OFFICE OF WASTEWATER MANAGEMENT
WASHINGTON, D.C. 20460

SOLICITATION OF PUBLIC COMMENT FOR PROJECT-SPECIFIC BUILD AMERICA, BUY AMERICA NONAVAILABILITY WAIVER PROPOSAL

SUBJECT: UNDER EVALUATION: Project-Specific Nonavailability Waiver of Build America, Buy America Act Manufactured Product Requirements to the Town of Newton, New Jersey, for a 500kW Standby Generator Assembly

Introduction

This solicitation of public comment by the U.S. Environmental Protection Agency (EPA) is to evaluate a Build America, Buy America (BABA) waiver request submitted by an assistance recipient based on nonavailability of a single product for a single project.

This solicitation of public comment does not represent a final agency decision. The purpose of this proposal is to inquire whether potential alternative BABA-compliant products may be available that were not identified by the assistance recipient or through the EPA's product research efforts, and whether other factors should be considered in the evaluation of a waiver.

The EPA has completed its market research efforts and was unable to identify an alternative BABA-compliant product meeting performance-based specifications in sufficient and reasonably available quantities and of a satisfactory quality. The EPA makes every effort to locate BABA-compliant alternative products through its waiver process, and the public comment period provides an additional meaningful opportunity to augment the Agency's research. In the EPA's experience, a viable BABA-compliant product may be identified through public comment. Through this public comment period, commenters may provide information that indicates a compliant item is available. In that circumstance, the EPA would not issue a final waiver.

Public comments are requested for 15 days (specific dates noted on the EPA's website). Please submit comments to BABA-OW@epa.gov. Please include information in the subject of the email identifying it as a public comment on this waiver request, such as "Waiver Comment: Town of Newton, NJ Generator" or similar. The proposed waiver will also be posted to the Made in America website.

Background

The Buy America Preference set forth in section 70914 of the BABA, included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58), requires that all iron, steel, manufactured products, and construction materials used for infrastructure projects under Federal financial assistance awards be

produced in the United States.

Under section 70914(b), the EPA may waive the application of the Buy America Preference, in any case in which it finds that: applying the domestic content procurement preference would be inconsistent with the public interest; types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or the inclusion of iron, steel, manufactured products, or construction materials produced in the U.S. will increase the cost of the overall project by more than 25 percent.

Summary

Proposed Waiver: The EPA is soliciting comments regarding whether to issue a project waiver of the manufactured product requirements of section 70914 of the BABA, included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58), for a 500kW standby generator assembly used in an infrastructure project funded through the Clean Water State Revolving Fund.

Waiver Type: Nonavailability of a single BABA-compliant product in sufficient and reasonably available quantities or of a satisfactory quality.

Waiver Level and Scope: Project level waiver for a single project. No other project may utilize the waiver.

Proposed Waiver Description: Project-specific nonavailability waiver of BABA manufactured product requirements to the Town of Newton, New Jersey, (Applicant) for a 500kW standby generator assembly for the Town of Newton Water Utility SCADA/PLC Replacement Project.

Project Summary: This project is taking place in Newton, New Jersey. The Applicant is completing upgrades at the Newton Wastewater Treatment Plant (WWTP). Certain equipment at the WWTP has reached the end of its useful life and requires replacement. The natural gas powered 500kW standby generator will be installed in the Applicant's project which will also include chemical room upgrades, WWTP automatic backwash sand filter rehabilitation, generator transfer switch replacement, and main electrical switch replacement. Work directly associated with the generator transfer switch replacement will include mobilization to the site, decommissioning the existing 300 kW indoor natural gas generator and automatic transfer switch (ATS), installation of a new 500 kW indoor natural gas generator, 800A ATS, 800A generator panel, gas piping, exhaust fan, louvers, room renovation, and minor roof work associated with the generator replacement, startup, testing and troubleshooting.

Length of the waiver: From the effective date of the final waiver until project completion, estimated to be March 31, 2029.

Summary of Items Covered in the Proposed Waiver (including NAICS): The Applicant is seeking a waiver for a standby generator and associated assemblies, including the automatic transfer switch, load bank, and Triplex Switch (NAICS code 335312; PSC 6115), which is a BABA manufactured product. The Applicant proposes to procure a standby generator which is not a certified, BABA-compliant product as no compliant alternative products were identified by the Applicant, or through the EPA's market research completed in January 2026.

For additional information on the project and waiver request, see the attached original waiver

request from the assistance recipient and supporting documents.

Description of Efforts Made to Avoid the Need for a Waiver
The Applicant made a good faith effort to identify alternative compliant products that meet project specifications. The Applicant contacted Prior to requesting a waiver from the EPA, the Applicant contacted local vendors via email in October 2025 and was unable to identify BABA-compliant products meeting their technical specifications. The recipient proposes to procure a product from a manufacturer that is unable to meet the cost of components test.

The EPA also conducted market research in January 2026. The market research process included thorough review of the waiver request submission, examination of domestic manufacturer catalogs and other technical data and marketing materials, and communication with domestic manufacturers.

The EPA researched and contacted ten (10) standby generator manufacturers and suppliers. The manufacturers were asked whether they manufacture BABA-compliant standby generators that meet the project's specifications, and if so, what the estimated lead time would be. There were no (zero) manufacturers identified who could provide BABA-compliant standby generators meeting the technical specifications of the project.

Anticipated Impact if No Waiver is Issued
Absent a waiver from the EPA, the Applicant will be unable to complete necessary upgrades to the wastewater treatment plant. Equipment at wastewater treatment plant, including the standby generator, has reached the end of its useful life and is due for replacement. Replacement of aged equipment is an essential part of preventing failure of the wastewater treatment facility and preventing impact to human health and the environment.

Description of Award
Recipient Name and/or Unique Entity Identifier (UEI): HM2KJ1H7XBC8

Federal Financial Assistance Identification Number (FAIN): N/A

Federal Financial Assistance Listing Name: 66.458 Clean Water State Revolving Fund

Federal Financial Assistance Listing Number: 66.458

Agency CGAC: 068

Federal Financial Assistance Funding Amount: $1,012,000.00

Total Cost of Infrastructure Expenditures: $1,392,127.00

[redacted]

December 12, 2025

[redacted]

Re: Project No. S340449-09
Town of Newton Water Utility
SCADA/PLC Replacement Project
BABA Waiver – WWTP Generator

Dear Mr. Pessirilo,

On behalf of the Town of Newton, we are requesting a BABA Availability Waiver for: Emergency Backup Generator.

Per the waiver checklist we are providing the below information:

1. Description of the foreign and domestic construction materials
   Generator Set [redacted]
2. Unit of measure
   500kw Standby Generator
3. Quantity
   1
4. Price
   Generator Set Only. [redacted]
5. [redacted]
6. Location of the construction project
   Newton, NJ
7. [redacted]
8. A detailed justification for the use of foreign construction materials
   Current Foreign Suppliers meet delivery schedule and price point.
9. Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor
   Please see attached email correspondence between contractor and specified vendors confirming they cannot meet BABA requirements.
10. Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested:

Please refer to the [redacted] addressing BABA and our submittal for material description.

11. Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials.
    See #9 above
12. Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers.
    See #9 above

13. Project schedule
    Please see attached preliminary schedule which does not account for waiver approvals or delays.
14. Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials.
    Please see attached project specification.
15. Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought
    Please refer to the provided [redacted] addressing the BABA request.
16. Has the State received other waiver requests for the materials described in this waiver request, for comparable projects?
    Unknown at this time whether State has received other waiver requests.

Should you have any questions regarding the above, please do not hesitate to contact me or [redacted]

[redacted]

[redacted]

PRELIMINARY PROJECT SCHEDULE

TOWN OF NEWTON
WWTP GENERATOR REPLACEMENT PROJECT
NEWTON, NJ
Project No. S340449-09

Contractor Projected Contract SCOPE Durations:

1. Notice to Proceed: 9/26/25
2. Shop Drawing Approvals: 9/27/25 – 10/31/25
3. Release Generator & ATS: 10/31/25, delivery plus 25 weeks
4. Receive Generator, ATS and all other materials: 4/30/26
5. Mobilize Jobsite: 5/4/26
6. Installation of a new 500 kW indoor natural gas generator, 800A ATS, 800A generator Camlok panel, gas piping, exhaust fan, louvers, room renovation, and minor roof work associated with the generator replacement: 5/4/26 – 12/31/26
7. Startup, testing and troubleshooting: 1/3/27- 1/15/27
8. Switching over from the existing generator to the new generator, while contractor shall provide temporary power to the building lights, fire alarm panel, and three 14 HP pumps 1/16/27 – 2/15/27
9. Decommissioning the existing 300 kW indoor natural gas generator and automatic transfer switch (ATS): 2/16/27 – 3/15/27
10. Final Punch List and Contract Closeout: 3/15/27 – 3/26/27

Contract Duration: 545 Consecutive Calendar Days

GAS-ENGINE-DRIVEN GENERATOR SETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gas-engine-driven generator sets.
2. Gas engine.
3. Gas fuel system.
4. Control and monitoring.
5. Generator overcurrent and fault protection.
6. Generator, exciter, and voltage regulator.
7. Remote radiator motors.
8. Vibration isolation devices.

B. Related Requirements:

1. Section 26 36 00 "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine generators.

1.2 DEFINITIONS

A. EPS: Emergency power supply.

B. EPSS: Emergency power supply system.

C. LP: Liquefied petroleum.

D. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Include time-current characteristic curves for generator protective device.

3. Include fuel consumption in cubic feet per hour (cubic meters per hour) at 0.8 power factor at 0.5, 0.75 and 1.0 times generator capacity.
4. Include generator efficiency at 0.8 power factor at 0.5, 0.75, and 1.0 times generator capacity.
5. Include air flow requirements for cooling and combustion air in cfm at 0.8 power factor, with air supply temperature of 95 deg F, 80 deg F, 70 deg F, and 50 deg F. Provide drawings showing requirements and limitations for location of air intake and exhausts.
6. Include generator characteristics, including, but not limited to, kilowatt rating, efficiency, reactances, and short-circuit current capability.

B. Shop Drawings:

1. Include plans and elevations for engine generator and other components specified.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Identify fluid drain ports and clearance requirements for proper fluid drain.
4. Design calculations for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
5. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include base weights.
6. Include diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams showing terminal markings for EPS equipment and functional relationship between all electrical components.

1.4 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Data: Certificates, for engine generator, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: With engine and generator mounted on rails, identify center of gravity and total weight, external silencer, and each piece of equipment not integral to the engine generator, and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Source Quality-Control Reports: Including, but not limited to, the following:

1. Certified summary of prototype-unit test report.
2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.

3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
5. Report of sound generation.
6. Report of exhaust emissions showing compliance with applicable regulations.
7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.

C. Field quality-control reports.

D. Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For engine generators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:

   a. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
   b. Operating instructions laminated and mounted adjacent to generator location.
   c. Training plan.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: One for every 10 of each type and rating, but no fewer than one of each.
2. Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.
4. Tools: Each tool listed by part number in operations and maintenance manual.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GAS-ENGINE-DRIVEN GENERATOR SETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

[redacted]

5. Approved Equal.

B. Source Limitations: Obtain packaged engine generators and auxiliary components through one source from a single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Engine generator housing, engine generator, batteries, battery racks, silencers, and sound attenuating equipment, accessories, and components shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
2. Shake-table testing shall comply with ICC-ES AC156. Testing shall be performed with all fluids at worst-case normal levels.
3. Component Importance Factor: 1.5.

B. B11 Compliance: Comply with B11.19.

C. NFPA Compliance:

1. Comply with NFPA 37.
2. Comply with NFPA 70.
3. Comply with NFPA 99.
4. Comply with NFPA 110 requirements for Level 1 EPSS.

D. UL Compliance: Comply with UL 2200.

E. Engine Exhaust Emissions: Comply with EPA Tier 3 requirements and applicable state and local government requirements.

F. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by engine generator including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

G. Environmental Conditions: Engine generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: 5 to 104 deg F.
2. Relative Humidity: Zero to 95 percent.
3. Altitude: Sea level to 1000 feet.

2.3 ENGINE GENERATOR ASSEMBLY DESCRIPTION

A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and use.

C. Power Rating: Industrial Standby.

D. Overload Capacity: 110 percent of service load for 1 hour in 12 consecutive hours.

E. EPSS Class: Engine generator shall be classified as Type 10 according to NFPA 110.

F. Service Load: 500 kW / 625 kVA.

G. Power Factor: 0.8, lagging.

H. Frequency: 60 Hz.

I. Voltage: 480 V ac.

J. Phase: Three-phase, four wire, wye.

K. Induction Method: Naturally aspirated.

L. Governor: Adjustable isochronous, with speed sensing.

M. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.

1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.

N. Capacities and Characteristics:

1. Power Output Ratings: Nominal ratings as indicated at 0.8 power factor excluding power required for the continued and repeated operation of the unit and auxiliaries, with capacity as required to operate as a unit as evidenced by records of prototype testing.
2. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

O. Engine Generator Performance:

1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
8. Start Time:

a. Comply with NFPA 110, Type 10 system requirements.
b. 10 seconds.

2.4 GAS ENGINE

A. Fuel: Natural gas.

B. Rated Engine Speed: 1800 rpm.

C. Lubrication System: Engine or skid-mounted.

1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Jacket Coolant Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with UL 499 and with NFPA 110 requirements for Level 1 equipment for heater capacity.

E. Integral Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator mounting frame and integral engine-driven coolant pump.

1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
3. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
4. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.

a. Rating: 50-psig maximum working pressure with coolant at 180 deg F, and non-collapsible under vacuum.
b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

F. Muffler/Silencer:

1. Critical type sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

a. Minimum sound attenuation of 25 dB at 500 Hz.
b. Sound level measured at a distance of 25 feet from exhaust discharge after installation is complete shall be 78 dBA or less.

G. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

H. Starting System: 12-V electric, with negative ground.

1. Components: Sized so they are not damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Performance Requirements" Article.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified.
4. Battery: Lead acid, with capacity within ambient temperature range specified in "Performance Requirements" Article to provide specified cranking cycle at least twice without recharging.
5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
6. Battery Compartment: Factory fabricated metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 50 deg F regardless of external ambient temperature within range specified in "Performance Requirements" Article. Include accessories required to support and fasten batteries in place. Provide ventilation to exhaust battery gases.
7. Battery Stand: Factory-fabricated, two-tier metal with acid-resistant finish designed to hold the quantity of battery cells required and to maintain the arrangement to minimize lengths of battery interconnections.
8. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35 A minimum continuous rating.
9. Battery Charger: Current-limiting, automatic-equalizing and float-charging type designed for lead-acid batteries. Unit shall comply with UL 1236 and include the following features:

a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg F to 140 deg F to prevent overcharging at high temperatures and undercharging at low temperatures.

c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
f. Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.

2.5 GAS FUEL SYSTEM

A. Natural Gas Piping: Comply with requirements in [redacted] "Facility Natural Gas Piping."

B. Engine Fuel System:

1. Vapor-Withdrawal System:

a. Carburetor.
b. Secondary Gas Regulators: One for each fuel type, with atmospheric vents piped to building exterior.

2. Fuel Filters: One for each fuel type.
3. Manual Fuel Shutoff Valves: One for each fuel type.
4. Flexible Fuel Connectors: Minimum one for each fuel connection.
5. LP gas flow adjusting valve.
6. Fuel change gas pressure switch.

2.6 CONTROL AND MONITORING

A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of engine generator. When mode-selector switch is switched to the on position, engine generator starts. The off position of same switch initiates generator-set shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts engine generator. The off position of same switch initiates generator-set shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

C. Provide minimum run time control set for 15 minutes with override only by operation of a remote emergency-stop switch.

D. Comply with UL 508A.

E. Configuration:

1. Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the engine generator. Mounting method shall isolate the control panel from generator-set vibration. Panel shall be powered from the engine generator battery.

F. Control and Monitoring Panel:

1. Digital controller with integrated LCD, controls, and microprocessor, capable of local and remote control, monitoring, and programming, with battery backup.
2. Instruments: Located on the control and monitoring panel and viewable during operation.

    a. Engine lubricating-oil pressure gage.
    b. Engine-coolant temperature gage.
    c. DC voltmeter (alternator battery charging).
    d. Running-time meter.
    e. AC voltmeter, for each phase.
    f. AC ammeter, for each phase.
    g. AC frequency meter.
    h. Generator-voltage adjusting rheostat.

3. Controls and Protective Devices: Controls, shutdown devices, and common visual alarm indication, including the following:

    a. Cranking control equipment.
    b. Run-Off-Auto switch.
    c. Control switch not in automatic position alarm.
    d. Overcrank alarm.
    e. Overcrank shutdown device.
    f. Low water temperature alarm.
    g. High engine temperature prealarm.
    h. High engine temperature.
    i. High engine temperature shutdown device.
    j. Overspeed alarm.
    k. Overspeed shutdown device.
    l. Low fuel main tank.

1) Low-fuel-level alarm shall be initiated when the level falls below that required for operation for the duration required for the indicated EPSS class.

m. Coolant low-level alarm.
n. Coolant low-level shutdown device.
o. Coolant high-temperature prealarm.
p. Coolant high-temperature alarm.
q. Coolant low-temperature alarm.
r. Coolant high-temperature shutdown device.
s. EPS supplying load indicator.
t. Battery high-voltage alarm.
u. Low cranking voltage alarm.
v. Battery-charger malfunction alarm.
w. Battery low-voltage alarm.
x. Lamp test.
y. Contacts for local and remote common alarm.
z. Low-starting air pressure alarm.
aa. Low-starting hydraulic pressure alarm.
bb. Remote manual stop shutdown device.
cc. Air shutdown damper alarm when used.
dd. Air shutdown damper shutdown device when used.
ee. Hours of operation.
ff. Engine generator metering, including voltage, current, Hz, kW, kVA, and power factor.
gg. Generator overcurrent protective device not closed alarm.

G. Connection to [redacted]:

1. A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication.
2. Provide connections for datalink transmission of indications to remote data terminals via [redacted] Ethernet. Data system connections to terminals are covered in Section 26 09 13 "Electrical Power Monitoring and Control."

H. Common Remote Panel with Common Audible Alarm: Include necessary contacts and terminals in control and monitoring panel. Remote panel shall be powered from the engine generator battery.

I. Remote Emergency-Stop Switch: Flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.

J. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Overcurrent protective devices shall be coordinated to optimize selective tripping when a short circuit occurs.

1. Overcurrent protective devices for the entire EPSS shall be coordinated to optimize selective tripping when a short circuit occurs. Coordination of protective devices shall consider both utility and EPSS as the voltage source.
2. Overcurrent protective devices for the EPSS shall be accessible only to authorized personnel.

B. Generator Overcurrent Protective Device:

1. Molded-case circuit breaker, electronic-trip type; 100 percent rated; complying with UL 489:

    a. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
    b. Trip Settings: Selected to coordinate with generator thermal damage curve.
    c. Shunt Trip: Connected to trip breaker when engine generator is shut down by other protective devices.
    d. Mounting: Adjacent to or integrated with control and monitoring panel.

C. Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of alternator will occur. When signaled by generator protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from load circuits. Protector performs the following functions:

1. Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms. Contacts shall be available for load shed functions.
2. Under single or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.
3. As overcurrent heating effect on the generator approaches the thermal damage point of the unit, protector switches the excitation system off, opens the generator disconnect device, and shuts down the engine generator.
4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.

D. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground fault.

1. Indicate ground fault with other engine generator alarm indications.
2. Trip generator protective device on ground fault.

2.8 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H Class F.

D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required. Provide six lead alternator.

E. Range: Provide limited range of output voltage by adjusting the excitation level.

F. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

G. Enclosure: Dripproof.

H. Instrument Transformers: Mounted within generator enclosure.

I. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified and as required by NFPA 110.

1. Adjusting Rheostat on Control and Monitoring Panel: Provide plus or minus 5 percent adjustment of output-voltage operating band.
2. Maintain voltage within 15 percent on one step, full load.
3. Maintain frequency within 15 percent and stabilize at rated frequency within 5 seconds.

J. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

K. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

L. Subtransient Reactance: 12 Insert number percent, maximum.

2.9 REMOTE RADIATOR MOTORS

A. Description: NEMA MG 1, Design B, medium induction random-wound, squirrel-cage motor.

B. Efficiency: Energy efficient, as defined in NEMA MG 1.

C. Service Factor: 1.15.

D. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

E. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

F. Temperature Rise: Match insulation rating.

G. Code Letter Designation:

1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
2. Motors Smaller Than 15 HP: Manufacturer's standard starting characteristic.

H. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

I. Controllers, Electrical Devices, and Wiring: Electrical devices and connections are specified in electrical Sections.

2.10 VIBRATION ISOLATION DEVICES

A. Elastomeric Isolator Pads: Oil- and water-resistant elastomer or natural rubber, arranged in single or multiple layers, molded with a nonslip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment.

1. Material: Standard neoprene separated by steel shims.
2. Shore "A" Scale Durometer Rating: 30.
3. Number of Layers: Three.
4. Minimum Deflection: 1 inch.

B. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.

1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch- thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Minimum Deflection: 1 inch.

C. Comply with requirements in Section 23 21 16 "Hydronic Piping Specialties" for vibration isolation and flexible connector materials for steel piping.

D. Comply with requirements in Section 23 31 13 "Metal Ducts" for vibration isolation and flexible connector materials for exhaust shroud and ductwork.

E. Vibration isolation devices shall not be used to accommodate misalignments or to make bends.

2.11 Stationary Stand-Alone Mounted Generator Load Bank:

A. Manufacturer: [redacted] or Approved Equal

B. Model: NEPTUNE (Basis of Design)

C. Operational Ratings and Limitations as follows:
1. Capacity: 200 KW, 1.0 PF.
2. Voltage: 480V AC, 3-phase, 3-wire.
3. Frequency: 60 Hertz.
4. Load steps: 5 KW step resolution (5-10-10-25-50-100….KW).
5. Duty cycle: Continuous.
6. Ambient temperature: 125°F.
7. Exhaust rise: 220°F (Note: as airflow is not laminar, exhaust air temperatures are not equal at all points at the plane of air exhaust. Some parcels of air may reach approximately 600°F before mixing).
8. Airflow required: 12,500 cfm.
9. Fan/Control power: Internal, 480V, 3-phase. Control circuits at 120V via transformer and 24vDC via power supply. Cooling fan motor at line voltage. Control circuits fused, 100,000 A.I.C. current limiting type, 600V fuses. Cooling fan: 5.0 HP, 230/460v, 13.0/6.5a, 60 hertz.
10. Control load: Approx 500VA, 230/460V, 2.2/1.1a. Heater load (when ordered): 1000w, 8.3a, External, 120V, 15A service feed.

D. Principal Systems and Components as follows:
1. The load bank is a completely self-contained, freestanding unit which includes all resistive load elements, load control devices, load element branch circuit fuse protection, main load bus and terminals, cooling system, control power supply, digital controller with malfunction detection system. Outdoor type enclosure.
2. Load elements: Simplex Powr Web: UL/CUL Recognized component. Open wire, helically wound, chromium alloy, thermally derated to 60%. 5% tolerance, 2% balance. 0.995 power factor. Element wire mechanically supported over entire length such that if a wire should break, the broken wire segments will not short to adjacent conductors or to ground.

3. Load elements individually serviceable and replaceable in the field without major disassembly of load bank. Load elements installed in slide-out, removable trays such that any element is easily accessed without disturbing any other elements.
4. All materials used in the mounting and installation of the load elements are suitable for the temperatures encountered, in both normal operation and under fault conditions. Materials in direct contact with the element wire are ceramic. Other materials which structurally support the load elements and/or which form the hot air duct within which the elements are mounted are steel, stainless steel or aluminum.
5. Load control: Branch circuit contactors, each step or each 50kw circuit maximum, 3-pole, 600v, with enclosed silver surfaced contacts, 120V coils; electrically operated and electrically held.
6. Element circuit protection: Branch circuit fuses, each 50kw branch circuit maximum, 200kAIC, 600v, current limiting type.
7. Power wiring: 150°C insulated; color-coded and numbered.
8. Control wiring: 105°C insulated, color-coded and numbered.
9. Power connection: Plated bus bar within Type 3R terminal junction box to accept terminated contractor/field cables.
10. Control connection: To terminal blocks. Remote HMI requires Belden 9481 shielded pair or equal.
11. Cooling: Forced air, vertical airflow, top exhaust. 5HP, 3-phase, TEFC motor driving cast aluminum fan blade. Circuit breaker combination fan motor starter with adjustable overload relay.
12. System protection: Fan failure, high exhaust temp, hi intake temp, fan motor overload; lockout and alarm message display on HMI. Airflow pressure differential switch; dual exhaust temperature thermocouples; intake air temperature thermocouple; fan motor overload relay. Display of temperatures on HMI .
13. Enclosure: Type 3R control section; Type 3R power section. Dimensions: 38.5” W x 111” Ht. (69” basic cabinet, 42” exhaust hood) x 54” Depth. Approx. 1,600 lbs. Hinged access doors with lockable latches. Power section double-wall construction for thermal isolation. Vertical airflow, top exhaust. Screened inlets/exhaust. Rain shedding vanes within exhaust hood. Forklift channels, lifting eyes. Powder coated dark gray cabinet, high temperature black exhaust hood. UL/CUL Listed process.

E. Digital Controller: PLC based with 6-inch color TFT touchscreen with programmable softkeys (HMI) with Local control. When local, installed behind weatherproof cover. Capable of limited user programming for time/load sequencing includes:
   1. Power supply for PLC / screen, 24vDC
   2. Malfunction detection/auto disconnect system. Monitors airflow pressure differential switch, temperature sensing thermocouples and fan motor overload relay. Display air temperatures on screens. Allows operator programming of temperature setpoints. Allows for failure sensing time delays. Displays alarm messages. Provides remote [redacted] registers and remote alarm contacts.

3. Remote load dump circuit to allow use of remote dry contacts (close to run) to trip load bank offline.
4. Remote communications modules, [redacted] RTU/RS-485 (std), [redacted] RTU/TCIP (Ethernet) (Optional)
5. Auxiliary dry contacts to indicate "normal operation"/"system failure".
6. HMI functions, including:
    a. Control Power On – Off buttons (starts/stops cooling fan)
    b. Bypass switch to override remote load dump.
    c. Direct entry load application: keypad to enter direct values, apply and remove pushbuttons. Displays load programmed and load applied. Allows direct transition from preset to preset.
    d. HMI messages including (repeated as [redacted] registers):
        1) Control Power On/Off
        2) Manual mode
        3) Auto mode (if equipped)
        4) Load dump: normal/bypass
        5) Normal operation
        6) High exhaust temp with numeric display
        7) High intake temp with numeric display
        8) Airflow failure
        9) Fan motor overload
        10) Master load on
        11) Load step on (one for each load step)

F. Automation: Digital transducer and current transformers to capture electrical values. Provide the following capability:
    1. Display of electrical values on touchscreen: 3-phase voltage, 3-phase amperes, frequency, KW

2.12 FINISHES

A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

2.13 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine generator using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

    1. Tests: Comply with IEEE 115 and with NFPA 110, Level 1 Energy Converters.

B. Project-Specific Equipment Tests: Before shipment, factory test engine generator and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
2. Test generator, exciter, and voltage regulator as a unit.
3. Full load run.
4. Maximum power.
5. Voltage regulation.
6. Transient and steady-state governing.
7. Single-step load pickup.
8. Safety shutdown.
9. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
10. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.

B. Examine roughing-in for piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Owner no fewer than 14 working days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Owner's written permission.

3.3 INSTALLATION

A. Comply with NECA 1 and NECA 404.

B. Comply with packaged engine generator manufacturers' written installation and alignment instructions and with NFPA 110.

C. Equipment Mounting:

1. Install packaged engine generators on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in [redacted] "Cast-in-Place Concrete."
2. Coordinate size and location of concrete bases for packaged engine generators and remote radiators mounted on grade. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
3. Install packaged engine generator with elastomeric isolator pads restrained spring isolators having a minimum deflection of 1 inch on 4-inch- high concrete base. Secure engine generator to anchor bolts installed in concrete bases. Concrete base construction is specified in [redacted] "Seismic Controls for Electrical Systems."
4. Remote Radiators:

    a. Install remote radiator with elastomeric isolator pads restrained spring isolators on concrete base on grade.
    b. Coordinate size and location of roof curbs, equipment supports, and roof penetrations for remote radiators. These items are specified in [redacted] "Roof Accessories."

D. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

E. Cooling System: Install Schedule 40, black steel piping with welded joints for cooling water piping between engine generator and . Piping materials and installation requirements are specified in [redacted] "Hydronic Piping."

1. Install isolating thimbles where exhaust piping penetrates combustible surfaces. Provide a minimum of 9 inches clearance from combustibles.
2. Insulate cooling system piping and components according to requirements in [redacted] "HVAC Piping Insulation."

F. Exhaust System: Install Schedule 40, black steel piping with welded joints and connect to engine muffler. Install thimble at wall. Piping shall be same diameter as muffler outlet.

1. Install flexible connectors and steel piping materials according to requirements in [redacted] "Hydronic Piping Specialties."
2. Insulate muffler/silencer and exhaust system components according to requirements in [redacted] "HVAC Piping Insulation."
3. Install isolating thimbles where exhaust piping penetrates combustible surfaces with a minimum of 9-inch clearance from combustibles.

G. Drain Piping: Install condensate drain piping to muffler drain outlet with a shutoff valve, stainless-steel flexible connector, and Schedule 40, black steel pipe, the full size of the drain connection, with welded joints.

H. Gaseous Fuel Piping:

1. Natural gas piping, valves, and specialties for gas distribution are specified in [redacted] "Facility Natural Gas Piping."
2. LP gas piping, valves, and specialties for gas piping are specified in [redacted] "Facility Liquefied-Petroleum Gas Piping."

I. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

3.4 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping and specialties.

B. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.

C. Connect cooling-system water piping to engine generator and remote radiator with flexible connectors.

D. Connect engine exhaust pipe to engine with flexible connector.

E. Gaseous Fuel Connections:

1. Connect fuel piping to engines with a gate valve and union and flexible connector.
2. Install manual shutoff valve in a remote location to isolate gaseous fuel supply to the generator.
3. Vent gas pressure regulators outside building a minimum of 60 inches from building openings.

F. Ground equipment according to [redacted] "Grounding and Bonding for Electrical Systems."

G. Connect wiring according to [redacted] "Low-Voltage Electrical Power Conductors and Cables." Provide a minimum of one 90-degree bend in flexible conduit routed to the engine generator from a stationary element.

H. Balance single-phase loads to obtain a maximum of 10 percent unbalance between any two phases.

3.5 IDENTIFICATION

A. Identify system components according to [redacted] "Identification for HVAC Piping and Equipment" and [redacted] "Identification for Electrical Systems."

B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location.

3.6 FIELD QUALITY CONTROL

A. Testing Agency:

1. Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Tests and Inspections:

1. Perform tests recommended by manufacturer and each visual and mechanical inspection and electrical and mechanical test listed in the first two subparagraphs below as specified in the NETA ATS. Certify compliance with test parameters.

    a. Visual and Mechanical Inspection:

        1) Compare equipment nameplate data with drawings and specifications.
        2) Inspect physical and mechanical condition.
        3) Inspect anchorage, alignment, and grounding.
        4) Verify the unit is clean.

    b. Electrical and Mechanical Tests:

        1) Perform insulation-resistance tests in accordance with IEEE 43.

            a) Machines larger than 200 hp. Test duration shall be 10 minutes. Calculate polarization index.
            b) Machines 200 hp or less. Test duration shall be one minute. Calculate the dielectric-absorption ratio.

        2) Test protective relay devices.
        3) Verify phase rotation, phasing, and synchronized operation as required by the application.
        4) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.
        5) Perform vibration test for each main bearing cap.
        6) Verify correct functioning of the governor and regulator.

2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here, including, but not limited to, single-step full-load pickup test.
3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

    a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
    b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
    c. Verify acceptance of charge for each element of the battery after discharge.
    d. Verify that measurements are within manufacturer's specifications.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg. Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
7. Exhaust Emissions Test: Comply with applicable government test criteria.
8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases and verify that performance is as specified.
9. Harmonic-Content Tests: Measure harmonic content of output voltage at 25 percent and 100 percent of rated linear load. Verify that harmonic content is within specified limits.
10. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations 25 feet from edge of the generator enclosure, and compare measured levels with required values.

C. Coordinate tests with tests for transfer switches and run them concurrently.

D. Test instruments shall have been calibrated within the last 12 months, traceable to NIST Calibration Services, and adequate for making positive observation of test results. Make calibration records available for examination on request.

E. Leak Test: After installation, charge exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.

F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Remove and replace malfunctioning units and retest as specified above.

I. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

J. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

K. Infrared Scanning: After Substantial Completion, but not more than 60 days after final acceptance, perform an infrared scan of each power wiring termination and each bus connection while running with maximum load. Remove all access panels so terminations and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies terminations and connections checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.7 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.