U.S. DEPARTMENT of ENERGY | Federal Energy Management Program

Performance Assurance Planning Guide for Utility Energy Service Contracts

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Disclaimer

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List of Acronyms

BAS	Building Automation System
CO	Contracting Officer
COR	Contracting Officer Representative
CPARS	Contractor Performance Assessment Reporting System
DOE	U.S. Department of Energy
ECM	Energy Conservation Measure
EO	Executive Order
ESCO	Energy Service Company
FAR	Federal Acquisition Regulation
FEMP	Federal Energy Management Program
FPE	Federal Project Executive
HVAC	Heating, Ventilation, Air Conditioning
IGA	Investment Grade Audit
LOI	Letter of Interest
M&V	Measurement & Verification
NREL	National Renewable Energy Laboratory
O&M	Operations and Maintenance
OMB	Office Of Management and Budget
SOW	Statement of Work
UESC	Utility Energy Service Contract
USC	United States Code

Executive Summary

Administered by the U.S. Department of Energy's (DOE) Federal Energy Management Program (FEMP), the Utility Program has fostered collaboration among federal agencies and their serving utilities for more than 25 years. The Utility Program supports agencies using Utility Energy Service Contracts (UESCs), a well-developed, effective contracting vehicle that enable the latest approaches to cost-effective energy management at federal sites. Federal agencies have successfully used UESCs to award over 2,000 energy and water efficiency projects, which are furthering the federal government's efforts to reduce energy costs and intensity.

Authorized by 42 U.S. Code § 8256 (10 U.S. Code § 2913 for the Department of Defense), a UESC is a limited-source acquisition between a federal agency and an eligible serving utility for energy management services that generate savings from the implementation of energy and water conservation measures (collectively referred to as ECMs), for a contract term up to 25 years. Through a UESC, the utility partner assesses, designs, and implements the desired ECMs, and may also include financing for the project. These ECMs can range from energy efficiency upgrades and distributed energy systems to combined heat and power plants, or other technologies and strategies. The agency may use any combination of appropriations and third-party financing to pay for the project, providing useful flexibility. There is no limit to the project size, big or small, that can be implemented using a UESC.

To assist agencies implementing a UESC, FEMP has developed the Utility Energy Service Contracts: Enabling Documents, the Utility Energy Service Contract Guide, and this companion guidance document to provide best practices for agencies to ensure project performance. However, some agencies may have adopted more stringent requirements and should follow agency specific policy for UESCs. The best practices in this document utilize a detailed set of project-specific, actionable, protocols that define important tasks and responsibilities throughout the contract term. They are developed to reflect the site conditions, agency capabilities, operations and maintenance requirements, and complexities of the planned ECMs.

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"By failing to prepare, you are preparing to fail." — Benjamin Franklin

Under 42 U.S.C. § 8256 (c)(1), "Utility Incentive Programs," federal agencies are authorized and encouraged to participate in programs to increase energy efficiency. UESCs offer the flexibility to achieve a variety of policy goals, including meeting mandated energy efficiency savings and implementing energy resilience measures. However, to be considered successful, every UESC must generate and maintain energy, water, and/or other operational savings over the life of the contract. To do this, energy and water conservation measures must be commissioned and fully functional to meet the design intent and must be maintained throughout the performance period, which can extend up to twenty-five years.

Under 42 U.S.C. § 8253 (f)(5), "Follow-Up on Implemented Measures" states, "each energy manager shall ensure that -

> (A) equipment, including building and equipment controls, is fully commissioned at acceptance to be operating at design specifications;
>
> (B) a plan for appropriate operations, maintenance, and repair of the equipment is in place at acceptance and is followed;
>
> (C) equipment and system performance is measured during its entire life to ensure proper operations, maintenance, and repair; and
>
> (D) energy and water savings are measured and verified."

In addition, under section II of OMB Memorandum 12-21, the conditions under which the budget costs of UESCs are set forth, including their total capital costs, may be scored (and obligated) on an annual basis during the term of the contract rather than have these costs be fully scored (and obligated) "up front" to the first year of the contract. Through this authority, a UESC may be scored on an annual basis if:

1. The UESC meets requirements incorporating performance assurance or saving guarantees covering the cost of the improvements
2. The UESC provides a mechanism to conduct measurement and verification (M&V) to verify the savings
3. The UESC satisfies competition requirements as determined by statue or agency policy prior to entering into a UESC.

To meet these requirements and to ensure ECM performance throughout the life of a UESC, FEMP recommends that the utility and agency together develop a comprehensive Performance Assurance Plan. The Performance Assurance Plan details the steps that will be taken during project development, implementation, and the performance phase of the contract to ensure ECMs perform as designed. The Performance Assurance Plan incorporates the following types of information:

- Building commissioning and recommissioning plans and report
- Performance Measurement and Verification (M&V) plan and report
- Key performance indicators (KPIs) for each ECM
- Warranty details and Risk, Responsibility, and Performance Matrix (RRPM)
- Comprehensive training programs and deliverables
- Operations and Maintenance (O&M) and Repair and Replacement (R&R) plans
- Performance Discrepancy Plan
- Communication and documentation deliverable plans.

To assist agencies and utilities in developing the Performance Assurance Plan, FEMP has developed this Guide to provide best practices for Performance Assurance Plan development and implementation. FEMP has also developed a UESC Task Order Template which includes recommended contract language outlining the requirements for the Performance Assurance Plan.

Using the Performance Assurance Guide

This Guide defines actions specifically related to the development of the Performance Assurance Plan, but it does not address all tasks, elements, and components of UESC project acquisition, development, and construction. For complete UESC guidance, please refer to the Utility Energy Service Contract Guide.

Throughout this Guide, we will refer to the agency's selected "utility" as the prime contractor for the UESC. However, the utility may elect to competitively select and subcontract an energy service company (ESCO) to perform the work. Any reference herein to the "utility" includes the utility's contracted implementing "ESCO."

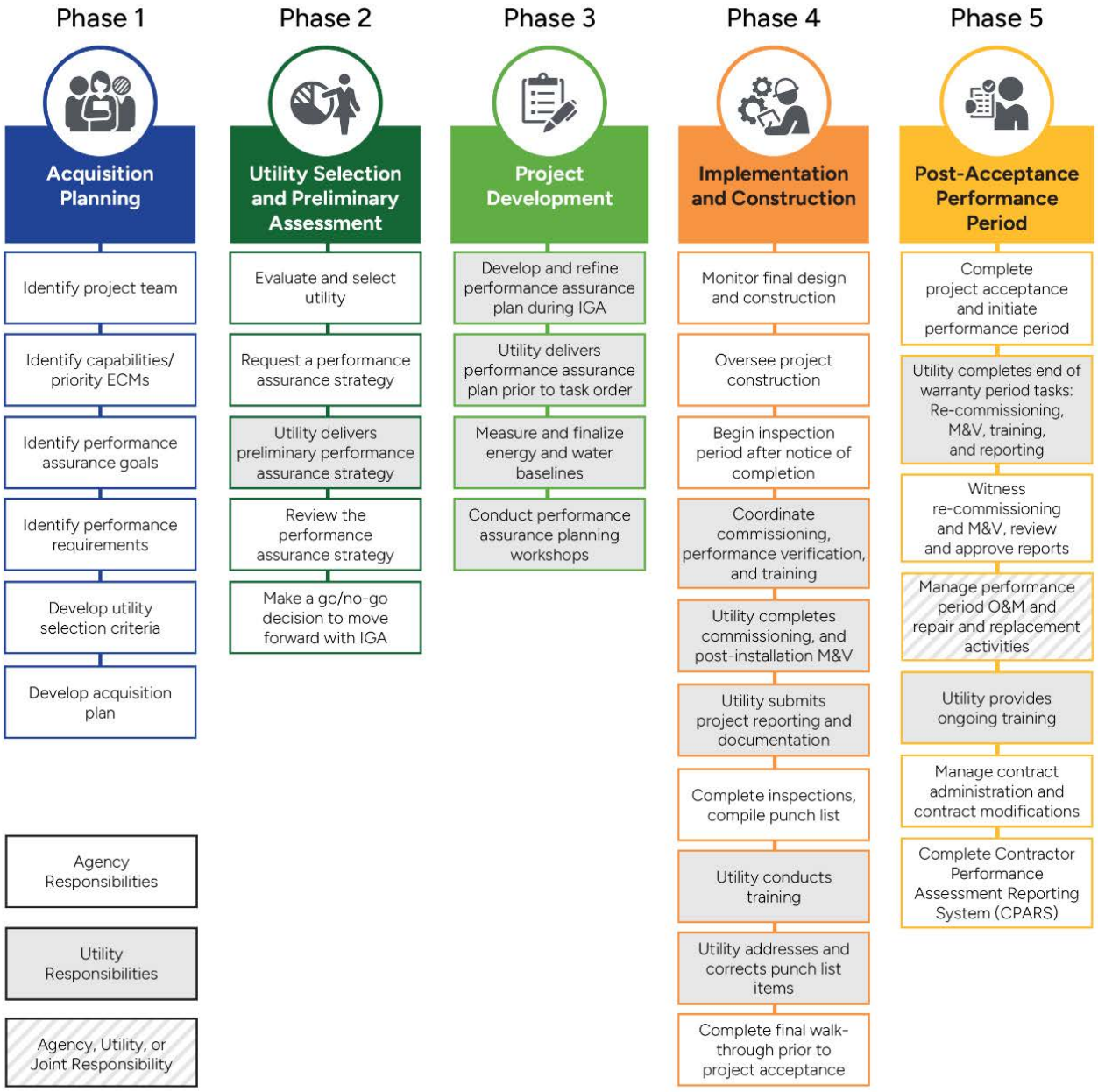

Figure 1. Utility Energy Service Contract Project Life Cycle

Illustration by Fred Zietz, NREL

Phase 1: Acquisition Planning

"The time to repair the roof is when the sun is shining." — John F. Kennedy

Key Performance Assurance Objectives Phase 1:

- Agency establishes qualified project team
- Agency identifies staff capabilities and priority ECMs
- Agency identifies high level performance assurance requirements
- Agency identifies savings guarantee requirements
- Agency develops utility selection criteria related to its performance assurance requirements
- Agency completes Acquisition Plan.

Establish a Qualified Project Team

While each phase of a UESC project is important, overall project success can often be traced back to the level of care and attention to detail taken during the Acquisition Planning phase. Beginning the project by identifying and engaging with a well-qualified, diverse project team is critical. This team should include expertise from several different perspectives such as facilities, energy, engineering, technology subject matter experts (SMEs), the agency's contracting officer (CO), the contracting officer's representative(s) (COR), legal counsel, and senior leadership. FEMP also provides federal project executives (FPEs), and other Technical Assistance to aid agencies in developing and implementing their projects.

Due to the duration of a UESC, which may extend up to a maximum of twenty-five years, agency staff turnover must be expected at every level throughout the contract's life. For this reason, it is critical that the project team begin documenting their activities early and maintain a record of what decisions were made and why throughout the entire project cycle.

Identify Staff Capabilities and Priority ECMs

The project team will likely be thinking of a set of desired ECMs at several identified facilities and will often begin by developing a rough cost estimate for these improvements. At this stage, the project team will also typically weigh the advantages and disadvantages of different procurement options.

While weighing their procurement options, the project team considers their staffing levels, technical capabilities, whether the agency will require a savings guarantee for

any ECM, and the level of M&V that will be required, along with other fundamental performance assurance considerations. This is an important step since UESC legislation does not require energy or water savings guarantees (although savings verification is required), and many ECM performance assurance responsibilities may ultimately fall to the agency unless otherwise established during the development of the performance assurance requirements.

Determine High-Level Performance Assurance Requirements

Not all agency limitations or challenges will be identified during acquisition planning since the full scope of the UESC project will not be finalized until the Investment Grade Audit (IGA) is complete. However, critical initial discussions regarding site conditions, in-house O&M capabilities, staffing, and other performance assurance considerations should begin in this first project phase to determine the agency's requirements when scoping the performance assurance roles and responsibilities for a UESC.

Agencies do not have to assign the same performance assurance goals and requirements to all ECMs. For example, the agency could use a strict performance assurance strategy for a subset of high-value, or complex, ECMs where the utility is responsible for ongoing O&M, R&R, M&V, and includes a savings guarantee. This would occur in cases where the agency determines it does not retain adequate staffing or staffing with the correct qualifications to ensure those ECMs would be operated and maintained in a manner required to sustain the savings for the entire performance period. Conversely, for the remainder of the ECMs, the agency may determine it does have adequate staffing, and/or staffing expertise to self-perform the O&M, R&R, M&V, and may elect to forego the savings guarantee requirement for those remaining ECMs.

It will be between the agency and utility to develop a UESC project that provides flexibility to the performance assurance approach, tailored to the specific requirements and needs of the agency, to ensure that the UESC meets its goals and performance requirements.

Evaluating site conditions, along with agency needs, capabilities and resources will help the agency determine its performance assurance needs prior to selecting a utility. These internal assessments and identified requirements should be communicated early in the discussions during the utility evaluation(s) and identified in the scope of work for development and discussion in the Preliminary Assessment in phase 2.

UESC and Savings Guarantees

Although savings guarantees are not required, 42 U.S.C. § 8253 mandates that energy and water savings are measured and verified. The OMB Memorandum 12-21 states the UESC project costs may be scored on an annual basis if the project meets "*energy savings performance assurances or guarantees of the savings to be generated by*

improvements, which must cover the full cost of the federal investment for the improvements…" Therefore, either the agency performs the tasks necessary to ensure it meets the requirements for commissioning, M&V, and achieves the projected savings requirements, or the agency may seek to include commissioning, M&V, and/or savings guarantees as a part of the contract with the utility. Alternatively, the agency may elect to enter into a contract with a third party to perform the commissioning and M&V tasks at acceptance and throughout the project performance period. Failing to meet and sustain project savings places the agency in a position of having to supplement their energy and/or water budgets to cover any shortfall if a project were not to perform as designed. These are key considerations for agencies when developing the utility selection criteria and selecting the utility.

Project Documents

Starting with the Acquisitions Planning phase and continuing throughout the project, agencies are to ensure all project documentation and meeting notes are collected, organized, reviewed, recorded, and filed for historical record keeping. This deliberate approach is necessary to ensure the long-term integrity of the project and creates a reference library of project communications and contract documents for the agency and utility throughout the performance period. Maintaining good reference records is a project management best practice and an effective risk mitigation tool.

Develop an Acquisition Plan and Utility Selection Criteria

As part of the development of the Acquisition Plan, agencies will develop and define utility selection criteria. For performance assurance selection criteria, an agency will typically be interested in the utility's demonstrated experience with performance assurances for other UESC projects, identifying ECM savings guarantees, technical expertise with proposed ECMs, O&M capability, project management approach, and the corresponding experience of the utility's subcontracted ESCOs, if applicable.

By considering and identifying agency capabilities and requirements early in the project, and clearly communicating those requirements early in the process, agencies can expect better project results.

Phase 2: Utility Selection and Preliminary Assessment

"Someone's sitting in the shade today because someone planted a tree a long time ago." – Warren Buffett

Key Performance Assurance Objectives Phase 2:

- Utility solicitation, evaluation, and selection
- Agency requests a performance assurance strategy in the Preliminary Assessment statement of work (SOW)
- Utility delivers preliminary performance assurance strategy with the Preliminary Assessment
- Agency reviews the performance assurance strategy and discusses adjustments as needed with utility
- Agency makes a go / no-go decision to move forward with the Investment Grade Audit.

Utility Evaluation

In phase 2, the agency will utilize the performance assurance selection criteria and project requirements compiled during phase 1, (e.g., whether the agency will or will not require savings guarantees, which party will operate and maintain ECMs, etc.), and communicate those requirements in a Letter of Interest (LOI) or Sources Sought Notice (SSN, for posting on SAM.gov) to select the utility.

Preliminary Assessment

After selecting a utility, the agency will request the development of the Preliminary Assessment. It is through a Preliminary Assessment that the agency should seek to gain a fresh perspective on the full potential scope of the UESC through a fence-to-fence assessment that includes the utility's proposed approach to performance assurance for each of the proposed ECMs. This assessment should incorporate the agency's requirements disclosed during the selection process.

The Preliminary Assessment should be based on a utility site visit and walk-through audit, engineering estimates, professional experience, discussions with site staff, agency requirements, and utility conclusions. A general performance assurance approach should be outlined in the Preliminary Assessment report, which addresses those findings and includes, but is not limited to, O&M, R&R, ECM training, and the other key components specified by the agency.

Go / No-Go Decision to Move Forward with the Investment Grade Audit

Following the utility's delivery of the Preliminary Assessment, the agency will review the proposed project scope and ECMs, the agreed-upon energy and water baselines and savings estimates, rough cost estimates, and the performance assurance strategy. The Preliminary Assessment allows the agency to consider the project scope, and its benefits, which enables the agency's go/no-go decision criteria for the project which should align with the agency's capabilities to ensure the project's success. The project scope, plan to define the baseline and savings, and performance assurance approach should address most of the agency's needs and provide confidence that the utility team can develop the desired project in the IGA.

See Phase 3 for Performance Assurance Plan requirements.

Phase 3: Project Development

"Tell me and I forget, teach me and I may remember, involve me and I learn."

– Benjamin Franklin

Key Performance Assurance Plan Objectives Phase 3:

- Agency and utility develop and refine ECM scope and the accompanying Performance Assurance Plan during Investment Grade Audit (IGA) development
- Utility delivers IGA iterations for agency review and approval which must include a fully developed Performance Assurance Plan prior to issuance of the Task Order
- Energy and water baselines are finalized
- Performance assurance planning workshops occur during the development of the IGA.

Proceeding with the Investment-Grade Audit

Once the agency has completed its review of the Preliminary Assessment and resolved any questions, the agency project team will need to make a go/no-go decision regarding whether to proceed with the UESC. If the agency decides to proceed, it will issue a Letter of Request for Proposal for Investment Grade Audit (IGA), and work with the utility to develop an IGA task order, ultimately leading to a Notice to Proceed to IGA. See the Utility Energy Service Contract Guide for further details. The IGA SOW should specify that the Performance Assurance Plan is a required stand-alone document submitted along with the technical and cost proposals.

Importance of Energy and Water Baselines

During the project development phase and prior to issuance of the project task order, the energy- and water-use baselines are finalized. The energy- and water-use baselines are benchmark measurements and are foundational to evaluate the performance of ECMs which are finalized during phase 3 and installed during phase 4. Energy- and water-use baselines are required to verify all savings calculations. Therefore, the agency should ensure that baseline measurements are done accurately, and that the agency's subject matter expert has witnessed and reviewed the performance measurements, data sources and findings, and agrees upon the methodology from which the final baselines are derived. Agencies may refer to the "Energy Intensity Baselining and Tracking Guidance 2019" that was developed for the DOE's Office of Energy Efficiency and Renewable Energy (EERE) as part of the Better Buildings, Better Plants Program. This document provides guidance on setting baselines and calculating their values. Accurate verification of guaranteed savings cannot occur if the baselines

are inaccurate. Once ECMs are implemented, the data necessary to identify the baseline is lost.

Planning Workshops

Also, during this phase, it is recommended that the utility and agency conduct Performance Assurance Plan workshops to iteratively refine the Plan requirements. These workshops can cover the whole project, or individual sessions may be held to address more complex ECMs. This allows the agency and utility stakeholders to address each aspect of the performance assurance scope to ensure there are no unplanned consequences in the management and operations of the project's ECMs.

Finalize the Performance Assurance Plan

The Performance Assurance Plan deliverables should be developed specifically for each ECM, and may include some or all the following components based on the agency requirements:

- UESC Project Overview and ECM Summary
- Communications Plan
- Commissioning Plan and Report
    - Seasonal Commissioning Plan
    - Re-Commissioning Plan
- Energy- and Water-Use Baselines
- Post-Installation M&V Plan and Reporting
- Training Plan
- O&M Plan
- R&R Plans
- Warranty Plan
- Risk, Responsibility, and Performance Matrix (RRPM)
- Performance Discrepancy Plan
- Project Documents.

The Performance Assurance Plan must be fully developed prior to the execution of the task order, except for the details specific to the Commissioning Plans which are finalized after the task order is awarded. The Performance Assurance Plan should provide a blueprint for an agency (or a designated contractor) to manage, operate, maintain, measure and verify ECM performance and savings throughout the performance period.

Refer to Appendix 1 for the detailed Performance Assurance Plan outline.

Phase 4: Implementation and Construction

"The most important thing in communication is hearing what isn't said." – Peter Drucker

Key Performance Assurance Plan Objectives Phase 4:

- Agency monitors utility final design and construction
- Agency provides project oversight during construction
- Utility issues notice of substantial completion, which starts window for agency's inspection period for the installed ECMs
- Utility and agency coordinate the commissioning, performance verification, and training of the ECMs
- Utility completes commissioning and post-installation M&V
- Utility submits post-installation reporting and documentation – commissioning, M&V, checklists, as-builts, parts, et al.
- Agency completes its inspections and compiles a punch list
- Utility conducts training according to the Performance Assurance Plan
- Utility addresses and corrects punch list items
- Agency and utility complete final walk-through prior to project acceptance.

Final Design and Construction

Phase 4 is a complex phase with several important project milestones occurring that are tied to the Performance Assurance Plan. The utility finalizes the ECM design and Commissioning Plan, before commencing construction of the ECMs under agency oversight. Following substantial completion of each ECM, the commissioning, performance verification, reporting, initial training, and delivery of all project documentation occurs. The utility is responsible for delivering a completed project that provides energy and/or water savings according to the design documents. Throughout the implementation of the ECMs, the utility should provide the agency with the ECM scheduling, installation procedures, quality assurance plan, notification of work conducted outside of regular office hours, planned utility outages, and periodic reporting as specified in the contract.

Agency Project Oversight

The agency is responsible for ensuring the final design review is completed, with the correct details incorporated into separate tasks within the Performance Assurance Plan. The agency is also responsible for monitoring the utility's progress during the

construction of the ECMs to ensure that the work, inspections, commissioning, and training proceed according to schedule and as agreed under the task order. Following notice of substantial completion of the ECMs, the agency will ensure all inspections occur within the time-frame allowable under the task order, the training for all ECMs is scheduled and attended by the necessary staff, a punch list is developed and addressed in coordination with the utility, and all specified reporting occurs as required under the task order and Performance Assurance Plan.

Agency project oversight responsibilities include:

- Monitoring ECM installation activity
- Reviewing and verifying construction safety and quality assurance
- Verifying proper ECM installation pursuant to task order requirements, design/installation plans, and approved submittals
- Generate and manage project punch list
- Conduct regularly scheduled progress meetings with the utility and agency teams
- Utility completes the ECM commissioning, and post-installation M&V (or alternate options as identified)
- The agency ensures that all commissioning and M&V are witnessed by appropriate agency staff, and reporting is submitted and reviewed by the agency. This includes:
    - Verifying completion of construction punch list items
    - Verifying that any revised post-installation submittals are acceptable
    - Coordinating CO, COR, contractors, agency staff, and O&M and R&R training with the utility
    - Verifying receipt of and reviewing the following utility deliverables:
        - Record drawings and specifications
        - As-built drawings and specifications
        - O&M manuals and schedules
        - Spare parts lists
        - Spare parts provided
        - Equipment lists (to be added to agency’s preventative maintenance schedule/database)
        - Manufacturer warranties
        - ECM training materials/recordings
        - Post-installation reports and/or checklists
        - Commissioning Report
        - Post-installation M&V Report.

Phase 4 Key Milestones

Commissioning

As part of the scope of work to be completed by the utility, the Commissioning Plan should ensure that each ECM is commissioned by a qualified commissioning agent to verify that the ECM is installed and operating according to design specifications. The qualified commissioning agent may be paid for by the utility or agency, as determined in the task order. Commissioning for each ECM should be witnessed by a qualified agency representative with the appropriate background and technical expertise.

Commissioning Report

The commissioning agent and/or utility will submit the Commissioning Report to the agency, which should include a checklist developed specifically for each ECM. This report will describe the activities and protocols utilized during the commissioning process, details on the equipment—such as manufacturer specifications, functional testing performed, performance targets, and key performance indicators; and how verification was met to ensure that the installed ECM is operating according to design intent. The Commissioning Report also documents the agency witness(es) in attendance. The agency's qualified technical representative should review the Commissioning Report to confirm they agree with the reported findings, and that the ECMs are operating according to the contract's requirements.

Measurement & Verification (M&V)

Based on the agency's requirements under the contract, the measurement and verification (M&V) scope of services should be included, requiring the utility (or alternate options as identified) to conduct M&V following completion of ECM installation. This is done to verify that the ECM(s) can provide the energy and/or water cost savings specified. Agencies can conduct M&V internally, hire a third-party contractor, or include the task as part of the scope of work under the task order. Agencies should consult FEMP's Measurement and Verification for Performance-Based Contracts Version 5.0 to evaluate available M&V methodologies, and select or define the agency's methodology based on the complexity of the project ECMs, expected savings, reporting requirements, frequency, and other factors. The M&V activities should be witnessed (see FEMP's Guide to Government Witnessing and Review of Measurement and Verification Activities) by a qualified agency representative with the necessary technical expertise to validate the M&V process, methodology, and performance outcomes.

Post-Installation Measurement & Verification Report

The post-installation M&V Report for each ECM should be submitted by the utility (or alternate options as identified) based on the agreed-upon M&V methodology. The Report should describe the energy and/or water savings verification process for each ECM, provide a checklist developed specifically for the ECM, describe specific activities

performed, and identify the qualified agency representative present during the M&V process (i.e., witnessing). The M&V Report should identify the agency's COR or other qualified technical representative present during the M&V process, who should also review and approve the M&V Report to ensure they agree with the findings that the M&V process and methodology complies with event(s) witnessed and meets the requirements under the task order. FEMPs Measurement and Verification for Performance-Based Contracts Version 5.0 provides a template for the agency's reporting requirements.

Training

The purpose of training is to prepare the agency to properly operate, maintain, repair and/or replace ECMs, or ECM components. All training should include classroom instruction, with appropriate instruction manuals, followed by hands-on equipment application directly in the actual facility(ies) environment to ensure proper understanding and application of the curriculum according to the Training Plan. Training should instill the necessary knowledge in the agency staff to properly operate, maintain, repair and/or replace ECMs, or ECM components. In cases where ECMs are maintained by the utility, training should be provided to familiarize agency staff with the ECM's purpose and potential emergency operations. Training should occur upon ECM completion and, dependent on the ECM complexity, may include scheduled re-training during the performance period for technology updates, content retention, and staff turnover.

Performance Discrepancy Plan

The agency and utility should agree on a clear and comprehensive Performance Discrepancy Plan to establish communication protocols, timelines, and lines of responsibility in cases where the project experiences an event. This Plan should include a resolution process, which addresses possible failure causes, and distinguishes between excusable versus inexcusable, or critical versus non-critical events, and considers establishing plans to resolve the impacts of unforeseen events, such as construction delays, ECM performance gaps, or other issues that are not covered in the contract documents resulting in the need for action by the utility, agency, or both.

Including a comprehensive Performance Discrepancy Plan is important as projects can experience a wide variety of issues, some of which may have cascading impacts to the project schedule, project costs, and labor cost; or warranty issues. It is incumbent upon the agency and utility to have a clear and concise plan to mitigate potential impacts with appropriate and effective resolution strategies.

Project Documents

The utility provides all project as-built and record drawings, building-level technical specifications, user guides, cut sheets, equipment warranty information, parts lists, spare parts (clearly labeled), related ECM design specifications, key performance

indicators, setpoints, and schedules. All project documents should be provided by site location, building, floor, room, and/or control point.

Final Walk Through, Project Acceptance

Prior to project acceptance, a final walk-through should be conducted together with the agency and utility. Walk-throughs should be completed by the agency's project lead, the CO or this task may be assigned to the COR. In some cases, agencies may also involve subject matter experts related to specific ECMs, such as facility managers, energy managers, or other specialists. During the walk-through, the ECMs should be fully operational, with all required documents submitted, reviewed, and approved. When all tasks are completed, and verified, the project will be accepted and move to phase 5, the post-acceptance phase.

Refer to Appendix 1 for the detailed Performance Assurance Plan outline.

Phase 5: Post Acceptance – Performance Period

"The real risk is doing nothing" - Denis Waitley

Key Performance Assurance Plan Objectives Phase 5:

- Agency completes project acceptance, initiates performance period
- Utility completes end-of-warranty period tasks – re-commissioning, M&V, training, and reporting, as assigned in the task order and Risk, Responsibility, and Performance Matrix
- Agency witnesses M&V and re-commissioning activities performed by utility Agency reviews and approves re-commissioning and M&V reports and savings calculations with utility
- Performance Period O&M, R&R, monitoring and reporting – ongoing O&M, R&R, re-commissioning, and M&V activities occur at the specified intervals as assigned in the task order and Risk, Responsibility, and Performance Matrix
- Utility provides ongoing training
- Agency manages contract administration/contract modifications
- Agency completes Contractor Performance Assessment Reporting System (CPARS) evaluations on utility performance.

Project Acceptance

During phase 5 of the project, the agency will issue written notification to the utility, confirming that the installed ECMs comply with the contract terms and have been accepted. This initiates the performance period tasks and marks the point where the invoices may be submitted to the agency according to the task order terms.

End of Warranty Period Tasks

Prior to the end of the warranty period (typically covered by the utility), the utility performs any contractually binding re-commissioning and/or M&V of the ECMs to ensure the equipment has been properly operated and maintained, meets key performance indicators, and is performing as designed. All performance period re-commissioning and/or M&V is to be witnessed by a qualified agency representative. The utility prepares the end of the warranty period reports and reviews the findings with the agency. They will then address any discrepancies or issues that occurred during the warranty period. The agency's qualified representative should review the report's findings to ensure they are consistent and accurate according to the events witnessed and the requirements under the task order. Any discrepancies should be addressed according to the Warranty Plan, and/or the Performance Discrepancy Plan.

Monitoring and Reporting

Throughout the performance period, the ongoing sustainment of the ECMs is critical to the success of the UESC. Responsibility for optimal O&M/R&R falls to the designated party – agency, utility, or third-party, as defined in the task order and outlined in the Risk, Responsibility, and Performance Matrix. The agency should continuously monitor the ECMs to confirm that the assigned party completes the specified recurring M&V, re-commissioning, and O&M/R&R tasks according to the schedule developed in the Performance Assurance Plan. If required by the task order, the utility will provide a performance assurance report at agreed-upon intervals (e.g., annually) which will include results of any performance assurance activities included (e.g., M&V, O&M, R&R, etc.).

Ongoing Training

The agency may contract with the utility to provide ongoing training activities for specific ECMs, particularly more complex ECMs. The agency should coordinate with the utility for the ongoing training and ensure that the appropriate staff attend and maintain the training documentation. In the event periodic training is not negotiated in the task order, the agency should still ensure other resources are identified and made available to staff for refresher courses, staff turnover, or for ECMs that are complex, and/or receive ongoing updates or revisions.

Agency Administers Contract/Contract Modifications

Agencies should conduct periodic reviews of the project's progress throughout the performance period. These reviews should include the agency's CO, legal counsel, senior leadership, subject matter experts, other relevant staff, the utility project management team, and the ESCO (if applicable). Thorough and complete documentation of these periodic reviews and communication are essential for tracking the project's performance and any issues that may arise. All performance assurance activities that occur, whether conducted by the utility or the agency, should be documented throughout the term of the task order.

If an occasion arises requiring a contract modification, these ongoing reviews and communication will ensure all parties are informed prior to any request for modifications. Contract modifications may be necessary resulting from changing conditions, such as equipment removal, replacements, and demolitions. Any changes to contractual performance or savings parameters should be incorporated into the task order. Actual requests to modify the contract should be pursued by the CO and legal counsel. If a modification is necessary, the agency should ensure that it monitors the modification throughout the contracting process until completed. Conducting project reviews, maintaining good documentation, and storing communications ensure all parties will be aware of project success. This practice will result in a better transitionary period for any modifications required during the performance period.

Conclusion

A successful UESC requires that performance assurance tasks be developed for each unique project and completed according to the agreed-upon contract requirements, and that ECM performance is sustained throughout the contract term. The agency and utility are responsible for complying with the task order and ensuring that energy and/or water cost savings are maintained. A well-developed Performance Assurance Plan will help document the development and execution of performance plan activities throughout the project life cycle.

Appendix 1

This appendix includes additional details on the recommended components of the Performance Assurance Plan. Agencies may use the descriptions below as a starting point for defining expectations and requirements for their project specific set of actionable protocols that will define important tasks and responsibilities throughout the contract term and reflects the site conditions, complexities, agency capabilities, and operations and maintenance requirements for the planned ECMs.

Components of the Performance Assurance Plan:

- UESC Project Overview and ECM Summary
- Communications Plan
- Commissioning Plan and Report
    - Seasonal Commissioning Plan
    - Re-Commissioning Plan.
- Energy- and Water-Use Baselines
- Post-Installation M&V Plan and Report
- Training Plan
- O&M Plan
- R&R Plan
- Warranty Plan
- Risk, Responsibility, and Performance Matrix
- Performance Discrepancy Plan
- Project Documents.

The Performance Assurance Plan should be a standalone deliverable that represents a complete understanding of performance assurance requirements and agreement between the agency and utility. The Performance Assurance Plan should include the finalized baselines, ECM details, and the operational plans which ensure that measures are maintained during the performance period. The baselines provide the project's starting benchmark from which the project implements ECMs and measures its performance throughout the contract term.

The Performance Assurance Plan requirements are provided for each ECM individually and may include some or all the following plans:

UESC Project Overview/ECM Summary. A high-level overview of the UESC project and summary identifying the ECM scope, its location(s) by building and floor, room, if relevant, and the current state of existing systems and the planned future state.

Communications Plan. This plan should include a point of contact for the agency, utility, ESCOs, and all stakeholders in the project. An organizational chart should be provided for the entire project team, defining the roles and responsibilities of each team member. Agencies should track and maintain all project communications–from meeting minutes during the acquisitions planning, all the way through to documents and communications that occur during project acceptance and beyond. The collection of historical minutes, memoranda, schedules, testing and inspection reports, checklists, and performance discrepancies provides a reference resource for agency staff to consult throughout the performance period. Each written report should be submitted by utility to the agency in electronic format and maintained as a reference record for the agency.

Commissioning Plan. The Commissioning Plan should include ECM functional testing details, methodology, and any other ECM specific requirements necessary to ensure the ECM performs as designed at the completion of the installation. The Commissioning Plan should explain the methodology and protocols for performance testing, in a user-friendly format, and should be readily understandable, with step-by-step instructions including activities, a checklist, performance target(s), any necessary calculations, and digital files. It should also include a seasonal plan, so that the agency may utilize the Commissioning Plan for seasonal changes and recommissioning the ECMs. The qualified commissioning agent may be paid for by the utility or agency, as determined in the task order. Commissioning for each ECM includes a qualified agency representative with the appropriate background and technical expertise to witness the commissioning activities.

Commissioning Report. The commissioning agent and/or utility should submit the Commissioning Report to the agency and should include a checklist developed specifically for each ECM, which describes the activities and protocols that occurred during the commissioning process, details on the equipment, including manufacturers specifications, the testing performed, performance targets, key performance indicators, and how verification was met to ensure that the installed ECM is operating according to manufacturer's specifications and design intent. The Commissioning Report should also provide the agency witness(es) in attendance. The agency's qualified technical representative should review the Commissioning Report to ensure

they agree with the findings reported, and that the ECMs are operating in accordance with the requirements under the contract.

Seasonal Commissioning Plan. The Commissioning Plan should include a detailed Seasonal Commissioning Plan for on-peak and off-peak adjustment instructions, so that the agency can make seasonal changes to system operations and verify that ECM adjustments are applied correctly, and the ECM continues to operate as designed during the specified seasonal period. The seasonal adjustments should include instructions on how to restore the ECM and/or system at the end of the seasonal period. This should be provided in a step-by-step format, with verification protocols, to ensure ECM success throughout the Performance Period.

Re-Commissioning Plan. The re-commissioning of ECMs may occur at the schedule specified in the Performance Assurance Plan (if included). The re-commissioning of ECMs is conducted according to the instructions in the Commissioning and Seasonal Commissioning Plans.

Energy- and Water-Use Baselines. During the project development phase and prior to issuance of the project task order, the energy- and water-use baselines are finalized. The energy- and water-use baselines are the benchmark measurements used to evaluate the performance of ECMs whose development are finalized during phase 3 and installed during phase 4. Accurate energy- and water-use baselines are required to perform all savings verification calculations. Therefore, the agency should ensure that baseline measurements are done correctly, that the agency's subject matter expert has witnessed and reviewed the data sources and findings and agrees upon the methodology from which the final baselines are derived (See FEMP's Guide to Government Witnessing and Review of Measurement and Verification Activities). Accurate verification of energy and water savings cannot occur if the baselines are inaccurate. Once ECMs are implemented, the data necessary to identify the baseline is lost.

Post Installation Measurement & Verification (M&V) Plan. Based on the agency's requirements and frequency under the contract, the measurement and verification scope of services should be included, requiring the utility (or alternate options as identified) to conduct M&V of the ECM(s) following completion of installation. This is done to verify the ECM(s) performance is/are in accordance with contract requirements and are providing the energy and/or water cost savings specified. Agencies can conduct M&V internally, hire a third-party contractor, or include the task as part of the scope of work

under the task order. Agencies should consult FEMP's Measurement and Verification for Performance-Based Contracts Version 5.0 to evaluate available M&V methodologies and select or define the agency's methodology based on the complexity of the project ECMs, expected savings, reporting requirements, frequency, and other factors. The performance of M&V should be witnessed (see FEMP's Guide to Government Witnessing and Review of Measurement and Verification Activities) by a qualified agency representative with the necessary technical expertise to validate the M&V process, methodology, and performance outcomes.

Post Installation M&V Report. The post-installation M&V report for each ECM should be submitted by the utility (or alternate options as identified) based on the agreed-upon M&V methodology and frequency. The report should describe the cost savings verification process of each ECM, provide a checklist developed specifically for the ECM, describe specific activities performed, identify the qualified agency representative present during the M&V process (i.e., witnessing), and demonstrate that the installed ECM meet the design specifications according to the task order. The M&V report should identify the agency's COR or other qualified technical representative present during the M&V process, who should also review and approve the M&V report to ensure they agree with the findings that the M&V process and methodology complies with event(s) witnessed and meets the requirements under the task order. FEMPs Measurement and Verification for Performance-Based Contracts Version 5.0 provides a template for the agency's reporting requirements.

Training Plan. A Training Plan is developed and conducted for agency staff, and/or the agency's designated third-party contractor (e.g., O&M contractor) and includes:

- Training schedule of dates and curriculum to be covered
- Hands-on classroom training for all agency staff, and/or contractors including:
    - ECM-appropriate training and may include beginning, intermediate, and advanced level courses prior to, or just after completion of the ECM, and prior to the end of the warranty period [these intervals should comply with the agency's internal needs dependent on the complexity of the ECM].
    - Classroom lectures, with appropriate instructional manuals, followed by hands-on training in the actual facility(ies) environment to ensure an appropriate understanding of the curriculum.

    - A physical review of each ECM, visual inspection of installed equipment, review of O&M requirements, ECM programming, and functional testing.
- All training course materials and data, including O&M, should be provided in a bound, written, instruction manual format, as well as provided in a digital video recording(s) of instruction for future agency use/reference
- Additional ad hoc training as requested by the agency, and as is required to maintain the ECM during the performance period
- ECM-specific refresher training throughout the contract period appropriate to the ECM
- Ad hoc phone support/assistance as requested by the agency throughout the contract period.

The utility ensures that all necessary computers, demonstration equipment, meeting rooms, AV equipment, advanced level instructors, and any other relevant tools and resources are available to agency staff and/or third-party contractors to ensure a comprehensive course is delivered to the agency staff, and/or its contractor.

Operations and Maintenance (O&M) Plan. The O&M Plan should include a detailed operations and maintenance schedule on an ECM-by-ECM basis, including a Risk, Responsibility, and Performance Matrix, defined roles and responsibilities and staffing requirements, key performance indicators, and efficiency targets, any repair and/or replacement procedures and O&M requirements that meet the manufacturer's specifications.

Repair and Replacement (R&R) Plan. The R&R Plan should include details for each ECM covered under the task order. R&R includes repairs and/or replacement of ECMs or components of ECMs that are within the manufacturer warranty period and repairs and/or replacement of ECMs or ECM components for the duration specified following the manufacturer warranty period. Repair and/or replacement should include the use of either a new or refurbished product, including replacement repair response times. The agency should consult its contracting specialists for further contract details.

Warranty Plan. For each ECM, the Performance Assurance Plan should specify the scope of the utility's warranty obligations with each party's responsibilities defined, and their duration, in the Risk, Responsibility, and Performance Matrix for the entire performance period (pre and post warranty period). The utility should provide this information in a complete warranty

schedule of ECMs, itemizing equipment, parts list, with related warranty information and/or wrap around warranty detail.

Risk, Responsibility, and Performance Matrix. The Risk, Responsibility, and Performance Matrix summarizes and documents the agency's agreements regarding allocation of risks and responsibilities (agency, utility, or shared) for each ECM to be included for all activities in the Performance Assurance Plan for the pre- and post-warranty period. Utility assigns a representative to the agency as a single point of contact for the duration of the performance period to assist with any requests, questions, or project-related resources.

Performance Discrepancy Plan. The agency and utility should agree on a clear and comprehensive Performance Discrepancy Plan to establish communication protocols, timelines, and lines of responsibility in cases where the project experiences an event. This Plan should include a resolution process, which addresses possible failure causes, and distinguishes between excusable versus inexcusable, or critical versus non-critical events, and considers establishing plans to resolve the impacts of unforeseen events, such as construction delays, ECM performance gaps, and other issues that are not covered in the contract documents resulting in the need for action by the utility, agency, or both.

Including a comprehensive Performance Discrepancy Plan is important as projects can experience a wide variety of issues, some of which may have cascading impacts to the project schedule, project costs, and labor cost, or warranty issues. It is incumbent upon the agency and utility to have a clear and concise plan to mitigate potential impacts with appropriate and effective resolution strategies.

Project Documents. The utility provides all project as-built and records drawings, building level technical specifications, user guides, cut sheets, equipment warranty information, parts lists, spare parts (clearly labeled) related ECM design specifications, key performance indicators, setpoints, and schedules. All project documents should be provided by location, building, floor, room, and/or control point.

The Performance Assurance Plan must be fully developed prior to the execution of the task order, except for the details specific to the Commissioning Plans which are finalized after the task order is awarded. The Performance Assurance plan should provide the blueprint for an agency (or a designated contractor) to commission and/or re-commission, measure and verify savings, and operate and maintain each ECM implemented throughout the performance period.

End of Appendix 1

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