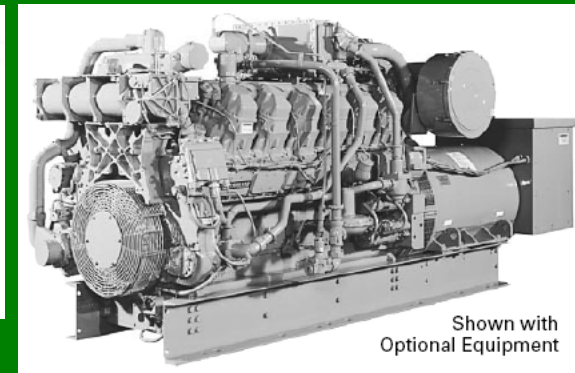
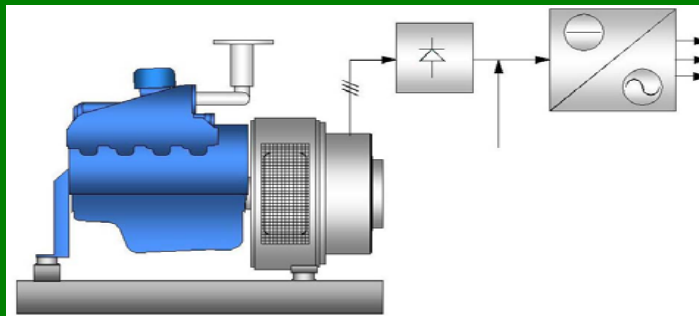


Con Edison

Department of Buildings Cogeneration Forum

September 24, 2009



Shown with
Optional Equipment

Con Edison's Infrastructure Delivers Energy to New York City And Westchester

- 3.3 million electric customers
- 1.1 million gas customers
- 1,800 steam customers
- 690 MW of regulated generation
- 36,000 miles of overhead transmission and distribution lines
- 94,000 miles of underground transmission and distribution lines
- 4,300 miles of gas mains
- 105 miles of steam mains and lines



Solar Distributed Generation

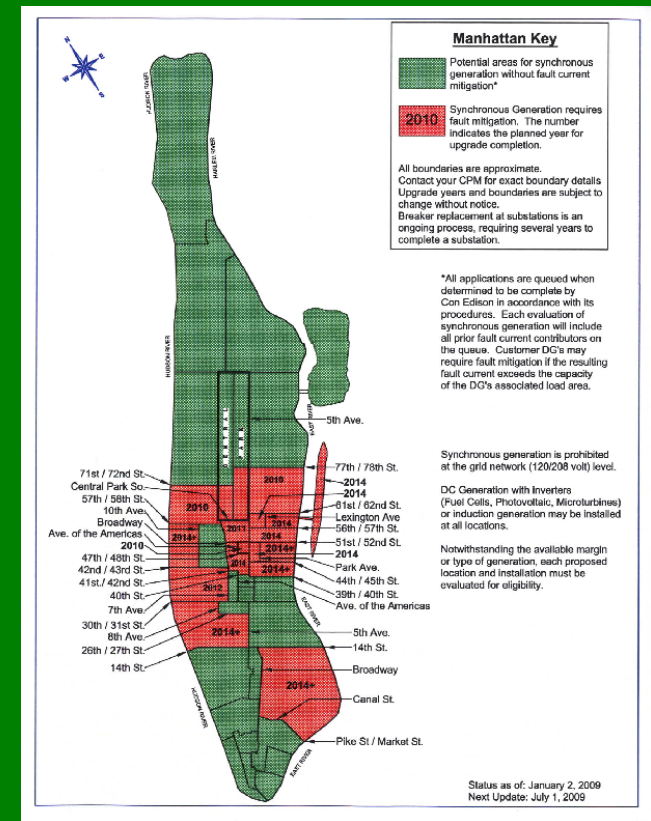


Coney Island Terminal (210kW)

Technology	MW	%
Internal Combustion Engine	118.0	46%
Combustion Turbine	82.3	32%
Steam Turbine	43.5	17%
Hydroelectric	2.0	1%
Fuel Cell	3.5	1%
Microturbine	5.0	2%
Photovoltaic	3.0	1%
Total	257	100%

Potential Impacts of DG on Electric and Gas Distribution Systems

- High pressure gas needed for Cogeneration equipment can impact gas distribution system pressure
- Increased fault duty on company circuit breakers
- Interference with the operation of protection systems
- Islanding
 - System restoration and Power system stability
- Power Quality
 - Harmonic distortion contributions and Voltage flicker



Potential Impacts of DG on Gas Distribution System

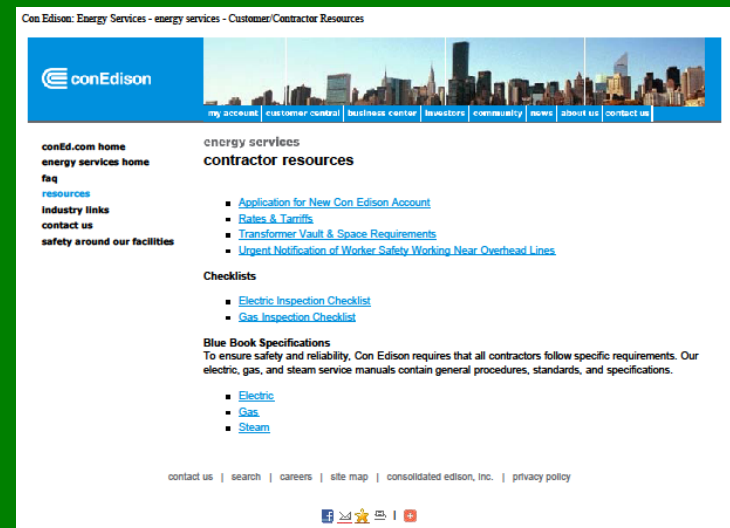
- Higher pressure gas to Cogeneration equipment can impact gas distribution system pressure
- Some areas have available high pressure (55 psi) – ConEdison and PSC ruling required
- Transmission Pressure not available to customers.
- For equipment requiring more than 7" wc –(1/4 psi)
 - Pressure switch trips gas booster if gas distribution system drops to 3" wc.
 - Check valve closes on back flow.
 - Gas Blue Book Standard G-2040

Online Information for Distributed Generation



- www.coned.com/es
- Single point of Contact – ‘Find my Representative’
- Gas and Electric ‘Blue Book’
- Application for gas and new electric service through ‘Project Center’

- www.coned.com/dg
- Technical requirements, tariffs, application forms, links to PSC, etc.
- DG Technical Expert and Ombudsman – provide additional support
- Interconnection Applications Process – Online early 2010



Electrical Interconnection Applications

- **Authorization letter**
- **Equipment Detail Application Form**
- **Standardized Contract**
- **Three Line Diagram**
- **Copy of the Manufacturer Data Sheets**
- **Operations and Verification Test Procedures**
- **Application Fee**

Three Line Diagram - Sample

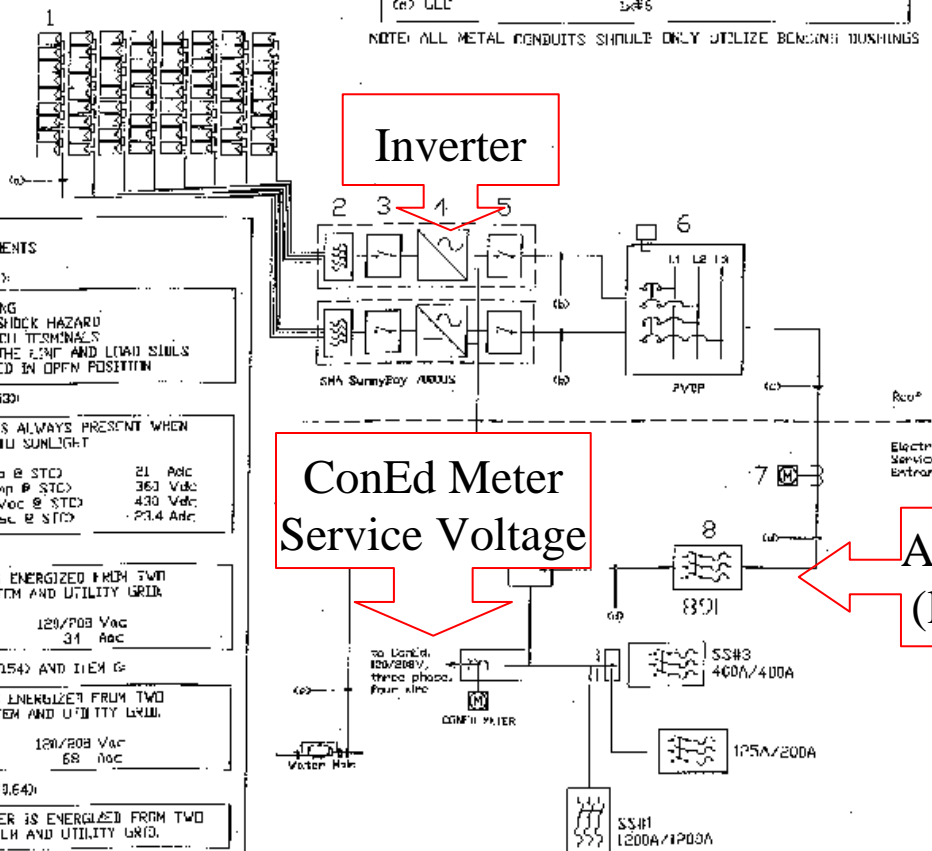
Wire Schedule

(a) ARRAY WIRING	2x#10 USE-2; #10 GROUND; TYPICAL
(b) INVERTER OUT	3x#8 THWN-2; #10 GROUND; TYPICAL
(c) PVDP OUT	1x#8 THWN-2; #5 GROUND
(d) AC DISCONNECT OUT	1x#2 THWN-2; #6 GROUND
(e) GEC	1x#5

NOTE: ALL METAL CONDUITS SHOULD ONLY UTILIZE BENDING BUSHINGS

Equipment Schedule

- (1) PV Array: 8 Strings of 9 SunPower SPR-210 modules
- (2) Fused 4-string combiner box with 15A fuse, part of inverter assembly
- (3) 60A, 60Vdc, disconnect, part of inverter assembly
- (4) SMA SunnyBoy 7000US
- (5) AC disconnect, part of inverter assembly
- (6) 120/240V, 125A electrical panel, w/ two 50A two-pole circuit breaker for the pv system and a SDSA2630 Secondary Surge Arrestor
- (7) 3-phase PV-designated power-meter
- (8) 240V, 120A fused AC disconnect, w/ 200A Class R fuses, SPD I3B3



Inverter - SMA SunnyBoy 7000US

Maximum Output Power	7000 W
AC Output Voltage	208 VAC
Maximum Output Current	31 A
DC Maximum Input Voltage	600 VDC
DC Maximum Current	30 A

Module - SunPower SPR-210

P _{max}	210 W
V _{mp}	40 V
I _{mp}	5.25 A
V _{oc}	47.7 V
I _{sc}	5.85 A

NFC LABELING REQUIREMENTS

DC DISCONNECTS (690.53)

WARNING: ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS IN BOTH THE LINE AND LOAD SIDES
MAY BE ENERGIZED IN OPEN POSITION

DC DISCONNECTS (690.53)

WARNING: DC VOLTAGE IS ALWAYS PRESENT WHEN
MODULES ARE EXPOSED TO SUNLIGHT

OPERATING CURRENT (I _{mp} @ STC)	21 Aac
OPERATING VOLTAGE (V _{mp} @ STC)	360 Vdc
MAX SYSTEM VOLTAGE (V _{oc} @ STC)	430 Vdc
MAX SYSTEM CURRENT (I _{sc} @ STC)	23.4 Aac

INVERTER (690.54)

WARNING: DISCONNECT IS ENERGIZED FROM TWO
SOURCES -- SOLAR SYSTEM AND UTILITY GRID

AC OPERATING VOLTAGE	120/208 Vac
MAXIMUM AC CURRENT	31 Aac

AC DISCONNECT 690.54 AND 110.6

WARNING: DISCONNECT IS ENERGIZED FROM TWO
SOURCES -- SOLAR SYSTEM AND UTILITY GRID

AC OPERATING VOLTAGE	120/208 Vac
MAXIMUM AC CURRENT	68 Aac

AC CIRCUIT BREAKER (690.64)

WARNING: CIRCUIT BREAKER IS ENERGIZED FROM TWO
SOURCES -- SOLAR SYSTEM AND UTILITY GRID

Show 'New' and 'Existing'

Indicate Field Labeling

Note: SunPower POSITIVE solar grounded.
Positive source and output circuits conductors are not switched. Switch negative conductors only.

PV - BASIC ELECTRICAL SCHEMATIC

DESIGNED BY
R.S.

DRAWN BY
R.S.

CHECKED BY

APPROVED BY

SIZE
A

DWG NO.
PV 1.3

DATE: Jun/22/2007

SHEET 1 OF 1

NO. DATE
RS AUG/27/07
RS Nov/12/07
RS Dec/12/07

Electrical Interconnection Application Process

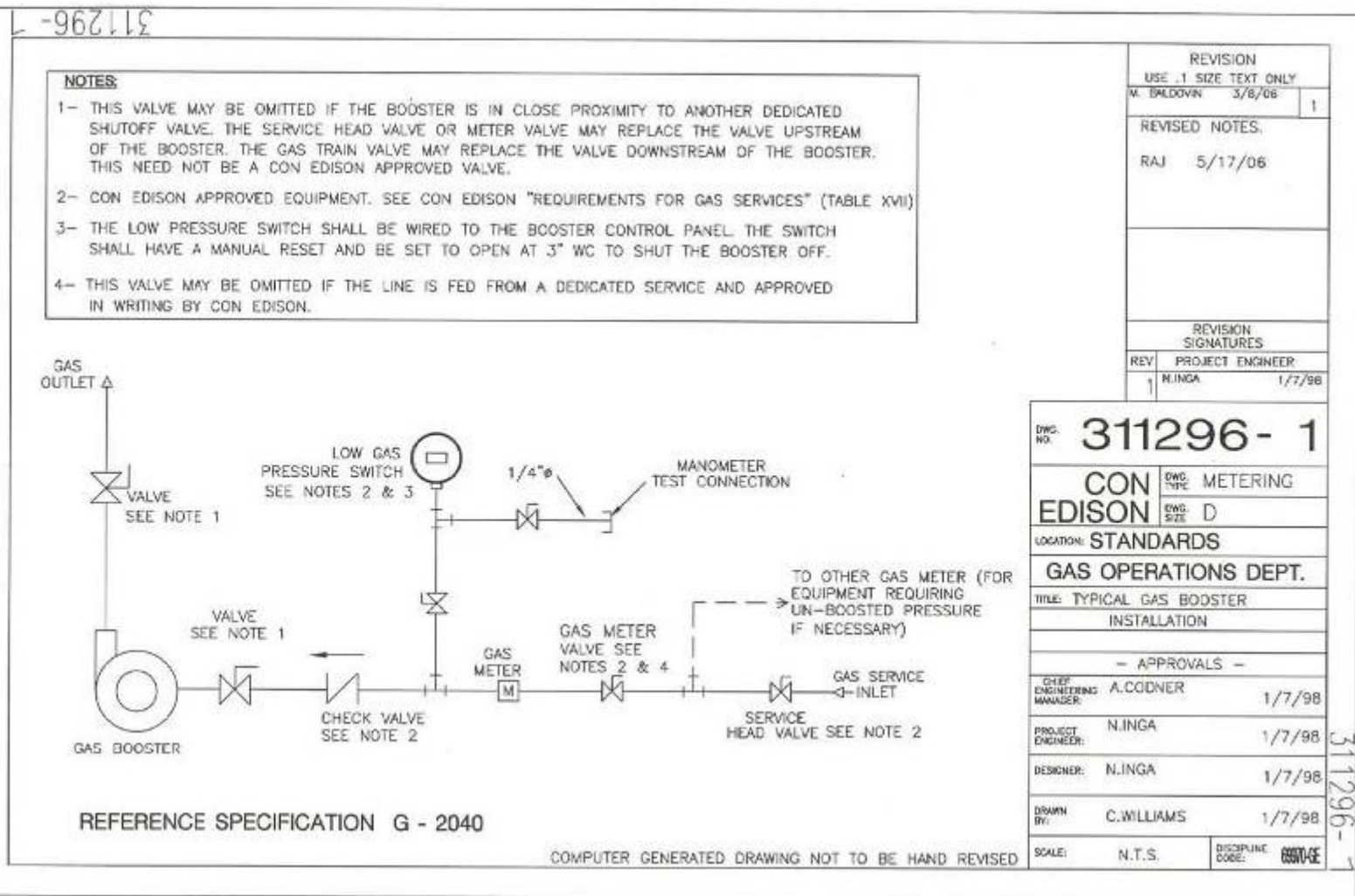
- Application review
 - Whether complete
 - Whether meets requirements of the Standardized Interconnections Requirements (SIR) and the Utility
- Cost Estimate for the Coordinated Electric System Interconnection Review (CESIR)
 - Applicant Commits to CESIR
 - Utility Completes CESIR
- Construction
- Metering installed once installation is complete
- System Test
- Final Acceptance Letter and Cost reconciliation
- Issued once verification test is complete and approved

[http://www.dps.state.ny.us/Final SIR 02-12-09 Clean.pdf](http://www.dps.state.ny.us/Final_SIR_02-12-09_Clean.pdf)

Cogeneration Gas Application Process

- File online through Project Center.
- Customer Project Manager (CPM) is single point of contact.
 - Load letter to Energy Services
 - Rider H applications
 - Load factor requirement
 - Separately metered Cogeneration Rate requires separate dedicated meter run
- Timing Issues with Gas Turn on for testing/DOB/FDNY approvals.


Typical Gas Booster Installation - Specification G-2040



Web Based Application – what to expect

- **Already exists for new and upgraded Electric and Gas service**
- **Registration – for Customer and Contractor**
- **Application documents**
- **Application tracking and contact information**
 - **Milestones**
 - **Status and Responsibility** - who is responsible for the next milestone, customer / contractor or Con Edison.
- **Expected in place for CoGen January 2010**

Web Based Application – what to expect


Energy Services **Project Center**
✕

Case #3150

[Show related cases](#)
Close Window


Date submitted: 9/21/2009






Customer Name: Steven Tyler

Service Address: 23 EAST HOUSTON ST
NEW YORK, NY 10909

Request Type: Distributed Generation

Status: Design Review

Customer Rep: Michael Rollins (212) 460-6101 

Request Received Electronically

Application Filing

Design Review

Project Installation

Verification, Testing and Project Completion

Milestones
What Con Edison Has
Case Contacts
Forms
Attachments
Original Request

Milestone	Responsible	Completion Date
Request Received Electronically Description +	Contractor/Customer	09/21/2009
Application Filing Description +	Contractor/Customer	09/21/2009
Design Review Description +	Contractor/Customer	09/21/2009
Project Installation Description -	ConEdison	09/21/2009

Description	Responsible Party	Planned Comp Date	Actual Comp Date	Status
Contract for interconnection received	Customer	9/24/2009	9/21/2009	Completed
Advance payment received	Customer	9/24/2009	9/21/2009	Completed
Project Construction in accordance with Con Ed Spec	Customer	9/24/2009	9/21/2009	Completed
Verification, Testing and Project Completion Description +	ConEdison			In Progress

Con Edison Incentives for Cogeneration

- Favorable Gas and Electric Rates for High Load Factor Cogen
- Ability to participate in Targeted, Economic, and Emergency Demand Side Management and Energy Efficiency Programs
- Specifications under development for participation in NYISO Ancillary Markets – telemetry through Transmission Owner.
- Net metering extended to CHP and Fuel Cells under 10kW.
- Energy Cost Savings Program – City incentive through Utility

THANK YOU!!

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