City of FRESNO **REPORT TO THE CITY COUNCIL**

AGENDA ITEM NO.	1 J
COUNCIL MEETING:	01/17/13
APPROVED BY	
DEPARTMENT DIRECTOR	
CITY MANAGER	

January 17, 2013

FROM: PATRICK N. WIEMILLER, Director
Department of Public Utilities

BY: MARTIN A. QUERIN, P.E., Assistant Director
Department of Public Utilities – Water Division

SUBJECT: APPROVE INTERCONNECTION AGREEMENT WITH PG&E FOR EMERGENCY GENERATION FACILITIES AT THE T-3 WATER STORAGE AND PACKAGE SURFACE WATER TREATMENT FACILITY AND AUTHORIZE THE DIRECTOR OF PUBLIC UTILITIES OR HIS DESIGNEE TO SIGN ON BEHALF OF THE CITY

RECOMMENDATIONS

Staff recommends that the City Council:

1. Approve the Interconnection Agreement with PG&E for emergency generation facilities at the T-3 Water Storage and Package Surface Water Teatment Facility, and

2. Authorize the Director of Public Utilities or his designee to sign on behalf of the City of Fresno.

EXECUTIVE SUMMARY

The T-3 Water Storage and Package Surface Water Treatment Facility (T-3 Facility) is anticipated to operate in meeting summer peak water demand periods and area fire flow requirements. To minimize potable water supply impacts in the event of a power outage, an onsite emergency generator will be utilized. When such an event does occur and PG&E distribution system (grid) power has been restored, the specialized design of this generator allows for a 'seamless' transition back to the grid without further disruption to facility operations. This seamless transition is accomplished through a short (100 millisecond) connection between the PG&E distribution grid and the generator. As is typical for these types of connections, and for protection of any potential power surges or transient anomalies to the grid, execution of a standard Facility Interconnection Ageement with PG&E is required.

BACKGROUND

Construction of the T-3 Facility is complete. This site includes a 3-million gallon (3MG) water storage tank and package surface water treatment system with an initial capacity to treat 4-million gallons per day (4MGD). The ultimate water treatment build-out capacity of this facility will be 8MGD. Construction of the T-3 Facility is necessary in meeting area peak demand periods and fire-flow requirements.

Although the T-3 Facility maintains the intent and capability of un-manned (remote) operation, the California Department of Public Health (CDPH) will require the facility to be manned for the first year prior to consideration for approval of any form of remote operation.

Inclusive in design for either manned or unmanned operations were considerations for an on-site emergency power generator in the event of a power outage. The initial impact of such occurances is an immediate

interruption to facility operations and customer service. Although the emergency generator will supply enough power to continue treatment and distribution of potable water, proper sequence for facility restart is essential.

Typically, when PG&E power is restored to the grid, a second facility shutdown would be required for reconnection to PG&E services. To maintain customer service and avoid a second interruption, design considerations for transition of power back to PG&E include a "Momentary Parallel" (100 millisecond) connection to the distribution grid. In this manner, there is a seamless 'hand-off' of power back to the grid without further disruption to facility operations.

Within the short lifespan of this power "hand-off" connection, the alternating currents of both the grid and generator must be synchronized to within one percent (1%) difference. Although all design and physical precautions have been implemented, any significant variance of current during this time may be detrimental to the generator and/or power distribution grid.

Prior to utilization of this type of Momentary Parallel type connection, PG&E must enter into a 'connection specific' agreement with the City (PG&E Agreement Form 79-973; "Generating Facility Interconnection Agreement for Non-Export Generating Facilities"), to account for any potential power anomalies that may occur.

The Agreeement has been 'approved as to form' by the City Attorney's Office, and approved for insurance requirements by the Risk Management Division. Upon approval of this agreement, and to meet project completion timelines, PG&E will schedule their final "pre-parallel" inspections to allow and authorize parallel operation of the T-3 Facility.

FISCAL IMPACT

No additional funding relative to this Report is anticipated.

Attachment(s):

- PG&E Form 79-973; Generating Facility Interconection Agreement for Non-Export Generating Facilities

Pacific Gas and Electric Company

WE DELIVER ENERGY.

PG&E GENERATING FACILITY INTERCONNECTION AGREEMENT FOR NON-EXPORT GENERATING FACILITIES

This *Generating Facility Interconnection Agreement for Non-Export Generating Facilities* (Agreement) is entered into by and between City Of Fresno (Producer), and Pacific Gas and Electric Company (PG&E) a California Corporation. Producer and PG&E are sometimes also referred to in this Agreement jointly as "Parties" or individually as "Party." In consideration of the mutual promises and obligations stated in this Agreement and its attachments, the Parties agree as follows:

1. SCOPE AND PURPOSE

This Agreement provides for Producer to interconnect and operate a Non-Export Generating Facility in parallel with PG&E's Distribution System to serve the electrical loads connected to the electric service account that PG&E uses to interconnect Producer's Generating Facility (or, where permitted under Section 218 of the California Public Utilities Code (PUC), the electric loads of an on-site or neighboring party lawfully connected to Producer's Generating Facility through Producer's circuits).

2. SUMMARY AND DESCRIPTION OF PRODUCER'S GENERATING FACILITY

2.1 A description of the Generating Facility, including a summary of its significant components and a single-line diagram showing the general arrangement of how Producer's Generating Facility and loads are interconnected with PG&E's Distribution System, are attached to and made a part of this Agreement. (Supplied by Producer as Appendix A).

2.2 Generating Facility identification number: 60G82289 (Assigned by PG&E).

2.3 Producer's electric service account number: 2506515764 (Assigned by PG&E).

2.4 Name and address used by PG&E to locate the electric service account used to interconnect the Generating Facility with PG&E's Distribution System:

Name: City Of Fresno
Address: 6736 E Dakota Ave.
City/Zip Code: Fresno, CA 93727

2.5 The Gross Nameplate Rating of the Generating Facility is: 450 kW.

2.6 The Net Nameplate Rating of the Generating Facility is 450 kW.

2.7 The expected annual energy production of the Generating Facility is n/a kWh.

2.8 For the purpose of securing the Competition Transition Charge exemption available under Section 372 of the California Public Utilities Code (PUC), Producer hereby declares that the Generating Facility O does / Ø does not meet the requirements for Cogeneration as such term is used in Section 216.6 of the California Public Utilities Code.

This page intentionally left blank.

2.9 The Generating Facility's expected date of Initial Operation is 12/31/12. The expected date of Initial Operation shall be within two years of the date of this Agreement.

3. DOCUMENTS INCLUDED; DEFINED TERMS

3.1 This Agreement includes the following exhibits which are specifically incorporated herein and made a part of this Agreement.

Appendix A- Description of Generating Facility and Single-Line Diagram (Supplied by Producer).

Appendix B- Copies of Rules 2 and 21 and other selected rules and tariffs of PG&E (Supplied by PG&E).

Appendix C- A Copy of *PG&E's Agreement for Installation of Allocation of Special Facilities for Parallel Operation of Nonutility-Owned Generation and/or Electrical Standby Service* (Form 79-280) (Special Facility Agreement), if applicable, (Formed by the Parties).

3.2 When initially capitalized, whether in the singular or in the plural, the terms used herein shall have the meanings assigned to them either in this Agreement or in PG&E's Rule 21, Section C.

4. TERM AND TERMINATION

4.1 This Agreement shall become effective as of the last date entered in Section 16, below. The Agreement shall continue in full force and effect until the earliest date that one of the following events occurs:

(a) The Parties agree in writing to terminate the Agreement.

(b) Unless otherwise agreed in writing by the Parties, at 12:01 A.M. on the day following the date the electric service account through which Producer's Generating Facility is interconnected to PG&E's Distribution System is closed or terminated.

(c) At 12:01 A.M. on the 61st day after Producer or PG&E provides written Notice pursuant to Section 9 below to the other Party of Producer's or PG&E's intent to terminate this Agreement.

4.2 Producer may elect to terminate this Agreement pursuant to the terms of Section 4.1(c) for any reason. PG&E may elect to terminate this Agreement pursuant to the terms of Section 4.1(c) for one or more of the following reasons:

(a) A change in applicable rules, tariffs, and regulations, as approved or directed by the Commission, or a change in any local, state or federal law, statute or regulation, either of which materially alters or otherwise affects PG&E's ability or obligation to perform PG&E's duties under this Agreement; or,

(b) Producer fails to take all corrective actions specified in PG&E's Notice that Producer's Generating Facility is out of compliance with the terms of this Agreement within the time frame set forth in such Notice; or,

(c) Producer fails to interconnect and operate the Generating Facility per the terms of this Agreement prior to 120 days after the date set forth in Section 2.9, above, as the Generating Facility's expected date of Initial Operation; or,

(d) Producer abandons the Generating Facility. PG&E shall deem the Generating Facility to be abandoned if PG&E determines, in its sole opinion, the Generating Facility is non-operational and Producer does not provide a substantive response to PG&E Notice of its intent to terminate this Agreement as a result of Producer's apparent abandonment of the Generating Facility affirming Producer's intent and ability to continue to operate the Generating Facility.

4.3 Notwithstanding any other provisions of this Agreement, PG&E shall have the right to unilaterally file with the Commission, pursuant to the Commission's rules and regulations, an application to terminate this Agreement.

4.4 Any agreements attached to and incorporated into this Agreement shall terminate concurrently with this Agreement unless the Parties have agreed otherwise in writing.

5. GENERATING FACILITY, OPERATION AND CERTIFICATION REQUIREMENTS

5.1 The electric power produced by Producer's Generating Facility shall be used solely to serve electrical loads connected to the electric service account that PG&E uses to interconnect Producer's Generating Facility (or, where permitted under Section 218 of the PUC, the electric loads of an on-site or neighboring party lawfully connected to Producer's Generating Facility through Producer's circuits). Producer shall attempt in good faith to regulate the electric power output of Producer's Generating Facility so as to prevent the flow of electric energy from the Generating Facility to PG&E's electric system. Unless otherwise agreed upon in writing by the Parties, this Agreement does not provide for, nor otherwise require PG&E to receive, purchase, transmit, distribute, or store the electrical power produced by Producer's Generating Facility.

5.2 If Producer declares that its Generating Facility meets the requirements for Cogeneration as such term is used in Section 216.6 of the PUC (or any successor definition of Cogeneration) (Cogeneration Requirements), Producer warrants that, beginning on the date of Initial Operation and continuing throughout the term of this Agreement, its Generating Facility shall continue to meet such Cogeneration Requirements. If Producer becomes aware that its Generating Facility has ceased to meet the Cogeneration Requirements, Producer shall promptly provide PG&E with Notice of such change pursuant to Section 9.1 below. If at any time during the term of this Agreement PG&E determines in its sole discretion that Producer's Generating Facility may no longer meet the Cogeneration Requirements, PG&E may require Producer to provide evidence that its Generating Facility continues to meet the Cogeneration Requirements within 15 business days of PG&E's request

for such evidence. Additionally, PG&E may periodically (typically, once per year) inspect Producer's Generating Facility and/or require documentation from Producer to monitor the Generating Facility's compliance with Section 216.6 of the PUC. If PG&E determines in its sole judgment that Producer either failed to provide evidence in a timely manner or that it provided insufficient evidence that its Generating Facility continues to meet the Cogeneration Requirements, then the Cogeneration status of the Generating Facility shall be deemed ineffective until such time as Producer again demonstrates to PG&E's reasonable satisfaction that the Generating Facility meets the requirements for a Cogeneration facility (the Status Change).

5.2.1 PG&E shall revise its records and the administration of this Agreement to reflect the Status Change and provide Notice to Producer of the Status Change pursuant to Section 9.1 below. This Notice shall specify the effective date of the Status Change. This date shall be the first day of the calendar year for which PG&E determines in its sole discretion that the Generating Facility first ceased to meet the Cogeneration Requirements. PG&E's Notice shall include an invoice for Competition Transition Charges (CTCs) that were not previously billed during the period between the effective date of the Status Change and the date of the Notice in reliance upon Producer's representations that the Generating Facility complied with the Cogeneration Requirements and therefore was eligible for the exemption from CTCs available under Section 372 of the PUC.

5.2.2 Any amounts to be paid or refunded by Producer, as may be invoiced by PG&E pursuant to the terms of this Section 5.2, shall be paid to PG&E within 30 days of Producer's receipt of such invoice.

6. INTERCONNECTION FACILITIES

6.1 Producer and/or PG&E, as appropriate, shall provide Interconnection Facilities that adequately protect PG&E's Distribution System, personnel, and other persons from damage or injury, which may be caused by the operation of Producer's Generating Facility.

6.2 Producer shall be solely responsible for the costs, design, purchase, construction, operation, and maintenance of the Interconnection Facilities that Producer owns.

6.3 If the provisions of PG&E's Rule 21, or any other tariff or rule approved by the Commission, requires PG&E to own and operate a portion of the Interconnection Facilities, Producer and PG&E shall promptly execute an Special Facilities Agreement that establishes and allocates responsibility for the design, installation, operation, maintenance, and ownership of the Interconnection Facilities. This Special Facilities Agreement shall be attached to and made a part of this Agreement as Appendix C.

7. LIMITATION OF LIABILITY

Each Party's liability to the other Party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either Party be liable to the other Party for any indirect, special, consequential, or punitive damages of any kind whatsoever.

8. INSURANCE

8.1 In connection with Producer's performance of its duties and obligations under this Agreement, Producer shall maintain, during the term of this Agreement, general liability insurance with a combined single limit of not less than:

(a) Two million dollars ($2,000,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is greater than one hundred (100) kW;

(b) One million dollars ($1,000,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is greater than twenty (20) kW and less than or equal to one hundred (100) kW; and

(c) Five hundred thousand dollars ($500,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is twenty (20) kW or less.

(d) Two hundred thousand dollars ($200,000) for each occurrence if the Gross Nameplate Rating of Producer's Generating Facility is ten (10) kW or less and Producer's Generating Facility is connected to an account receiving residential service from PG&E.

Such general liability insurance shall include coverage for "Premises-Operations, Owners and Contractors Protective, Products/Completed Operations Hazard, Explosion, Collapse, Underground, Contractual Liability, and Broad Form Property Damage including Completed Operations."

8.2 The general liability insurance required in Section 8.1 shall, by endorsement to the policy or policies, (a) include PG&E as an additional insured; (b) contain a severability of interest clause or cross-liability clause; (c) provide that PG&E shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for payment of premium for such insurance; and (d) provide for thirty (30) calendar days' written notice to PG&E prior to cancellation, termination, alteration, or material change of such insurance.

8.3 If Producer's Generating Facility is connected to an account receiving residential service from PG&E and the requirement of Section 8.2(a) prevents Producer from obtaining the insurance required in Section 8.1, then upon Producer's written Notice to PG&E in accordance with Section 9.1, the requirements of Section 8.2(a) shall be waived.

8.4 Evidence of the insurance required in Section 8.2 shall state that coverage provided is primary and is not in excess to or contributing with any insurance or self-insurance maintained by PG&E.

8.5 Producer agrees to furnish the required certificates and endorsements to PG&E prior to Initial Operation. PG&E shall have the right to inspect or obtain a copy of the original policy or policies of insurance.

8.6 If Producer is self-insured with an established record of self-insurance, Producer may comply with the following in lieu of Sections 8.1 through 8.4:

(a) Producer shall provide to, PG&E, at least thirty (30) calendar days prior to the date of Initial Operation, evidence of an acceptable plan to self-insure to a level of coverage equivalent to that required under Section 8.1.

(b) If Producer ceases to self-insure to the level required hereunder, or if Producer are unable to provide continuing evidence of Producer's ability to self-insure, Producer agrees to immediately obtain the coverage required under Section 8.1.

8.7 All insurance certificates, statements of self-insurance, endorsements, cancellations, terminations, alterations, and material changes of such insurance shall be issued and submitted via email or fax to the following:

Pacific Gas and Electric Company
c/o EXIGIS LLC
support@exigis.com
Fax: 646-755-3327

9. NOTICES

9.1 Any written notice, demand, or request required or authorized in connection with this Agreement (Notice) shall be deemed properly given if delivered in person or sent by first class mail, postage prepaid, to the person specified below:

If to PG&E: Pacific Gas and Electric Company
Attention: Generation Interconnection Services- Contract Management
245 Market Street
Mail Code N7L
San Francisco, California 94105-1702

If to Producer: Producer Name: City Of Fresno
Address: 6736 E. Dakota Ave
City: Fresno, CA
Phone: (559) 621-7116
FAX: (__) _____

9.2 A Party may change its address for Notices at any time by providing the other Party Notice of the change in accordance with Section 9.1.

9.3 The Parties may also designate operating representatives to conduct the daily communications, which may be necessary or convenient for the administration of this Agreement. Such designations, including names, addresses, and phone

numbers may be communicated or revised by one Party's Notice to the other.

10. REVIEW OF RECORDS AND DATA

10.1 PG&E shall have the right to review and obtain copies of Producer's operations and maintenance records, logs, or other information such as, unit availability, maintenance outages, circuit breaker operation requiring manual reset, relay targets and unusual events pertaining to Producer's Generating Facility or its interconnection with PG&E's Distribution System.

10.2 Producer authorizes to release to the California Energy Commission (CEC) information regarding Producer's facility, including customer name, location, size, and operational characteristics of the unit, as request6ed from time to time pursuant to the CEC's rules and regulations.

11. ASSIGNMENT

Producer shall not voluntarily assign its rights nor delegate its duties under this Agreement without PG&E's written consent. Any assignment or delegation Producer makes without PG&E's written consent shall not be valid. PG&E shall not unreasonably withhold its consent to Producer's assignment of this Agreement.

12. NON-WAIVER

None of the provisions of this Agreement shall be considered waived by a Party unless such waiver is given in writing. The failure of a Party to insist in any one or more instances upon strict performance of any of the provisions of this Agreement or to take advantage of any of its rights hereunder shall not be construed as a waiver of any such provisions or the relinquishment of any such rights for the future, but the same shall continue and remain in full force and effect.

13. GOVERNING LAW, JURISDICTION OF COMMISSION, INCLUSION OF PG&E's TARIFF SCHEDULES AND RULES

13.1 This Agreement shall be interpreted, governed, and construed under the laws of the State of California as if executed and to be performed wholly within the State of California without giving effect to choice of law provisions that might apply to the law of a different jurisdiction.

13.2 This Agreement shall, at all times, be subject to such changes or modifications by the Commission as it may from time to time direct in the exercise of its jurisdiction.

13.3 The interconnection and services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the Tariff Schedules and Rules applicable to the electric service provided by, PG&E, which Tariff Schedules and Rules are hereby incorporated into this Agreement by this reference.

13.4 Notwithstanding any other provisions of this Agreement, PG&E shall have the right to unilaterally file with the Commission, pursuant to the Commission's rules and regulations, an application for change in rates, charges, classification, service, tariff or rule or any agreement relating thereto.

14. AMENDMENT AND MODIFICATION

This Agreement can only be amended or modified in writing, signed by both Parties.

15. ENTIRE AGREEMENT

This Agreement, including any incorporated Tariff Schedules and rules, contains the entire agreement and understanding between the Parties, their agents, and employees as to the subject matter of this Agreement. Each party also represents that in entering into this Agreement, it has not relied on any promise, inducement, representation, warranty, agreement or other statement not set forth in this Agreement or in the incorporated tariff schedules and rules.

16. SIGNATURES

IN WITNESS WHEREOF, the Parties hereto have caused two originals of this Agreement to be executed by their duly authorized representatives. This Agreement is effective as of the last date set forth below.

PRODUCER'S NAME		PACIFIC GAS AND ELECTRIC COMPANY	
By:	_____	By:	_____
Name:	_____	Name:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____

APPENDIX A
DESCRIPTION OF GENERATING FACILITY
AND SINGLE-LINE DIAGRAM,
(Provided by Producer)

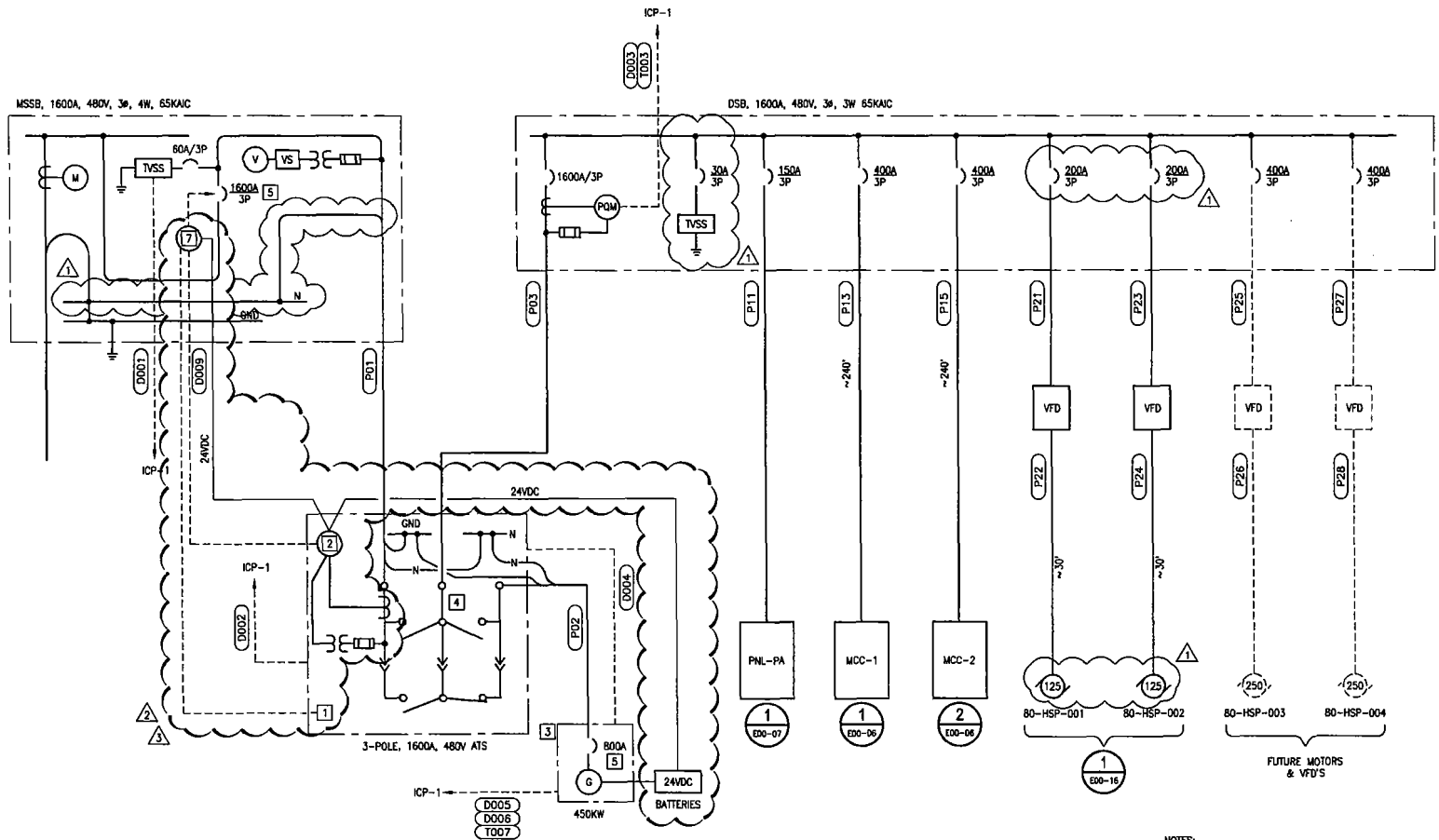
APPENDIX 'A'

DESCRIPTION OF GENERATING FACILITY

The City of Fresno will utilize a Cummins 450 kW (Model DFEJ 60 Hz) Generator for emergency use during times of power outages at the T-3 Water Storage and Package Surface Water Treatment Facility at 6736 E. Dakota Avenue, Fresno, CA, 93727.

This emergency generator will engage during times of power outages and has been specifically structured, designed and approved for Momentary Parallel Operation (100 milliseconds) with P.G.& E's distribution system for seamless transition upon re-establishment of distribution system power.

Single line diagrams and specifics related to the generating facility are attached hereto for reference.



NOTES:

1. STAGE 2 BACKUP SHUNT TRIP PROTECTION.
2. REVERSE POWER PROTECTIVE RELAY, BASLER BE1-IPS100. SHUNT TRIPS UTILITY DISCONNECT CIRCUIT BREAKER UPON REVERSE POWER.
3. NEUTRAL SHALL NOT BE BONDED TO GENERATOR FRAME.
4. NEUTRAL SHALL NOT BE BONDED TO GND BUS IN ATS.
5. WITH GROUND FAULT DETECTION SYSTEM.
6. SEE GENERAL NOTE 5 ON DWG E00-01.
7. SHUNT TRIP UNIT.

MSSB AND DSB SINGLE LINE DIAGRAM [6]

1 / –

04/11/12

REV	DATE	DESCRIPTION	APPR
4	4/11/12	AS SHOWN IN CLOUDS	PLT
3	3/8/12	AS SHOWN IN CLOUDS	PLT
2	11/19/10	REVISIONS PER ADDENDUM 2	PLT

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DESIGNED BY: PT
DRAWN BY: DD
CHECKED BY: –
DATE: Apr-12

PROJECT ENGINEER
REG. NUMBER: EXP. DATE
PROJECT NUMBER: 60061279
CADD STANDARDS: AECOM--BOYLE

REGISTERED PROFESSIONAL ENGINEER — PHILIP L. TOY — No. E12945 — Exp. 9/30/12 — STATE OF CALIFORNIA

AECOM

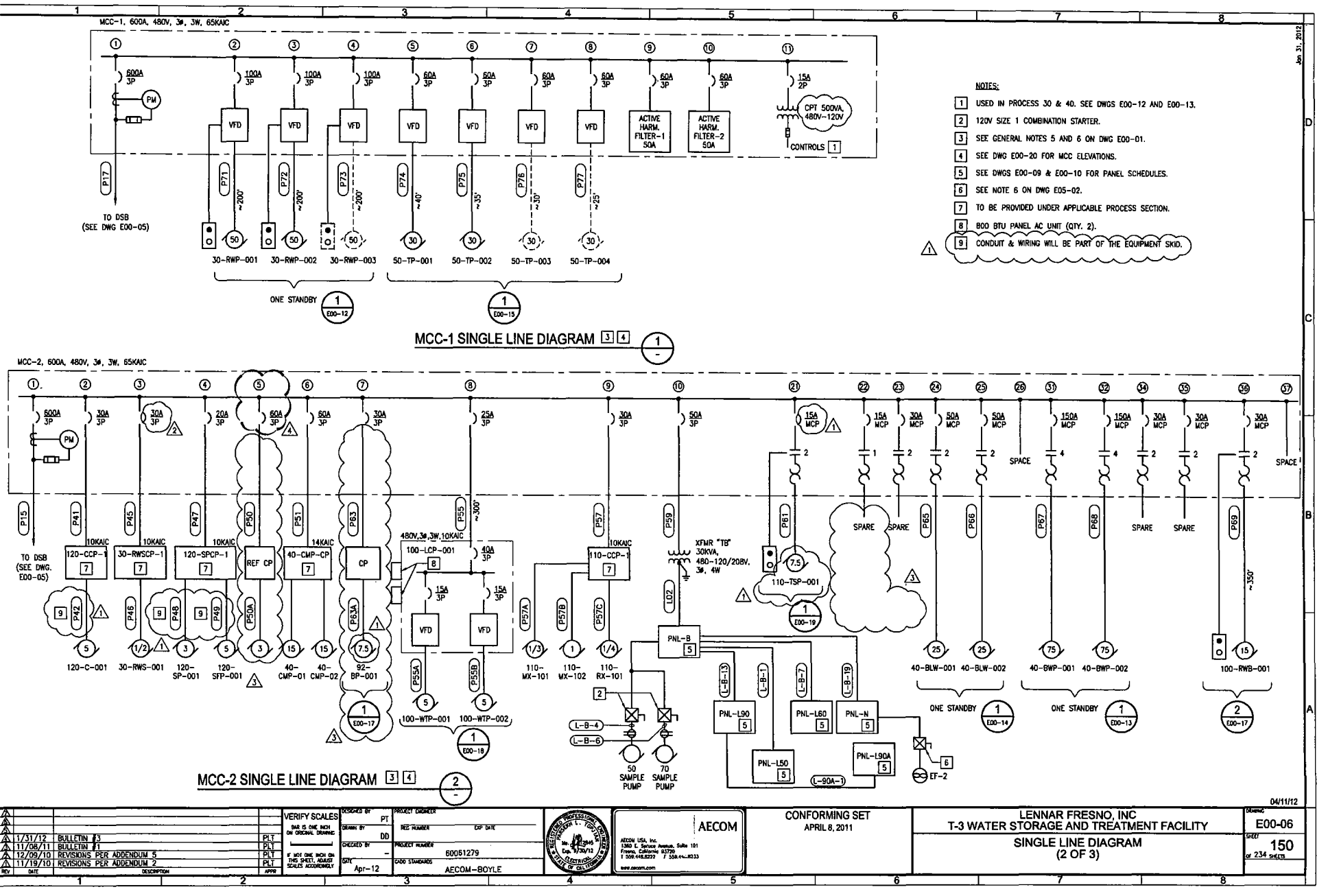
AECOM USA, Inc.
1300 E. Shaw Avenue, Suite 101
Fresno, California 93720
T 559.448.8222 F 559.448.8233
www.aecom.com

CONFORMING SET
APRIL 8, 2011

LENNAR FRESNO, INC
T-3 WATER STORAGE AND TREATMENT FACILITY

SINGLE LINE DIAGRAM
(1 OF 3)

DRAWING: E00-05-R3
SHEET: 149
OF 234 SHEETS



REV	DATE	DESCRIPTION	APPR
3	1/31/12	BULLETIN #3	PLT
2	11/08/11	BULLETIN #1	PLT
1	12/09/10	REVISIONS PER ADDENDUM 5	PLT
0	11/19/10	REVISIONS PER ADDENDUM 2	PLT

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DESIGNED BY PT
DRAWN BY DD
CHECKED BY -
DATE Apr-12

PROJECT ENGINEER
REG NUMBER EXP DATE
PROJECT NUMBER 60061279
CADD STANDARDS AECOM-BOYLE

AECOM
AECOM USA, Inc.
1360 E. Spruce Avenue, Suite 101
Fresno, California 93720
T 559.448.8222 F 559.44x.8233
www.aecom.com

CONFORMING SET
APRIL 8, 2011

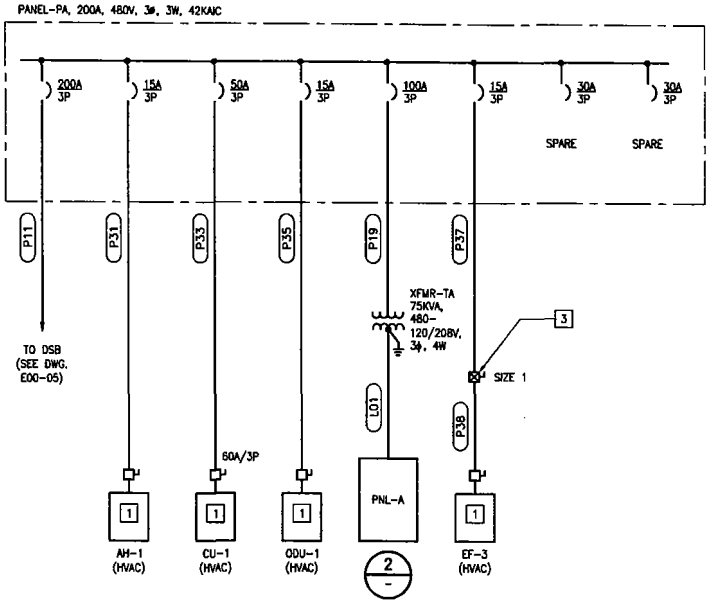
LENNAR FRESNO, INC
T-3 WATER STORAGE AND TREATMENT FACILITY

SINGLE LINE DIAGRAM
(2 OF 3)

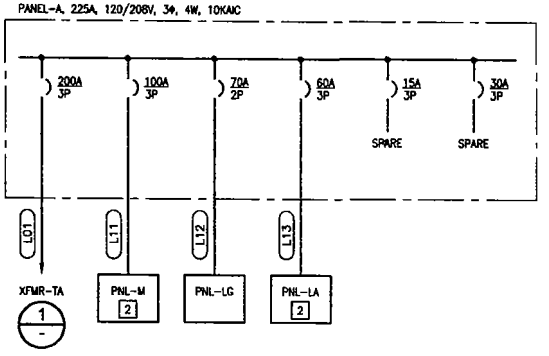
04/11/12

DRAWING E00-06
SHEET 150 OF 234 SHEETS

Jan 31, 2012



PANEL-PA SINGLE LINE DIAGRAM 1



PANEL-A SINGLE LINE DIAGRAM 2

NOTES:

1. SEE DWG. M-3 FOR HVAC EQUIPMENT SIZES.
2. SEE DWGS E00-09 & E00-10 FOR PANEL SCHEDULES.
3. SEE NOTE 9 ON DWG E00-22.

DESIGNATION: PNL-LG	FED FROM: PANEL A								MOUNTING: SURFACE								ENCLOSURE: NEMA 1
BUS (Amps): 100	VOLTAGE, Ph, W: 120/208, 1-Ph, 3-W								MAIN (Amps): 60 / 2P							KAIC: 10	TOP or BOTTOM FEED: SEE PLANS
LOCATION: GENERATOR ENCLOSURE									ADDITIONAL FEATURE:								
DESCRIPTION	LOAD VA			NOTES	QTY	BRKR		CKT	BRKR		QTY	NOTES	LOAD VA			DESCRIPTION
	A	B				TRIP	P	REF	P	TRIP			A	B		
LIGHTING	50				2	20	1	1	2	60	1		4,000			JACKET WATER HEATER
RECEPTACLES		360			2	20	1	3	4		1			4,000		
BATTERY CHARGER	50				1	20	1	5	6	1	20					SPARE
ANTICONDENSATION HEATER		300			1	20	1	7	8	1	20					SPARE
SPARE						20	1	9	10	1	20					SPARE
SPARE						20	1	11	12	1	20					SPARE
TOTAL VA (Odd Ckts)/ PH	100	660											4,000	4,000		TOTAL VA (Even Ckts)/ PH
TOTAL VA (All Ckts)/ PH + 25% OF CONTINUOUS LOADS/ PH	4,100	4,860											4,100	4,860		TOTAL VA (ALL Ckts)/ PH
25% OF ALL CONTINUOUS LOADS =			VA.	TOTALS + 25% OF CONTINUOUS LOADS = 8,760 VA. AVERAGE AMPS/PH= 42 A												
													AVERAGE: VA / PH= 4,380 VA			

NOTES

- VA SUMS AND AVERAGES ARE ROUNDED TO THE NEAREST : 10 VA.
- QUANTITIES IN 'QTY' COLUMN, IF ANY, INDICATE NUMBER OF POWER CONSUMING OUTLETS CONNECTED TO THE RELEVANT CIRCUIT.
- THIS IS A MAIN-BREAKER TYPE PANEL. A BRANCH BREAKER SHALL NOT BE USED AS A MAIN BREAKER.
- 'X' IN THE 'NOTES' COLUMNS, IF USED, INDICATES THAT LOAD IN THAT CIRCUIT IS CONTINUOUS.

NUMBERED NOTES

(NOT USED)

04/11/12

REV	DATE	DESCRIPTION	APPR
1			
2			
3			
4			
5			

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

DESIGNED BY PT
DRAWN BY DD
CHECKED BY -
DATE Apr-12

PROJECT ENGINEER
REG. NUMBER EXP. DATE
PROJECT NUMBER 60061279
CADD STANDARDS AECOM-BOYLE

AECOM
AECOM USA, Inc. 1360 E. Spruce Avenue, Suite 101 Fresno, California 93720 T 559.448.8222 F 559.448.8233

CONFORMING SET
APRIL 8, 2011

LENNAR FRESNO, INC
T-3 WATER STORAGE AND TREATMENT FACILITY

SINGLE LINE DIAGRAM
(3 OF 3)

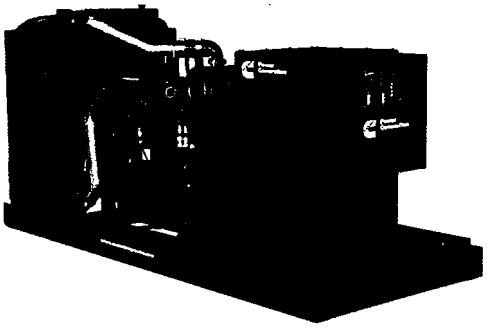
DRAWING E00-07
SHEET 151 OF 234 SHEETS

Power Generation

Diesel Generator Set

Model DFEJ 60 Hz
EPA Emissions

450 kW, 563 kVA Standby
410 kW, 513 kVA Prime



Description

The Cummins Power Generation DF-series commercial generator set is a fully integrated power generation system providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature of the DF GenSet is strong motor-starting capability and fast recovery from transient load changes. The torque-matched system includes a heavy-duty Cummins 4-cycle diesel engine, an AC alternator with high motor-starting kVA capacity, and an electronic voltage regulator with three-phase sensing for precise regulation under steady-state or transient loads. The DF GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 requirements.

The standard PowerCommand® digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum GenSet performance.

Optional weather-protective enclosures and coolant heaters shield the generator set from extreme operating conditions. Environmental concerns are addressed by low exhaust emission engines, sound-attenuated enclosures, exhaust silencers, and dual-wall fuel tanks. A wide range of options, accessories, and services are available, allowing configuration to your specific power generation needs.

Every production unit is factory tested at rated load and power factor. This testing includes demonstration of rated power and single-step rated load pickup. Cummins Power Generation manufacturing facilities are registered to ISO9001 quality standards, emphasizing our commitment to high quality in the design, manufacture, and support of our products. The generator set is CSA certified and is available as UL2200 Listed. The PowerCommand control is UL508 Listed.

All Cummins Power Generation systems are backed by a comprehensive warranty program and supported by a worldwide network of 170 distributors and service branches to assist with warranty, service, parts, and planned maintenance support.

Features

UL Listed Generator Set - The complete generator set assembly is available Listed to UL 2200.

Low Exhaust Emissions - Engine certified to U.S. EPA Nonroad Source Emission Standards, 40 CFR 89, Tier 2.

Cummins Heavy-Duty Engine - Rugged 4-cycle industrial diesel delivers reliable power, low emissions, and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings; low waveform distortion with non-linear loads, fault clearing short-circuit capability, and class H insulation. The alternator electrical insulation system is UL1446 Recognized.

Permanent Magnet Generator (PMG) - Offers enhanced motor starting and fault clearing short circuit capability.

Control System - The PowerCommand electronic control is standard equipment and provides total genset system integration, including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protection, output metering, auto-shutdown at fault detection, and NFPA 110 compliance. PowerCommand control is Listed to UL508.

Cooling System - Provides reliable running at the rated power level, at up to 50°C ambient temperature.

Integral Vibration Isolation - Robust skid base supports the engine, alternator, and radiator on isolators, minimizing transmitted vibration.

E-Coat Finish - Dual electro-deposition paint system provides high resistance to scratches, corrosion, or fading.

Enclosures - Optional weather-protective and sound-attenuated enclosures are available.

Fuel Tanks - Dual wall sub-base fuel tanks are also offered.

Certifications - Generator sets are designed, manufactured, tested, and certified to relevant UL, NFPA, ISO, IEC, and CSA standards.

Warranty and Service - Backed by a comprehensive warranty and worldwide distributor network.

Generator Set

The general specifications provide representative configuration details. Consult the outline drawing for installation design.

Specifications – General

See outline drawing 500-3326 for installation design specifications.

Unit Width, in (mm)	60.0 (1524)
Unit Height, in (mm)	71.3 (1812)
Unit Length, in (mm)	152.1 (3864)
Unit Dry Weight, lb (kg)	9000 (4082)
Unit Wet Weight, lb (kg)	9300 (4218)
Rated Speed, rpm	1800
Voltage Regulation, No Load to Full Load	±0.5%
Random Voltage Variation	±0.25%
Frequency Regulation	Isochronous
Random Frequency Variation	±0.25%
Radio Frequency Interference	IEC 801.2, Level 4 Electrostatic Discharge IEC 801.3, Level 3 Radiated Susceptibility

Cooling	Standby	Prime
Standard Set-Mounted Radiator Cooling (Dwg. 500-3326)		
Set Coolant Capacity, US Gal (L)	15.3 (57.9)	15.3 (57.9)
Total Heat Rejected from Cooling System, BTU/min (MJ/min)	14750.0 (15.6)	12950.0 (13.7)
Heat Radiated to Room, BTU/min (MJ/min)	3735.0 (4.0)	3730.0 (4.0)

Air		
Combustion Air, scfm (m^3/min)	1355.0 (38.3)	1300.0 (36.8)
Alternator Cooling Air, scfm (m^3/min)	2190.0 (62.0)	2190.0 (62.0)
Radiator Cooling Air, scfm (m^3/min)	25000.0 (707.5)	25000.0 (707.5)
Max. Static Restriction, in H_2O (Pa)	0.5 (124.5)	0.5 (124.5)

Rating Definitions

Standby Rating based on: Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

Prime (Unlimited Running Time) Rating based on: Applicable for supplying power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

Site Derating Factors

Genset may be operated up to 1740 m (5700 ft) and 40°C (104°F) without power deration. For sustained operation above these conditions up to 2220 m (7280 ft), derate by 2.8% per 305 m (1000 ft) and 5.7% per 10°C (3.2% per 10°F). Above 2220 m (7280 ft) up to 3000 m (9840 ft), derate 3.9% total for 2220 m (7280 ft) plus 4.3% per 305 m (1000 ft) and 5.7% per 10°C (3.2% per 10°F). Above 3000 m (9840 ft), derate 14.9% total for 3000 m (9840 ft) plus 1.8% per 305 m (1000 ft) and 10% per 10°C (5.6% per 10°F).

Engine

Cummins heavy duty diesel engines use advanced combustion technology for reliable and stable power, low emissions, and fast response to sudden load changes.

Electronic governing provides precise speed regulation, especially useful for applications requiring constant (isochronous) frequency regulation such as Uninterruptible Power Supply (UPS) systems, non-linear loads, or sensitive electronic loads. Optional coolant heaters are recommended for all emergency standby installations or for any application requiring fast load acceptance after start-up.

Note: Features included with the engine: battery charging alternator, fuel/water separator, shutdown low coolant and bypass oil filtration.

Specifications – Engine

Base Engine	Cummins Model QSX15-G9 Nonroad 2, Turbo-charged with air-to-air charge air cooling, diesel-fueled
Displacement in^3 (L)	912.0 (14.9)
Overspeed Limit, rpm	2150 ±50
Regenerative Power, kW	52.00
Cylinder Block Configuration	Cast iron with replaceable wet liners, In-Line 6 cylinder
Battery Capacity	900 amps minimum at ambient temperature of 32°F (0°C)
Battery Charging Alternator	35 amps
Starting Voltage	24-volt, negative ground
Lube Oil Filter Types	Single spin-on combination element with full flow and bypass filtration
Standard Cooling System	104° F (40° C) ambient radiator

Power Output	**Standby**	**Prime**
Gross Engine Power Output, bhp (kWm)	755.0 (563.0)	680.0 (507.3)
BMEP at Rated Load, psi (kPa)	318.0 (2192.5)	291.0 (2006.4)
Bore, in. (mm)	5.39 (136.9)	5.39 (136.9)
Stroke, in. (mm)	6.65 (168.9)	6.65 (168.9)
Piston Speed, ft/min (m/s)	1995.0 (10.1)	1995.0 (10.1)
Compression Ratio	17.0:1	17.0:1
Lube Oil Capacity, qt. (L)	88.0 (83.3)	88.0 (83.3)
Fuel Flow		
Fuel Flow at Rated Load, US Gal/hr (L/hr)	112.0 (423.9)	112.0 (423.9)
Maximum Inlet Restriction, in. Hg (mm Hg)	5.0 (127.0)	5.0 (127.0)
Maximum Return Restriction, in. Hg (mm Hg)	6.5 (165.1)	6.5 (165.1)
Air Cleaner		
Maximum Air Cleaner Restriction, in. H_2O (kPa)	25.0 (6.2)	25.0 (6.2)
Exhaust		
Exhaust Flow at Rated Load, cfm (m^3/min)	3105.0 (87.9)	2910.0 (82.4)
Exhaust Temperature,°F (°C)	865.0 (462.8)	825.0 (440.6)
Max Back Pressure, in. H_2O (kPa)	41.0 (10.2)	41.0 (10.2)

Fuel System	Full Authority Electronic (FAE) Cummins HPI-TP

Fuel Consumption		**Standby**				**Prime**			
60 Hz Ratings, kW (kVA)		**450 (563)**				**410 (513)**			
	Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
	US Gal/hr	10.8	17.4	23.4	30.1	10.2	16.2	21.9	27.7
	L/hr	41	66	89	114	39	61	83	105

 Specifications subject to change without notice

Alternator

Single-bearing alternators couple directly to the engine flywheel with flexible discs for drivetrain reliability and durability. No gear reducers or speed changers are used. Two-thirds pitch windings eliminate third-order harmonic content of the AC voltage waveform and provide the standardization desired for paralleling of generator sets.

A Permanent Magnet Generator (PMG) excitation system limits voltage dip during transient load application, sustains 3-phase short circuit current at approximately three times rated for up to 10 seconds, and is resistant to harmful effects of harmonics generated by non-linear loads. The alternator delivers excellent performance in applications containing large motors or sensitive electronics.

Various alternator sizes are available to meet individual application needs. Alternator sizes are differentiated by maximum winding temperature rise at the generator set standby or prime rating when operated in a 40°C ambient environment. Available temperature rises range from 80°C to 150°C. Not all temperature rise selections are available on all models. Lower temperature rise is accomplished using larger alternators at lower current density. Lower temperature rise alternators have high motor starting kVA, lower voltage dip upon load application, and they are generally recommended to limit voltage distortion and heating due to harmonics induced by non-linear loads.

Alternator Application Notes

Alternator Space Heater - is recommended to inhibit condensation.

Available Output Voltages

Three Phase

[ ] 110/190
[ ] 110/220
[ ] 115/200
[ ] 115/230
[ ] 120/208
[ ] 127/220
[ ] 139/240
[ ] 220/380
[ ] 230/400
[ ] 240/416
[ ] 255/440
[ ] 277/480
[ ] 347/600

Specifications – Alternator

Design	Brushless, 4-pole, drip-proof revolving field
Stator	2/3 pitch
Rotor	Direct-coupled by flexible disc
Insulation System	Class H per NEMA MG1-1.65 and BS2757
Standard Temperature Rise	125°C standby
Exciter Type	Permanent Magnet Generator (PMG)
Phase Rotation	A (U), B (V), C (W)
Alternator Cooling	Direct-drive centrifugal blower
AC Waveform Total Harmonic Distortion	<5% total no load to full linear load <3% for any single harmonic
Telephone Influence Factor (TIF)	<50 per NEMA MG1-22.43.
Telephone Harmonic Factor (THF)	<3

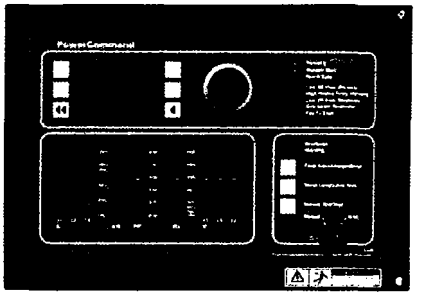
Three Phase Table[1]		**105° C**	**105° C**	**125° C**	**125° C**	**125° C**	**125° C**	**125° C**	**150° C**	**150° C**	**150° C**	**150° C**	
Feature Code		B259	B301	B258	B252	B414	B246	B300	B426	B413	B424	B419	
Alternator Data Sheet Number		308	306	307	306	307	305	305	307	306	305	305	
Voltage Ranges		110/190 Thru 139/240 220/380 Thru 277/480	347/600	110/190 Thru 139/240 220/380 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	277/480	347/600	110/190 Thru 139/240 220/380 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	277/480	347/600	
Surge kW		515	516	513	512	515	513	511	513	512	513	511	
Motor Starting kVA (at 90% sustained voltage)	PMG	2429	1896	2208	1896	2208	1749	1749	2208	1896	1749	1749	

Full Load Current - Amps at Standby Rating	110/190	120/208	110/220	115/230	139/240	220/380	230/400	240/416	255/440	277/480	347/600
	1711	1563	1478	1414	1355	856	813	782	739	677	542

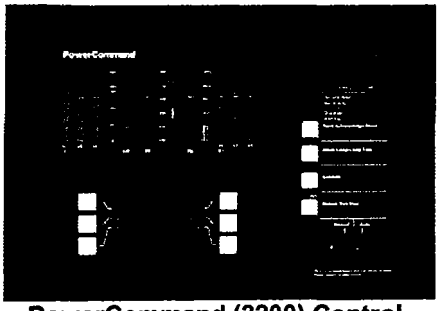
Notes:

1. Single Phase Capability: Single phase power can be taken from a three phase generator set at up to 40% of the generator set nameplate kW rating at unity power factor.

Control System



PowerCommand (2100) Control



PowerCommand (3200) Control

PowerCommand Control with AmpSentry™ Protection

- The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions.
- PowerCommand Controls include integral AmpSentry protection. AmpSentry provides a full range of alternator protection functions that are matched to the alternator provided.
- Controls provided include Battery monitoring and testing features, and Smart-Starting control system.
- InPower PC-based service tool available for detailed diagnostics
- PCCNet interface. Available with Echelon LonWorks network interface
- NEMA 3R enclosure (2100 only)
- Suitable for operation in ambient temperatures from –40C to +70C, and altitudes to 13,000 feet (5000 meters)
- Prototype tested; UL, CSA, and CE compliant

AmpSentry AC Protection	Engine Protection	Operator Interface
• Overcurrent and short circuit shutdown • Overcurrent warning • Single & 3-phase fault regulation • Over and under voltage shutdown • Over and under frequency shutdown • Overload warning with alarm contact • Reverse power and reverse Var • Excitation fault (2100 only)	• Overspeed shutdown • Low oil pressure warning and shutdown • High coolant temperature warning and shutdown • High oil temperature warning • Low coolant level warning or shutdown • Low coolant temperature warning • High and low battery voltage • Weak battery • Dead battery • Fail to start (overcrank) shutdown • Fail to crank shutdown • Redundant start disconnect • Cranking lockout • Sensor failure indication	• OFF/MANUAL/AUTO mode switch • MANUAL RUN/STOP switch • Panel lamp/reset switch • Emergency Stop switch • Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments • LED lamps indicating genset running, not in auto, common warning, common shutdown • (5) configurable LED lamps (2100 only) • LED Bargraph AC data display • Panel Lighting with switch and timer
Alternator Data	**Engine Data**	**Other Data**
• Line to Line and Line to Neutral AC volts • 3-phase AC current • Frequency • Total and individual phase kW and kVA	• DC voltage • Lube oil pressure • Coolant temperature • Lube oil temperature • FAE engine data (varies with engine)	• Genset model data • Start attempts, Starts, running hours • KW hours (total and since reset) • Fault history • Load Profile (Hours less than 30% and hours more than 90% load) • System Data Display (optional with network and other PowerCommand gensets or transfer switches)
Governing	**Voltage Regulation**	**Control Functions**
• Integrated digital electronic isochronous governor • Temperature dynamic governing • Smart idle speed mode • Glow plug control (some models)	• Integrated digital electronic voltage regulator • 3-phase line to neutral sensing • PMG Control Interface • Single and three phase fault regulation • Configurable Torque Matching	• Data logging on faults • Fault simulation (requires InPower) • Time delay start and cooldown • Cycle cranking • PCCNet Interface • (4) Configurable inputs • (4) Configurable outputs (2100 only)
Options		
❑ Fast Closed Transition Power Transfer Control (3200 Control) ❑ Ramping Closed Transition Power Transfer (3200 Control) ❑ Paralleling (3200 Control)	❑ Key-type mode switch ❑ Ground fault module ❑ Exhaust Temperature Monitor	❑ Echelon LonWorks interface ❑ Digital input and output module(s) (loose) ❑ Remote Annunciator (loose) ❑ (8) configurable network inputs and (16) outputs

 Specifications subject to change without notice

Generator Set Options

Engine

[ ] 208/240/480 V thermostatically controlled coolant heater for ambient above 40°F (4.5°C)
[ ] 208/240/480 V thermostatically controlled coolant heater for ambient below 40°F (4.5°C)
[ ] 120 V 300 W lube oil heater
[ ] Heavy-duty air cleaner with safety element

Cooling System

[ ] 125°F (50°C) ambient radiator

Fuel System

[ ] 300 Gal (1136 L) Sub-base tank
[ ] 400 Gal (1514 L) Sub-base tank
[ ] 500 Gal (1893 L) Sub-base tank
[ ] 600 Gal (2271 L) Sub-base tank
[ ] 660 Gal (2498 L) Sub-base tank
[ ] 850 Gal (3218 L) Sub-base tank
[ ] 1700 Gal (6435 L) Sub-base tank

Alternator

[ ] 80°C rise alternator
[ ] 105°C rise alternator
[ ] 150°C rise alternator
[ ] 120/240 V, 300 W anti-condensation heater

Control Panel

[ ] 120/240 V, 150 W control anti-condensation space heater
[ ] Ground fault alarm
[ ] Paralleling configuration
[ ] Power transfer control
[ ] Remote fault signal package
[ ] Run relay package

Exhaust System

[ ] Critical grade exhaust silencer
[ ] Exhaust packages
[ ] Industrial grade exhaust silencer
[ ] Residential grade exhaust silencer

Generator Set

[ ] AC entrance box
[ ] Batteries
[ ] Battery charger
[ ] Export box packaging
[ ] UL2200 Listed
[ ] Main line circuit breaker
[ ] Paralleling accessories
[ ] Remote annunciator panel
[ ] Sound-attenuated enclosure (2 levels) with internal silencers
[ ] Spring isolators
[ ] Weather-protective enclosure with internal silencer
[ ] 2 year prime power warranty
[ ] 2 year standby warranty
[ ] 5 year basic power warranty
[ ] 10 year major components warranty

Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Power Generation products and services include:

Diesel and Spark-Ignited Generator Sets

Transfer Switches

Bypass Switches

Parallel Load Transfer Equipment

Digital Paralleling Switchgear

PowerCommand Network and Software

Distributor Application Support

Planned Maintenance Agreements

Warranty

All components and subsystems are covered by an express limited one-year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available. Contact your distributor/dealer for more information.

Certifications

ISO9001 - This generator set was designed and manufactured in facilities certified to ISO9001.

CSA - This generator set is CSA certified to product class 4215-01.

PTS - The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Products bearing the PTS symbol have been subjected to demanding tests in accordance to NFPA 110 to verify the design integrity and performance under both normal and abnormal operating conditions including short circuit, endurance, temperature rise, torsional vibration, and transient response, including full load pickup.

UL - The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.

See your distributor for more information

Power Generation

Cummins Power Generation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
763.574.5000
Fax: 763.574.5298
www.cumminspower.com

Important: Backfeed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

APPENDIX B
RULES "2" AND "21"
(and any other Tariffs pertinent to the situation)
(Provided by PG&E)

(Note: PG&E's tariffs are included for reference only and shall at all times be subject to such changes or modifications by the Commission as the Commission may, from time to time, direct in the exercise of its jurisdiction.)

APPENDIX C
(If Applicable)
RULE 21 "SPECIAL FACILITIES" AGREEMENT
(Formed between the Parties)

N/A