Pacific Gas and Electric Company

Nathan Bengtsson
Representative
State Agency
Relations

77 Beale Street, B10C
San Francisco, CA
94105

(415) 973-4912
(415) 271-3747

nxbz@pge.com

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Elizabeth Scheehle
Chief, Oil and GHG Mitigation Branch
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: Pacific Gas and Electric Company's Comments on the Revised Draft Regulation Proposal for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

Dear Ms. Scheehle,

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the Air Resources Board's (ARB) Revised Draft Regulation Proposal for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities[1] (Revised Proposal). PG&E provides its general comments on the Revised Proposal in Section I and detailed input on the source proposals in Sections II through VII.

I. GENERAL COMMENTS

PG&E is committed to providing safe and reliable natural gas service while continuing to support the State's climate goals. To date, PG&E has developed one of the most aggressive and comprehensive gas transmission pipeline modernization programs in the country; adopted the latest innovative technologies, including an advanced, car-mounted Picarro leak-detection device; and reduced our response time for odor calls to 19 minutes. These efforts increase safety and reduce operational risk as well as reducing methane emissions from our natural gas system. Additionally, PG&E has upgraded its measurement, monitoring, and data management systems to improve the accuracy of greenhouse gas (GHG) data reported to the United States Environmental Protection Agency (EPA) and ARB in support of the Mandatory Reporting Regulation (MRR). PG&E appreciates ARB's attention to this important policy area. With this in mind, PG&E offers two general comments on the Revised Proposal, before addressing each section in detail.

[1] Air Resources Board. 2015. Proposed Regulation Order, Article 4: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities. Website: http://www.arb.ca.gov/cc/oil-gas/meetings/Draft%20ARB%20OG%20Regulation_Feb%201%202016%20Clean.pdf

A. The ARB Oil and Gas Rulemaking Should Be Coordinated with Similar Proceedings to Avoid Regulatory Confusion

PG&E echoes the comments, made by SoCalGas and SDG&E, that the ARB should coordinate its efforts on this regulation with the other state and local entities engaged in similar rulemakings before implementing a revised regulation. [2] This will allow PG&E to implement specific activities and efforts, and develop consistent practices to comply with multiple regulations and further drive methane emissions reductions within this sector. Additionally, coordination will potentially avoid duplicative efforts and costly regulatory overlap. PG&E suggests that the timeline for this proceeding be amended to allow sufficient time to ensure that other developing regulations are reviewed and aligned to focus on driving emission reductions and ensuring public safety.

B. ARB Should Continue to Consult with Owners and Operators to Develop Accurate Cost Estimates

Upon review of the summary cost information provided at the ARB's February 4, 2016 workshop on the Revised Proposal, PG&E cautions that ARB may overestimate the cost-effectiveness of reducing methane emissions through this regulation. PG&E notes ARB's reliance on two key assumptions:

1. The ARB has chosen to use global warming potential (GWP) values based on a 20-year time horizon. Using this time horizon, rather than the 100-year GWP values used consistently across State and Federal regulatory regimes including the ARB's own Cap-and-Trade and Low Carbon Fuel Standard programs, artificially diminishes the cost of compliance. Comments filed by the other IOUs address this topic in more detail.[3]

2. The ARB is relying on cost-effectiveness estimates derived from the US EPA Natural Gas STAR documents. As explained in comments filed by SoCalGas and SDG&E, these documents contain cost data that are not representative of all the sources to be covered by the Revised Proposal, and likely underestimates the cost of compliance.[4]

PG&E supports ARB's development of a technically feasible, cost-effective and environmentally beneficial oil and gas regulation, and appreciates ARB staff's continued openness and willingness to work with stakeholders. The Revised Proposal does contain some cost-effectiveness and feasibility improvements; however, a number of sections require further clarification to ensure that cost effective measures are implemented which lead to activities and practices that provide significant methane emission reductions. PG&E's detailed comments are provided below.

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[2] Jerilyn Mendoza, Program Manager, Environmental Affairs, SoCalGas, February 18, 2016. "SoCalGas and SDG&E Comments on Revised Draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities."
[3] *Ibid.* p. 2-3.
[4] *Ibid.* p. 11.

II. SEPARATOR AND TANK SYSTEMS

As noted in our previous comments, PG&E uses a wide variety of tank and separator systems to maintain gas quality on its pipeline system.[5] These vary from small tanks that are emptied infrequently (e.g., once a year) to larger systems on PG&E's gas storage wells. PG&E reiterates and refines our initial comments on this source category proposal and provides the following additional recommendations:

- **ARB Should Increase the Allowable Duration of Excepted Temporary Tanks, Clarify Applicability of Exception:** The Revised Proposal allows operators to use tanks for temporarily storing byproducts from newly constructed wells for up to 30 calendar days.[6] PG&E has found that standard well cleanup operations require at least 33 days to complete, with temporary tanks sometimes holding produced fluid for longer. We recommend increasing the allowable duration for excepted temporary tanks from 30 to 45 calendar days, as the change will not measurably increase fugitive emissions and allow PG&E to continue its tested, safe, and successful method of well maintenance.

  Additionally, we ask that ARB clarify whether Section 95668(a)(2)(B) is intended to apply solely to new wells, or to any well that is undergoing inspection or reworking so long as the well is not receiving a well stimulation treatment. The small volumes of fluid produced and held in temporary tanks from work done on inspected and reworked wells is not gas saturated, so excepting temporary tanks used for those purposes should not result in a measurable increase in methane emissions.

- **ARB Should Establish a Throughput Threshold for Separator Equipment at Natural Gas Storage Wells:** For separation equipment, ARB should establish a throughput threshold to exclude systems that collect small amounts of liquid. This would reduce the cost and environmental impacts from mobilizing crews to extract small quantities of liquid.

  PG&E recommends that ARB exempt primary and secondary vessels generating less than 365 barrels (bbl oil) of liquid per year based on the company's limited gas-oil-ratio (GOR) and gas-water-ratio (GWR) data. This exemption will eliminate the unnecessary cost of flash testing vessels that would be below the 10 metric ton threshold regardless of the GOR/GWR value due to low throughput.

  Additionally, PG&E notes that many vessels are drained infrequently, as the sump capacities are large relative to the fluid accumulation rate. This practice will lead to high but infrequent measurements of daily generation. In addition, daily fluid accumulation rates vary depending on whether a facility is in use. In light of these considerations, any throughput exemption for separator equipment should be granted on the basis of yearly or

[5] Matthew Plummer, Representative, State Agency Relations, Pacific Gas and Electric Company. May 22, 2015. "Pacific Gas and Electric Company's Comments on the Draft Regulation Proposal for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities."

[6] 95668(a)(2)(B)

monthly, rather than daily, throughput. This change will have no measurable impact on the proposed exemption threshold.

- **ARB Should Exempt Separator Equipment at Natural Gas Compressor Stations:** PG&E reiterates the recommendation that separators used in the natural gas compression process or located at a compressor station should be exempt. Separators associated with compression collect small amounts of liquid relative to storage and production facilities. Exempting the separators related to compression will reduce record keeping and enforcement costs.

- **ARB Should Exempt Dry Gas Storage Fields from Flash Testing After Three Consecutive Years of Compliance**: The Revised Proposal specifies that the required frequency of flash testing may be reduced if the 10 metric ton per year threshold is not exceeded. PG&E's dry gas reservoir storage fields primarily produce water as a byproduct, the methane composition of varies very little over time, making repeated flash testing redundant even at the reduced, five year interval. PG&E recommends that dry gas storage fields be exempted from the flash testing after three consecutive years of no change in GOR/GWRs beyond the error of the test method. This exemption will avoid unnecessary compliance costs without allowing increased methane emissions.

- **ARB Should Provide for Streamlined Testing Procedures:** ARB staff has indicated that the Revised Proposal is intended to allow for representative flash testing for vessels operating in the same processes and conditions. In order to clarify this in the regulation, PG&E suggests adding the following language under Section 95668(4):

  Representative results may be used for multiple vessels removing the same product from the same production stream at similar temperatures and pressure, for example, multiple separators operating in parallel.

III. RECIPROCATING COMPRESSORS

PG&E currently has 30 reciprocating compressors in its service territory, which are all rated above 500 horsepower. ARB's Revised Proposal improves on the Draft Proposal by: providing an alternative to an access port for emissions measurements;[7] allowing a technically feasible amount of time for repair;[8] and by providing a critical component exemption.[9] All of these changes are necessary and appropriate considering the need to safely and reliably operate the natural gas system even when repair or replacement is required. PG&E provides the following suggestions on the Revised Proposal:

- **Allow Flexibility With Regard to Compressor Monitoring and Repair:** As PG&E relies on compressors to move gas through the transmission system, PG&E's ability

[7] 95668(d)(2)(B)
[8] 95668(d)(2)(E)
[9] 95668(d)(2)(F)

to repair and return compressors to service during the expanded 30 day window is still contingent upon:

1. The ability of PG&E to stagger surveys throughout the year and vary the dates between measurement periods.
2. The ARB or local air district promptly confirming that repairs are satisfactory and allowing PG&E to return the unit to service.

IV. PNEUMATIC DEVICES AND PUMPS

PG&E uses a combination of high-bleed, low-bleed, and intermittent-bleed devices within its system. ARB's Revised Proposal allows for continuous bleed pneumatic devices installed in 2015 or before that are certified to vent less than or equal to six standard-cubic-feet-per-hour (scfh). This is an improvement over the Draft Proposal, which prohibited continuous-bleed pneumatic devices and pumps except under specific conditions, and could have resulted in expensive equipment replacements without significant GHG benefits.[10] This change also better aligns the Revised Proposal with direction PG&E has received from ARB in the (MRR).[11] PG&E provides the following additional recommendations for this source category:

- **ARB Should Allow Low-Bleed Pneumatic Devices Installed in 2016:** PG&E installed low bleed natural gas devices in the 2015 calendar year, compliant with the AB 32 mandatory reporting regulations and current US EPA Gas STAR recommendations. PG&E requests that the rule be changed to allow the use of all low bleed devices installed prior to 2016 in order to avoid a redesign of equipment that was just installed recently to comply with other regulatory requirements.

- **ARB Should Extend the Monitoring Intervals for Continuous Bleed Pneumatic Devices:** The Revised Proposal calls for quarterly monitoring of continuous bleed pneumatic devices to ensure they do not exceed the six scfh threshold. However, PG&E is not aware of any study that indicates pneumatic device bleed rates will degrade significantly over the course of a few months. Consequently, PG&E calls for the monitoring interval for these devices to be at least annual, with a longer interval as compliance is demonstrated over time, in line with other testing requirements in the Revised Proposal. Testing on an annual basis would be consistent with current practice as required by ARB's own MRR.

In addition to the suggestions above, PG&E offers the following technical notes:

- To provide clarity, PG&E recommends the following language for Section 95668(f)(3):

[10] 95213(g)(1)

[11] In 2015, ARB required the installation of metering devices on high-bleed pneumatic devices using a threshold of 6 scfh. As a result, PG&E removed 46 high-bleed devices from service, replacing 12 with low-bleed devices.

Beginning January 1, 2018, pneumatic devices, **except those covered in section 95668(f)(2),** shall not vent natural gas to the atmosphere and shall comply with the leak detection and repair requirements specified in section 95669.

- With regard to Section 95668(f)(4), PG&E notes that intermittent devices should be tested for leakage when control action is not necessary, rather than "when not actuating." This would align with the current definition of "intermittent bleed." This distinction is important because some pneumatic, zero steady state bleed pilots will bleed as the process nears set point but before actually moving the valve. PG&E can provide specific equipment models for examples if requested.

V. NATURAL GAS STORAGE WELL MONITORING REQUIREMENTS

In response to the emergency regulations issued by the Division of Oil, Gas, and Geothermal Resources (DOGGR) on February 5, 2016,[12] PG&E developed and is in the process of submitting to DOGGR a proposal to address new natural gas storage well monitoring requirements.[13] While these requirements were developed under the direction of DOGGR, PG&E believes they align with the requirements in ARB's proposal, and encourages ARB to coordinate their review of this requirement with DOGGR and other agencies developing similar requirements.

VI. METHANE LEAK DETECTION AND REPAIR:

While we appreciate ARB's phased approach, PG&E recommends developing cost-effective monitoring thresholds that support significant GHG reductions through methane leak detection and repair (LDAR).

- **ARB Should Set the Minimum Threshold at 10,000 parts per million by volume (ppmv):** The Revised Proposal relies on US EPA Method-21 for measurement of leak emissions. Method-21 sets a 10,000 ppmv threshold for leak repair, as this measurement indicates the presence of methane at 20 percent of the Low Explosive Limit (LEL). This threshold is a meaningful safety criterion to prevent the inflammation of methane, and merits inclusion in the regulation.

  However, any leak threshold below 10,000 ppmv should be eliminated from the regulation, as monitoring and repairing such leaks will likely incur substantial cost with a negligible impact on emissions reduction. A 2012 California Energy Commission (CEC) study[14], in which ARB participated, found that approximately 89

[12] California Department of Conservation Division of Oil, Gas, and Geothermal Resources. February , 2016. Requirements for Underground Gas Storage Projects.

[13] PG&E's protocol in response to DOGGR's emergency regulations will be formally submitted to DOGGR on Friday, February 26. PG&E will provide a link to that protocol as soon as possible after it is posted.

[14] California State University, Fullerton. 2012. Estimation of Methane Emissions from the California Natural Gas System (California Energy Commission), website: http://www.energy.ca.gov/2014publications/CEC-500-2014-072/CEC-500-2014-072.pdf

percent of fugitive emissions would be captured with a threshold of 50,000 ppmv and 96 percent would be captured with a threshold of 10,000 ppmv.[15] See Table 1 below for reference.

Table 1: California State University Fullerton (CSUF) Natural Gas Systems Leak Data

Method 21 Leak Concentration (ppmv)	Leaks Detected	Leak Rate (cfm)			lb CH4/ day[1]	Percent Total
		Max	Min	Average		
0 to 999	16	0.005	0.005	0.005	0.30	0.07
1,000 to 9,999	108	0.410	0.005	0.029	1.8	2.79
10,000 to 49,999	109	1.640	0.005	0.071	4.3	6.90
50,000+	205	8.850	0.005	0.489	30	89.40
Total	438	8.850	0.005	0.256	16	100.00
Notes: 1. Based on average leak rate and assumes 100% of leaked gas is methane						

Furthermore, PG&E points out that Method-21 is not necessarily an accurate measurement of leak flow rate, as recognized in ARB's own summary of Method-21: "This procedure is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rate from individual sources." [16]

While Method-21 is appropriate for measurements related to safety risk, the use of this measurement to mandate repairs for environmental risk may not be.

- **ARB Should Include "Delay of Repair" Provisions in Recognition of Operational, Environmental, and Reliability Constraints on Repair:** PG&E seconds the comments of the other IOUs in calling for Section 95669 to include "delay of repair" provisions, which are common to LDAR programs. PG&E agrees generally with the suggestions made in the other IOU comments on this topic.[17]

In addition to the comments above, PG&E offers the following technical recommendations:

- Section 95669(h) directs owners to minimize leaks immediately after initial detection. PG&E suggests that this requirement be removed or the additional

[15] Note that this can be obtained by multiplying the average flow rate (cubic feet per minute [cfm]) and the component count.

[16] California Air Resources Board. July 1, 1999. *Method 21 Determination of Volatile Organic Compound Leaks.*

[17] Jerilyn Mendoza, Program Manager, Environmental Affairs, SoCalGas, February 18, 2016. "SoCalGas and SDG&E Comments on Revised Draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities." P 14.

detail be provided as to the definition of "minimize," which as currently stated could be construed as a repair:

Section 95667(b)(25): "'Minimize' means tightening, adjusting, or replacing components or equipment for the purpose of ***stopping or reducing leaks below the lowest leak threshold*** specified in this subarticle." (Emphasis added).

This definition is effectively the same as the definition for successful repair:

Section 95667(a)51: "'Successful repair" means tightening or adjusting or replacing equipment or a component for the purpose of ***stopping or reducing fugitive leaks below the lowest leak threshold*** specified in this subarticle." (Emphasis added).

As natural gas is a valuable commodity, operators are incentivized to minimize detected leaks; however, there may be instances when immediate repair cannot minimize the leak below the specified thresholds because additional equipment or materials are required for final repair. Without further specificity there may be disagreement between ARB and regulated entities regarding what constitutes minimization versus a repair.

- Section 95669(j) directs open-ended lines and valves at the end of lines to be sealed at all times except during operations requiring flow-through. PG&E recommends this provision be removed as many lines are left open for critical operational or safety purposes, or the line is not designed and tested to be sealed. As the proposed LDAR requirements will check against leaks already, this requirement is redundant, and could hamper typical operations.

- Section 95669(o) establishes leak allowances based on the number of components at a given facility. PG&E recommends this provision be removed as:

  1. A single facility may contain thousands of components. It is likely that surveyors would arrive at conflicting numbers of components, which is unacceptable considering that enforcement action could result. The alternative, creating and maintaining a database of components, would be extremely costly with no direct impact on GHG emission reduction.
  2. Managing and correcting leaks will have a financial and operational impact on owners and operators, providing a natural incentive for compliance and leak reduction.

- Section 95669(n)(3) specifies that final repair of critical components shall be completed by the end of the next process shutdown or 180 days from initial leak detection, whichever comes first. PG&E recommends that the 180 day repair window be expanded, as logistical considerations dictate that procurement and repair or replacement of a critical gas storage facility component can take longer than 180 days.

VII. APPLICABILITY, DEFINITIONS, CRITICAL COMPONENTS, RECORD KEEPING REQUIREMENTS, REPORTING REQUIREMENTS, IMPLEMENTATION, AND ENFORCEMENT

PG&E offers the following comments with regard to the sections listed above:

- Section 95666: PG&E asks for confirmation that, in the case of a natural gas compressor station located at the same facility as a power plant, only the equipment associated with the compressor station would be subject to the Revised Proposal.

- 95667(a)(16): PG&E asks for clarification regarding which requirements of the Revised Proposal apply to portable equipment.

- 95667(a)(28): PG&E requests that the following language be added for clarification.

  "Natural gas processing plant" means a plant used for the separation of natural gas liquids (NGLs) or non-methane gases from produced natural gas, or the separation of NGLs into one or more component mixtures**, excluding any facility located on a natural gas transmission pipeline.**

- 95670: PG&E recommends that an exemption be added allowing for an extended repair window in cases where the components would need to be depressurized prior to repair. Gas released during depressurization could far exceed gas released from a small leak.[18] An extended repair exemption will allow work to be bundled and related blowdowns to be minimized. Additionally, the pipeline can be managed to depressurize areas where maintenance is required, avoiding blowdowns. An extended repair exemption would allow PG&E to wait for system conditions where this would be possible, further minimizing blowdowns.

- 95670(c): PG&E is concerned that relative emissions might be the only criteria used to determine critical component status. Emissions should be a factor in the evaluation; however, safety, reliability and operational factors should also be considered. An exemption should be made to Section 95670(c) for components that would disable a critical process if shut down, even if component shutdown would not result in higher emissions.

- 95672: The Revised Proposal requires reports be submitted to ARB. However, the requirements of the regulation will be included in local Air Pollution Control

[18] For example, using the CSUF average leak rate vs. PPM data from Table 1, a leak with a rate of 100,00 ppmv would result in emissions of 3160 cubic feet per month, while a single blowdown of one compressor at PG&E's McDonald Island facility using average field pressure may result in emissions of over 50,000 cubic feet of methane. This demonstrates how the stringent LDAR requirements in the new regulation could result in an overall increase in emissions if an exception is not included allowing for flexibility in leak repair.

District (APCD) permits. To streamline the compliance process, PG&E recommends that reports be submitted to local APCDs, who then submit the reports to ARB. This will avoid the potential for two parallel and duplicative administrative work streams.

- 95673(a): This section suggests that ARB and the local APCD can both take enforcement action. PG&E recommends that enforcement responsibility for this regulation be delegated to the local APCDs, who can take action under their local air district rules. Since the requirements from this regulation will be included in local APCD permits, it would be appropriate for the APCDs to have enforcement authority.

- 95673(b): This section indicates that facility owners and operators are responsible for ensuring that their local air district permits contain terms ensuring compliance with the Revised Proposal. PG&E recommends that this role be transferred to the local APCDs or other relevant permitting authorities, which are responsible for regularly updating these documents

VIII. CONCLUSION

Thank you for the opportunity to submit these comments on the ARB's regulatory activities for the oil and natural gas sector. Please feel free to contact me if you have any questions or concerns.

Sincerely,

/s/

Nathan Bengtsson

Cc: Jim Nyarady (jim.nyarady@arb.ca.gov)
Carolyn Lozo (clozo@arb.ca.gov)
Joe Fischer (joseph.fischer@arb.ca.gov)
Johanna Levin (jlevine@arb.ca.gov)
Chris Hurley (churley@arb.ca.gov)
Stephanie Detwiler (sdetwile@arb.ca.gov)