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Guide to Government Witnessing and Review of Measurement and Verification Activities

Recommendations for Government Oversight of Measurement & Verification Activities for Energy Performance Contracts

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Foreword

This resource explains how to incorporate government witnessing as part of government oversight in key activities related to measurement and verification (M&V) under federal energy performance contracts. While this guide focuses on federal energy savings performance contracts (ESPCs), it may also be applicable to utility energy service contracts (UESCs) and other energy performance contracts. This document updates previous versions: “Guide to Government Witnessing and Review of Post-Installation and Annual Measurement and Verification Activities”, released February 2007 and “Guide to Government Witnessing and Review of Measurement and Verification Activities”, released March 28, 2014.

This is DOE FEMP’s official guidance for federal agencies on government witnessing.

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List of Abbreviations and Acronyms

CO	contracting officer (also KO)
COR/COTR	contracting officer representative/technical representative
CS	contract specialist
Cx	commissioning
DOE	U.S. Department of Energy
ECM	energy conservation measure
EMCS	energy management control system
ESCO	energy service company
ESPC	energy savings performance contract
FEMP	Federal Energy Management Program
IDIQ	indefinite delivery, indefinite quantity
IGA	investment grade audit
M&V	measurement & verification
O&M	operations and maintenance
PA	preliminary assessment
PNNL	Pacific Northwest National Laboratory
R&R	repair and replacement
RFP	request for proposal
TO	task order
TO RFP	task order request for proposal
UESC	utility energy service contract
WCM	water conservation measure

Executive Summary

Energy savings performance contracts (ESPCs) and utility energy service contracts (UESCs), collectively referred to as Energy Performance Contracts (EPCs), are multi-year performance-based contracts where contractors install energy and water conservation measures (ECMs/WCMs) and are repaid from reduced utility and related costs over a contract term that can be up to 25 years. These projects rely on government oversight to ensure that installed measures are performing and generating the required savings, and the contractor is following the agreed-to site-specific measurement and verification (M&V) plan.

For this resource, government oversight refers to the processes by which contractor actions are monitored to ensure accountability, transparency, and compliance with contractual requirements. Government witnessing means the verification of contractor activities, documents, or measurements to confirm authenticity and accuracy, often by direct observation. Government witnessing is a key aspect of government oversight for these long-term, multi-year contracts.

Government oversight includes confirming M&V activities and data collection occurred, savings are accurately reported, and the contractor performed actions as laid out and agreed-to in the project task order. M&V activities are comprised of actions that support verification of performance and ensure the persistence of savings and performance over the contract term, which may include data collection, measurements, monitoring, and visual inspection. Government oversight provides checks on contractor performed work to verify savings, mitigates risk of unverifiable claims and unrealized savings, and offers transparency to ensure that savings are occurring. If government oversight fails, there are risks to the government, including:

- Unverified savings: Agencies may pay for savings that don’t materialize.
- Performance impacts: buildings, systems and equipment do not meet agency performance requirements.
- Contract disputes: Lack of clear witnessing/reviewing can lead to disagreements with contractors.

Government witnessing of contractor M&V activities ensures that the ordering agency understands the M&V process, ensures it is applied as required, and has confidence that the cost savings on which the annual payments are based are realized. Government witnessing is required for federal EPCs – selecting the appropriate level to ensure government oversight of these multi-year performance-based contracts is key to sustained performance and confidence that the project is meeting guarantees.

This resource details guidance and steps to ensure that M&V activities throughout the project lifecycle meet contract requirements and ensure that resulting cost savings are accurate and credible.

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1 Introduction

Energy savings performance contracts (ESPCs) are long-term performance-based contracts that require performance and savings guarantees to ensure that energy, water and related cost savings are realized by the government. Utility energy service contracts (UESCs) are similar long-term performance-based contracts that require performance assurance[1]. Both ESPCs and UESCs –collectively referred to as Energy Performance Contracts (EPCs) – have a maximum 25-year contract term, beginning at task order award, and continuing through project implementation and performance phases. Government oversight responsibilities for ESPCs are key to verifying that performance and guaranteed savings are delivered by the contractor or energy service company (ESCO). The responsibilities for UESCs are similar though delivered by the serving utility, and UESCs are not required to have guaranteed savings. This oversight includes ordering agency witnessing activities, which occur throughout project development, implementation, and performance periods.

This document provides guidance and recommendations pertaining to government witnessing of activities related to measurement and verification (M&V) activities in federal EPC task order (TO) awards. For ESPCs, the U.S. Department of Energy (DOE) Federal Energy Management Program (FEMP) requires that the ordering agency witness M&V activities carried out by the ESCO as detailed in the site-specific M&V plan. Government witnessing is needed to determine whether contractually guaranteed cost savings and performance are delivered and accurately reported by the contractor. For the purposes of this guide, the term “ESCO” and “contractor” are used interchangeably. While this guide focuses primarily on federal ESPCs, it may also be applicable to UESCs, with the utility as the prime contractor, and to ESPCs in other sectors such as the municipal, university, state and hospitals (MUSH) market.

Government oversight ensures the ordering agency’s and federal facility’s continued involvement with the EPC. This oversight refers to the processes by which contractor actions are monitored to ensure accountability, transparency, and compliance with contractual requirements. Government witnessing is a key aspect of government oversight. Witnessing is the verification of contractor activities, documents, or measurements to confirm authenticity and accuracy, often by direct observation. Both government oversight and government witnessing ensure that these long-term, multi-year contracts provide benefit and value to the federal government, meeting contractual requirements and providing confidence in the reported performance.

[1] For more information on performance assurance for UESCs, see FEMP’s Performance Assurance Planning Guide and website on Performance Assurance Planning for Utility Energy Service Contracts.

M&V ensures that installed measures meet project performance and cost savings requirements throughout the contract term. Government witnessing of M&V helps ensure the accuracy of baselines and calculation methods used in M&V activities. If the contractor is performing operations, preventive maintenance, repair, and/or replacement procedures related to implemented energy and water conservation measures (ECMs/WCMs), the ordering agency must periodically, and at least annually, witness and/or inspect the contractor's performance ensuring those activities are occurring as part of government oversight activities. Witnessing of M&V activities is a part of the process of reviewing and approving baseline measurements, ECM/WCM installation, and M&V activities and deliverables, including the on-site inspections, spot measurements, short-term monitoring, and performance tests described in the site-specific M&V plan.

Government witnessing of M&V activities is required by the DOE ESPC indefinite delivery, indefinite quantity (IDIQ) contract prior to the installation of ECMs/WCMs, during post-installation verification, and annually throughout the performance period. Witnessing gives the ordering agency confidence that contractor activities associated with verifying performance and savings (such as visual inspection, data collection, and measurements), presented in annual M&V reports, were performed as required by the M&V plan and represent accurate results and credible justification for contract payments based on realized performance and guaranteed cost savings. Government witnessing is detailed in the site-specific M&V plan, including the recommended level of witnessing of M&V activities for each ECM/WCM.

This guidance describes witnessing in each project phase (Section 2: Witnessing through Project Phases); procedures for preparing for, coordinating, and witnessing contractor M&V activities (Section 3: Procedures for Oversight and Witnessing); and discussion of a graded approach to M&V oversight and witnessing, including three levels of practice and minimum staff qualifications for each (Section 4: Roles and Responsibilities). Appendix A is a suggested format for recording government witnessing at an ECM/WCM level, with Appendix B providing a sample template for the building level. Appendix C provides the DOE Gen 4 ESPC IDIQ master contract clauses and suggested language to be used in the ESPC task order request for proposal (TO RFP) pertaining to contractor report submission, witnessing activities, and government review and acceptance of reports. The DOE Gen 4 ESPC IDIQ contract requires the contractor to prepare and submit a site-specific M&V plan with its TO proposal, which includes the recommended level of government witnessing for each ECM/WCM and documents witnessing completed prior to TO award (e.g., data logging and/or measurements conducted during project development while establishing the energy/water baseline), as well as the government oversight planned throughout project implementation and performance period.

1.1 Expected Outcomes

Government witnessing is one aspect of due diligence in implementing an EPC project. As in any contract, the government (or ordering agency) is responsible for ensuring that the ESPC or UESC is a good deal for the government through understanding the terms of the contract and providing competent contract administration and oversight. In ESPCs, due diligence also requires that the government understand the nature and terms of these performance-based savings guarantees, and how M&V activities confirm whether or not guarantees have been met. Government witnessing of contractor M&V activities helps answer the question, "How does the ordering agency know whether the M&V report is accurate?"

Anticipated positive outcomes of following this guidance also include these benefits:

- Ensure clear and regular communication between the ordering agency and contractor to reach a full mutual understanding of the site-specific M&V plan and activities and how they demonstrate whether guaranteed performance and savings are being achieved.
- Facilitate, coordinate, and oversee contractor M&V activities by designated agency personnel to expedite the process of executing M&V activities by the contractor and agency review and approval of the resulting M&V reports.
- Prevent, minimize or expeditiously resolve disputes about performance and verified savings.

1.2 FEMP Guidance on M&V

This witnessing guidance is fully consistent with both the most recent FEMP M&V Guidelines: Measurement and Verification for Performance-Based Contracts and the procedures FEMP recommends for reviewing performance reports (i.e., post-installation M&V and annual M&V reports) in *Reviewing Post-Installation and Annual Reports for Federal ESPC Projects* (located on the FEMP Resources for Implementing Federal Energy Savings Performance Contracts web page, under Measurement and Verification, M&V Post-Installation and Performance Period). Government witnessing is an integral element in M&V activities.

As noted in FEMP M&V Guidelines, there are several common types of M&V-related activities that may apply to these performance-based contracts, from establishing baseline(s) to verifying performance. They may include surveys, spot measurements, short-term metering or measurements, and/or data file collection and associated documentation. Different types of activities lend themselves to different levels of government witnessing.

FEMP M&V Guidelines provide an M&V plan outline for use in developing the site-specific M&V plan for federal ESPCs, though it can be used for other energy performance contracts (e.g., UESCs). This outline includes sections defining the schedule of M&V activities, requirements for and recommended level(s) of government witnessing for M&V activities for each ECM/WCM during baseline development, post-installation verification activities and post-acceptance performance period (Appendix C, section 2.3). Similarly, the post-installation report outline (Appendix D, section 2.3) includes details on post-installation M&V activities conducted, including dates/times of data collection, inspections or measurements, names of personnel, and documentation of government witnessing. And finally, for annual M&V reports, the outline (Appendix E, section 2.2) details measurements, monitoring, and inspections conducted during the reporting period in accordance with the site-specific M&V plan. These details include ensuring that inspections and measurements conducted by the contractor are witnessed by the ordering agency and including copies of witnessing documentation as an appendix to the annual M&V report.

This witnessing guidance complements the FEMP M&V Guidelines described above, and DOE FEMP's Commissioning Guidance for ESPCs and as shown in Figure 1 below.

M&V Guidelines	Government Witnessing Guidance	Commissioning (Cx) Guidance

• Describes M&V methods, approaches, and guidance for ECMs & WCMs in an EPC project, including witnessing.
• Applies to M&V activities for EPC projects during:
  • Baseline development
  • Post-installation
  • Performance period
• Details the M&V plan, Post-Installation, and Annual M&V report outlines for federal ESPCs.
	• DOE official guidance for agencies on government witnessing of M&V, O&M and Cx activities.
	• Recommends witnessing activities and qualifications for government oversight of an EPC project.
	• Identifies the roles and responsibilities of government witnesses and the EPC contractor.
	• Applies to EPC M&V activities during:
	  • Baseline development
	  • Post-installation
	  • Performance period
		• Describes Cx activities and expectations in an EPC project, including witnessing Cx activities.
		• Identifies the roles and responsibilities of government staff and the EPC contractor.
		• Supports development of the Cx plan and Cx report.
		• Applies to EPC project phases:
		  • Project Implementation
		  • Post-installation

Figure 1. Overview of Witnessing in Other FEMP Resources for EPCs

More guidance on M&V and related aspects of federal ESPCs is also available on FEMP's Resources for Implementing Federal ESPCs web page.

2 Witnessing Through Project Phases

Government witnessing plays a role throughout project development, implementation, and performance phases of these long-term contracts. In all phases of the project, the contractor is required to coordinate with the ordering agency to ensure knowledgeable agency witness(es) are involved. The contractor proposes the specific requirements and levels for Government witnessing in the site-specific M&V plan submitted with the TO proposal for ordering agency review and concurrence.

2.1 Project Development (Preliminary Assessment, Investment Grade Audit)

Witnessing coordination begins during project development, as early as the preliminary assessment (PA). As part of the PA, the contractor provides a general description of the M&V approach proposed for each suggested ECM/WCM and recommended level of government witnessing. This starts the planning of M&V related activities that will take place during the investment grade audit (IGA) stage. If the ordering agency opts to pursue the direct to IGA approach skipping the PA, additional details surrounding the planned M&V activities and associated government witnessing, including monitoring, metering, measurements and establishment of the baseline should be discussed at the IGA kick-off meeting.

During the IGA, the contractor establishes baseline energy and water consumption, load profiles, and parameters that will need to be metered, measured, monitored and/or collected from existing data sources. In order to provide government oversight, the ordering agency and/or its authorized representative(s) (e.g., knowledgeable facility personnel) should witness these activities, noting where and when the activities are taking place (e.g., system, sensor, building) and who is involved (i.e., who is conducting the activities and who from the government is witnessing). This is all documented to ensure that there is concurrence in what information was collected and its applicability to establish the baseline for the ECM/WCM, building, and/or project.

When reviewing the technical proposal from the contractor, the supporting documentation is typically included in the appendices. Baseline or pre-retrofit M&V activities must be witnessed by the ordering agency representative in accordance with the final site-specific M&V plan prior to the installation of ECMs/WCMs; this is typically completed during the IGA. Both the activity of witnessing and the documentation of the activities gives the government confidence in the establishment of baseline(s).

2.2 Project Implementation

After TO award, the project implementation phase begins. During this phase, the contractor coordinates with the ordering agency to ensure that the appropriate government personnel are available to witness activities in accordance with the site-specific M&V plan. Government witnessing occurs for the measurements, inspections, metering, and data collection after ECM/WCM implementation, following the site-specific M&V plan. This includes witnessing commissioning (Cx) activities after the implementation of ECMs/WCMs and prior to project acceptance, as well as post-installation M&V activities. The contractor documents the government witnessing in both the post-installation M&V report and the commissioning report(s).

Witnessing and documentation of witnessing activities related to project implementation provides government oversight of contractor activities and gives confidence in the ability of the implemented ECMs/WCMs to meet performance and savings guarantees.

2.3 Post-Acceptance Performance

Finally, at least annually throughout the post-acceptance, or performance period, the ordering agency must witness M&V activities as described in the site-specific M&V plan, and document witnessing those events. This includes periodically witnessing and/or inspecting contractor performance of ECM/WCM operations and maintenance (O&M) and repair and replacement (R&R), to ensure contractor compliance with agreed-to procedures detailed in the awarded TO and agency understanding of the work that was performed.

The ordering agency, upon reviewing the annual M&V report, confirms that the documented findings align with the activities witnessed and documentation of government oversight is included in the M&V report.

Table 1. Overview of Government Witnessing by Project Phase

Project Phase	Typical Government Witnessing Activities
Acquisition Planning	• Discuss importance of government oversight, including witnessing activities with acquisition team, as part of training on EPCs.
ESCO Selection and Preliminary Assessment	• Consider general M&V approach, with description of recommended level of government witnessing by ECM/WCM. Sample witnessing forms should be provided by the contractor, incorporating any agency-specific requirements. This may include baseline inspections, data collection and measurements that occurred as part of the PA.
Project Development (Investment Grade Audit)	• Review/approve site-specific M&V plan, with description of recommended level of government witnessing and witnessing activities by ECM/WCM. • Government witnessing and documentation of baseline inspections, data collection, and measurements, as well as review of calculations and modeled assumptions.
Project Implementation	• Government witnessing of post-installation M&V inspections, data collection/recording and measurements according to site-specific M&V plan. • Government witnessing of Cx activities. • Documentation of government witnessing included in Cx report(s). • Documentation of government witnessing included in post-installation M&V report.
Post-Acceptance Performance Period	• Witness M&V activities (inspections, data collection, measurements) witnessed in accordance with site-specific M&V plan. • Government witnessing contractor performance of O&M and R&R, as applicable. • Documentation of government witnessing included in annual M&V report by ECM/WCM or building.

3 Procedures for Oversight and Witnessing

The ordering agency Contracting Officer (CO, or KO for Department of Defense entities) will appoint a Contracting Officer's Representative (COR) and/or Contracting Officer's Technical Representative (COTR), in accordance with ordering agency procedures, to perform delegated functions of the TO, which may include government oversight of M&V activities, witnessing, and review of M&V-related reports (i.e. Commissioning, Post-Installation, and Annual M&V reports). A federal contract specialist (CS) may also support these activities. However, the agency witness does not need to be the COR/COTR/CS as long as the CO/KO determines that the designated witness is proficient to understand and properly evaluate whether the tests, measurements, or other M&V activities are being performed correctly and reported accurately.

Decisions regarding the level of necessary oversight and review and who will be responsible for specific tasks should be: a) considered in the preliminary assessment, b) discussed during the investment grade audit, c) detailed in the site-specific M&V plan included in the TO, and d) communicated to all parties, including the ordering agency CO/KO and the contractor, prior to scheduling M&V activities. It is encouraged that the ordering agency and site revisit oversight activities, and review and adjust as necessary throughout the term of the contract.

The procedures outlined below apply primarily to Government witnessing of post-installation M&V activities prior to project acceptance and annual M&V activities after project acceptance. Prior to the installation of ECMs/WCMs, the ordering agency representative witnesses baseline measurements and activities conducted by the contractor. This typically occurs during project development, prior to task order award.

3.1 Procedures for Oversight and Witnessing

Post-installation M&V is conducted after installation of the ECMs/WCMs, and results are documented in the post-installation M&V report, which is reviewed and approved by the ordering agency prior to project acceptance. Witnessing post-installation M&V is often critical for ECMs/WCMs that are subject to Option A M&V methodology, because their actual performance may only be measured at this point, with subsequent M&V activities limited to visual verification (i.e., inspections) to verify "potential to perform". The schedule for implementation, inspections, submittal, and review of the post-installation M&V report and project acceptance is specified in the TO.

Federal ESPC regulations require that M&V activities be conducted and reported to the ordering agency at least annually during the post-acceptance performance period, and the recommendations here assume an annual schedule of performance-period M&V activities and reports. However, M&V inspections and reports may be conducted more

frequently than annually, and M&V data collection may be completed in a variety of ways, such as during operations and maintenance (O&M) visits or through an energy management control system (EMCS). These procedures can be adapted for those types of schedules as well as through annual M&V activity data collection. UESCs require annual performance assurance activities, which may include M&V for performance measurements; additional information on UESC performance assurance planning can be found in FEMP's Performance Assurance Planning Guide for UESCs.

The ordering agency is obligated to perform its oversight and review of M&V activities and the contractor-issued reports in the timeframes described in the TO. The contractor coordinates with the ordering agency to ensure an agency witness will be involved in the post-installation and post-acceptance M&V activities.

The recommended procedures below include steps for the ordering agency to take (1) in preparation for M&V activities, (2) during facilitation and witnessing of M&V activities, and (3) after the contractor's M&V activities are completed.

These procedures are intended to enable government oversight and review of M&V activities in order to:

- verify that all M&V activities are conducted in accordance with the site-specific M&V plan;
- confirm that the reported results of verifications and measurements are accurate and represent actual operation of the equipment or systems involved; and ensure that M&V activities are properly documented.

3.2 Agency Preparation for Facilitating and Witnessing Activities

The key preparatory tasks for the designated ordering agency representative(s) in advance of the contractor's site visit include the following:

- **Review project details.** Review and understand the expected performance of the ECMs/WCMs, how their baselines were calculated, and how performance will be measured and/or verified per the site-specific M&V plan (including the tests, equipment to be used, duration of measurements, and required site data). Materials to be reviewed may include: a) the ECM/WCM descriptions, baseline definitions, site-specific M&V plan, and financial schedules in the final proposal/TO; b) any contract modifications that could impact ECM/WCM performance and/or M&V activities; c) post-installation M&V report; and d) the most recent or other previous annual M&V reports where available. Where models will be used, ensure that the contractor's planned data gathering is sufficient to get the full picture of system performance (e.g. gathering data in

multiple seasons when modeling performance of an air handling unit rather than extrapolating from a single season).

- **Coordinate with site personnel for contractor visits**. Coordinate visits to occupied and affected spaces (i.e., where ECMs/WCMs were implemented) with appropriate agency/site personnel. Schedule operations personnel who have information relevant to specific ECM/WCM operations and performance, including data logs, to be available for the site visit. Ensure that arrangements are made for the contractor to have access to all equipment and all areas necessary to evaluate the performance of ECMs/WCMs. The contractor may have specific areas that require access that change each year (e.g., rotating sampling of equipment); thus, request the contractor provide a list in advance of required access areas.

- **Review government witnessing forms**. Ensure that forms for recording dates, personnel, and measurement information are prepared (typically by the contractor, incorporating agency requirements) for each ECM/WCM or facility for which inspections and measurements will be witnessed. A sample form for witnessing by ECM/WCM is provided in Appendix A; a sample form for witnessing by building is provided in Appendix B. Completed forms will be signed by the agency witness(es) and contractor personnel and attached to the contractor's annual M&V report and reviewed by the ordering agency.

- **Coordinate with the contractor.** Communicate with the contractor prior to the visit to determine needs for access, information and records, and any required or helpful participation of site personnel in ECM/WCM inspections, tests, and monitoring. Review and provide the contractor with all pertinent records per the site-specific M&V plan (e.g., utility bills, O&M records, EMCS trend data, and documentation of occupancy or usage changes in affected spaces). Provide the contractor with secure remote access to data where permitted. If possible, provide records to the contractor in advance of M&V inspections.

- **Schedule contractor inspections**. Work with the contractor to schedule for times to conduct M&V activities that are not disruptive to agency or site operations. To the extent possible, schedule for dates and times when ECMs/WCMs are subject to actual, normal operating conditions. It is imperative that the ordering agency and the contractor make considerable effort to coordinate the dates and times of witnessing so both parties in the effort are prepared and available for the scheduled inspections.

- **Plan ahead for virtual witnessing**. If virtual or remote government witnessing by the ordering agency is needed when in-person witnessing by government

personnel are not applicable or possible, make sure to plan ahead. Virtual witnessing methods include video tours, photographic evidence, written testimony from facility operations personnel, and trend data provided by the ordering agency and/or submitted by the contractor (see section 3.4 for virtual witnessing requirements).

- **Hold a meeting with key stakeholders**. Conduct a meeting with the COR or COTR, witness(es), and contractor personnel to review the M&V inspection schedule, determine site and building access requirements where M&V will be conducted, and discuss the M&V activities that the contractor intends to perform. Ensure that all parties understand how the performance of ECMs/WCMs will be evaluated (e.g., what data will be collected, what forms to use) and what constitutes performance to meet the terms of the contract. Any participation by agency personnel to facilitate M&V activities, either during or after the visit (e.g., tests and monitoring, recording or transmit information from data loggers) should be agreed upon before M&V activities begin.

3.3 Agency Facilitating and Witnessing Contractor M&V Activities

Once the contractor arrives at the site, the key tasks for the ordering agency representative(s) include:

- **Gather information**. Provide any utility data, occupancy schedules, O&M records, and/or metered data as requested by the contractor that could not be provided in advance. If the contractor is granted access and pulls data remotely (e.g., from EMCS or utility meter from solar photovoltaic monitoring system), the contractor must include the data pulled in the M&V report (a copy or summary of data collected including the date(s) and a representative sample of the data at a minimum).
- **Ensure availability**. Escort contractor personnel, observe tests or inspections performed by the contractor, make notes of test or measurement equipment used by contractor (calibration certifications should be included in M&V reporting), and obtain any needed clarification of how tests are being performed, depending on level of witnessing detailed in the M&V plan. Ensure that all needed access to equipment is provided and that all agreed upon tests are performed and record any anomalies that affect M&V activities, performance, or savings (e.g., equipment inoperable or unavailable for testing).
- **Document observations**. Record any observed malfunctions either of ECMs/WCMs or monitoring equipment during witnessing of M&V activities. Sign the data collection forms used to record these observations (Appendix A and/or B).

- **Verify information used**. For witnessing M&V activities using utility bill analysis, ensure that the ordering agency reviews billing data, independent variables, and regression analysis calculations; for computer energy simulation, ensure reviews of model inputs and results for reasonableness.
- **Share concerns**. Ensure that facility operations staff bring to the attention of the contractor and the COR any problems related to operation, maintenance, repair or replacement, or performance they have experienced with equipment or systems installed as part of the installed ECMs/WCMs or project overall. The M&V plan should include a process for on-site staff to record issues in a central location, as they may occur throughout the year, so these anomalies can be captured. In some cases, issues can impact project savings. Deficiencies that need to be addressed by the contractor or the ordering agency are identified in the annual M&V report along with recommended corrective actions.
- **Double check information**. For initial post-installation M&V and/or commissioning inspections (prior to project acceptance), agency witnessing should include confirmation that the equipment installed matches what was specified in the design, and that it was properly installed in accordance with applicable site-specific M&V and commissioning plans.
- **Confirm documentation is complete**. Proof of witnessing activities is important and must be documented on a form(s) provided by the agency and/or contractor. Documentation includes providing a name and signature from both the agency representative and the contractor. Identify the professional title of the witness(es) so that the capabilities of the witness(es) are understood.

3.4 Virtual/Remote Witnessing Considerations

In-person government oversight of M&V activities is preferred; however, this is not always possible due to the type of activity or availability of government personnel. In this case, thorough documentation is required to capture the following key information:

- What equipment or system was evaluated.
- Where the equipment or system is located, with supporting information indicating the room or location where the M&V activities occurred and ideally noted on a floor plan where applicable data were collected.
- What tools or devices were used in the collection of required information.
- For those M&V activities that require measurements, a copy of the calibration certificate for the specific device; and

- Time-stamped photographic and/or videographic documentation of the results of any testing, measurements, and/or M&V activities.

Virtual witnessing documentation should be formally submitted, reviewed, and approved by the authorized ordering agency representative (e.g., COR). This process does not negate the government's oversight requirements for energy performance contracts, but rather expands the required volume of clear, detailed documentation to remotely verify baseline and post implementation conditions impacting the achievement of the projects guaranteed performance and savings. As with onsite witnessing, proper documentation includes providing a signature and the professional title of the witness(es) so that the capabilities of the witness(es) are understood.

Virtual witnessing methods include video tours, photographic evidence, written testimony from facility operations personnel submitted by the contractor. Trend data (e.g., energy management control system trends, solar photovoltaic energy generation records) may be provided by the ordering agency to the contractor. Virtual witnessing must include the system/equipment, location, date, and photographic evidence to demonstrate data collected was appropriate and followed the site-specific M&V plan.

There are instances where the government is providing key performance data directly to the contractor (e.g., energy management control system trends or solar photovoltaic meter data). In these instances, similar key information is required as above, including:

- What system(s) or data point(s) are included.
- Where the equipment or system is located.
- Confirmation that the system is still operable (via videography); and
- Time-stamped data that matches the appropriate performance period.

The ordering agency should coordinate with local site or agency cybersecurity officials when obtaining data and providing it to the contractor or allowing the contractor to access agency systems remotely (e.g., EMCS or building performance analytics software), in compliance with agency cybersecurity requirements and policies. With increasing reliance on digital devices and tools in federal facilities, agencies should address data integrity risks and ensure authorization and safeguards are in place for connected systems.

3.5 Agency Post-M&V Site Visit Steps

After the contractor's site visit, the contractor will develop the M&V report and submit it to the ordering agency for review. Key tasks for the ordering agency representative(s) during this phase include:

- **Follow up as needed**. Respond to any requests by the contractor for information not available at the time of visit and follow up with the contractor for any clarification that may be needed in a timely manner. Follow up as necessary with operating personnel for any observations they may have of contractor testing and monitoring.
- **Review M&V report**. Schedule staff time needed for M&V report reviews as agreed upon in the TO. Once received, the ordering agency reviews the contractor's M&V report in accordance with FEMP's guidance on Reviewing Post-Installation and Annual Reports for Federal ESPC Projects. Ensure that the data collected and witnessed matches the data presented and documented in the M&V report and includes any changes or impacts that may have affected the ability of the project to generate energy and water savings. Changes and impacts may affect one or more ECMs and can sometimes result in an energy or water savings surplus rather than a shortfall. The ESCO creates a "running log of impacts" in the M&V report and the ordering agency reviews this log each year of the performance period.
- **Provide feedback as needed**. Prepare a written review (or edit and approve reviews prepared by others, e.g., COR) of the M&V report submitted by the contractor. This review should include all comments for the contractor and should clearly specify any action or information requested of the contractor. The reviewed M&V report should be delivered according to the schedule outlined in the TO award or IDIQ contract (typically within 20 days of receipt). If necessary, the contractor may be required to submit a revised M&V report or a plan for corrective action if any shortfalls are found. See Appendix C for submittal requirements for the most recent DOE ESPC IDIQ contract. *Note: The DOE/FEMP project facilitator will normally prepare reviews of the commissioning report, post- installation report, and the first annual M&V report, working with the ordering agency.*
- **Save documents to project file**. Provide copies of the M&V report review, with completed government witnessing forms attached, to the contractor, the agency CO/KO, and the DOE ESPC CO who will archive it for project records. Electronic files are required for DOE documentation when using the DOE ESPC IDIQ contract.
- **Resolve discrepancies and disputes**. Any dispute between the agency and contractor must be resolved in a manner consistent with the dispute resolution language in the M&V plan, the generation of the DOE ESPC IDIQ contract under

which the TO was awarded and the TO/TO RFP. Documentation of resolutions for discrepancies and disputes should include pertinent parties (agency, contractor), personnel involved and outcomes and be saved to the contract file.

3.6 Project Documentation

Detailed project data is vital for tracking project performance and reporting results to stakeholders. One document repository is eProject Builder (ePB), a web-based platform for ordering agency staff, ESCOs, and utility companies to record, track, and report EPC project information securely. ePB can generate project financial schedules and customized reports, and also store project information and M&V data allowing for the ability to review or export project data at any time.

The DOE FEMP Contract Management Plan (CMP) template exhibits best practices in the effective administration and management of an EPC project during the post-installation phase. The CMP provides a mechanism for capturing the necessary performance period information from both a project management and an M&V perspective. The CO/KO and the COR can use the CMP to assist in monitoring and documenting the performance period activities for the contract term. The CMP also provides a documentation matrix to assist the agency in managing and archiving the relevant project documents. The ordering agency should store all correspondence and documents in a safe and easily accessible location. Lastly, the CMP can be leveraged to train and assist any new agency personnel during the contract term.

4 Roles and Responsibilities

There are several key roles that are involved with EPCs throughout the life of the contract and support the layered oversight of the project. Each of these roles and some of the key responsibilities and the focus of the oversight are described in Table 2 below.

Table 2. Summary of Roles, Responsibilities, and Oversight Focus Related to Witnessing

Role	Key Responsibilities	Oversight Focus
Ordering Agency (Federal Agency) CO/KO	• Manage the EPC task order contract and ensure compliance with federal guidelines. • Assign government witnesses and reviewers. • Approve or reject contractor deliverables based on M&V results. • Maintain oversight to protect taxpayer funds.	Overall governance, contract enforcement, accountability.
Contracting Officer Representative (COR), Contracting Officer Technical Representative (COTR)	• Serve as the technical liaison between the Contracting Officer and contractor. • Monitor day-to-day technical performance of the contract. • Ensure ECMs and M&V activities meet technical specifications. • Review contractor reports and provide recommendations to the Contracting Officer. • Document project performance issues and verify corrective actions.	Technical oversight, ensuring contract requirements are met in practice.
Agency Government Witness	• Observe contractor's M&V activities on-site. • Confirm inspections/tests follow the approved M&V plan. • Review and sign witnessing forms. • Provide independent assurance that reported savings are credible.	Transparency and accountability in M&V activities and reported savings.
Agency M&V Reviewer	• Review contractor's M&V deliverables (reports, calculations, monitoring data, witnessing forms). • Check consistency with DOE/FEMP M&V guidelines and contract requirements. • Flag discrepancies or risks in reported savings.	Technical accuracy and reliability of savings claims.
Contractor (ESCO/Utility)	• Develop and execute the M&V plan, including witnessing forms. • Engage with site personnel for Cx and post-installation M&V activities (e.g., access to site locations, witnessing). • Coordinate with site personnel for annual M&V activities (e.g., 2-, 4-weeks advance notice, sampling locations). • Report verified cost savings and provide documentation. • Document government witnessing, using agreed-to forms. • Respond to agency reviewer comments, work to resolve questions and issues.	Delivering guaranteed savings and accurate reporting; resolving comments and/or performance issues.

4.1 COR/COTR Lead Responsibilities for Contract Administration

A COR/COTR appointed by the ordering agency provides technical support with the authority delegated by the CO/KO. It is the CO/KO who bears ultimate responsibility for M&V oversight and project acceptance for an EPC TO. FEMP recommends that the COR/COTR be a Certified Energy Manager or have equivalent knowledge combined with at least five years of experience with energy efficiency projects, including familiarity with the site and specific equipment and operations included in the EPC. Familiarity with federal EPCs is recommended, and on-demand training is available from FEMP, found on the FEMP Training Catalog webpage, under the topic areas of “Energy Savings Performance Contracts” and “Utility Program and Utility Energy Service Contracts”. Contract administration support for the ordering agency COR/COTR for the ESPC TO may include the following:

- Provide technical oversight on the development and implementation of the site-specific M&V plan and commissioning plan.
- Prior to ECM/WCM installation, witness measurements and review calculations, records (e.g., utility bills), assumptions, and other elements of baseline(s) to confirm accuracy and consistency with the approved site-specific M&V plan.
- During ECM/WCM installation, witness ECM/WCM testing identified in site-specific M&V and commissioning plans based on contractor advance notification of scheduled system testing.
- During post-installation performance verification, witness ECM/WCM testing and performance measurements conducted by contractor.
- Review post-installation and commissioning reports to confirm that ECMs/WCMs are installed and performing as specified; complete review of reports within 20 days of receipt (as per DOE ESPC IDIQ contract Gen 4), or within the time specified in the TO or IDIQ contract.
- Witness scheduled inspections conducted by the contractor during the performance period to confirm ECM/WCM performance.
- Review annual M&V reports; complete report reviews within 20 days of receipt (as per DOE ESPC IDIQ contract Gen 4), or within the time specified in the TO or IDIQ contract.

In the event of a change in ordering agency staff serving as COR/COTR, it is critical for the ordering agency to ensure that as much knowledge as practical of the EPC project and TO be transmitted to succeeding personnel. Both the contractor and the DOE ESPC IDIQ CO should be provided with written notices of changes in CO/KO or COR/COTR assignments. As described in section 3.6, DOE FEMP's contract management plan template is available to support ordering agencies in effective project administration and management, including with project staff turnover.

4.2 Agency Roles for Witnessing

There may be multiple agency personnel involved with witnessing activities for an EPC. They may include government witness(es) and agency M&V report reviewers. These two primary roles may be filled by a single individual or multiple individuals. Activities related to each role are described below.

The government witness may be one or more individuals who observe and verify M&V activities that the contractor performs meet the task order requirements and site-specific M&V plan. This individual confirms that inspections, tests, and/or measurements follow the approved M&V plan, and that the contractor is conducting the appropriate, required activities on the appropriate equipment. Additionally, the government witness reviews data collected by the contractor and signs the witnessing forms. The government witness provides assurance that the resulting measured and reported savings are credible.

The site and/or ordering agency may also have an individual that is responsible for reviewing contractor deliverables related to M&V (e.g., post-installation report, annual report). This individual reviews the documentation provided by the contractor (e.g., reports, calculations, monitoring and/or energy management control system data, witnessing forms) and ensures that they are accurate and complete. During the ordering agency's review, any discrepancies or risks to performance in the reported savings are flagged and documented. The agency reviewer ensures that data presented in the reports aligns with data collection and witnessing forms, as well as task order requirements and the site-specific M&V plan. Any additional information needed to verify and provide the government oversight can be requested from the contractor. All discrepancies are communicated to the appropriate personnel (e.g., COR and/or CO) to resolve with the EPC contractor.

It is important that the ordering agency assigns qualified personnel to conduct the witnessing and complete reviews in a timely fashion so to not cause any unnecessary delays related to project acceptance and payment. Given the wide range of technologies implemented in EPC projects and the skills and experience needed to effectively review contractor and project performance, a single individual may not have

all of the qualifications or capacity necessary to provide proper oversight, witnessing, and review. An ordering agency may choose to conduct witnessing virtually or contract with a third party (e.g., FEMP project facilitator) to provide these services if there is insufficient time and/or expertise in-house.

(See Section 5 Graded Approach to Witnessing and Qualifications for determining the level of effort needed in government witnessing and recommended minimum qualifications for personnel conducting M&V oversight and witnessing.)

4.3 Contractor Roles for Witnessing

The EPC contractor is responsible for actively supporting witnessing activities related to the M&V process, beginning with the preliminary assessment through project development, implementation and performance periods. The contractor drafts the M&V approach, including proposed witnessing forms, during the preliminary assessment. During project development, the contractor finalizes the site-specific M&V plan based on ordering agency feedback, which details:

- witnessing activities for each ECM/WCM
- proposed levels of government witnessing for each ECM/WCM
- government witness and contractor responsibilities
- ordering agency approval and sign-off requirements

The contractor also works with the ordering agency to incorporate any agency-specific witnessing requirements into the witnessing forms to be used for all M&V activities. See the latest FEMP M&V Guidelines for additional details on federal ESPC requirements related to M&V plans and reporting.

The contractor is responsible for coordinating with the agency and/or site to ensure that a government witness will be involved as described in the site-specific M&V plan. This may require a 2-week and/or 4-week notification in advance by the contractor to coordinate with the appropriate agency or site personnel. It is recommended to discuss coordination requirements during project development and include them in the site-specific M&V plan.

5 Graded Approach to Witnessing and Qualifications

5.1 Focused Review of High-Value ECMs/WCMs

This guidance recognizes that many ordering agencies may be limited in time and expertise to devote to government witnessing of contractor M&V activities and suggests

that a prioritized or graded approach may be considered. FEMP's guidance on Reviewing Post-Installation and Annual Reports (cited in Section 1.2) recommends placing priority on the ECMs/WCMs that account for the greatest portion of the savings or have the greatest performance or savings risk.

Principal review efforts should be focused on the measures providing the largest portion of the cost savings for the project, and/or ECMs/WCMs whose failure to operate as expected would have the most impact on the facility. This strategy of reviewing the principal cost-saving or otherwise critical measures first will help the reviewer efficiently make use of limited time available while maximizing the value of the review.

This approach should align with the M&V plan for government witnessing of M&V activities. While a detailed review of each ECM/WCM is recommended, if possible, the resources invested by the government in oversight and review of M&V activities may vary based on the magnitude of the savings, complexity of the ECMs/WCMs, and the resources available.

5.2 Required, Greater, and High Levels for M&V Oversight and Witnessing

This graded approach, addressing progressive levels of rigor in M&V oversight, is defined below to assist agencies in determining the type of review that is necessary and who will be responsible for specific tasks. These decisions should be communicated to and agreed-upon by all parties, including the ordering agency CO/KO and the contractor, and documented as part of the project prior to scheduling M&V and witnessing activities. Ideally, resource assignments and responsibilities are determined in advance of the project installation and laid out in the M&V plan. Given the wide range of technologies implemented and the skills and experience needed to review a particular project, it is unlikely that a single individual will possess all of the qualifications necessary to provide proper oversight and review.

Three levels of oversight and review of M&V activities and minimum qualifications for staff to carry out each level are described below:

1. Required (minimum) - applied to all projects.
2. Greater (more rigorous) - applied to measures with greater cost savings and/or more complex measures.
3. High (most rigorous) - where resources permit, applied to measures with greatest risk of savings realization or complex measures.

By applying the appropriate level of rigor in M&V oversight and differentiating between the qualifications needed to witness M&V activities and those needed to assess compliance with the M&V plan and the validity of the measurements, it is expected that agencies will be able to apply resources efficiently to provide adequate oversight at minimal cost.

The minimum requirements outlined in Table 3 (below) apply to both onsite/in-person oversight and virtual/remote oversight, as it is important that personnel understand what systems, data, and activities are being performed to ensure accuracy and applicability with the site-specific M&V plan.

Table 3 Summary of Government Witnessing Levels

Witnessing Level	Considerations	Activities	Qualifications
Level 1 - Required	Low level of ECM/WCM complexity and/or low savings risk.	• Review M&V plan. • Confirm contractor site visit to collect M&V data. • Review and sign inspection/data collection form that contractor was on-site (date, time, building(s)). • Confirm required tasks were performed, either in-person or virtually. • Verify data in M&V report matches data collected on site visit.	Familiarity with scope of work and/or equipment being inspected.
Level 2 - Greater	Medium level of ECM/WCM complexity and/or greater savings risk.	Level 1 activities and: • Review calibration requirements for instrumentation. • Spot check contractor M&V activities while on-site. • Ensure data collection and/or measurements match M&V plan. • Sign data collection forms for specific activities witnessed.	Level 1 qualifications and: • Working knowledge of data collection equipment used. • Experience and knowledge of ECMs, M&V and tests and/or data collection performed. • Familiarity with the site, systems, and proposed project.

Witnessing Level	Considerations	Activities	Qualifications
Level 3 - High	High level of ECM/WCM complexity and/or high savings risk.	Level 1 and 2 activities and: • Accompany contractor during site data collection. • Observe installation and removal of monitoring equipment. • Review information recorded for consistency with M&V plan (sample size, number of measurements, data points, etc.). • Ensure data collected are within expected operation of monitored equipment.	Level 1 and 2 qualifications and: • Professional certifications (e.g., Certified Energy Manager, Certified M&V Professional), Professional Engineer in applicable discipline. • Experience with specific technologies subject to M&V.

Level 1 - Required Government Witnessing and Oversight Activities

Actions: At a minimum, a qualified government representative should do the following:

- Review the M&V plan and previous commissioning, post-installation, and annual M&V reports for the project prior to the site visit.
- Provide comments or request for clarification to the contractor before and/or after the site visit.
- Review the inspection and/or measurement data collection forms to confirm that all of the required tasks were performed and appropriate data were collected.
- Sign data collection forms acknowledging that the contractor was on site to conduct M&V activities on a particular day or time and include affected areas or buildings.
- Confirm that the results reported on the inspection and measurement data collection forms are consistent with the expected operation of the ECMs/WCMs and the requirements of the TO.

Qualifications: The minimum qualifications for the government representative for Level 1 M&V oversight are as follows:

- A minimum of two years of experience in the operation, maintenance and/or engineering of the equipment and/or systems being inspected.

- Familiarity with the scope of the specific ECMs/WCMs to be inspected.
- Familiarity with the specific equipment and systems to be inspected.
- Completion of all necessary safety training required to perform inspection activities.

Level 2 – Greater Rigor Practice

Actions: For those ECMs/WCMs with greater savings risk and/or more complex measures, it is recommended that a qualified government representative should complete the following in addition to the minimum activities described above:

- Review calibration requirements for portable instrumentation and verify that they are in compliance with the M&V plan.
- Conduct spot checks of contractor M&V activities while they are on site, and verify that the inspection, measurements, monitoring, data collection and performance tests are being conducted in accordance with the M&V plan, at the appropriate locations.
- Sign the data collection forms used for the activities witnessed.
- Review the results to verify that they are consistent with the witness's understanding of the expected results at the observed operating conditions.

Qualifications: The minimum qualifications for the government representative for level 2 – greater rigor practices are the following, in addition to those for Level 1 activities:

- 3-5 years of experience operating, maintaining systems or equipment subject to verification activities.
- Working knowledge of instrumentation to be used in conducting M&V measurements.
- Familiarity with both the site and the details of the proposed EPC project.
- Understanding of the measurement, monitoring, data collection and performance tests to be conducted based on the M&V plan.

Level 3 – High Rigor Practice

Actions: For ECMs/WCMs with high savings risk and/or complex measures, the following are recommended M&V oversight and witnessing for a qualified government representative and includes, in addition to the Level 1 and 2 activities described above:

- Accompany contractor personnel during the site visit data collection, witness the inspection, measurements, data collection and performance tests, and observe installation and removal of monitoring equipment at appropriate locations; and

- Review the information recorded on the data collection forms to verify that it is consistent with the government's understanding of the results of M&V activities and are with the expected operation of the monitored equipment.

Qualifications: The minimum qualifications for the lead government representative, in addition to those listed above for levels 1 and 2, include the following:

- Certification as a Certified Energy Manager (CEM), Certified M&V Professional (CMVP), Certified Building Commissioning Professional (CBCP), Performance Measurement and Verification Analyst (PMVA) or registration as a professional engineer (P.E.) in the appropriate discipline.
- A minimum of 5 years of experience in analysis, design, commissioning, or M&V of energy efficiency projects.
- Experience with specific technologies subject to M&V.
- Familiarity with the safety training requirements and site-specific safety requirements for activities to be conducted.

6 Best Practices for Government Oversight

Energy performance contracts must be actively managed to ensure that guaranteed savings and performance are delivered, including government oversight. Government oversight responsibilities for EPCs throughout the project development, implementation, and performance phases are key to verifying that savings and performance are delivered by the contractor (guaranteed savings for ESPCs). This oversight includes ordering agency witnessing activities and the associated documentation that verifies this was completed. Verifying or validating the accuracy of EPC savings as reported by the contractor through government witnessing and oversight is a key responsibility of the ordering agency.

Over the DOE FEMP program history, several best practices have been identified to assist ordering agencies in ensuring that witnessing is completed and documented.

6.1 Personnel

- Make sure there is continuity of personnel overseeing contract administration, including CO/KO and COR/COTR with delegated authorities.
- Ensure appropriate experience or qualifications of personnel participating in witnessing activities.
- Leverage training through the FEMP Training Catalog. Courses specific to M&V include *Long-term Management of Measurement and Verification in Performance Contracts* and *Advanced Measurement & Verification for ESPCs*.

6.2 M&V Activities

- Assign appropriate level of witnessing by ECM or building within the TO. Detail the expectations for both the ordering agency witness(es) and contractor in the site-specific M&V plan.
- Plan for contractor site visit, ensuring appropriate personnel are available. If virtual witnessing is needed, ensure that suitable protocols are in place.
- Follow the site-specific M&V plan. Review the site-specific M&V plan prior to annual contractor M&V activities.

6.3 Documentation

- Plan for ordering agency timely review of M&V-related reports.
- Ensure that reports provide all needed information and documentation, including witnessing forms with government and contractor personnel listed and signatures that activities were completed. Ask for additional information, documentation, or details as needed.
- Validate data the contractor used to determine the performance as documented in an M&V report and confirm data presented aligns with government witnessed activities.
- Keep ordering agency's contract file current, accurate, and complete. Ensure any missing records or documents are retrieved or requested from the contractor.

6.4 Cybersecurity

When digital tools and remote monitoring of energy management control systems are required as part of M&V activities, the site and agency should discuss potential data security risks with the contractor. This includes addressing remote access risks and plans to conduct M&V activities that may have cybersecurity implications. Cybersecurity control(s) requirements should be discussed and included in the project development, specifically during the IGA phase and as part of the M&V plan as applicable. The ordering agency should establish a point in the development that the requirements must be put in writing by the contractor and submitted for review by the ordering agency.

Any key cybersecurity parameters are recommended to be summarized in the contract management plan. The contract management plan should include the process to ensure that cybersecurity requirements are met during project implementation and maintained throughout the performance period.

Appendix A: Sample Template for Recording Government Witnessing by ECM/WCM

Government Witnessing Data, by ECM/WCM

ECM/WCM Name /#: _____ Date/time of Witnessing: _____

Contractor Staff: _____

Gov't Staff: _____ Title: _____

☐ Onsite Witnessing ☐ Virtual/Remote Witnessing (check one)

Locations of Witnessing (building, room, system): _____

Witnessing Activities Conducted: _____

Data Types Collected: _____

Data for ECM/WCM Measurements: _____

Equipment Used: _____ Calibration Date: _____

Copy of calibration certificate included in appendices: ☐ Yes / ☐ No

Location of Measurement (center of room, pipe surface, inside duct, etc.): _____

Baseline Data: (Pre-Install)_____

Expected Data: (Post-Install)_____

As-Found Data: _____

Noted changes (if any): _____

Other observations: _____

[Repeat for all ECMs/WCMs to be witnessed]

This document accurately represents the M&V activities witnessed for the installed ECMs/WCMs on the date indicated above.

Government Witness Signature	**M&V Contractor Signature**
Name:	Name:
Title:	Title:
Unit/Org:	Unit/Org:
Signature:	Signature:
Date:	Date:

Appendix B: Sample Template for Recording Government Witnessing by Building

Government Witnessing Data, by Building

Building/Facility Name or ID: _____

Date/time of Witnessing: _____

Contractor Staff: _____

Gov't Staff: _____ Title: _____

☐ Onsite Witnessing ☐ Virtual/Remote Witnessing (check one)

ECM/WCM Names / #s: _____

Locations of Witnessing (room, system): _____

Witnessing Activities Conducted: _____

Data Types Collected: _____

Equipment Used: _____ Calibration Date: _____

Copy of calibration certificate included in appendices: ☐ Yes / ☐ No

Baseline Data: (Pre-Install)_____

Expected Data: (Post-Install)_____

As-Found Data: _____

Noted changes (if any): _____

Other observations: _____

[Repeat for all Buildings to be witnessed]

This document accurately represents the M&V activities witnessed for the ECMs/WCMs installed in the building and on the date indicated above.

Government Witness Signature	**M&V Contractor Signature**
Name:	Name:
Title:	Title:
Unit/Org:	Unit/Org:
Signature:	Signature:
Date:	Date:

Appendix C: DOE ESPC IDIQ Master Contract Clauses Related to M&V Submittals and Witnessing

This appendix provides current (2023) DOE ESPC IDIQ master contract (Gen 4) section C.4.2 on M&V submittals, along with witnessing language added in the Gen 4 ESPC IDIQ contract.

Note that other relevant contract requirements are in Gen 4 DOE ESPC IDIQ sections C.4 (Measurement and Verification of ECM/WCM Performance), C.5.6 (ECM/WCM Commissioning), C.6 through C.8 (operations, preventative maintenance, and repair and/or replacement of ECMs/WCMs), E.3 (Inspection of Installed ECMs/WCMs), E.4 (Acceptance), and G.5 (Payment to the Government for a Guaranteed Annual Cost Savings Shortfall).

Attachments to the Gen 4 ESPC IDIQ contract related to M&V include Attachment J-8, eProject Builder System Instructions and J-10, References and Web Links. DOE FEMP M&V Guidelines: Measurement and Verification for Performance-Based Contracts outlines the standard procedures and guidelines for M&V, including M&V Plan Outline, Post-Installation Report Outline, and Annual M&V Report Outline.

C.4.2 M&V Submittals During TO Development and Post-Award

a. The contractor shall prepare and submit a general M&V approach with its Preliminary Assessment (PA), identifying the M&V options and methods to determine a site-specific pre-installation baseline and post- installation ECM performance for each proposed ECM.

b. The contractor shall prepare and submit a site-specific M&V plan with its TO proposal, per the requirements in Section H, and the current standards in the latest version of the DOE FEMP M&V Guidelines. This site-specific M&V plan shall include a schedule indicating M&V activities, recommended level of government witnessing for each ECM/WCM per the latest version of DOE FEMP's "Guide to Government Witnessing and Review of Measurement and Verification Activities" (see Attachment J-10, References and Web inks, for specific website address), and post-award M&V reporting milestones for each ECM/WCM. Prior to installation of ECMs/WCMs, the ordering agency must witness measurements and review calculations, records (e.g., utility bills) and other elements of the baseline, to confirm their accuracy and to confirm that methods are consistent with the approved M&V plan. The Contractor shall coordinate with the ordering agency to ensure an agency witness will be involved as required in the approved site-specific M&V plan.

c. The contractor shall prepare and submit a post-installation report to the ordering agency, per the report outline in the latest version of the DOE FEMP M&V Guidelines. The post-installation report shall include results of eProject Builder (ePB) output (see Attachment J-8 for instructions), and M&V data and calculations. This report shall verify that installed ECMs/WCMs will meet the required standards of service and the guaranteed annual cost savings specified in the awarded TO. Inspections and measurements conducted by the Contractor for this post-installation report are to be witnessed by the ordering agency, according to the approved site-specific M&V plan. The post-installation report shall be reviewed as recommended in the latest version of DOE FEMP's "Reviewing Performance Reports for Federal ESPC Projects" (See Attachment J-10, References and Web Links, for specific website address), and must be accepted in writing, by the authorized ordering agency official(s). The authorized ordering agency official(s) will provide the written acceptance of, and/or review comments on, the post-installation report within 20 working days after receiving the report (or such other period as may be specified in the TO). The Contractor shall reply to any post-installation report comments within 20 working days after receiving the comments (or as specified by the ordering agency). The Contractor shall coordinate with the ordering agency to ensure an agency witness will be involved as required in the approved site-specific M&V plan.

d. The Contractor shall prepare and submit an annual M&V report to the ordering agency, per the annual M&V report outline in the latest version of the DOE FEMP M&V Guidelines. The annual M&V report shall include results of ePB output (Attachment J-8), and data and calculations that demonstrate that continued ECM/WCM performance achieves the guaranteed annual cost savings as required by the TO. Inspections and measurements conducted by the Contractor for this annual M&V report are to be witnessed by the ordering agency in accordance with the approved site-specific M&V plan. The annual M&V report shall be reviewed, as recommended in the latest version of DOE FEMP's "Reviewing Post-Installation and Annual Reports for Federal ESPC Projects," and must be accepted in writing by the authorized ordering agency official(s). Review and acceptance of the annual M&V report, in accordance with FEMP's "Guide to Government Witnessing and Review of Measurement & Verification Activities", constitutes documentation to determine the amount of the Contractor payment. The authorized ordering agency official(s) will provide the written acceptance of, and/or review comments on, the annual M&V report within 20 working days after receiving the report (or such other period as may be specified in the TO). The Contractor shall reply to any annual M&V report comments

within 20 working days after receiving the comments (or as specified by the ordering agency). The Contractor shall coordinate with the ordering agency to ensure an agency witness will be involved as required in the approved site-specific M&V plan.

e. In accordance with the site-specific M&V plan, each annual M&V report shall include a section that documents, on a continual basis, the changes or impacts that have affected the ability of the project to generate energy and water savings. This "running log of impacts", with associated impact on energy and water savings, is included so that when these become significant a TO adjustment can be investigated. The ordering agency may adjust the TO when it is in the economic best interest of the Government to make the necessary changes.

f. Each annual M&V report shall include a copy of the previous year's M&V report comments and responses in the appendix to the report, for the purpose of bringing consistency to the M&V evaluation process.

C.6 Operation of ECMs/WCMs

c. Contractor (ESCO) Performance of ECM/WCM Operations – The Contractor shall conduct ECM/WCM operations with sufficient frequency to assure guaranteed savings are being achieved, as agreed to by both the ordering agency and the Contractor. The ordering agency must periodically witness and/or inspect the Contractor's performance of ECM/WCM operations with sufficient frequency to assure compliance with operations work procedures. The ordering agency will notify the Contractor of any compliance issues and direct the Contractor to take any necessary corrective actions.

C.7 Preventative Maintenance of ECMs/WCMs

c. Contractor (ESCO) Performance of Preventive Maintenance – The Contractor shall conduct ECM/WCM preventive maintenance with sufficient frequency to assure guaranteed savings are being achieved, as agreed to by both the ordering agency and the Contractor. The ordering agency must periodically witness and/or inspect the Contractor's performance of ECM/WCM preventive maintenance with sufficient frequency to assure compliance with preventive maintenance work procedures. The ordering agency will notify the Contractor of any compliance issues and direct the Contractor to take any necessary corrective actions.

C.8 Repair and/or Replacement of ECMs/WCMs

c. Contractor (ESCO) Performance of Repair and/or Replacement – The Contractor shall repair and/or replace ECMs/WCMs as needed to assure guaranteed savings are being achieved, as agreed to by both the ordering agency and the

Contractor. The ordering agency must witness and/or inspect the Contractor's performance of ECM/WCM repair and/or replacement as needed to assure compliance with repair and/or replacement work procedures. The ordering agency will notify the Contractor of any compliance issues and direct the Contractor to take any necessary corrective actions.

Glossary

Annual Measurement and Verification (M&V) – The term annual M&V means a procedure including, but not limited to, verification of the savings achieved, compared to the guaranteed energy, water, and related cost savings and energy unit savings, resulting from implementation of ECMs/WCMs, and a determination of whether an adjustment to the energy baseline is justified by conditions beyond the contractor's control.

Measurement and Verification (M&V) – The process of measuring and verifying energy, water and related cost savings.

Post-Acceptance Performance Period Annual (or Regular Interval) M&V – At least annually, the contractor and the ordering agency shall verify that the installed equipment/systems have been properly maintained, continue to operate correctly, and continue to have the potential to generate the predicted savings. This ensures that the M&V monitoring and reporting systems are working properly, and it allows fine-tuning of measures throughout the year based on operational feedback. The Post-Acceptance Performance Period Annual M&V will inform an annual report that will be used to determine whether the guaranteed annual savings are met.

Post-Installation M&V Activities – Post-installation M&V consists of, but is not limited to, the following activities: measurements, inspections, and Government witnessing. These activities are designed to determine whether the annual energy and/or water cost savings performance guarantees provided by the contractor are being achieved.

Government Witness – Typically a government official or designated agency representative with the appropriate qualifications who observes and verifies the M&V activities, testing, and calculations performed by the contractor within an EPC according to the site-specific M&V plan. The witness documents these activities with due diligence in the contract file to ensure the accuracy of project performance over the contract term.

Government Witnessing – The oversight provided by the government for observing, understanding, and validating data collected and used by the contractor (e.g., ESCO) to verify EPC performance. Witnessing also helps ensure that savings are accurately tracked and documented in M&V reports to prevent disputes and ensure payments to the contractor are justified. Witnessing is a key quality assurance step in federal EPCs, confirming ECMs/WCMs installed by the contractor continue to perform throughout the contract term.

References

"Commissioning Guidance for Energy Savings Performance Contracts (ESPCs)." 2024. Federal Energy Management Program, Department of Energy. https://www.energy.gov/cmei/femp/articles/2024-commissioning-guidance-energy-savings-performance-contracts

"Cybersecurity Considerations for Performance Contracts." Federal Energy Management Program, Department of Energy. https://www.energy.gov/cmei/femp/cybersecurity-considerations-performance-contracts

"DOE IDIQ ESPC Contract Management Plan Template." 2018. Federal Energy Management Program, Department of Energy. https://www.energy.gov/cmei/femp/articles/doe-idiq-espc-contract-management-plan-template

"Federal Energy Management Program Training Catalog." Federal Energy Management Program. Department of Energy. https://www.energy.gov/cmei/femp/federal-energy-management-program-training-catalog

"M&V Guidelines: Measurement and Verification for Performance-Based Contracts Version 5.0." 2024. Federal Energy Management Program, Department of Energy. https://www.energy.gov/cmei/femp/articles/mv-guidelines-measurement-and-verification-performance-based-contracts-version-0

"Performance Assurance Planning Guide for Utility Energy Service Contracts." 2025. Federal Energy Management Program. Department of Energy. https://www.energy.gov/cmei/femp/articles/performance-assurance-planning

"Resources Page for Implementing Federal ESPCs." Federal Energy Management Program. Department of Energy. https://www.energy.gov/cmei/femp/resources-implementing-federal-energy-savings-performance-contracts

"Reviewing Post-Installation and Annual Reports for Federal ESPC Projects." 2007. Federal Energy Management Program. Department of Energy. https://www.energy.gov/cmei/femp/articles/reviewing-post-installation-and-annual-reports-federal-espc-projects?nrg_redirect=415577%0C



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