FDNY

Energy Storage System Approval Process

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Relevant Codes / Rules

Fire Code 2022 Section FC 608: Stationary Energy Storage Systems (outdoor and indoor)

NFPA 855 as modified by Fire Code 2022 Appendix B

FDNY Rules 3 RCNY Section 608-01: Outdoor Stationary Storage Battery Systems

Steps in the Approval Process

1. ESS Product Review & Approval - Certificate of Approval (COA)

2. ESS Plan Review and Installation Approval

3. ESS Installation Inspection and Operating Permit

ESS Product Review & Approval - Certificate of Approval (COA)

Background

- All energy storage systems for stationary installations and mobile systems require a product-specific approval called a Certificate of Approval (COA) from the New York City Fire Department (FDNY).
- To obtain a COA, the applicant (e.g., manufacturer or their authorized agent) must submit an FDNY application form TM-2.
    - The TM-2 form is submitted for FDNY review and approval of the product via the FDNY Business Portal. The application type should be specified as “Certificate of Approval.”

Note: Stationary energy storage systems with an individual size of 2 kWh or less for outdoor use do not require a COA.

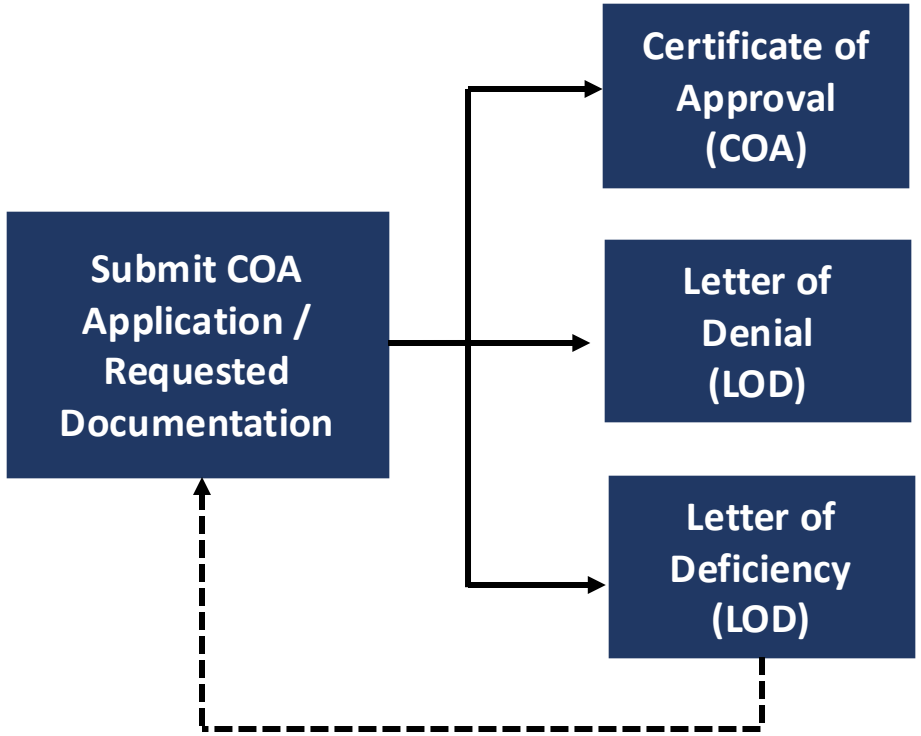
Required Documents

1. The complete Nationally Recognized Testing Laboratory (NRTL) product and test report based on the following UL standards:
   a. **UL 1741**: Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
   b. **UL 1973**: Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications
   c. **UL 9540:** Energy Storage Systems and Equipment
2. Full-scale testing report based on **UL 9540A** (Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems) test method consistent with the UL 9540A test method test report recording requirements.
3. Hazard Mitigation Analysis (HMA) report and the recommended mitigation measures prepared by a New York State licensed Registered Architect or Professional Engineer.
4. A description of the battery technology/chemistry, modes of operation, incorporated safety systems and activation sequences.

Required Documents (Continued)

5. Manufacturer/product specific documents such as installation & operational manuals, Safety Data Sheets (SDS), emergency management/response plan, etc.
6. Maximum energy capacity of each unit/product listed or certified to the UL 9540 standard.
7. A clear notation of whether the product is listed or certified for outdoor, indoor or roof mounted installation.
8. A detailed description of the Energy Storage System remote monitoring capability and technology, including the remote monitoring facility, if any.
9. Type of application/use of the ESS/battery unit, such as: grid support, building power, emergency power, Uninterruptible Power Supply (UPS), etc.

Possible Outcomes



Certificate of Approval (COA): If ESS is deemed acceptable, a COA will be issued.
Letter of Deficiency (LOD): if ESS is not deemed acceptable, a LOD will be issued asking for more information or deficiencies be corrected.
Letter of Denial (LOD): If ESS is deemed unsafe or cannot meet NYC requirements.

ESS Plan Review and Installation Approval

Background

- A site-specific plan approval is required for each Energy Storage System (ESS) installation from the FDNY and/or the DOB.
- The approval depends on the energy capacity/size of the installation and its location (indoor or outdoor).
- All ESS/battery units must have a Certificate of Approval (COA) issued by the FDNY to be eligible for plan review and installation approval.
- A DOB construction work permit is required for each stationary ESS installation, regardless of capacity/size.
- The aggregate rated energy capacity per control area of indoor systems must not exceed the limits specified in Fire Code FC Table 608.9.1.1.
    - The design and number of control areas are outlined in Fire Code FC Table 5003.8.3.3.

Jurisdiction Based on Installation Location

Indoor Installations

All applications for indoor installations shall follow DOB procedures. NFPA 15 water spray systems for indoor installations must be approved by DOB. Please refer to DOB's website for complete guidance.

Note: Indoor installations are not subject to an FDNY TM-1 mechanical plan review unless the installation of the battery unit is not in compliance with the terms and conditions of the COA.

Outdoor Installations

Applications for plan review of ESS/battery units for small and medium systems (as set forth in Table 1 of the Fire Department rule 3RCNY Section 608-01) shall be submitted to DOB for review and approval.

Note: FDNY plan review is not required for these two capacities/sizes if they have obtained a COA.

Applications for plan review of ESS/battery units for large systems (as set forth in Table 1 of the Fire Department rule 3RCNY Section 608-01) shall be subject to both FDNY and DOB plan reviews.

Filings to FDNY

1. TM-1 Engineering Plan review for Installations (Mechanical) of the Energy Storage Systems.
2. TM-1 Plan Review of Fire Alarm (including emergency alarm or gas detection system) associated with Energy Storage Systems.
3. TM-1 Plan review for The NFPA 15 Suppression System for Energy Storage Systems (outdoor only).

NOTE: Depending on the site and equipment, the following plans may be required to be submitted to FDNY for review and approval.

1. Non-Water Based (Alternative) Fire Extinguishing Systems
2. Fire Apparatus Access (if not in compliance with FC 503)
3. Rooftop Access Variance (if not in compliance with FC 504)
4. Fire Hydrant location
5. New Private Hydrant

TM-1 for Installation Approval

Required Documents

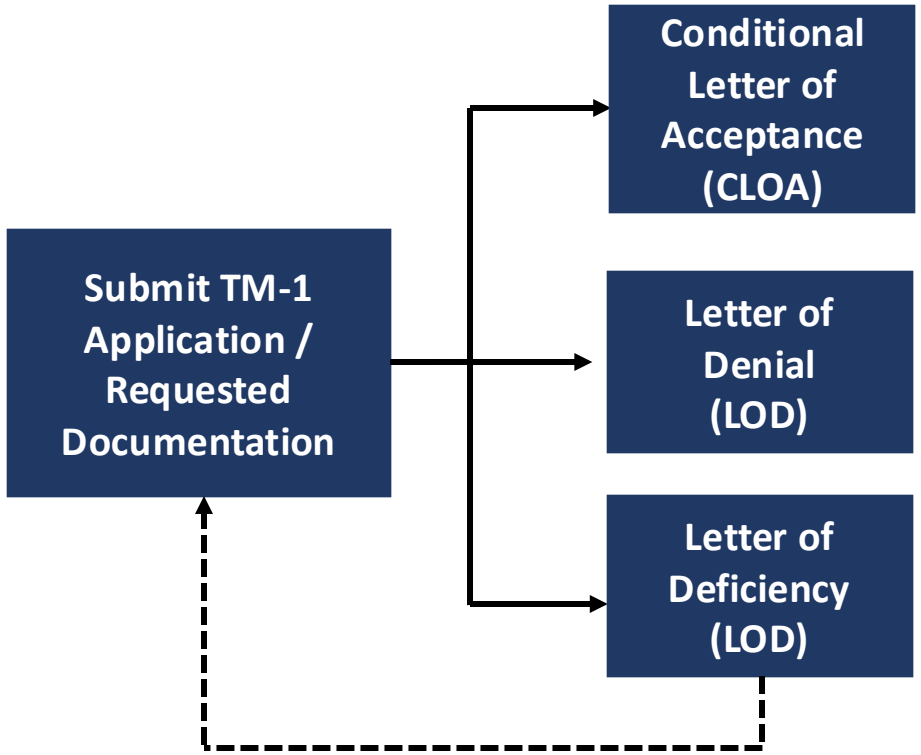
The TM-1 application must be accompanied by all required documents mentioned in the TM-1 application form, including the following:

1. Plans/drawings signed and sealed by a NYS Registered Design Professional showing the proposed location of BESS installation.
2. Additional drawings such as 100 & 250-feet radii site plans, fire alarm, fire protection plans, etc
3. Narrative of the scope of work including pictures of the proposed site.
4. Installation, operation, maintenance manuals, technical documentations, etc
5. Commissioning and decommissioning plans
6. Emergency Management Plan (EMP)
7. A site-specific hazard mitigation analysis (HMA) signed and sealed by a NYS Registered Design Professional.
8. Other pertinent information (copy of COA, signage, flood zone map, certificate of occupancy, DEP letter for hydrant flow test, UL listing/certificate, etc. as applicable)

TM-1 for Installation Approval (Continued)

9. Information on the Certificate of Fitness (COF) holder, Subject Matter Expert (SME) and remote monitoring facility, etc
10. Fencing to ensure site complies with NYC noise requirements, if applicable

Possible Outcomes



Conditional Letter of Acceptance (CLOA): If plans are deemed acceptable, a CLOA will be issued.

Letter of Deficiency (LOD): if plans are not deemed acceptable, a LOD will be issued asking for more information or deficiencies be corrected.

Letter of Denial (LOD): If site is deemed unsafe or cannot meet NYC requirements.

TM-1 for Fire Alarm

Fire alarm applications associated with ESS are required to be submitted to the Fire Alarm Plan Examination Unit within the Bureau of Fire Prevention for review.

1. The job description for the system shall indicate the type of protection.
2. The types of initiating devices activating the system.
3. Indicate that it is for an ESS and state the energy capacity of the installation.
4. A TM-1 form completed by a NYS Registered Design Professional (NYS Professional Engineer/Registered Architect).
5. a Conditional Letter of Acceptance (CLOA) for the ESS installation, or other documents such as a Certificate of Approval (COA) shall be provided as part of the supporting documents.
6. Specification sheets for the proposed panel/devices featured in the proposed fire alarm system design. Fire alarm panels utilized must have a Certificate of Approval for use in NYC.

TM-1 for Fire Alarm (Continued)

7. Mechanical approval for non-water based/water-spray suppression systems, which may be monitored/connected to the fire alarm system, shall be obtained from the Technology Management Unit.
8. For job sites that are not under the jurisdiction of the NYC Department of Buildings (DOB) for permitting of use and occupancy, the Authority Having Jurisdiction (AHJ) that precedes over the job site shall provide an equivalent “Letter of No Objection/Verification” for the address and occupancy use of the site.
9. Fire alarm systems that serve ESS shall be provided with descriptive contact I.D. that identifies the coverage to be for an “Energy Storage system” to the central monitoring station.

Note: Outdoor installations will require fire alarm devices to be listed and designed for use in outdoor locations, specifically for weather rating and operating temperatures, as listed by the manufacturer.

General guidance for filing a fire alarm application may be found in the following link: tips-fire-alarm-systems.pdf

TM-1 for Fire Alarm (Continued)

Once the fire alarm plans are approved:

- A project authorization shall be requested to begin the work.
- Once the project authorization is granted, an 8-digit record ID is generated which will be used for the on-site inspection.

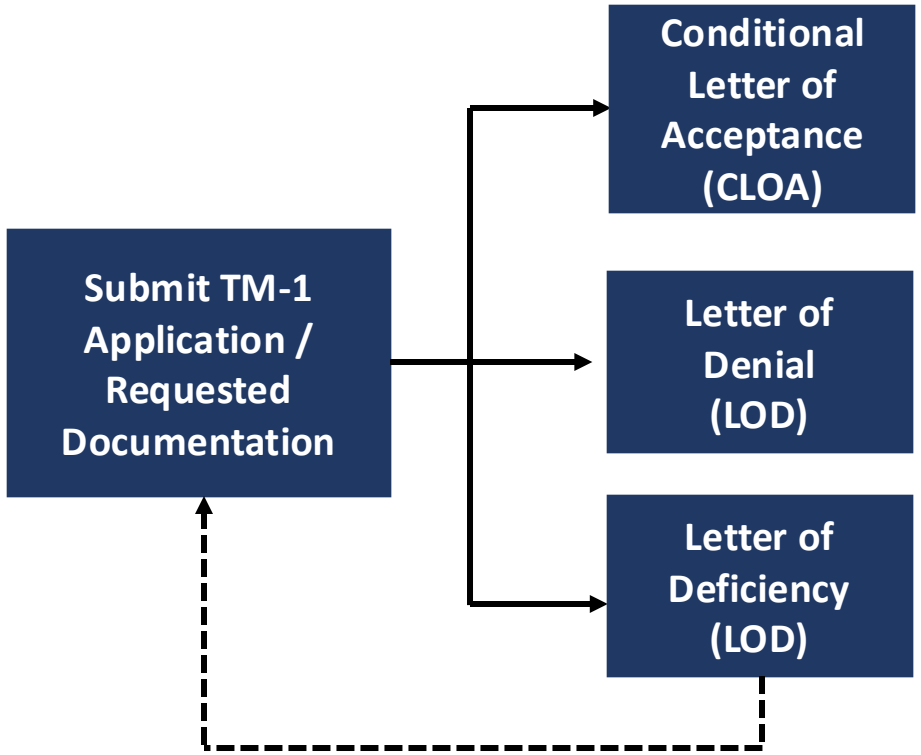
  Note: Utilize this number when the installation is complete, and while scheduling the inspection.

- 3. Confirm the installation is finalized and pre-tested. Failure to do so will result in violations and delays in the final approval.

TM-1 for NFPA 15 Suppression System for Energy Storage Systems

- Required for all large outdoor installations
  - The system shall be installed, positioned, and designed to provide a minimum density of 0.5 gpm/ft² over the entire surface area of the protected ESS containers.
  - Arrange the system to be zoned such that water flow will not exceed 1,000 gpm in each zone.
- Submit a TM-1 for plan review with all required and relevant documents. Application Type should be “Engineering Application”.

Possible Outcomes



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Letter of Deficiency (LOD): if plans are not deemed acceptable, a LOD will be issued asking for more information or deficiencies be corrected.

Letter of Denial (LOD): If site is deemed unsafe or cannot meet NYC requirements.

ESS Installation Inspection and Operating Permit

Background

- A permit is required for all systems exceeding 20 kWh aggregate capacity on premises.
- To obtain the permit, submit a request for an FDNY Final Emergency Shutdown Test (ESDT)/Permit Inspection.
    - Done by Bulk Fuel Safety Unit (BFSU)
- Prior to requesting a Final ESDT/Permit Inspection, ensure the following systems are tested and have obtained a Letter of Approval from the respective Fire Department inspection units:
    - Fire Alarm inspection Unit
        - Fire alarm system
        - Emergency alarm system
        - Detection systems system
    - Rangehood Inspection Unit
        - Non-water-based (alternative) fire extinguishing systems
        - NFPA 15 Suppression System

Note: Exceptions for FDNY Installation Inspection and Operating Permit

1. FDNY permit is not required for any outdoor systems with an aggregate capacity of 20 kWh or less.
2. FDNY permit is not required for any residential systems serving R-3 (one and two family) occupancies.

Please visit the inspection page of the Fire Department to see the comprehensive list of documents and applicant requirements by inspection type.

Fire Alarm Inspection

- Requests for initial fire alarm inspections are to be submitted in person at FDNY headquarters located at 9 Metrotech Center, Brooklyn NY 11201 (use Flatbush Avenue entrance) on Tuesdays and Thursdays from 9AM to 12PM.
- Information on who can request the inspection as well as a list of required documents including the B45 Form, the A433C Form, Project Authorization and Approved Plans can be found on the Request an Inspection page on the FDNY website.
- Once submitted, an email listing the inspection date and time will be sent to the applicant. All contractors shall be on site to perform the inspection.

Fire Alarm Inspection (Continued)

Possible Outcomes/Result of Inspection

1. Letter of Approval (LOA):
    - When the fire alarm system is installed in accordance with all applicable codes, and free of all defects, a letter of approval for the system is generated.
2. Notice of Defect (NOD):
    - If defects are found during the inspection process, a notice of defect or violation order is issued. These defects will need to be corrected. Depending on the severity of the defects, a re-test and/or submission of an amended plan may be required. If an amended plan is required, it must be submitted to the Fire Alarm Plan Examination Unit for review. Minor defects may be subject to professional certification, if desired. This will be noted on the notice of defect. Information on this process can also be found on the Request an Inspection website.

Fire Alarm Inspection (Continued)

3. If a re-test is to be conducted, the inspection request must be submitted through the FDNY business portal:
   - Go to FDNY Business Accela Citizen Access and Login.
   - Navigate to: Begin Application/Request → Public Request → Public Request for Inspections.
   - Follow the inspection instruction manual found on the Request an Inspection on how to submit a request for inspection through FDNY Business - Accela Citizen Access

Note: For any questions/concerns, contact FDNY.Businesssupport@FDNY.nyc.gov "ATTN FAIU"

NFPA 15 Suppression System for Energy Storage Systems Inspection

Pre-Scheduling

1. Project Authorization:
    - A project authorization shall be requested from the FDNY Technology Management Unit.
    - Upon issuing the project authorization, a record ID number will be provided. This record ID will be used for the on-site inspection.

Scheduling

1. Initial Email:
    - Send an email to Rangehood_Unit@fdny.nyc.gov with the FDNY approved plan and a filled out B45 Inspection request form attached.
    - Request a date to check for availability.

NFPA 15 Suppression System for Energy Storage Systems Inspection (Continued)

2. Online Scheduling:
    - Go to **FDNY Business**.
    - Navigate to: Begin Application/Request → Public Request → Public Request for Inspections.
    - Fill in the address.
    - Fill out the Permit/LOA Contact and Billing Contact.
    - In the Inspection Request Details section:
        - Add a row.
        - Select "Rangehood".
        - For "Alternate Agent Test", select the type of system and test date.
        - Continue filling out the form until you receive a request number (e.g., 2024-INSP-Request-040444).

NFPA 15 Suppression System for Energy Storage Systems Inspection (Continued)

Inspection

1. Preparation:
    - Ensure the contact listed on the B45 form and the inspection request is on-site on the day of the inspection.
    - Be prepared to present documentation such as:
        - S-12 or S-15 Certificate of Fitness.
        - Affidavit from the manufacturer stating that the nozzle is capable of outdoor use.

Note: Hydrostatic testing can only be conducted in non-freezing temperatures. The testing may take up to three hours.

NFPA 15 Suppression System for Energy Storage Systems Inspection (Continued)

Possible Outcomes/Result of Inspection

The contractor will be notified whether the test has passed or failed upon completion of the inspection.

1. Letter of Approval (LOA)
    - Upon passing the inspection, a LOA will be issued within three business days to the applicant on record. The contractor can also obtain the LOA through their NYC account using the record ID number provided when the project authorization was issued.
2. Letter of Defects
    - The contractor will receive an email with an attached letter of defects, listing all the issues that need to be fixed.
    - Re-testing, re-inspection, or an amended plan will be required.
        - For re-testing or re-inspection, the contractor may start the scheduling process again once the issues are fixed.
        - If an amended plan is required, it must be submitted to the FDNY Technology Management Unit for plan review.

Non-Water Based Fire Suppression System for Energy Storage Systems Inspection

Rangehood inspections of non-water based fire suppression systems will follow the same procedures mentioned In previous slides with the exception that it can be done all year long.

Note: For any rangehood questions/concerns, contact FDNY.Businesssupport@FDNY.nyc.gov

Final Inspection

- Applicant may contact the Bulk Fuel Safety Unit (BFSU - Hazard Control Inspection Group) at BFSU@fdny.nyc.gov or 718-999-2461/2463 to request:
    - Pre-commissioning (optional)
    - Commissioning which includes Final Emergency Shutdown Test upon passing permit inspection and LOA
- If directed by BFSU applicants must officially schedule an inspection via the FDNY Business Portal to obtain an inspection request ID number
- An ESS commissioning plan and Emergency Management Plan (EMP) must be submitted when requesting the Final Emergency Shutdown Test/Permit Inspection
- Promptly send notification to Hazmat.EmergingTech@fdny.nyc.gov with “ATTN Familiarization Drill” to schedule drills for their familiarization of the system, its operation, the safety systems incorporated, and actions to take in case of emergency according to the emergency management plan
- An inspection may not be granted until the required documents are submitted

Final Inspection (continued)

Pre-Commissioning Inspection (Optional)

The pre-commissioning inspection may be conducted by the Bulk Fuel Safety Unit (BFSU) following the installation of the Battery Energy Storage System (BESS), including fire protection systems such as the fire alarm system, fire suppression system (e.g., water-based deluge system), and Fire Department Connection (FDC). During this inspection, BFSU will meet with the owner or owner's representative, the Certificate of Fitness (COF) B28 holder, and the designated Subject Matter Expert (SME) to review documentation, inspection, and test requirements. These requirements are outlined in the Technology Management Unit (TMU) Letter of Approval/Acceptance (LOA), Fire Code, Fire Rule, and the relevant NFPA standards.

Final Inspection (continued)

Commissioning Inspection:

The commissioning inspection is conducted by BFSU after the Fire Alarm Inspection Unit (FAIU) completes satisfactory testing of the fire alarm system, and the Rangehood Unit (RHU) completes testing of the suppression system and fire department connections. This inspection includes the emergency shutdown test of the BESS, which involves activating the emergency shutdown switch/button, fire alarm and detection devices (e.g.,fire detectors, UV detectors), and manual pull stations to verify the transmission of alarm signals to the BESS remote monitoring station or approved central station as applicable. It also involves testing emergency telephone numbers displayed on required signage.

BFSU will require the presence of the owner or representative, B28 COF holder, SME, remote monitoring station representative, and fire alarm technician holding a FDNY's COF(S97/S98) during the inspection. After successful commissioning testing and inspection, BFSU will issue a Letter of Approval and permit.

Final Inspection (continued)

The following shall be made available at the inspection site by the owner:

1. DOB work permit
2. Approved plans
3. As-built plans/drawings as applicable
4. Information and documentation about the remote monitoring facility staffed by trained and knowledgeable person(s) retained by the manufacturer or installer of the battery system
5. All approvals for the fire protection systems
6. Copy of the COA for the ESS/battery unit
7. FDNY or DOB variance approvals, if any
8. All required signs posted
9. A decommissioning plan
10. A maintenance plan
11. Site-specific Emergency Management Plan (EMP)

Final Inspection (continued)

Annual Permit Inspection:

The annual permit inspection will be conducted by BFSU on or before the expiration date of the BESS permit. This inspection will repeat the procedures performed during the commissioning and post-commissioning inspections to ensure ongoing compliance and performance of the system.

Note: An inspection may be conducted by BFSU after the successful completion of the commissioning of the BESS. This inspection is aimed at monitoring the performance of the BESS and verifying established inspection and maintenance records.

For any BFSU questions/concerns contact FDNY.Businesssupport@FDNY.nyc.gov and/or BFSU@fdny.nyc.gov.

Final Inspection (continued)

Possible Outcomes

1. Upon successful inspection, a Letter of Approval (LOA) and a site permit (valid for one year) will be issued to operate the system.

Note: OTCR Final acceptance letter may be required prior to issuance of the FDNY permit.

2. If the inspection has failed due to an administrative issue, a violation order is issued. Applicant may submit corrections/amendments via email (BFSU@fdny.nyc.gov) to resolve deficiencies.
3. If the inspection has failed due to other reasons such as missing equipment or mechanical issue, a violation order is issued. Applicants must request a reinspection/retest via FDNY Business Support or via email at BFSU@fdny.nyc.gov.

Thank you!