the Air Force CA PIT(I) determination statement, proposed security requirements, and IA controls required for each approved PIT(I) ICS. The ICS PM will enter the system into the EITDR with assistance from the ICS PFM.

**7.1.6.** Upon receipt of the PIT(I) determination statement, the ICS FAM will notify the respective ICS IAMs of the Air Force CA's determination and any required security actions. Transition to Phase 2 of the CE ICS C&A process is now authorized.

## **7.2. Phase 2: ICS PIT C&A.**

**7.2.1.** The ICS PM will provide the ICS PIT CA with an overview of, and any changes to, the CE ICS C&A process. PIT CA approval of the RA strategy, templates, tools, and test team activation is required prior to scheduling and supporting site visits at active and reserve bases. The Civil Engineer Maintenance, Inspection, and Repair Team (CEMIRT) currently provides, among other areas of expertise, ICS technical support to the ICS PIT IPT. That support is expanding to include CEMIRT RA teams to help base ICS IAMs assess ICS threats, vulnerabilities, and risks. CEMIRT will also identify, implement, and/or recommend risk mitigation strategies, techniques, and/or solutions. The CEMIRT RA team will generate an IA RA and mitigation report within two weeks after the RA. CEMIRT will not coordinate and schedule site visits until all site-specific PIT determination statements are received from the Air Force CA, thus preventing multiple site visits.

**7.2.2.** The ICS PM goal will be to review and validate the IA RA and mitigation report and assemble the accreditation decision package (ADP) for the PIT CA within 30 calendar days of receipt.



**7.2.3.** The PIT CA will review the ADP and submit a recommendation to the PIT DAA for consideration.

**7.2.4.** The PIT DAA will issue an ATO once all compliance actions are certified by the PIT CA. An IATO may be issued at the PIT DAA's discretion prior to a formal ATO to reduce or eliminate known risks/vulnerabilities. If the PIT DAA issues an IATO or ATO, the ICS FAM and ICS IAM will be provided with a copy of the C&A approval, and the ICS IAM is responsible for continuously monitoring the approved PIT configuration as defined in the PIT package for security compliance of the ICS and for making EITDR updates as necessary or as prescribed by the ICS FAM. Changes in submitted topology or component configuration shall be staffed to the ICS PM for approval prior to implementation.

### **7.3. Phase 3: ICS PITI C&A.**

**7.3.1.** If the PIT system has a previously identified interconnection to the AF-GIG, the formal AFCAP commences. The AFCAP will not begin until the PIT receives an IATO or ATO. The ICS PM will submit the entire package, with the proposed system design or legacy system interface description, along with the ICS PIT DAA signed ATO letter, to the Air Force CA.

**7.3.2.** Using the ICS system configuration submittals from the ICS FAM, the ICS PM and ICS PfM have the responsibility to work together and submit the package for C&A in accordance with AFI 33-210. If the ICS requires an on-site evaluation to validate IA controls, an IATT will be requested and submitted as part of the C&A package.

**7.3.3.** If the Air Force DAA/CA issues ATO and authority to connect (ATC) for the PITI, the ICS PM shall work with the ICS FAM and ICS IAM to implement any additional security actions to meet established AFCAP requirements (i.e., continuous monitoring and annual FISMA reporting requirements). The ICS IAM is responsible for maintaining accreditation and security for each ICS PITI. If the Air Force DAA and/or the Air Force CA disapproves interconnect, instructions/directions/rationale will be provided to the ICS PIT DAA and ICS PIT CA for corrective action.

**8. Technical Requirements.** This section outlines hardware and operational requirements for existing and new PIT ICSs and for existing PITI ICSs to operate while awaiting C&A and/or AFCAP approval.

**8.1.** Base-level ICS IAMs shall ensure that ICSs comply with the requirements in the following paragraphs. The MAJCOM ICS FAM is responsible for technical oversight of the requirements in this section of the ETL and shall consult with the HQ AFCESA ICS PM for clarification or interpretation of these requirements.



**Note:** ICSs on OCONUS military installations (outside the continental United States and its possessions [US&P]) or military installations not owned or operated by the DOD are installed and maintained under the rules and regulations of the host nation government. Personnel granted access to these systems shall comply with host nation and Air Force minimum training and experience requirements. Waivers to this policy require approval from the BCE, installation commander, MAJCOM CE, HQ AFCESA/CC, and the host nation governing body.

**Note:** For certification of supporting ICSs under host nation control and/or ownership, identify the ICS and forward technical information through the ICS FAM to the ICS PM for further guidance.

**8.1.1.** Because of inherent security risks, all commercial wireless networking devices are considered “external” connections to both PIT and PITI systems and warrant additional scrutiny before being implemented into the ICS architecture.

**8.1.1.1.** At a minimum, any data transmitted by commercial wireless devices, services, and technologies will implement data encryption from end to end over an assured channel (AC) (see clarification in Note below) and shall be validated under the Cryptographic Module Validation Program as meeting requirements, per Federal Information Processing Standards Publication (FIPS PUB) 140-2, *Security Requirements for Cryptographic Modules*, Overall Level 1 or Level 2, as dictated by the sensitivity of the data. Historically, ICS devices were not designed with encryption capabilities. In cases where commercial wireless must be employed but the ICS device(s) cannot provide FIPS PUB 140-2 encryption capabilities, the architecture must be carefully designed to provide an AC and additional defense-in-depth risk mitigation strategies to complement the IA controls to achieve an adequate level of security. The minimum acceptable cryptographic standard is the Advanced Encryption Standard (AES) using a cryptographic key length of 128 bits as outlined in FIPS PUB 197, *Advanced Encryption Standard (AES)*.

**Note:** To clarify, an AC is a network communication link protected by a security protocol providing authentication, confidentiality, and data integrity, and employs US government-approved cryptographic technologies whenever cryptographic means are used. Examples of protocols and mechanisms sufficient to meet the requirements of authentication, confidentiality, and data integrity protection for an AC are Internet Protocol Security (IPSec); Secure Sockets Layer (SSL) v3; Transport Layer Security (TLS); and systems using National Security Agency (NSA) -approved high assurance guards with link encryption methodology.

**Exception:** Fire alarm reporting systems do not require data encryption for signaling to/from the fire alarm control panel (FACP). See paragraph 8.1.5.3 for requirements for sensitive compartmented information facilities (SCIF).



- 8.1.1.2.** Substituting wireless for wired technology introduces numerous vulnerabilities into the network, which may be unacceptable or not cost-effective to mitigate. Convenience and/or minimal cost savings shall not be the sole justification for the use of wireless technologies.
- 8.1.1.3.** Adding commercial wireless technologies to an existing approved network configuration boundary is considered a major configuration change and requires a review of security controls and the accreditation decision.

**Note:** Data hashing, regardless of the method, is not a form of encryption.

### **8.1.2.** Telephone Modems.

- 8.1.2.1.** PIT systems with modem connections to the Defense Switched Network (DSN) require PITI C&A (i.e., AFCAP) on those connections.
- 8.1.2.2.** All telephone modems shall be a secure, dial-back (call-back) type. These exceptions apply:
- Dial-out modems for voice annunciation only are not required to be of the dial-back type.
  - Conventional modems over DSN lines are permitted for control of AASs.
- 8.1.2.3.** All telephone modems shall be configured to communicate with on-base or DSN numbers only.
- 8.1.2.4.** Submit a request to the Network Operations and Security Center (NOSC) administrator to block all incoming commercial callers to specific modem control numbers that access ICSs and to block modem dial-out numbers from going off base.
- 8.1.2.5.** The base-level ICS IAM shall provide these numbers to the voice protection system (VPS) personnel at the NOSC.

**Note:** If the PIT is connecting to one or more phone lines, the phone lines must be identified to the respective NOSC (East, West, Air National Guard). The voice protection team at the NOSC will assist in locking down the point of telephone service (POTS) line to further secure the PIT.

- 8.1.2.6.** Establish audit procedures to record and archive modem usage, blocked calls, and rule violations. This audit record is an IA control and shall be accomplished annually or more often if situations dictate. These records shall be available for a minimum of six years.



**8.1.3. ICS passwords shall be as follows:**

**8.1.3.1.** Top-level access portions of the ICS, such as system host or client stations or computers, must comply with the following IA password safeguards.

**8.1.3.1.1.** Passwords shall not be factory default settings.

**8.1.3.1.2.** Passwords shall be at least 15 characters in length (for new system acquisitions) or the maximum supportable, using the following criteria:

- Do not use a password that has been used in the past.
- Use a minimum of two numbers, two special characters (e.g., \$, %), two capital letters, and two lower-case letters. If special characters are not supported by the ICS, use the broadest combination of password features supported.
- Do not create a password that includes a phone number, home address, birth date, or personal specific dates.
- Do not use a word listed in a dictionary.
- Do not use simple or default passwords (e.g., 1234, data).

**8.1.3.1.3.** Passwords on all systems shall be changed every 90 days.

**8.1.3.1.4.** Password control shall incorporate a lock-out requirement.

**8.1.3.2.** Password-capable field devices (i.e., remote terminal units or field control devices) shall have their passwords changed from manufacturer defaults, and thereafter, as directed by the ICS IAM. The ICS IAM shall provide written certification to the MAJCOM ICS FAM that all password-capable field device passwords have been changed from manufacturer defaults. This certification shall be included as an artifact for final accreditation as PIT or PITI.

**8.1.4.** Radios used on any wireless ICS within the US&P that will transmit/receive within the Federal or military spectrum require frequency approval from base-level spectrum managers. A DD Form 1494, *Application for Equipment Frequency Allocation*, commonly referred to as the J-12 process, shall be approved before a spectrum allocation is issued. If the ICS uses an unlicensed frequency that complies with Federal Communications Commission (FCC) Part 15B (see Title 47 CFR, Part 15, *Radio Frequency Devices*), notify the base-level spectrum manager of the use of this unlicensed frequency. If a wireless solution is proposed for use outside the US&P, the MAJCOM ICS FAM shall contact the MAJCOM spectrum manager for host nation approval.

**8.1.4.1.** Develop contingency plans to manually control ICSs when RF interference disrupts monitoring or control.



**Note:** Non-licensed device operations must accept any interference from any Federal or non-Federal authorized radio station, other non-licensed devices, or industrial, scientific, and medical (ISM) equipment. The agency operating a non-licensed device that causes interference to an authorized radio station shall promptly take steps to eliminate the interference. Upon notification by the base spectrum manager that the device is causing interference, the operator of the non-licensed device shall cease all radiations from the device. Operations shall not resume until the condition causing the interference has been corrected.

**Note:** Non-licensed devices, since they operate on a non-interference basis, may not provide sufficient reliability for critical radio communications functions affecting human life or property; however, non-licensed devices may provide valuable and unique supplemental or expendable radio communications services where needed. To ensure adequate regulatory protection, Federal entities should rely only on devices with frequency assignments in the Federal or military spectrum and in the government master file as principal radio communication systems for safeguarding human life or property.

**8.1.4.2.** Any wireless transmission in the 2.4 gigahertz (GHz) unlicensed frequency range that is not a Combat Information Transport System Program Management Office (CITS PMO) -installed access point should be coordinated with the CITS lead command, AFNIC ([afnic.ecnn@us.af.mil](mailto:afnic.ecnn@us.af.mil), (618) 229-5666), for possible interference.

#### **8.1.5. Fire Alarm Reporting Systems.**

**8.1.5.1.** Manually connect/disconnect remote system access (RSA) on all FACPs and/or servers (e.g., D-21) when RSA actions are needed/complete. Section 8.1.2 of this ETL identifies modem connection requirements.

**8.1.5.2.** Communications modems shall comply with section 8.1.2.

**8.1.5.3.** Fire alarm reporting from any SCIF to FACPs shall be wired (e.g., copper, fiber) systems, not wireless, and require an (air gap) isolation device if the available notification appliance device is a speaker. Fire alarm reporting signals sent from the SCIF FACP to the central monitoring station must be encrypted.

#### **8.1.6. Virtual Local Area Networks (VLANs).**

**8.1.6.1.** VLANs divide physical networks into smaller logical networks to increase performance, improve manageability, and simplify network design. VLANs are achieved through the use of managed Ethernet switches. A managed switch provides all the features of an unmanaged switch, plus the ability to configure the switch to allow greater control over how the data



travels over the network and who has access to it. Each VLAN consists of a single broadcast domain that isolates traffic from other VLANs. Just as replacing hubs with switches reduces collisions, using VLANs limits the broadcast traffic, as well as allowing logical subnets to span multiple physical locations. There are two categories of VLANs:

- Static, often referred to as port-based, in which switch ports are assigned to a VLAN so that it is transparent to the end user.
- Dynamic, in which an end device negotiates VLAN characteristics with the switch or determines the VLAN based on the IP or hardware addresses.

**8.1.6.2.** Although more than one IP subnet may coexist on the same VLAN, the general recommendation is to use a one-to-one relationship between subnets and VLANs. This practice requires the use of a router or multi-layer switch to join multiple VLANs. Many routers and firewalls support tagged frames so that a single physical interface can be used to route between multiple logical networks.

**8.1.6.3.** VLANs are not typically deployed to address host or network vulnerabilities in the way that firewalls or IDSs are deployed; however, when properly configured, VLANs do allow switches to enforce security policies and segregate traffic at the Ethernet layer. Properly segmented networks can also mitigate the risks of broadcast storms that may result from port scanning or worm activity.

**8.1.6.4.** Switches have been susceptible to attacks such as media access control (MaC) address spoofing, table overflows, and attacks against the spanning tree protocols, depending on the device and its configuration. VLAN hopping, the ability for an attack to inject frames to unauthorized ports, has been demonstrated using switch spoofing and double tagging. These attacks cannot be conducted remotely and require local physical access to the switch. A variety of features such as MaC address filtering, port-based authentication using IEEE 802.1x, and specific vendor-recommended practices can be used to mitigate these attacks, depending on the device and implementation.

**8.1.6.5.** VLANs have been deployed effectively in ICS networks, with each automation cell assigned to a single VLAN to limit unnecessary traffic flooding and allow network devices on the same VLAN to span multiple switches. ICSs connected to a VLAN shall incorporate the following:

**8.1.6.5.1.** Firewalls separating base network traffic from external base traffic and the ICS VLAN. The configuration of the ICS VLAN must ensure that no ICS traffic exits the base firewall.

**8.1.6.5.2.** Hypertext Transfer Protocol Secure (HTTPS) for remote control of the ICS from the LAN. If Web services are provided to Nonsecure



Internet Protocol Router Network (NIPRNet) systems, implementation of an AC is required.

**8.1.7.** Replace any unmanaged switch with a managed switch. While awaiting replacement, add physical security measures, house unmanaged switches in a locked secure area, and/or add tamper-proof features. The ICS PM shall approve interim measures.

## 9. Additional Guidance.

### 9.1. Privatized ICSs.

- 911.** For the purposes of this ETL, privatization is defined as the transfer of ownership and operations of Air Force utility systems and associated industrial monitoring/control systems to the private sector. The private sector includes all privately owned and publicly owned entities.
- 912.** DOD and Air Force directives and instructions pertaining to IA and DIACAP requirements apply only to DOD-owned systems, including outsourced services such as operation and maintenance (O&M) by a private entity (e.g., Office of Management and Budget (OMB) Circular A-76, *Performance of Commercial Activities*, outsourced CE O&M or AF Form 9, *Request for Purchase*, service contract). A privatized utility is no longer a DOD-owned asset, including the privatized ICS that monitors and controls the privatized utility distribution system. Therefore, this formal real estate transaction relieves the US government from any and all planning, financing, designing, constructing, operating, and maintaining responsibilities of this utility infrastructure and associated monitoring and control system.
- 913.** RF spectrum utilization by a privately owned or publicly owned entity while in garrison requires base or regional spectrum management notification and/or approval.

**9.2.** Outsourced O&M of ICSs. The following information applies to any OMB Circular A-76 outsourced CE O&M of ICSs, including AF Form 9 service contracts. DOD IA requirements apply to government-owned PIT and PITI ICSs that are operated and maintained by a private entity. Specific guidance for outsourced IT processes is located below and in section 6.9 of DODI 8510.01.

**9.2.1.** Outsourced IT-based processes that may also support non-DOD users or processes must still be certified and accredited by DOD entities. IA requirements for DOD information in an outsourced environment are determined by the information's MAC and classification or sensitivity and need to know, just as for other DOD ISs. However, the following also apply:

**9.2.2.** Technical security of the outsourced environment is the responsibility of the service provider.



- 9.2.3.** Outsourced applications that are accessed by DOD users from DOD enclaves are subject to DOD enclave boundary defense IA controls for incoming traffic (e.g., ports and protocols and mobile code).
- 9.2.4.** Responsibility for procedural and administrative security is shared between the service provider and the supported DOD entity contracting for the service.
- 9.2.5.** The security responsibilities of the service provider down to the control level are made explicit in the contract, along with any other performance and service level parameters by which the DOD shall measure the IA profile of the outsourced IT-based process for the purpose of C&A.
- 9.2.6.** Any baseline IA controls not explicit in the contract or otherwise covered by a service level agreement are categorized as NC. All such NC IA controls must be documented in an IT security plan of action and milestones (POA&M) that explains the acceptability of the risk of operating the outsourced IT-based process with the control in an NC status.
- 9.2.7.** The security roles and responsibilities are to be made explicit in the acquisition, along with the performance and service level parameters by which the DOD shall measure the IA profile of the outsourced IT-based process. The PM for an outsourced IT-based process should carefully define and assess the functions to be performed and identify the technical and procedural security requirements that must be satisfied in the acquisition to protect DOD information in the service provider's operating environment and interconnected DOD ISs.
- 9.3.** Type Accreditation. DODI 8510.01 defines type accreditation as "the official authorization to employ identical copies of a system in specified environments." This form of C&A allows a single DIACAP package to be developed for an archetype (common) version of an IS that is deployed to multiple locations, along with a set of installation and configuration requirements or operational security needs, that will be assumed by the hosting location. Automated information system (AIS) applications accreditations are type accreditations. Stand-alone IS and DMZ accreditations may also be type accreditations.
- 9.3.1.** HQ AFCESA believes the majority of Air Force ICSs vary greatly in system hardware and software configurations, and consequently, a type accreditation is not warranted.
- 9.3.2.** See AFI 33-210, section 3.14, for additional requirements regarding type accreditations.
- 9.4.** Air Force Civil Engineer IT Investment Policy. In accordance with HQ USAF/A7C's *Information Technology Investment Policy Guidance Memorandum*, dated 9 June 2008, all IT investments with functionality supporting a



CE capability must be approved by the A7C IT governance structure prior to any development or sustainment activities or funds being committed or obligated. HQ AF/A7CRT, as the CE CIO, is the office of primary responsibility (OPR) for all CE IT investment processes, including IT portfolio management. The main purpose for the A7C IT governance structure is to analyze, control, select, and evaluate IT investments across the enterprise by standardizing capabilities, reducing duplication, and maximizing functionality across existing IT resources.

**10. Points of Contact.** The HQ AFCESA ICS PM has interpretive authority for the ICS IA and security issues contained in this ETL. The authority having jurisdiction over the content of this ETL is HQ AFCESA/CEOA.

**10.1.** HQ AFCESA ICS PM. To reach the ICS PM, e-mail [AFCESAReachBackCenter@tyndall.af.mil](mailto:AFCESAReachBackCenter@tyndall.af.mil), call DSN 523-6995 or commercial (850) 283-6995, or mail to 139 Barnes Drive, Suite 1, Tyndall AFB, FL 32403-5319. Subject line: ATTN HQ AFCESA ICS PM.

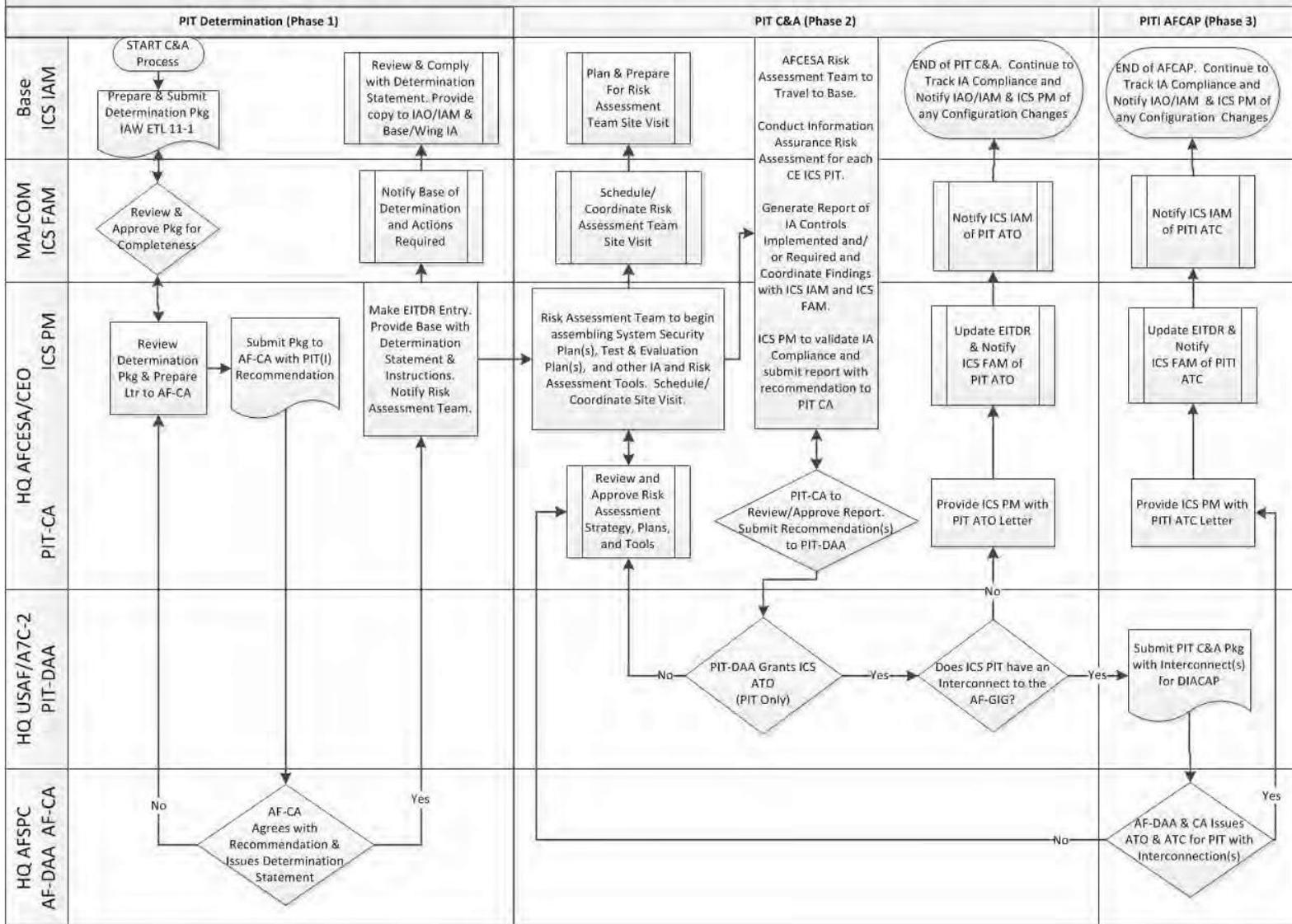
**10.2.** HQ AFCESA/CEOA. To reach HQ AFCESA/CEOA, e-mail [AFCESAReachBackCenter@tyndall.af.mil](mailto:AFCESAReachBackCenter@tyndall.af.mil) or [afcesa@aetc.af.smil.mil](mailto:afcesa@aetc.af.smil.mil), call DSN 523-6995 or commercial (850) 283-6995, or mail to 139 Barnes Drive, Suite 1, Tyndall AFB, FL 32403-5319.

DAVID J. ANASON, Lt Col, USAF  
Chief, Operations and Programs Support Division

4 Atchs  
1. CE ICS C&A Process  
2. Acronyms and Terms  
3. CE ICS PIT DAA Appointment  
4. Distribution List



Civil Engineer (CE) Industrial Control System (ICS) Certification & Accreditation (C&A) Process





## ACRONYMS AND TERMS

### Acronyms

AAS	- aircraft arresting system
AC	- assured channel
ADP	- accreditation decision package
AES	- Advanced Encryption Standard
AF-CA	- Air Force certifying authority
AFCAP	- Air Force Certification and Accreditation Program
AF-DAA	- Air Force designated accrediting authority
AF-GIG	- Air Force Global Information Grid
AFI	- Air Force instruction
AFNIC	- Air Force Network Integration Center
AFNIC/EV	- Air Force Network Integration Center, Information Assurance Directorate
AFPD	- Air Force policy directive
AIS	- automated information system
AMR	- automated meter reading
ATC	- authority to connect
ATO	- authority to operate
BCE	- base civil engineer
CA	- certifying authority
C&A	- certification and accreditation
CA	- certifying authority
CCA	- Clinger-Cohen Act
CE	- civil engineering
CEG	- civil engineer group
CEMIRT	- Civil Engineer Maintenance, Inspection, and Repair Team
CES	- civil engineer squadron
CFR	- Code of Federal Regulations
CIO	- chief information officer
CITS PMO	- Combat Information Transport System Program Management Office
Config	- configuration
DAA	- designated accrediting authority
DCS	- distributed control system
DIACAP	- DOD Information Assurance Certification and Accreditation Process
DMZ	- demilitarized zone
DOD	- Department of Defense
DODD	- Department of Defense Directive
DODI	- Department of Defense Instruction
DSN	- Defense Switched Network
EITDR	- Enterprise Information Technology Data Repository
EMCS	- energy management and control system
ETL	- Engineering Technical Letter



FACP	- fire alarm control panel
FAM	- functional area manager
FCC	- Federal Communications Commission
FIPS PUB	- Federal Information Processing Standard Publication
FISMA	- Federal Information Security Management Act
GHz	- gigahertz
GIG	- Global Information Grid
HQ AF/A7C-2	- The Air Force Deputy Civil Engineer
HQ AF/A7CRT	- The Air Force Civil Engineer, Resources Division, Information Technology Branch
HQ AFCESA	- Air Force Civil Engineer Support Agency
HQ AFCESA/CC	- Air Force Civil Engineer Support Agency Commander
HQ AFCESA/CEO	- Air Force Civil Engineer Support Agency, Operations and Programs Support Division
HQ AFCESA/CEOA	- Air Force Civil Engineer Support Agency, Operations and Programs Support Division, Engineer Support Branch
HTTPS	- Hypertext Transfer Protocol Secure (combination of the Hypertext Transfer Protocol and a cryptographic protocol)
IA	- information assurance
IAM	- information assurance manager or management
IAO	- information assurance officer
IAS	- information assurance strategy
IAT	- information assurance technical
IATO	- interim authority to operate
IATT	- interim authority to test
IAW	- in accordance with
ICS	- industrial control system
IDS	- intrusion detection system
IOC	- initial operating capability
IP	- Internet Protocol
IPSec	- Internet Protocol Security
IPT	- integrated product team
IS	- information system
ISM	- industrial, scientific, and medical
IT	- information technology
LAN	- local area network
Ltr	- letter
MAC	- mission assurance category
MaC	- media access control
MAJCOM	- major command
MDIP	- Modified DIACAP Implementation Plan
NIPRNet	- Nonsecure Internet Protocol Router Network
NIST	- National Institute of Standards and Technology
NIST SP	- NIST Special Publication
NOSC	- Network Operations and Security Center
NSA	- National Security Agency
NSTISSI	- National Security Telecommunications and information Systems Security Instruction



OCONUS	- outside the continental United States
O&M	- operation and maintenance
OMB	- Office of Management and Budget
OPR	- office of primary responsibility
PfM	- portfolio manager
PIT	- platform information technology
PIT-CA	- platform information technology certifying authority
PIT-DAA	- platform information technology designated accrediting authority
PITI	- platform information technology interconnection
Pkg	- package
PLC	- programmable logic controller
PM	- program manager
POA&M	- plan of action and milestones
POC	- point of contact
POTS	- point of telephone service
RA	- risk assessment
Rep	- representative
RF	- radio frequency
RSA	- remote system access
SCADA	- supervisory control and data acquisition
SCIF	- sensitive compartmented information facility
SIAO	- senior information assurance officer
SSL	- Secure Sockets Layer
TLS	- Transport Layer Security
UMAC	- utility monitoring and control
US&P	- United States and its possessions
U.S.C.	- United States Code
VLAN	- virtual local area network
VPS	- voice protection system
WWW	- World Wide Web

### **Terms**

**Accreditation** – A management decision by a senior agency official to authorize operation of a PIT-designated system based on the results of a certification analysis and other relevant considerations. The PIT DAA can grant system accreditation but cannot grant connection approval to the AF-GIG. Only the Air Force DAA may grant an ATC. The current Air Force DAA is AFSPC/A6.

**Certification** – A comprehensive analysis of the technical and non-technical aspects of an information system in its operational environment to determine compliance to stated security requirements and controls. The current Air Force CA is AFNIC.

**Computing Environment** – A computing environment has a server with multiple stations working from it. The stations can be standard computers, remote sensors, satellite feeds, etc.

**Computer Network** – The constituent element of an enclave responsible for connecting computing environments by providing short-haul data transport capabilities, such as



LANs, or long-haul data transport capabilities, such as wide area and backbone networks.

**Demilitarized Zone (DMZ)** – A secure interface between systems or components of systems or a perimeter network that adds an extra layer of protection between internal and external networks by enforcing the internal network’s IA policy for external information exchange. A DMZ, also called a “screened subnet,” provides external, untrusted sources with restricted access to releasable information while shielding the internal network from outside attacks.

**Enclave** – A collection of computing environments connected by one or more internal networks under the control of a single approval authority and security policy, including personnel and physical security.

**Global Information Grid (GIG)** – The globally interconnected, end-to-end set of information capabilities for collecting, processing, storing, disseminating, and managing information on demand to warfighters, policy makers, and support personnel. The GIG includes owned and leased communications and computing systems and services, software (including applications), data, security services, other associated services, and National Security Systems. Non-GIG includes stand-alone, self contained, or embedded IT that is not, and will not be, connected to the enterprise network. (DODD 8000.01)

**Information Assurance (IA)** – Measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities.

**IA Control** – An objective IA condition of integrity, availability, or confidentiality achieved through the application of specific safeguards or through the regulation of specific activities that is expressed in a specified format, i.e., a control number, a control name, control text, and a control class. Specific management, personnel, operational, and technical controls are applied to each DOD information system to achieve and appropriate level of integrity, availability, and confidentiality in accordance with OMB Circular A-130. (DODI 8500.2)

**Information System (IS)** – A discrete set of information resources organized for the collection, storage, processing, maintenance, use, sharing, dissemination, disposition, display, or transmission of information. (**Note:** Includes AIS applications, enclaves, outsourced IT-based processes, and PITIs.)

**Information Technology (IT)** – Any equipment or interconnected system or subsystem of equipment used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. This includes equipment used by the executive agency directly or used by a contractor under a contract with the executive agency, which (i) requires the use of such equipment, or (ii) requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. The term “information technology” includes computers, ancillary equipment, software, firmware, and similar



procedures, services (including support services), and related resources. Notwithstanding the preceding, the term "information technology" does not include any equipment that is required by a Federal contractor incidental to a Federal contract.

**Mobile Code** – Software modules obtained from remote systems, transferred across a network, and then downloaded and executed on local systems without explicit installation or execution by the recipient.

**Privileged User** – An authorized user who has access to system control, monitoring, or administration functions.

**Type Accreditation** – DODI 8510.01 defines type accreditation as “the official authorization to employ identical copies of a system in specified environments.” This form of C&A allows a single DIACAP package (i.e., System Identification Profile, DIACAP Implementation Plan, supporting documentation for certification, DIACAP Scorecard, and IT security POA&M [if required]) to be developed for an archetype (common) version of an IS that is deployed to multiple locations, along with a set of installation and configuration requirements or operational security needs, that will be assumed by the hosting location. AIS applications accreditations are type accreditations. Stand-alone IS and DMZ accreditations may also be type accreditations.



DEPARTMENT OF THE AIR FORCE  
WASHINGTON DC

OFFICE OF THE SECRETARY

FEB 25 2011

MEMORANDUM FOR AF/A7C

FROM: SAF/CIO A6  
1800 Air Force Pentagon  
Washington DC 20330-1800

SUBJECT: Appointment of Platform Information Technology (PIT) Designated Accrediting Authority (DAA)

1. In accordance with AF Policy Directive, *Information Assurance Program*, I hereby appoint the Air Force Deputy Civil Engineer (HQ USAF/A7C-2), the PIT DAA for all Civil Engineering Industrial Control systems (ICS) designated as PIT. AF/A7C has met the criteria, training, and certification requirements outlined in DoDI 8510.01E, *Information Assurance*, paragraph 4.25 and DoD 8570.1-M, *Information Assurance Workforce Improvement Program*, chapter 5. All Civil Engineering ICS categorized as PIT Interconnections (PITI) must obtain accreditation and connection approval from the Air Force Designated Accrediting Authority (AFSPC/A6) prior to connecting to the Air Force provisioned portion of the Global Information Grid (AF GIG).
2. The AF/A7C-2, as PIT DAA for Civil Engineering ICS, will maintain compliance with:
  - a. DoD approved DAA training either through the DISA Online DAA Training Course
  - b. Committee on National Security System Instruction 4012, *National Information Assurance Training Standard for Senior System Managers*
  - c. Statutory requirements (FISMA, Clinger Cohen Act, Federal Information Processing Standards, etc.), DoD and Air Force information assurance policies.
3. SAF/CIO A6 maintains authority to revoke this appointment based on lack of due diligence, non-compliance with aforementioned policies, and other security related infractions. AF/A7C will provide semi-annual reports to SAF/A6OI ([af.infoassurance@pentagon.af.mil](mailto:af.infoassurance@pentagon.af.mil)) providing status on all Civil Engineering PIT ICS accredited over the specified period. Direct any questions or comments to the SAF/CIO A6 point of contact, Ken Brodie, SAF/A6OI, DSN 425-1526, [kenneth.brodie@pentagon.af.mil](mailto:kenneth.brodie@pentagon.af.mil).

WILLIAM T. LORD, Lt Gen, USAF  
Chief of Warfighting Integration and  
Chief Information Officer

cc: AFSPC/CV/A6  
AFNIC/EV



## DISTRIBUTION LIST

### SPECIAL INTEREST ORGANIZATIONS

Information Handling Services (1)  
15 Inverness Way East  
Englewood, CO 80150

Construction Criteria Database (1)  
National Institute of Bldg Sciences  
Washington, DC 20005