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Mr. Kenneth Bruno
Program Manager
Gas Safety and Reliability Branch
Safety and Enforcement Division
California Public Utilities Commission
320 W. Fourth Street, Suite 500
Los Angeles, CA 90013

Dear Mr. Bruno:

The Safety and Enforcement Division (SED) of the California Public Utilities Commission conducted a G.O. 112¹ Operation and Maintenance Inspection of San Diego Gas and Electric's (SDG&E) Cathodic Protection (CP) Facilities in the South Distribution Inspection Unit (Inspection Unit) from August 31st through September 4th, 2015. The inspection included a review of the Inspection Unit's cathodic protection for calendar years 2013 and 2014 and a field inspection of a representative sample of pipeline facilities in the Metro, Eastern, and Beach Cities districts. SED staff also reviewed the Inspection Units Operator Qualification records, which included a field observation of randomly selected individuals performing covered tasks.

SED staff identified two probable violations of G.O. 112-E, Reference Title 49 Code of Federal Regulations (CFR), Part 192 during the course of this audit. Responses are detailed in the "Summary of Inspection Findings" enclosed with this letter. A summary of SED recommendations to this Inspection Unit is also enclosed in the "Recommendations and Concerns Summary."

Attached is SDG&E's written response, corrective actions and associated dates.

Please feel free to contact me at (213) 305-8660 if you have any questions or need additional information.

Sincerely,

W. Jeff Koskie

¹ General Order 112-F was adopted by the Commission on June 25, 2015 via Decision 15-06-044.

Cc: Alula Gebremedhin, SED/GSRB
Dennis Lee, SED/GSRB
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Attachments

Summary of Inspection Findings
2015 SDG&E South Distribution Inspection
August 31st through September 4th, 2015

I. SED Identified Probable Violations

1. Title 49 CFR §192.481(a) states:

“Each operator must inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion, as follows:

If the pipeline is located: Onshore

Then the frequency of inspection is: At least once every 3 calendar years, but with intervals not exceeding 39 months”

SED reviewed bridge and span inspection records and found that SDG&E did not perform atmospheric corrosion inspections of the following three above ground pipe locations listed in Table 1 below since installation. Therefore, SDG&E is in violation of 192.481(a).

Table 1: Bridge and Spans (Above Ground Pipe) Missed Inspections

Functional Location	ID Number	Location	City	Installation Year
GD.SDG.EST.BS.64	64	12403 WILLOW RD	LAKESIDE	1991
GD.SDG.EST.BS.65	65	WILLOW RD @ VIEJAS GRADE RD	ALPINE	2001
GD.SDG.CMT.BS.68	68	ORANGE AVE @ 54TH ST	SAN DIEGO	1957

SDG&E Response

Newly discovered Bridge/Span locations, as part of routine Leak Survey and Pipeline Patrol activities, are an ongoing effort. SDG&E is combining the boots on the ground with GIS queries to locate any potential Bridge/Span locations that may not be part of our current work management scheduled inspections. In these cases 2 of the locations were discovered via GIS queries and 1 during a scheduled Leak Survey. When discovered, thorough inspections take place immediately, and any required follow-up is addressed with a high priority.

2. Title 49 CFR §192.465(d) states in part:

“Each operator shall take prompt remedial action to correct any deficiencies indicated by the [external corrosion control] monitoring.”

PHMSA interpretation #PI-89-006 dated May 19, 1989 states that cathodic protection deficiencies are expected to be addressed and corrected by the next monitoring cycle (once each calendar year, but with intervals not exceeding 15 months) under normal conditions.

SED reviewed records of short sections of pipe, separately protected and monitored on a 10-year cycle (10%ers), that did not meet the -850 mV protection criteria during their 2014 calendar year inspections. SED found that SDG&E took more than a year to remediate three 10%ers locations listed in Table 2 below. SED believes the corrective actions were unreasonably delayed as SDG&E did not start the troubleshooting process until 15 months from the discovery dates. Therefore, SDG&E is in violation of 192.465(d) for failing to take prompt remedial action to correct the deficiencies.

Table 2: Late CP Deficiencies Remediation

District	Location	04/22/2014 PTS Read (V)	07/17/2015 PTS Read (V)	09/01/2015 PTS Read (V) and Comments
Metro	268 SURREY DR BONITA	-0.830	-0.720	-1
Metro	272 SURREY DR BONITA	-0.630	-0.645	-1.113
Metro	291 SURREY PL BONITA	-0.821	-0.428	Pending to install anode (concrete surface)

SDG&E Response

SDG&E would like to point out a correction needed in Table 2. The “9/01/2015 PTS Read (V) and Comments” has information for 272 and 291 Surry Place transposed. All work has been completed and each location is under cathodic protection with pipe-to-soil readings meeting regulatory requirements.

SDG&E does not believe that a violation of 192.465(d) occurred. SDG&E began troubleshooting immediately. In the case of these 3 CP 10 locations, down reads were identified on April 22, 2014. By May 6, 2014, troubleshooting was completed, and anode(s) installed.

Subsequent to anode installation, locations were found to have low readings, and further action necessary. A second round of troubleshooting was completed on October 9, 2014. Based on this troubleshooting, the anodes installed appeared to have failed because of potential bad connection and were evaluated for repair. Due to issues accessing the anodes, SDG&E installed a second set of anodes at a new location, which required permitting. The second set of anodes were installed, yielding passing reads on August 25, 2015 and October 9, 2015.

SDG&E strives to take prompt remedial action to correct any deficiencies indicated by the [external corrosion control] monitoring. Under normal conditions, the vast majority of CP area deficiencies are remediated in far less than 15 months. In the case of the 3 locations identified above, troubleshooting commenced within 3 weeks, and continual actions taken.

II. Recommendations and Concerns Summary

1. During SED’s field visit, SDG&E recorded DC voltage outputs exceeding the DC voltage ratings of the following rectifiers listed in Table 3 below.

Universal CP rectifiers’ manual states in part:

“Do not exceed AC or DC ratings of the rectifiers. Operating the rectifier at higher than the nameplate rating will result in eventual failure of the rectifier.”

Table 3: Rectifier DC Volts readings and ratings

District	CP Area	Point	Equipment No	DC Volts rating (V)	DC Volts recorded (V)	Upper Limit on Inspection Record (V)
Eastern	Sta-196	R 1	600412395	20	27	50
Eastern	Sta-353	R 1	600621744	20	25	50

On a side note, SDG&E’s inspection records show an “upper limit” value of 50V for all rectifiers while the DC voltage output ratings are, in majority, less than 50V.

Please provide an update on corrective measures to address this concern. In addition, SED suggests correcting the “upper limit” values of all rectifiers to reflect the actual rating values of the equipment as provided by the manufacturer.

SDG&E Response

SDG&E is reviewing current rectifier configuration and output settings that may currently be above manufacturer recommended values. We believe these rectifiers continue to provide the necessary Cathodic Protection for the CP Areas they are associated with. We also understand that exceeding manufacturer’s output recommendations may lead to a reduced life cycle for the units. Our review will determine if it may be prudent to increase the size of rectifiers at locations that are above recommended output or in some cases we may split an area to be able to reduce rectifier output. The review will also include determination of appropriate upper limit settings based on the various rectifier output capabilities in our system.

2. During SED's field visit, SED observed the following indications at the span locations listed below.
 - a. Bridge and Span 21: Wrap damage, pipe bend suspended off of bridge may need support, missing (not visible) pipe line marker
 - b. Bridge and Span 48: Missing (not visible) line marker, seaweed on the pipeline

Please provide an update on the corrective measures taken to address these indications.

SDG&E Response

The Span 21 pipeline marker issue was addressed prior to Audit closure. The possible need for one additional support hanger is being reviewed by Engineering Staff and permits have been requested (environmentally sensitive area) for the small damaged wrap area on the south end of the bridge.

A second pipeline marker was added and seaweed cleaned from Span 48 prior to Audit closure.

3. During the CP monitoring records review, SED found 65 CP areas where the CP protection was deficient in both 2013 and 2014. SED requested the SDG&E troubleshooting records of these areas and found that the pipe to soil reads fluctuated between inspection cycles; in a majority of the cases, "shorted pipe" was documented as the reason for the deficiency. SDG&E explained that about 46,000 homes in the city of San Diego alone are changing their home electric sources to solar systems and using the gas meter riser for electrical grounding which may cause SDG&E's system to have inadequate CP protection. SDG&E also explained that the city inspectors advised homeowners to ground their solar electric system to the gas line.

Considering SDG&E also provides electric distribution service to the city, we believe SDG&E can get more data on the extent of these switchovers and the associated cathodic protection concerns. As required by Part 192.616, Public Awareness, SED suggests that SDG&E contact the city officials to discuss the potential impacts of the external power sources grounding to SDG&E's gas facilities.

Please provide documentation on SDG&E's effort to communicate the issue with city officials, homeowners, or any parties involved with this concern.

Please also provide updates on SDG&E's plan to prevent the reoccurrence of this concern.

SDG&E Response

As clarification, while a significant number of SDG&E's electric customers are integrating solar power into their buildings' electric supply, only a relatively small number of these installations have been found to be grounded to gas service risers causing areas of SDG&E's steel distribution pipeline system to have inadequate cathodic protection. SDG&E estimates that, on average, it is finding two solar installations per month that may impact the gas cathodic protection system. Upon discovery, these situations are quickly corrected, clearing the problem.

The following actions and communications have been completed so far:

- 1) Two emails have been sent to local PV system installers. The first email was sent on 16 September and the second was sent on 22 October.

The second email is shown below as an example.

As a solar PV system installer, there are important safety considerations you need to know about. Having your employees comply with these standards will help your installations get approved without delays.

All solar installations must comply with the SDG&E gas and electric standards.

View the relevant gas and electric standards here (an active link in the communication)

Failing to meet these standards could create an unsafe situation ranging from a customer or even neighborhood experiencing a power outage, a gas leak or even worse, an explosion.

You can find more information at www.sdge.com/nem (an active link in the communication). We appreciate your help in maintaining a safe, reliable, and renewable electric grid.

Thank you,
SDG&E's Net Metering Team

- 2) The chairman of our International Code Council (ICC) Electrical Sub-committee reported the following information on SDG&E's behalf at Tuesday's (10/20) ICC San Diego Area Chapter meeting.

Page 1003 of the Service Standards & Guide under "Electric Bonding and Grounding of Gas Pipe":

The following are not permitted:

- Electric bonding to SDG&E's gas service piping, gas risers, or meter facilities.
- Using SDG&E's gas service piping, gas riser, or meter facilities for electrical grounding, or in a manner that the gas piping or other gas facilities become current-carrying conductors.

- 3) The website has been updated with this section. It is referenced from many places regarding NEM (Net Energy Metering – the tariff for rooftop solar) inspections and necessary clearances.
- a. <http://www.sdge.com/environment/gas-standard-fundamentals-solar-pv-systems>
(an active link in the communication)
- 4) The SDG&E Interconnection Handbook update is in review for several modifications, including the gas audit issue. Within section 3.3, 3) the following text has been added. The revision below is circulating for additional review and approvals.

The gas standard must be followed where electrical equipment is in the vicinity of the gas meter assembly. Any electrical connection to SDG&E's gas equipment is a violation of the Code and is unsafe. Electric bonding to SDG&E's gas service pipes, gas riser, or gas meter assembly is not permitted (Gas Standard page 1003).

4. During field visits to CP monitoring locations, SED observed numerous locations, listed in Table 4 below, continuing to have deficient levels of cathodic protection since the prior read date, or currently having deficient levels of cathodic protection since the prior adequate read. Please provide SED with an update on the remediation of each deficient read location listed in Table 4.

Table 4: SED Field Visit - Deficient Read Locations

District	CP Area	Point	Location	Lower Limit (Volts)	Last Read (Volts)	Field Visit Read (Volts)
Eastern	112.2	4	959 Wilson Ave N/O Eucalyptus El Cajon	-0.850	-0.82	-0.816
Eastern	292	4	6443 Dwane Ave W/O Madra Ave San Diego	-0.850	-0.815	-0.734
Eastern	308	4	3038 Crane St w/o Golden Ave Lemon Grove	-0.520	-0.42	-0.516
Eastern	353	11	1338 Clove St N/O Pepper Dr El Cajon	-0.520	-0.4	-0.373
Eastern	76.3	8	4701 Valencia N/O Solita San Diego	-0.850	-0.73	-0.767
Eastern	196	3	8310 Sunview S/O Sunglow El Cajon	-0.440	-0.3	-0.373
Eastern	196	4	12770 Jackson Hill Rd W/O Jackson Hill D El Cajon	-0.510	-0.38	-0.426
Eastern	79.1	10	5111 Tipton, north end of street San Diego	-0.850	-0.79	-0.671
Eastern	79.1	11	5442 Brookbank Pl N/O Falls Way San Diego	-0.850	-0.7	-0.728
Beach Cities	111.2	7	1815 Cross St N/O Gardenia San Diego	-0.510	-0.484	-0.467
Beach Cities	129	2	Harbor Police Sta on Shelter Island San Diego	-0.500	-0.196	-0.411

Beach Cities	129	3	3218 Macaulay N/O rectifier San Diego	-0.850	-0.34	-0.845
Beach Cities	291	6	3973 Mission Blvd S/O Zanzibar Ct San Diego	-0.850	-0.67	-0.642
Beach Cities	291	7	875 Garnet W/O Bayard San Diego	-0.850	-0.67	-0.835
Beach cities	377	33	6086 Via Regla San Diego	-0.850	-0.706	-0.678
Metro	215	8	901 "C" meter on 9th E/O "C" Ave Coronado	-0.850	-0.615	-0.675
Metro	215	9	1634 6th St W/O Glorietta Blvd Coronado	-0.850	-0.745	-0.817
Metro	294	15	3606 State St S/O Chalmers San Diego	-0.850	-0.875	-0.791
Metro	294	17	1714 Washington Pl E/O Portola Pl San Diego	-0.850	-0.82	-0.788
Metro	40.2	6	4135 Wilson Ave s/o Orange San Diego	-0.850	-0.79	-0.770
Metro	46.3	2	5417 Redwood E/O 54th St. San Diego	-0.500	-0.48	-0.436
Metro	46.3	4	5547 Redwood E/O W. Virgo San Diego	-0.500	-0.43	-0.470
Metro	53.4	12	3367 Copley W/O 34th St San Diego	-0.850	-0.8	-0.692
Metro	75.3	3	3725 Altadena S/O Wightman St San Diego	-0.850	-0.8	-0.801
Metro	75.3	5	4975 Trojan A/W/O 50th St. San Diego	-0.850	-0.8	-0.842
Eastern	CP10		4043 Georgia St., San Diego	-0.850	-0.855	-0.690
Metro	CP10		6255 Mchaney Ct., San Diego	-0.850	-0.852	-0.776

SDG&E Response

The areas listed below from the above list are currently passing. Details below

District	CP Area	Point	Location	Lower Limit (Volts)	Last Read (Volts)	Field Visit Read (Volts)	Status	Trouble Shooting Notes
Eastern	308	4	3038 Crane St w/o Golden Ave Lemon Grove	-0.52	-0.42	-0.516	up	CP Station 308 100mv TP 4 was found to be down during field audit. An up-read of -.531 was taken. Area is free of shorts and is being evaluated for a split to bring reads up.
Beach Cities	111.2	7	1815 Cross St N/O Gardenia San Diego	-0.51	-0.484	-0.467	up	CP Station 111-2 Rectifier breaker had tripped which caused the down read during the audit. Breaker was reset and now functioning properly and a passing 100mv shift. An up read of -.626 was taken.
Metro	215	8	901 "C" meter on 9th E/O "C" Ave Coronado	-0.85	-0.615	-0.675	up	CP Station 215 was found to have a 2 amp above ground short. Short was cleared and a passing 850mv read of -.924 was taken on test point 8 and a read of -.857 was taken on test point 9 area still polarizing up.
Metro	215	9	1634 6th St W/O Glorietta Blvd Coronado	-0.85	-0.745	-0.817	-	see above

The trouble-shooting on the remaining CP Areas will continue to determine the cause of the CP Area being out of tolerance. This includes identifying whether there are any shorts, interference or if anodes need to be installed to bring the CP areas within tolerance. Should anodes be needed SDG&E will create work orders to install anodes and issue follow-up orders to evaluate the CP area.