NY-Sun

Quality Assurance Policies and Procedures

For Commercial/Industrial and Large Nonresidential

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Overview

NYSERDA maintains the integrity of the NY-Sun Program through an independent Standards and Quality Assurance (SQA) team. This team manages the Quality Assurance (QA) platform for the program. This manual covers NY-Sun Commercial/Industrial and Large Nonresidential projects. NYSERDA offers another SQA Policy and Procedure manual for NY-Sun Residential and Nonresidential.

The 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 Codes with New York State Uniform Code Supplement compliance, the overall delivered quality of the solar electric installation, and if applicable, energy storage systems. NYSERDA or its representatives may make a reasonable number of visits to the customer or host site before, during, and/or after installation of a solar electric system to assess overall compliance.

Program Roles and Responsibilities

The program relies on contractors to implement new solar electric systems for customers seeking incentives through the program. The contractors have roles and responsibilities in the program, including the following:

Contractor Roles and Responsibilities

- Agree to terms of NYSERDA's participation agreement
- Hold the agreement with the customer
- 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 Commercial/Industrial and Large Nonresidential Systems were installed according to all program requirements. The QA inspection also includes selected health and safety, performance items, and specific compliance items per applicable code.

Field Inspections

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

QA field inspections are scheduled at the system owner's convenience. If the system owner is not the same as the contractor, the owner may request the contractor not attend. This is an exception, not the rule. System owners are encouraged to allow the contractor to attend the inspection to answer questions and perform minor fixes on site. If the system owner 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 system owner's convenience and efficient scheduling of inspections take precedence.

System owners have the right to request that 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 system owner 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.

Commercial/Industrial Solar Plus Energy Storage Projects

Each Commercial/Industrial and/or Large Nonresidential Solar Plus Energy Storage projects will receive a QA field inspection and usable capacity testing prior to the incentive payment being issued to the contractor. In addition to the components of the standard QA field inspection, Solar Plus Energy Storage Commercial/Industrial project inspections will confirm that the installed storage equipment (kW/kWh AC) is as approved by the program, ensure general quality of the storage installation complies with the Battery Energy Storage System Guidebook, codes, standards, and industry accepted practices and inspect that appropriate metering and data logging are in place.

QA field inspections will be conducted after the contractor submits the invoice for the Solar Plus Energy Storage Incentive. This inspection may also include review of up to one-week post-commercial operational data to check proper operation of the energy storage system and any automated controls operating the charge and discharge functions of the storage system.

The storage system must be commissioned in accordance with manufacturer specifications, and a commissioning report must be available at the time of invoicing to NYSERDA. The commissioning report should document the specific parameters within which the system was fully charged and discharged to determine its usable energy in accordance with manufacturer requirements.

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 system owner 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 track trends in installation quality over time
- Allow NYSERDA to gauge the relative quality of installations across installers, regions, or other screening criteria
- 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 solar electric 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
- Generate safe, reliable electricity consistent with pre-installation estimates

As shown in Table 1, program nonconformances are possible in each of these three categories. Since the NEC governs, to a large extent, the safety of a solar electric 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 Compliance	Program Compliance	Estimated Performance Verification
Incidental	No rewiring, minimal deviation	Equivalent equipment changes	TSRF reported*
Minor	Rewiring, safety, 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

* Only for Consolidated Edison projects ≥ 750kW.

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

National Electric Code 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:

- Missing screws on indoor enclosure covers, but cover is still secure and renders interior of enclosure inaccessible
- Installation debris (e.g., bits of wire, packing materials) left onsite
- 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:

- Conductors are not protected from abrasion as required
- 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:

- Conductors are not adequately protected from physical damage
- Improper system or equipment grounding
- Bonding neutral to ground in a meter enclosure
- Undersized circuit protection (nuisance tripping)
- Current Transformer(s) are missing, installed incorrectly or do not meet minimum program requirements

Critical

Critical 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:

- Lack of or oversized overcurrent protection
- DC input voltage exceeds inverter maximum input rating
- PV Backfed breaker current rating exceeds ampacity of circuit conductors
- 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 a particular installation, and thus, fall into a different category for that installation. Ultimately, the inspector will rely on his or her best judgment to determine the seriousness of a nonconforming item.

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 the following:

- Minimum fire rating, barriers or resistance has not been met
- Rooms and indoor areas containing Battery Energy Storage System (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. Projects receiving aa inspection score of 1-2 are considered failures whereas projects receiving an inspection score of 3-5 are passing scores.

Projects with an inspection score of 5 represents a fully compliant project that employs best practices. Projects with an inspection score of 3 signifies a fully acceptable project. Receiving a 1 on an inspection represents a project with major or critical failure. Inspection scores of 2 and 4 will be used to score projects that fall in between.

NYSERDA will produce a detailed report and determine whether the project fully complies with all program requirements and meets acceptable standards of workmanship. The QA inspection report will provide all evaluated elements of the project and list any nonconformances identified. Projects that have nonconformances related to critical (health and safety) or major (system performance) attributes will automatically fail. Projects that have only nonconformances related to minor or incidental attributes

may pass or fail based on the number and type of nonconformance observed. Specific criteria for each score are given in the following table:

Defect Class	QA Score				
	5	4	3	2	1
Incidental	3	Allowed	Allowed	Allowed	Allowed
Minor	0	1	3	Allowed	Allowed
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 for a 5 but exceeds the thresholds of a score of 3.

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 Commercial/Industrial solar electric 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 generate electricity consistent with program records. These systems may require urgent attention to address safety concerns.

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 from Inspection Report and in future work conducted in the program. Acknowledgment and plans for preventing future problems may be requested with the report. Nonconformances can be corrected 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 with 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 contractor or 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

1. All deficiencies are required to be addressed within 30 days of issuing report.
2. Critical and major deficiencies require a response through the link sent with the report.
3. Responses Corrective action will be reviewed and responded to by NYSERDA staff.
4. If NYSERDA staff accepts the corrective action, the deficiency will be marked resolved.
5. 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 take place:

1. Inspector contacts the QA contractor project manager to review critical issues and confirm shutdown decision.
2. Inspector takes necessary steps to safely shut down and secure the system and informs the site operator and system owner/operator, of the decision.
3. 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.
4. The QA contractor project manager will email notice of shutdown to the Energy Storage Program staff.
5. The QA contractor delivers a report to NYSERDA within three days.
6. 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 issued a prescriptive plan, in which specific results and a timeline for demonstrating those results will be prescribed and monitored. The contractor may be terminated from the program if determined necessary. Complete details of demonstrating continued project viability is located in the NY-Sun Upstate + Long Island Program Manual.

Corresponding with NYSERDA's Standards and Quality Assurance Team

When corresponding with NYSERDA's QA team, please be sure use the group email inspections@nyserda.ny.gov.