

Retail Energy Storage Program

Standards and Quality Assurance Policy and Procedure Manual For Participating Contractors

June 2019



Overview

NYSERDA maintains the integrity of the Retail Energy Storage Program through an independent Standards and Quality Assurance team, who manages the quality assurance system for the Program.

The Quality Assurance (QA) system has several components, including a review of qualifications and credentials, paperwork audits, establishment of program standards, and comprehensive field and photo inspections. QA inspections include verification of the contracted scope of work, accuracy of site analysis, comparison of installation to submitted design drawings, National Electric Code, International Building and Fire Codes with New York State Uniform Code Supplement compliance, demonstrating compliance with the requirements in the [Battery Energy Storage Guidebook](#) published by NYSERDA, and the overall delivered quality of the standalone storage system installation or storage paired with an eligible generation source such as solar PV. NYSERDA or its representatives may make a reasonable number of visits to the site before, during, and/or after installation of the Energy Storage System to assess overall compliance.

Program Roles and Responsibilities

The Program relies on contractors to implement new Energy Storage Systems. The contractors have roles and responsibilities in the program, including the following:

Contractor Roles and Responsibilities

- Agree to terms of NYSERDA's incentive contract
- Receive incentive payments
- Responsible for any complaints, warranties, and production guarantees
- Responsible for installation and quality of project
- Responsible for maintaining a credentialed person on staff

Inspections will primarily focus on the quality of the contractor's installation and average inspection scores will be calculated. The contractor will be included in any correspondence related to project inspections.

Inspection of Completed Projects

The purpose of the QA inspection is to provide NYSERDA with an opportunity to evaluate the accuracy of the site analysis and design paperwork and verify the Energy Storage System was installed according to all Program requirements. The QA inspection also includes selected health and safety, performance items, and specific compliance items per applicable code.

Selecting Completed Projects for Inspection

NYSERDA selects specific completed projects for QA inspections following a rational sampling protocol. The protocol utilizes a strategic sampling of completed projects with rates primarily based on the contractor's current program status and recent inspection scores.

NYSERDA intends to conduct both field and photo inspections based on the following sampling rates:

- **Provisional** status contractors will initially be subjected to up to 100% inspection, and after demonstrated competency, will move to full status. Inspections may be a series of field and or photo. Contractors must prove their ability to comply with code and Program requirements as well as demonstrate the ability to deliver a quality storage system with no major or critical deficiencies on at least three out of the five field inspections in order to continue submitting Solar Plus Energy Storage projects. Any major or critical deficiencies must be corrected. If contractors fail to pass required inspections, they may be subject to disciplinary action.
- **Full** status contractors will be subjected up to 20% field inspection and 20% photo inspection.
- **Probation** and **Suspended** status may subject contractors to up to 100% inspection.

NYSERDA will conduct photo or field inspections on up to 15% of systems less than 600kWh installed by full status contractors. NYSERDA will conduct photo or field inspections on 100% of 600kWh or greater systems installed by full contractors. Those with a probation or suspended status will have their completed projects inspected at a rate between 30% and 100% and will be detailed in the status change notice provided by NYSERDA prior to the change being enacted. Provisional contractors and builders will initially be subjected to up to 100% inspection rate. After the provisional status review is completed, the inspection rate will be determined based on the contractor's and builder's current status.

NYSERDA may select any completed project at any point in the future for a photo or field inspection based on site operator complaints, warranty-related issues, or a review of the work done by the contractor under status review or program disciplinary action. All contractors are encouraged to perform in-house quality control of their projects.

The Retail Energy Storage Incentive Program Manual provides further details on contractor's participation status details and is available at nyserdera.ny.gov/RetailStorage for retail program manual.

Field Inspections

Field inspections are conducted by a qualified independent third party, using comprehensive field inspection QA checklists and inspection processes approved and paid for by NYSERDA.

QA field inspections are scheduled at the site operator's convenience. Site operators are encouraged to allow the contractor to attend the inspection to answer questions and perform minor fixes on site. If the site operator agrees, the contractor will be notified between five and 14 days of the upcoming inspection. Every effort will be made to accommodate the schedule of the contractor, but the site operator's convenience and efficient scheduling of inspections take precedence.

Site operators have the right to request the contractor not attend the QA field inspection. In these situations, the contractor will not be notified of the scheduled inspection, but they will receive the results within 15 business days.

NYSERDA may select any completed project at any point in the future for a field inspection based on site operator complaints, warranty-related issues, or a review of the work done by the contractor under status review or program disciplinary action. All contractors are encouraged to perform in-house quality control of their projects.

Photo Inspections

Photo inspections are conducted by a qualified independent third party, using comprehensive photo inspection QA checklists and inspection processes approved by NYSERDA. The contractor is required to take construction photos for each project. NYSERDA expects contractors to take photos throughout the installation process. It is not the intention for contractors to obtain photos after a request for photos is received.

NYSERDA may request construction photos for purposes of conducting a photo inspection at any time. A photo documentation sample, which contains examples of required photos, will be available in the third quarter 2019. This sample document is not an all-inclusive list of required photos. Taking multiple pictures of everything installed will help ensure a smooth photo inspection process.

If photos are requested, the contractor will be notified and provided with link for submission. The contractor must provide pictures within 15 days. All photos must be submitted at the same time.

If the inspector finds there are photos missing or not clear enough to make a determination, a Can Not Verify (CNV) will be issued. The contractor will have 15 days to resubmit required photos through the CNV request. If the CNV is not responded to within 15 days, a deficiency for each CNV will be documented. There are no extensions granted for photo request or CNVs.

QA Inspection Report

The QA inspection report will provide details of all evaluated elements of the project and list any nonconformances identified. The report will provide an overall score of the project and identify a pass or fail.

The report will be made available to the contractor within approximately 15 days after the inspection following an internal review and scoring by NYSERDA. The report will be made available to the site operator, local Authority Having Jurisdiction and any interconnecting electric utility upon request directly to NYSERDA. The report will contain a score, based on the scoring criteria, and a list of any nonconformances found during the inspection.

Scoring Criteria

The scoring criteria characteristics will be used as a guideline for inspectors to gauge relative installation quality but cannot predict every possible situation. These QA scores will:

- Allow NYSERDA to gauge the relative quality of installations across installers, regions, or other screening criteria.
- Allow NYSERDA to track trends in installation quality over time.
- Provide valuable feedback to contractors, local code officials, and inspectors.

Classification of Program Nonconformances

Prior to issuing an overall QA score, it is important to understand the magnitude of nonconformances found during onsite inspections. A high-quality Energy Storage System will:

- Comply with the Uniform Code Supplement as published by the NYS Department of State.
- Comply with the National Electric Code, NEC.
- Meet all NYSERDA Program requirements and standards.

Store and discharge safe, reliable energy storage consistent with pre-installation estimates. As shown in Table 1, Program nonconformances are possible in each of these three categories. Since the NEC, Fire Code, and NYSERDA Battery Energy Storage Guidebook governs, to a large extent, the safety of an Energy Storage System, major nonconformances are reserved for this category alone. The intent is that major and critical nonconformances should require immediate action to address and this urgency does not translate to Program rules compliance or estimated performance verification, as these are not safety-related concerns. Additionally, structural nonconformances that do not comply with the International Building Code (IBC) series and amended by the New York State Uniform Code Supplement may also be deemed to be major. Critical nonconformances may require an immediate shut down of the system until the nonconformance is corrected.

Table 1. Summary of Nonconformance Classifications

Nonconformance Category	NEC, Fire Code, Battery Storage Guidebook Compliance	Program Compliance	Estimated Performance Verification
Incidental	No rewiring, minimal deviation	Equivalent equipment change	TSRF reported *
Minor	Rewiring, minimal deviation	Missing/inadequate meter	X
Major	Rewiring, safety, moderate deviation	All material and equipment must be new and undamaged	X
Critical	Rewiring, safety, imminent hazard	X	X

* For projects paired with Solar

Further detail regarding the proposed classification of NEC deviations is provided in the next section.

National Electric Code, NEC, Related Nonconformance Categories

Incidental

An incidental nonconformance is a violation of NEC that does not require rewiring to address and is not expected, on its own, to pose a substantial risk of system failure or hazard. Examples of incidental nonconformances include the following:

- Installation debris (e.g., bits of wire, packing materials) left onsite
- Missing screws on indoor enclosure covers, but cover is still secure and renders interior of enclosure inaccessible
- Poor wire management that is not expected to cause a fault condition
- Equipment installed does not match Program records, but is considered equivalent
- Missing/incomplete labels
- Incorrect color code on wires

Minor

Minor nonconformances require rewiring to address but are not expected to pose a substantial risk of system failure or hazard. Examples of minor nonconformances include the following:

- Insufficient clearance around boxes
- Missing/inadequate thermal expansion joints in long conduit runs
- Not adequately protecting conductors from accidental contact by unqualified personnel

Major

Major nonconformances present an increased risk of system failure or hazard but are not determined to be in imminent danger of failure or hazard. As compared with a NEC compliant system, these systems have a higher risk of failing or posing a hazard at some point within their expected lifetime. Examples of major nonconformances include the following:

- Allowing circuit conductors to come into contact with abrasive surfaces/sharp edges
- Bonding neutral to ground in a meter enclosure
- Undersized circuit protection (nuisance tripping)
- Improper system or equipment grounding
- Noncontinuous grounding electrode conductor

Critical

Major nonconformances present an imminent hazard and/or probability of system failure. These issues should be addressed quickly to prevent injury or damage to property. Examples include the following:

- Observed inverter ground fault conditions
- Lack of or properly sized overcurrent protection
- Oversized array strings that could lead to DC voltage in excess of inverter limits
- Use of non-DC rated equipment in DC circuits

This list is not intended to be exhaustive and inspectors will fully evaluate each installation on a case-by-case basis. Issues listed as examples in one of the categories could be problematic in an installation, and thus, fall into a different category for that installation. Severity levels are predetermined by NYSERDA's SQA team.

International Fire Code, IFC, Related Nonconformance Categories

Major

Major nonconformances present an increased risk of system failure or hazard but are not determined to be in imminent danger of failure or hazard. These systems have a higher risk of failing or posing a hazard at some point within their expected lifetime. Examples of major nonconformances include:

- Minimum fire rating, barriers or resistance has not been met
- Rooms and indoor areas containing BESS shall be separated from other areas of the building

Critical

Major nonconformances present an imminent hazard and/or probability of system failure. These issues should be addressed quickly to prevent injury or damage to property. Examples include the following:

- Rooms/areas in buildings and walk-in units containing electrochemical BESS must be protected by automatic fire suppression systems
- Rooms/areas containing BESS shall be separated from areas in which administrative and support personnel are located
- Must have an approved automatic smoke detection system or radiant energy-sensing fire detection system

This list is not intended to be exhaustive and inspectors will fully evaluate each installation on a case-by-case basis. Issues listed as examples in one of the categories could be problematic in an installation, and thus, fall into a different category for that installation. Severity levels are predetermined by NYSERDA's SQA team.

Overall QA Inspection Scoring Criteria

Each inspection will receive a score, on a five-point scale. This score is an indicator of the overall quality and compliance with Program requirements, based on the number and type of nonconformances observed. Specific criteria for each score are given in Table 2.

Table 2. Scoring Criteria

Defect Class	QA Score				
	5	4	3	2	1
Incidental	3	Allow ed	Allow ed	Allow ed	Allow ed
Minor	0	1	3	Allow ed	Allow ed
Major	0	0	0	1	2 or more
Critical	0	0	0	0	1 or more

When assigning a QA score, the inspector will consider the highest level of nonconformance observed. For example, a system with two major nonconformances would receive a score of 1, even if it had no minor or incidental nonconformances. Systems with any critical nonconformance will automatically receive a score of 1. A system with four minor nonconformances, would receive a score of 2 or 1 depending on severity on other nonconformances identified on the report. Similarly, a system with only one minor nonconformance would receive a score of 4 since it does not quite meet the requirements to get a 5 but exceeds the thresholds to receive a score of 3. The final score will be determined by the QA

contractor project manager and NYSERDA, who will have the latitude, if necessary, to recommend a higher or lower score, based on a holistic view of the installation.

QA Score Descriptions

5: System Meets All Program Criteria

A system receiving a score of 5 is generally well-installed, with no noticeable defects in workmanship, code compliance, or expected energy output. These systems are examples of best practices in Energy Storage system installation.

3: System Meets Key Program Requirements

A system achieving a score of 3 meets basic Program requirements, but it may require some modification to be considered fully compliant.

1: System Does Not Meet Program Requirements

Systems receiving a score of 1 have failed to meet key Program requirements and are not expected to safely store and discharge electricity consistent with Program records. These systems may require urgent attention to address safety concerns. Systems must receive a passing score of 3.0 or higher in order to receive NYSERDA incentive payments.

Procedure for Handling Nonconformance and Corrective Action

The QA inspection report will provide details of all evaluated elements of the project and list any nonconformances identified. The report will provide an overall score of the project and identify a pass or fail. Projects that have nonconformances related to critical, health and safety, or major, system performance, attributes will automatically fail. Projects that have minor or incidental nonconformances may pass or fail based on their overall merits.

All identified nonconformances are expected to be addressed and corrected in future work conducted in the Program. Acknowledgment and plans for preventing future problems may be requested with the report. Nonconformances can be rectified post installation through corrective action to the documentation, incentive applied to the project, or remediation of the installation or its components.

Contractors are required to respond to NYSERDA with proof of corrective action for those projects that received a failed inspection report, a score of 1 or 2. A failed inspection report must be either disputed within 15 days by contacting NYSERDA or remedied within 30 days. Sufficient evidence of remediation must be provided to NYSERDA documenting the completion of required actions. NYSERDA may, at its discretion, conduct a field verification of the remediated installation.

NYSERDA has the right to provide a copy of the QA report or specific information from the inspection directly to the site operator, AHJ, or the interconnecting utility based on health, safety, and compliance

concerns. In an emergency, NYSERDA or its representatives may shut down the system and will notify the contractor of such action as soon as is possible.

NYSERDA may communicate with any Program site operator on any matter relevant to a project. Such communications may be in reply to an inquiry from a site operator or at NYSERDA's initiation.

It is the contractor's responsibility to notify the local Authority Having Jurisdiction of any changes made to the installation and coordinate any required reinspection as needed.

Field Inspections Requiring Corrective Action

- All deficiencies are required to be addressed within 30 days of issuing report.
- Critical and Major deficiencies require a response through the link sent with the report.
- Responses Corrective action will be reviewed and responded to by NYSERDA staff.
- If NYSERDA staff accepts the corrective action, the deficiency will be marked resolved.
- If NYSERDA does not accept the response, the deficiency will be marked resubmit with a description of why the response was not accepted. The deficiency will remain open until NYSERDA accepts a response.

Photo Inspections Requiring Corrective Action

- All deficiencies are required to be addressed within 30 days of issuing report.
- Failed Inspections with Critical and Major deficiencies require a response through the link sent with the report.
- Responses will be reviewed and responded to by NYSERDA staff.
- If NYSERDA staff accepts the response, the deficiency will be marked resolved.
- If NYSERDA does not accept the response, the deficiency will be marked resubmit with a description of why the response was not accepted. The deficiency will remain open until NYSERDA accepts a response.

System Shutdowns

In an emergency, NYSERDA or its representatives may shut down the system. NYSERDA will notify the contractor whenever it takes such action as soon as is possible.

In the event an inspector feels an energy storage system, as installed, presents an imminent hazard to persons or property, the following procedure will be followed:

- Inspector contacts the QA contractor's project manager to review critical issues and confirm shutdown decision.

- Inspector takes necessary steps to safely shut down and secure the system and informs the site operator, system owner, of the decision.
- Inspector calls the system contractor to notify them of the situation and the shutdown. The contractor is instructed that the system may not be re-energized without corrective action being taken. The contractor may address critical issues before receiving the report.
- The QA contractor's project manager emails notice of shutdown to the Energy Storage Program staff.
- The QA contractor delivers a report to NYSERDA within three days.
- The contractor receives the report, who then must coordinate any required reinspection with the local authority having jurisdiction or third-party inspection authority.

Procedure for Contesting an Inspection Score

A contractor may contest the findings of an inspection by emailing supporting documents and information to inspections@nyserda.ny.gov. The request must be submitted to NYSERDA within 15 days of receiving the inspection report.

Upon review, if NYSERDA agrees with contractor, the deficiency will be removed. The inspection score may or may not change based on other deficiencies. If NYSERDA agrees with the inspector, the deficiency will stand, and the score will remain the same.

Prescriptive Probation and Disciplinary Action

When a contractor fails to consistently complete projects that pass NYSERDA's QA evaluation or fails to respond to or remedy failed inspections, NYSERDA may review their status in the Program and take further action.

A contractor may be moved to probation or suspended status, in which specific results and a timeline for demonstrating those results will be prescribed and monitored. The contractor or contractor may be terminated from the Program if determined necessary. Complete details of the participation status and review process can found under the Participation Status section of the program manual Program Manual available at nyserda.ny.gov/RetailStorage.

Corresponding with NYSERDA's Standards and Quality Assurance Team

Please be sure use the group email inspections@nyserda.ny.gov when corresponding with NYSERDA's QA team.



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