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Attachment to PG&Eâ€™s Comments on the California Energy Commission Staff Workshop on Californiaâ€™s Natural Gas Infrastructure, Storage, and Supply

This the the 11.28 Attached PG&E Comments to FERC on gas scheduling cycles.

Additional submitted attachment is included below.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Coordination of the Scheduling Processes Of Interstate Natural Gas Pipelines and Public Utilities	)))	Docket No. RM14-2-000

COMMENTS OF PACIFIC GAS AND ELECTRIC COMPANY ON NOTICE OF PROPOSED RULEMAKING

I. INTRODUCTION

Pacific Gas and Electric Company ("PG&E") respectfully offers these comments regarding the Federal Energy Regulatory Commission's ("FERC" or "Commission") Notice of Proposed Rulemaking ("NOPR") in Rulemaking 14-2-000.[1] The NOPR seeks to "address certain natural gas and electric industry coordination challenges" through changes to the start of the national gas day ("Gas Day") and through related changes to the nomination cycles and other gas scheduling practices.[2] The Commission notes that gas and electric coordination has become more crucial due to increased reliance on natural gas for electricity generation.

PG&E has significant experience with the coordination issues raised in the NOPR. PG&E owns and operates a major gas pipeline system, gas storage, and related facilities. PG&E also purchases and schedules gas for both core and gas-fired electric generation customers, and markets and schedules electric generation resources in electric markets, primarily through the California Independent System Operator ("CAISO"). PG&E engages in gas-electric

[1] *Coordination of the Scheduling Processes of Interstate Natural Gas Pipelines and Public Utilities*, 79 Fed. Reg. 18223 (April 1, 2014), FERC Stats. & Regs., Proposed Regs. ¶ 32,700 (2014).

[2] NOPR at P. 1.

coordination activities in California that range from daily calls between PG&E's gas operations center and the CAISO, quarterly outage planning meetings, and additional activities designed to support gas and electric system reliability, safety, and affordability in California.

PG&E is a part of the Coalition for Enhanced Electric and Gas Reliability ("Enhanced Reliability Coalition"), which includes a wide variety of natural gas industry stakeholders that provide services such as interstate pipeline transportation, gas distribution, gas procurement for core (residential and small commercial) and industrial customers, gas procurement for electric generation, gas storage, electric generation, electric transmission, gas and electricity marketers, and electric procurement for customers. PG&E fully supports the comments of the Enhanced Reliability Coalition that are being filed concurrently with these comments. PG&E offers these separate comments to provide additional detail and discussion about PG&E's experiences and its specific concerns regarding the NOPR.

PG&E's primary concern is with the NOPR proposal to change the start of the Gas Day from the current, well-established 9:00 a.m. Central Clock Time ("CCT") to 4:00 a.m. (CCT). The proposed 4:00 a.m. (CCT) Gas Day is unlikely to solve any of the coordination problems identified in the NOPR and would only create serious safety and reliability risks. Rather than changing the start of the Gas Day, PG&E recommends that the Commission encourage and support a review of regional electric market changes, better planning practices, and new gas pipeline construction for areas of the country facing gas-electric challenges.

To illustrate the challenges posed by a 4:00 a.m. (CCT) Gas Day start, a presentation on aspects of PG&E's gas system operations is appended to these comments as Attachment A. The presentation details technical aspects of PG&E's operations and describes the challenges associated with managing inventory and manual operations that would result from a change in the timing of the Gas Day. In addition to this presentation, below PG&E provides further detail

regarding the substantial safety, reliability, and affordability risks associated with starting the Gas Day at 4:00 a.m. (CCT).

II. THE PROPOSED 4:00 A.M. (CCT) GAS DAY START CREATES SAFETY AND RELIABILITY RISKS

Safety and reliability are core values and goals for PG&E's gas operations and service. In evaluating the proposed 4:00 a.m. (CCT) Gas Day start, PG&E undertook a detailed review of expected operational and service impacts. PG&E's safety assessment focused on the number of manual operations conducted by field workers as part of the start of the Gas Day, and on general worker-safety impacts associated with worker-travel. PG&E's reliability assessment focused on its ability to manage the inventory in its gas system in light of the proposed Gas Day start change, and on which customers could see increased curtailments if the proposed Gas Day start change creates system stress.

PG&E has assessed its daily operations and concluded that annually, a minimum of 2,200 manual and 3,500 automated operating changes will shift to 4:00 a.m. (CCT) if the start of the Gas Day is changed.[3] As a result, these operations will occur during the night, rather than during the daylight hours when they currently occur. This shift from daylight to nighttime operations could result in a significant increase in safety risks. Human fatigue has often been associated with serious accidents and the National Transportation Safety Board ("NTSB") has often included human fatigue on its Top 10 Most Wanted list of issues, as early as 1990 and as recently again as 2012.[4] Pipeline Safety by itself is on the 2014 Top 10 list.[5] Industries should

[3] *See* Attachment A, Slides 3 and 10.

[4] http://ntsb.gov/safety/nwl-1.html and http://ntsb.gov/doclib/speeches/rosekind/Rosekind_120927.pdf

[5] http://www.ntsb.gov/news/2014/140116.html

avoid fatigue situations where possible, rather than viewing mitigation alone as sufficient for safety.

Regardless of the degree of mitigation employed, a greater chance of problems exists when individuals are asked to conduct more activities at the time of least human alertness, between 2:00 a.m. and 5:00 a.m. NTSB Board member, Dr. Mark Rosekind, in a 2012 presentation described a model for dealing with fatigue as a safety risk.[6] The model essentially calls for multiple of layers of mitigation to minimize risk. It should be obvious, however, that avoiding high risk periods and activities in the first place, when possible, is a logical first step. Dr. Rosekind also emphasizes that fatigue can degrade every aspect of human capability, including reaction time, judgment, attention, situational awareness, memory, communication and mood. Other heightened risks include attentional lapses, irritability and apathy. In short, there is a greater likelihood of problems during the overnight hours, when fatigue may be a significant factor. Lessons learned from the NTSB's accident investigations, as outlined in Dr. Rosekind's presentation, suggest a similar a conclusion.

Additional support for the seriousness of fatigue in the workplace can be found in a paper recently published in the Journal of Occupational & Environmental Medicine resulting from the work of a special task force of the American College of Occupational and Environmental Medicine (ACOEM).[7] Key points made in the paper include:

- Fatigue is related to duration of sleep and timing of sleep.
- Times of decreased alertness include end of any shift, early afternoon, and early hours of the morning.

[6] https://www.ntsb.gov/doclib/speeches/rosekind/Rosekind_120927.pdf

[7] http://journals.lww.com/joem/Fulltext/2012/02000/Fatigue_Risk_Management_in_the_Workplace.17.aspx#

- Several fatigue and alertness studies have demonstrated that incidents are more related to time of day than to time on task, with an increased risk of fatigue-related incidents in the early morning hours, coinciding with the period of peak sleepiness.

- The system approach to preventing human error focuses on incorporating redundant safeguards and barriers; an error within such a system results from not one but several simultaneous failures.

- Schedule critical tasks at times of maximal alertness.

Concerns about safety issues are not limited to PG&E. A recent American Gas Association ("AGA") survey of 53 LDCs found that many LDCs have manual operations and that even LDCs with automation and storage fields could be detrimentally impacted by a change in the start of the Gas Day.[8] The AGA also explained the potential safety impacts on control room operators and managers as well as field technicians of a change to the start of the Gas Day.[9] The issues raised by AGA about the change in the start of the Gas Day are similar to PG&E's concerns and highlight the detrimental impact nationwide of the NOPR's proposed changes.

Besides safety risks, the change in the start of the Gas Day will also create reliability risks. Gas supplied to PG&E's gas system currently tends to be delivered into the system on a steady, ratable basis, with periodic adjustments made during daylight hours as a result of new gas day schedules and nomination cycle adjustments. Gas demand, however, is not steady and can change quickly throughout the Gas Day. In winter, for example, demand on PG&E's gas system tends to peak in the early morning hours and then peak, to a lesser degree, again in the evening.[10]

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[8] *Analysis of Potential Impacts to LDCs on Changes to the Gas Day Start Time*, issued on November 5, 2014 by the AGA Gas Control Committee at p. 11.

[9] *Id*. at pp. 13-15.

[10] Attachment A, Slides 4-5 (showing change in demand during the Gas Day).

PG&E accommodates these load swings with storage and linepack.[11] PG&E counts on building linepack in the overnight hours to meet the peak demands.[12] A key to managing linepack is knowing the inventory at the start of the Gas Day and during the packing period, typically from 4:00 a.m. to 9:00 a.m. (CCT). Since PG&E relies on timely deliveries of gas from suppliers and on knowledge of inventory to build linepack, PG&E's gas system would face increasing stress if upstream operators do not make needed rate changes or delay such changes until normal working hours which would be approximately five hours after the start of the proposed Gas Day.

In cases where untimely or no upstream supply adjustments create improper linepack, PG&E will likely tighten its operational constraints, resulting in less in-pipeline balancing.[13] Customers would thus be required to more frequently stay on schedule, or face Operational Flow Orders ("OFOs") or curtailments, restricting their operations. The challenge of meeting customer demand can be most extreme during the morning peak period where demand variability is driven primarily by residential and small business customers which can be highly temperature/weather dependent.[14] When PG&E must curtail end use customers, large industrial and electric generation customers would be the first to be curtailed. In short, supply uncertainty increases with a night time start to the Gas Day as there is a greater risk that upstream operators may not make flow rate changes in the middle of the night, and, if a problem arises, may not be able to diagnose and correct it until daytime hours.

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[11] *Id*., Slide 8 (showing storage and linepack).

[12] *Id*., Slides 4 and 6 (showing timing of linepack).

[13] *Id*., Slide 7.

[14] *Id*., Slide 5 (showing residential and small business usage).

To assess the increased safety and reliability risks associated with a nighttime Gas Day start, PG&E evaluated past flows from storage and pipeline interconnect operators.[15] PG&E concluded that 24% of the time, it anticipates a call out of field crews to deal with issues associated with the transition between Gas Days.[16] The changes and field needs will be significant enough to increase curtailment risk at least 10% of the time. Similarly, the historical evaluation of PG&E's interstate pipeline interconnects show a call-out need 13% of the time where 3% of these occurrences prompt a larger risk of curtailment.[17] These operations represent nearly 50 days of likely call-outs and 10 days of potential curtailments annually. During the middle of the night, response times for call-outs will also increase because support crews are not as readily available to assist with operational challenges, further impacting safety and reliability.

III. SYSTEMS AND NEW STAFFING COSTS WILL COST THE INDUSTRY MILLIONS WITH NO RELIABILITY IMPROVEMENT

Cost increases associated with a change to a 4:00 a.m. (CCT) Gas Day start will likely be substantial. Implementing these changes nationally will result in the industry nationwide incurring costs that are primarily intended to address challenges of a particular region. Ultimately, these costs will not be allocated based on causation, and these costs could be well in excess of the costs of more targeted regional solutions, such as regional market enhancements or new pipeline construction in affected areas.

PG&E estimates the costs to its operations will be $2-3 million with recurring costs of approximately $600,000 annually. As explained in the Enhanced Reliability Coalition comments, costs will involve a combination of information technology ("IT") system changes,

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[15] *Id*., Slides 8-9.

[16] *Id*., Slide 8.

[17] *Id*., Slide 9. Call-outs are times where workers must be called or dispatched to a physical site of system operations or equipment.

Supervisory Control and Data Acquisition ("SCADA") data-feed adjustments, meter changes to the degree that the current gas day is hard coded into devices, as well as staffing changes to add field personnel and traders/schedulers to cover overnight hours.

PG&E recommends that the Commission better assess the benefits of the proposed changes against the costs of requiring nationwide changes. At a minimum, such costs grossly exceed the estimates included in the NOPR (approximately $3 million in one–time costs for 166 companies *combined* and approximately $4 million in ongoing annual costs for the same 166 companies *combined*). Numerous parties, other than the interstate pipelines cited in the NOPR, will incur compliance costs, and consideration of these broader costs to market participants generally must also factor into the prudence of the rulemaking.

IV. THE 9:00 AM (CCT) GAS DAY START REMAINS THE BEST OPTION FOR SERVING THE COUNTRY VIA A SINGLE GAS DAY

The current 9:00 a.m. (CCT) Gas Day start has been in place since 1996 and reflects a compromise of relevant industry parties across the nation. This Gas Day start has worked effectively for almost two decades and all parties are now familiar with and have extensive experience with it. Retaining the 9:00 a.m. (CCT) Gas Day start prevents the safety and reliability risks described above, and will prevent parties from incurring unnecessary costs to change their systems from the current start of the Gas Day to a 4:00 a.m. (CCT) Gas Day start.

V. PG&E SUPPORTS TECHNICAL CONFERENCES TO EVALUATE REGIONAL COORDINATION SOLUTIONS

PG&E understands that certain areas of the country face gas and electric coordination challenges that can detrimentally impact reliability. The NOPR proposes several solutions that are not related to the start of the Gas Day to address some of these concerns (*i.e.*, changes to nomination cycles), and there may be additional regional solutions which will facilitate improved electric and gas coordination in parts of the country where coordination is a challenge. PG&E

believes that there would be substantial benefit in Commission-led technical conferences where interested parties can address electric and gas coordination concerns and propose workable solutions that will address these concerns, without the need to make sweeping changes such as the NOPR's proposed change to the start of the Gas Day that ultimately result in more harm than good.

VI. REGIONAL SOLUTIONS ARE APPROPRIATE FOR THE CURRENT CHALLENGES

Regional solutions should be the preferred approach to resolve regional challenges. Regional solutions can be more readily focused to address regional issues and involve fewer tradeoffs. Moreover, regional solutions can be tailored and perhaps implemented more rapidly than larger national changes. Regional solutions can more clearly direct costs of solutions based on causation. In the case of New England's gas-electric challenges resulting in part from coal-to-gas switching in the electric generation fleet, with little or no corresponding changes to the amount of pipeline infrastructure, regional solutions likely need to include new pipeline construction (perhaps with supportive long-term contracting reforms), adjustments to the timing of regional electric markets, and changes to the electric market to establish clearer price signals for firm generating capability (*e.g.*, revised capacity planning constructs). The Commission has already approved of capacity market enhancements for New England,[18] and the newly initiated inquiries into regional practices for fuel assurance may allow for further regional specialization in line with regional challenges.[19]

The Commission should also consider whether past regional planning efforts adequately address the challenges at hand. For instance, transitions to a region's fleet are typically

[18] *ISO New England*, 149 FERC ¶ 61,009 (2014).

[19] *See Order on Technical Conferences* issued on November 20, 2014 in Docket No. AD13-7-000 and AD14-8-000.

considered in long-term planning exercises. To avoid going-forward concerns that regions may be inadequately planning, PG&E recommends the Commission review the reasonableness of planning exercises.

VII. CONCLUSION

Given the significant and detrimental safety, reliability, and cost impacts associated with changing the current 9:00 a.m. (CCT) Gas Day start to a 4:00 a.m. (CCT), the Commission should not adopt the Gas Day start change proposed in the NOPR.

Respectfully submitted on Behalf of Pacific Gas and Electric Company

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Attorney for
PACIFIC GAS AND ELECTRIC COMPANY

Dated: November 28, 2014

ATTACHMENT A

Pacific Gas and Electric Company

Importance of Gas Day Start

Docket No. RM14-2-000
Coordination of the Scheduling Processes of Interstate Natural Gas Pipelines and Public Utilities

Jesus Soto, Dede Hapner, Mel Christopher
July 30, 2014

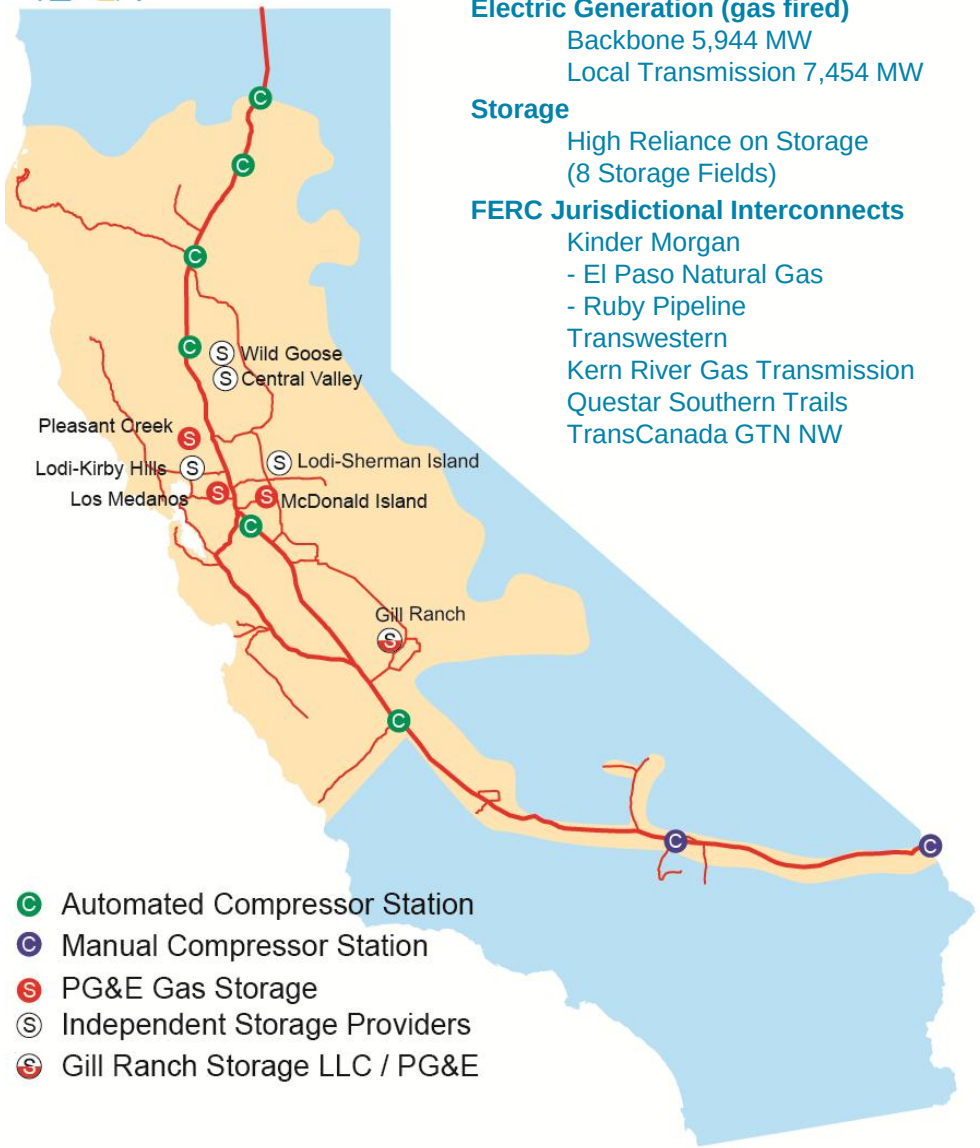
The Gas Day Change is a Risk Based Decision

- The proposed change in the Gas Day negatively impacts Safety, Reliability, and cost of operation.
- Analyzing the impact of the Gas Day change without considering all three impact areas results in an incomplete risk/benefit analysis.

Summary of Gas Day Safety and Reliability Impacts

- PG&E estimates that the change in the gas day will move a minimum of 2,200 manual and 3,500 automated operating changes per year from 7:00 a.m. to 2:00 a.m. (Pacific Time)
- Operations performed at 2:00 a.m. have safety and reliability implications
- Anecdotal comments with a number of industry participants indicates they recognize the safety issues and plan to mitigate by deferring manual operations to daylight hours
- As the load serving entity, PG&E cannot defer its manual operations to the daylight hours
- The risk of third parties delaying manual operations for five hours after the start of the gas day has significant reliability implications
- Not all participants in the delivery chain are FERC jurisdictional

Pacific Gas & Electric Company Overview



Electric Generation (gas fired)

Backbone 5,944 MW

Local Transmission 7,454 MW

Storage

High Reliance on Storage
(8 Storage Fields)

FERC Jurisdictional Interconnects

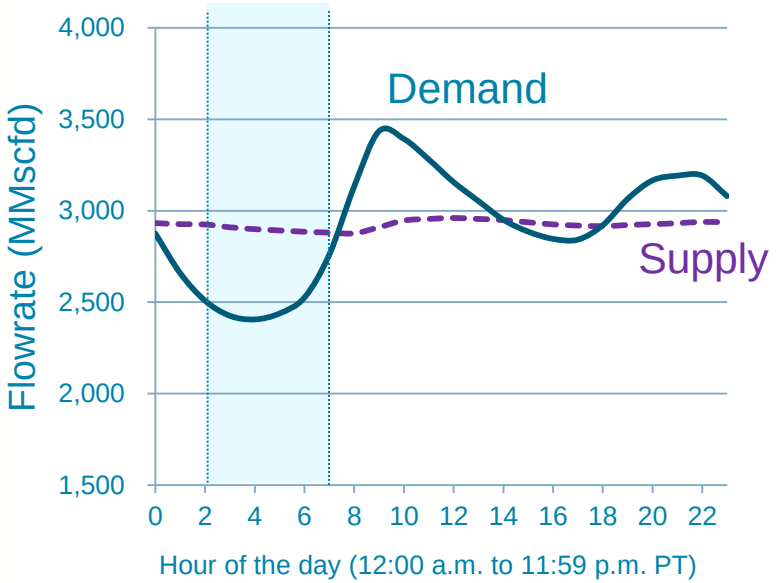
Kinder Morgan
- El Paso Natural Gas
- Ruby Pipeline

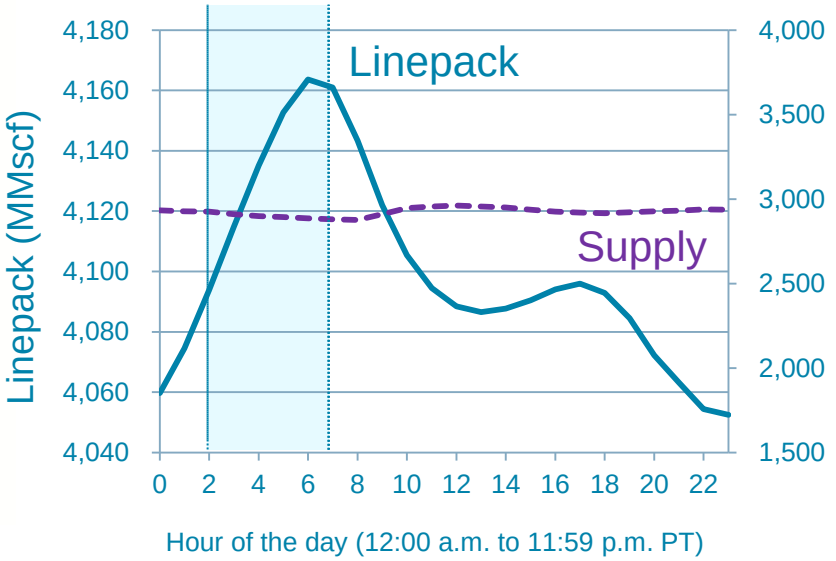
Transwestern

Kern River Gas Transmission

Questar Southern Trails

TransCanada GTN NW

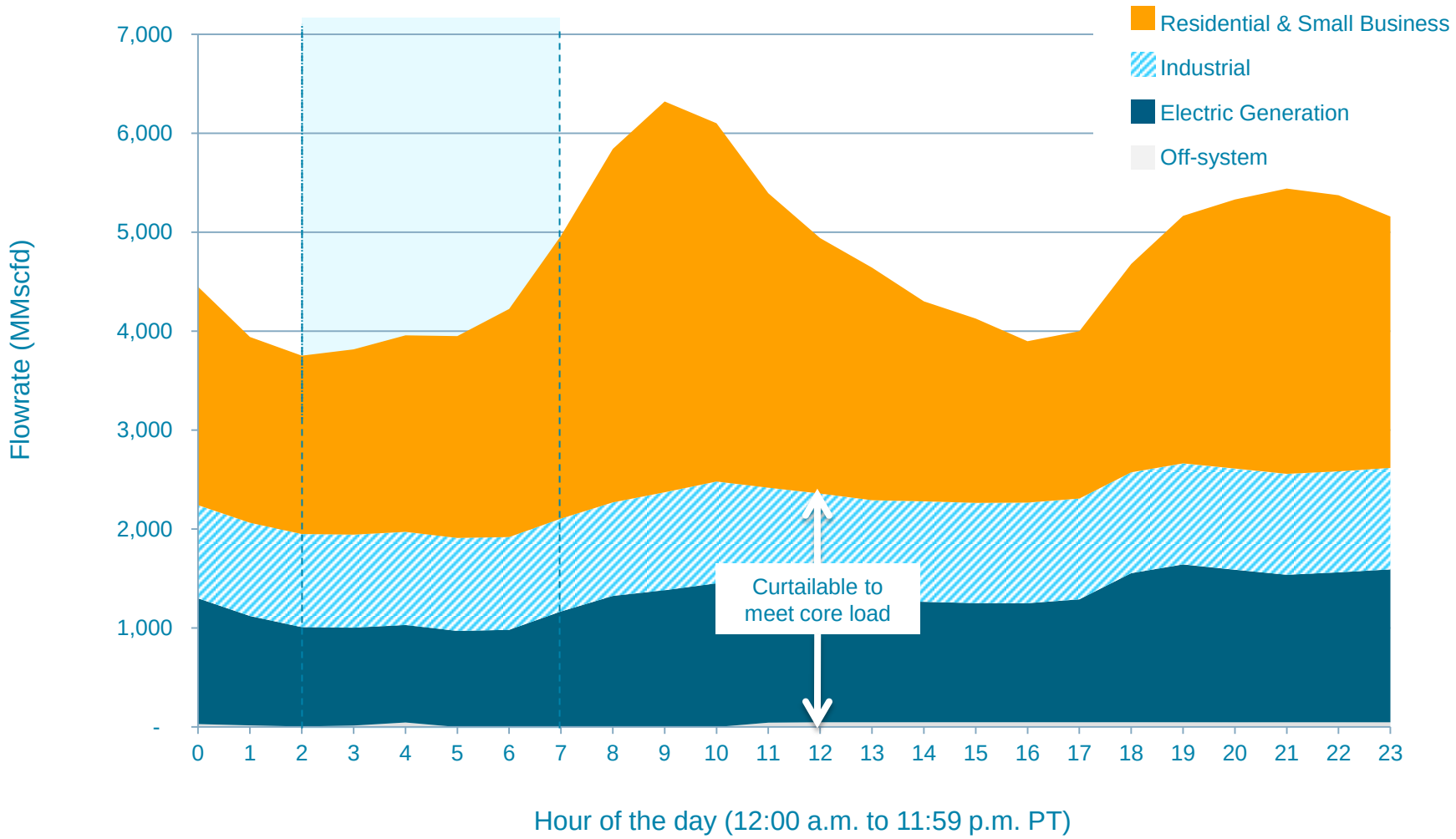




Values shown are 30 month averages

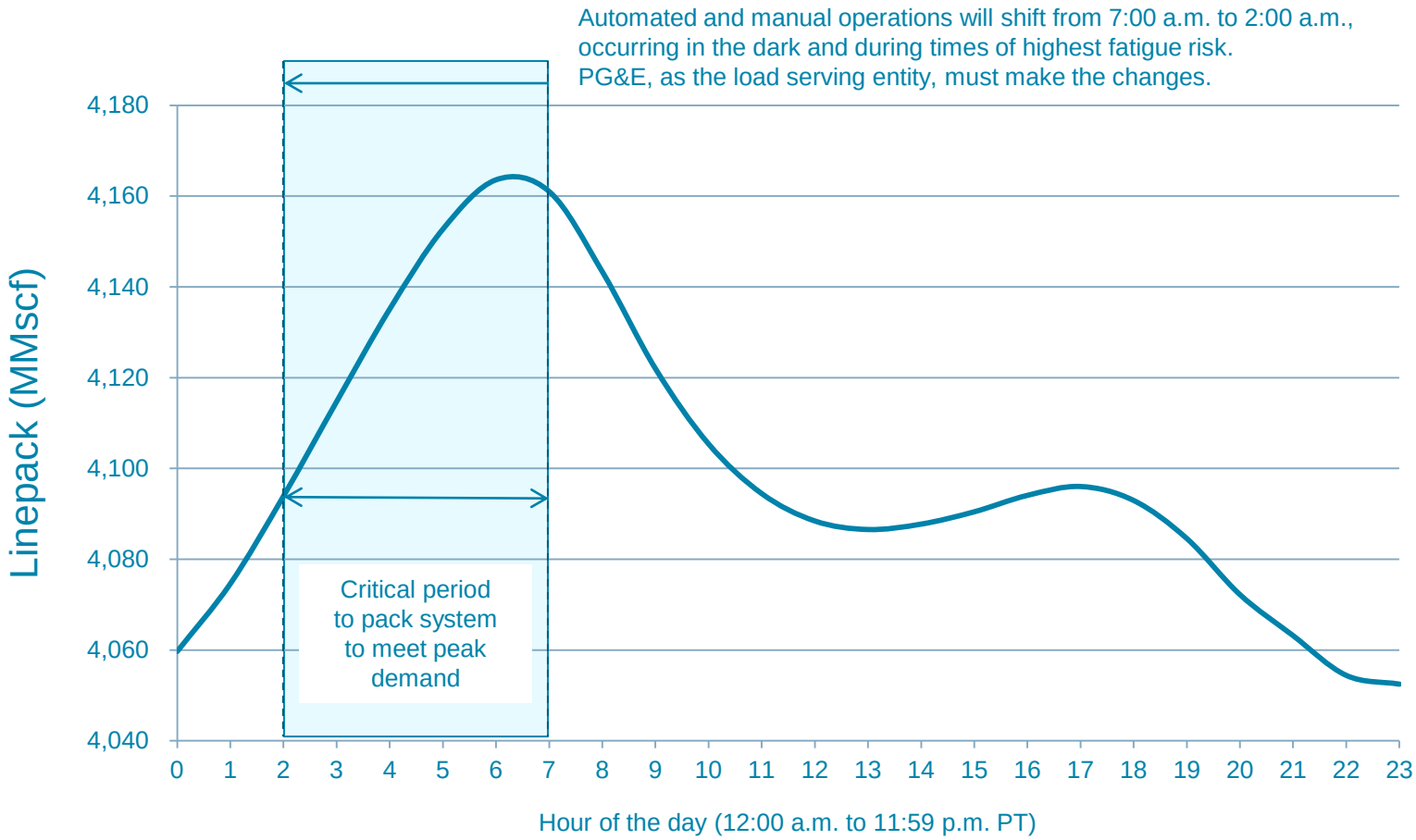
Understanding Demand Profile Drivers

- Demand variability driven primarily by residential and small business (Core) demand
- Electric Generation variability is driven by temperature and renewable generation
- Reliability risk may lead to more Industrial / Electric Generation curtailment



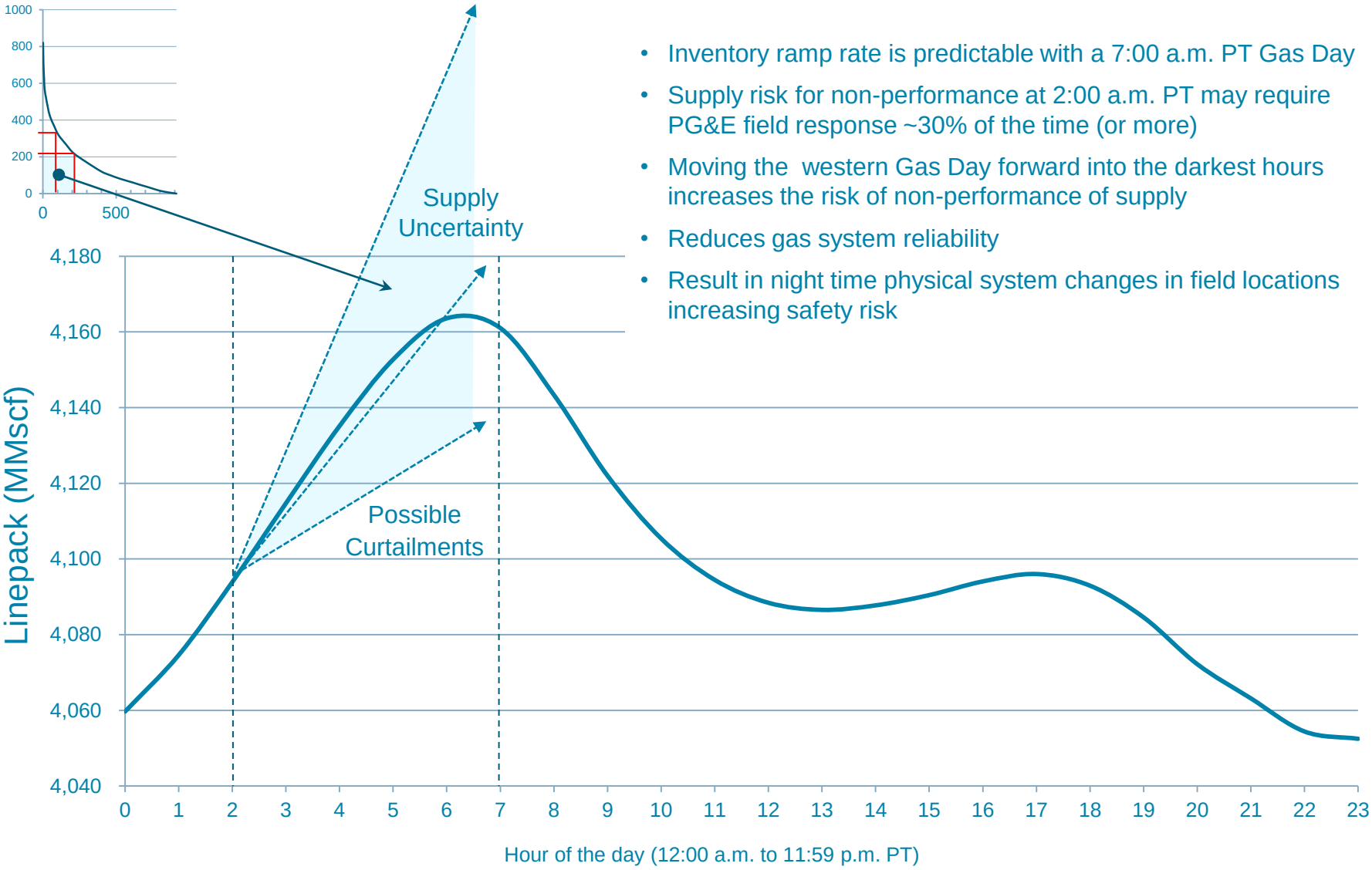
Managing Supply and Demand: Linepack by Hour

- Current Gas Day, 7:00 a.m. PT, inventory is known going into the peak demand period
- Currently, Gas Day supply adjustments are made in daylight hours
- Approximately 2,200 manual and 3,500 automated operations per year at 7:00 a.m. PT as the Gas Day starts
- All manual operations, including call outs for failed automated operations, require physical field level response



Values shown are 30 month averages

2:00 AM PT Gas Day Puts Linepack at Risk
Increased Risk of Supplier Non-Performance

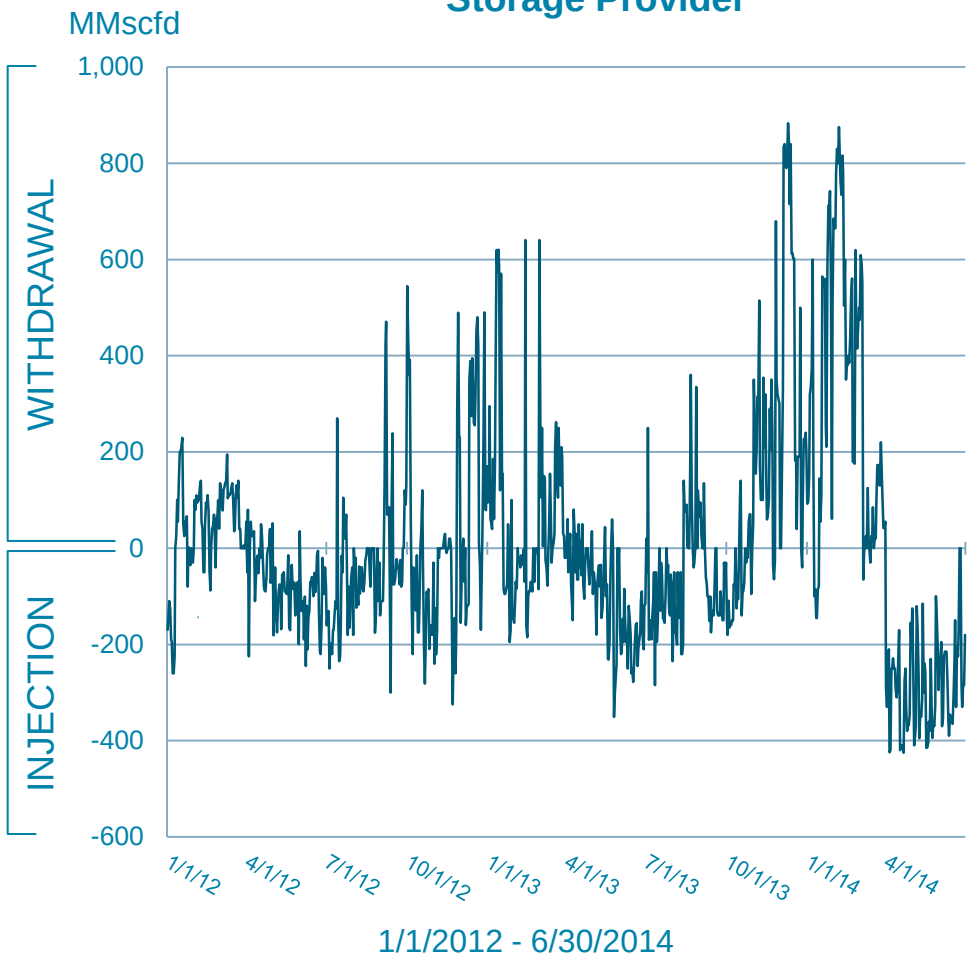


- Inventory ramp rate is predictable with a 7:00 a.m. PT Gas Day
- Supply risk for non-performance at 2:00 a.m. PT may require PG&E field response ~30% of the time (or more)
- Moving the western Gas Day forward into the darkest hours increases the risk of non-performance of supply
- Reduces gas system reliability
- Result in night time physical system changes in field locations increasing safety risk

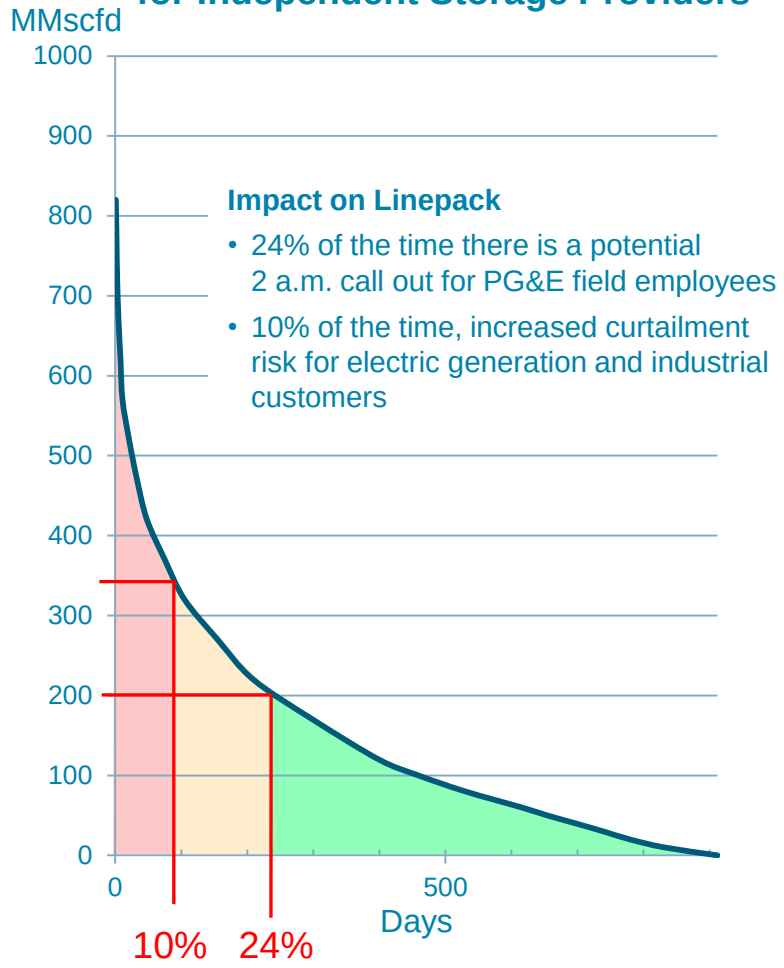
Values shown are 30 month averages

Storage Supply Varies Significantly at the Start of the Gas Day

Daily Volatility for one Independent Storage Provider



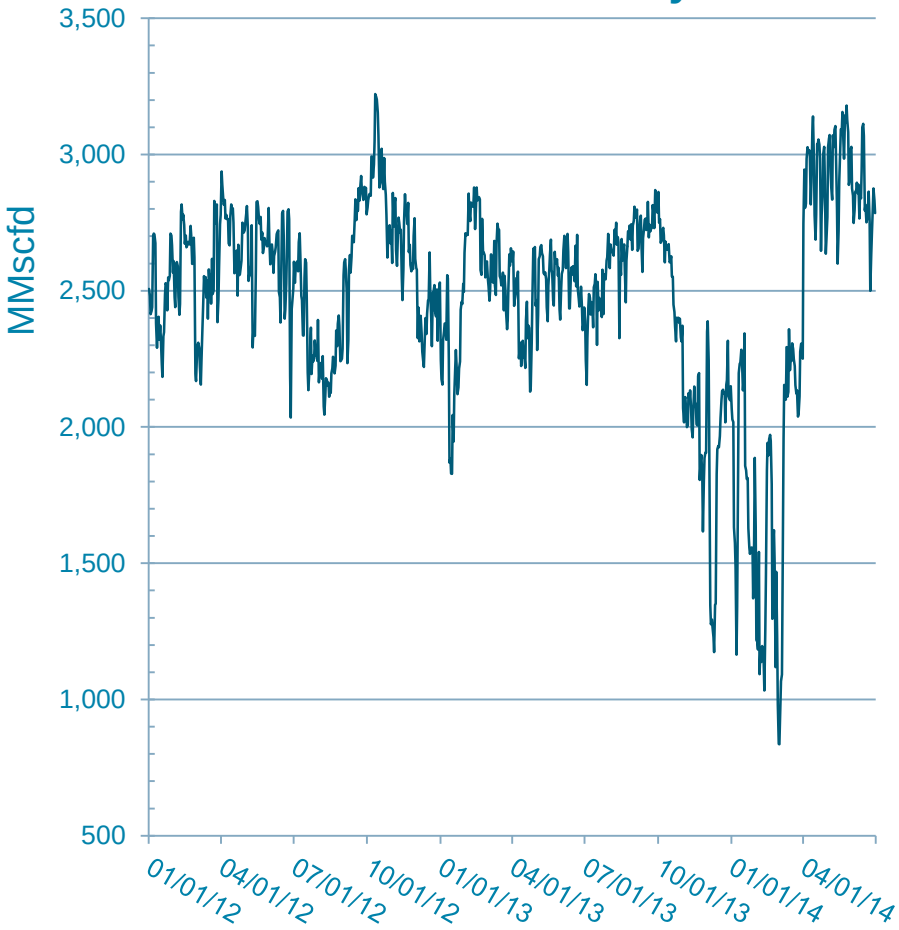
Frequency vs. Daily Flow Changes for Independent Storage Providers



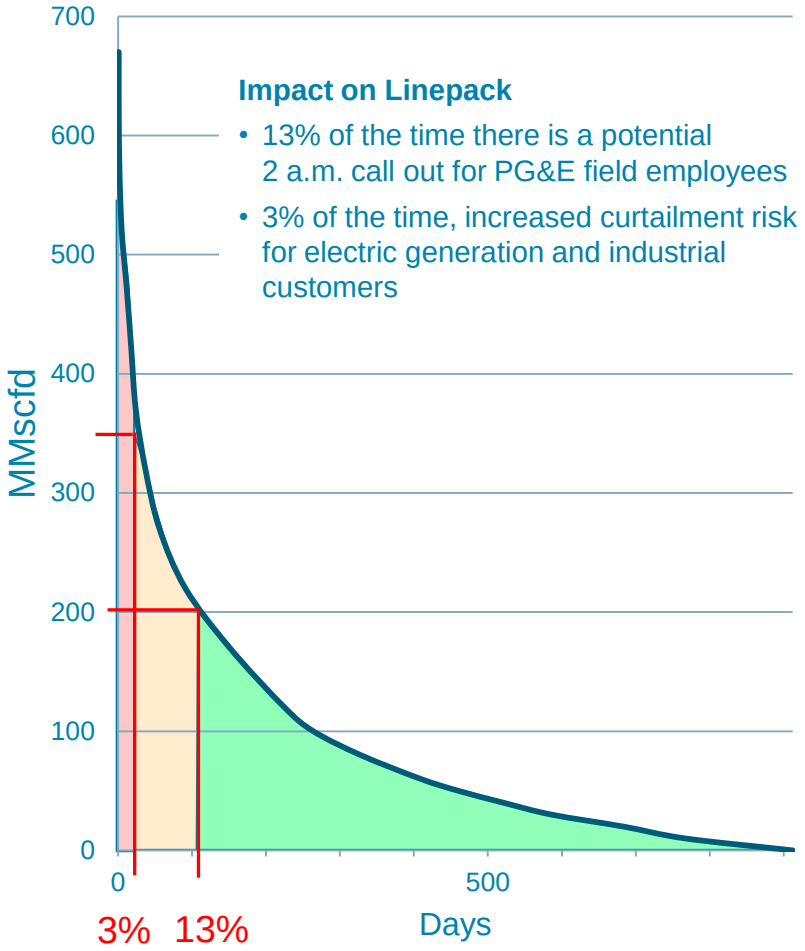
Values shown are 30 month averages

Interstate Pipeline Supply Varies Significantly at the Start of the Gas Day

Interstate Pipeline Flow Rate Changes at start of Gas Day



Frequency vs. Daily Flow Changes for Interstate

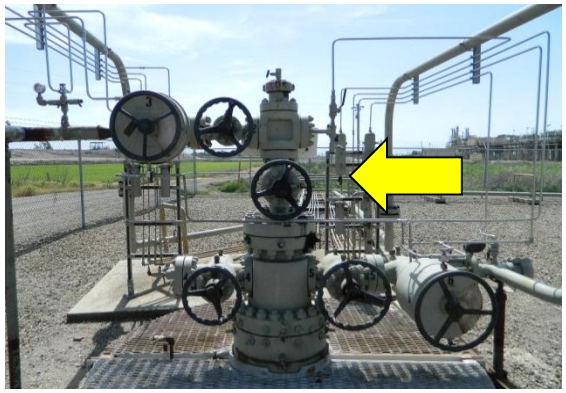


Values shown are 30 month averages

Manual Operations

- 6,000 acre facility
- 81 wells spread over 500 acres
- 3 platforms 25 feet off the ground

McDonald Island Underground Storage



Wellhead

Across PG&E there are 2,200 manual events that may move to 2:00 a.m. PT if the Gas Day is changed from 7:00 a.m. PT

McDonald Island

- 6,000 acre facility
- 81 wells spread over 500 acres
- 3 platforms 25 feet off the ground

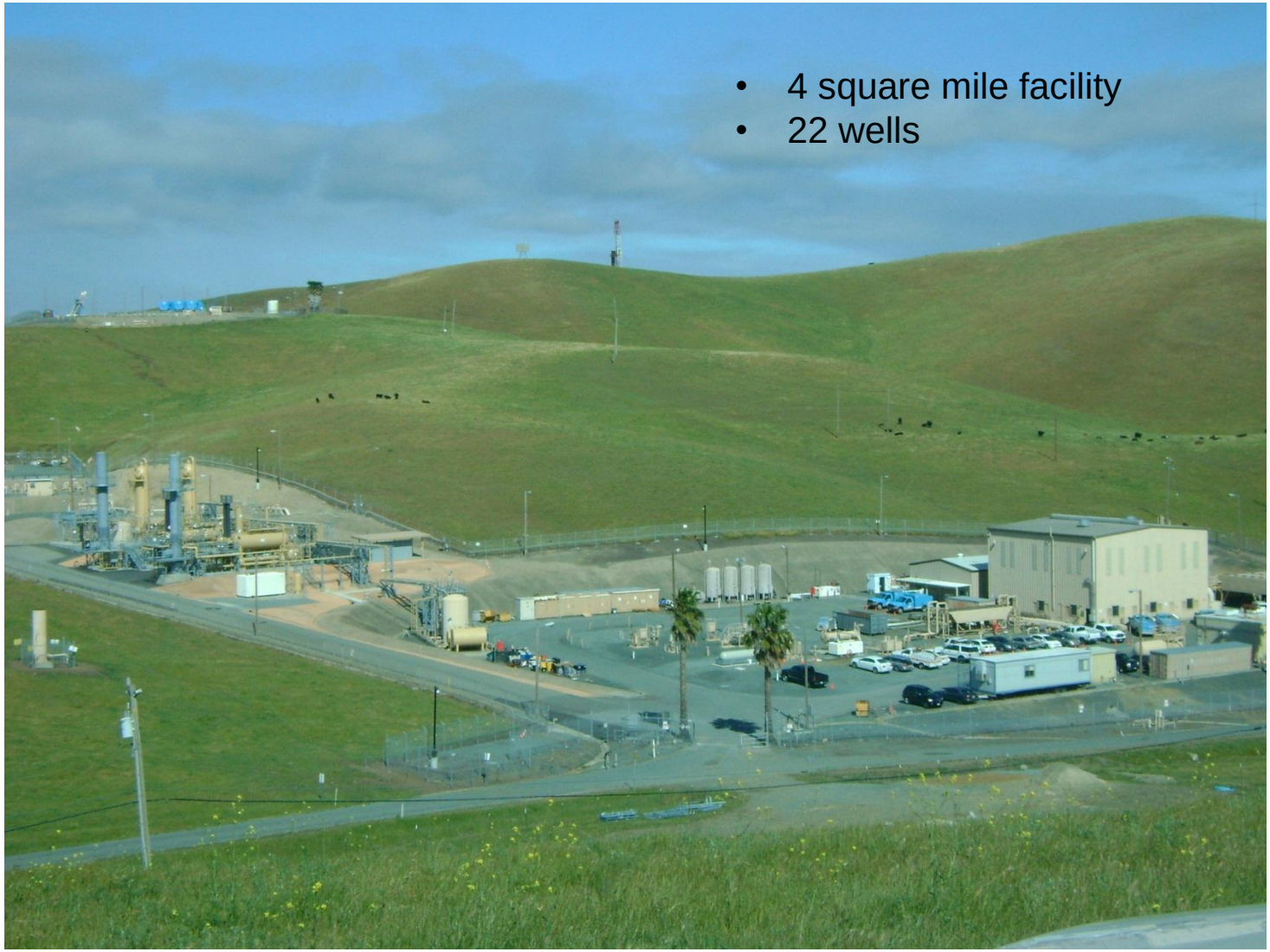
Hinkley Compressor Station

- 12 gas fired units
- Total 40,000 hp
- 10 manual operations per unit

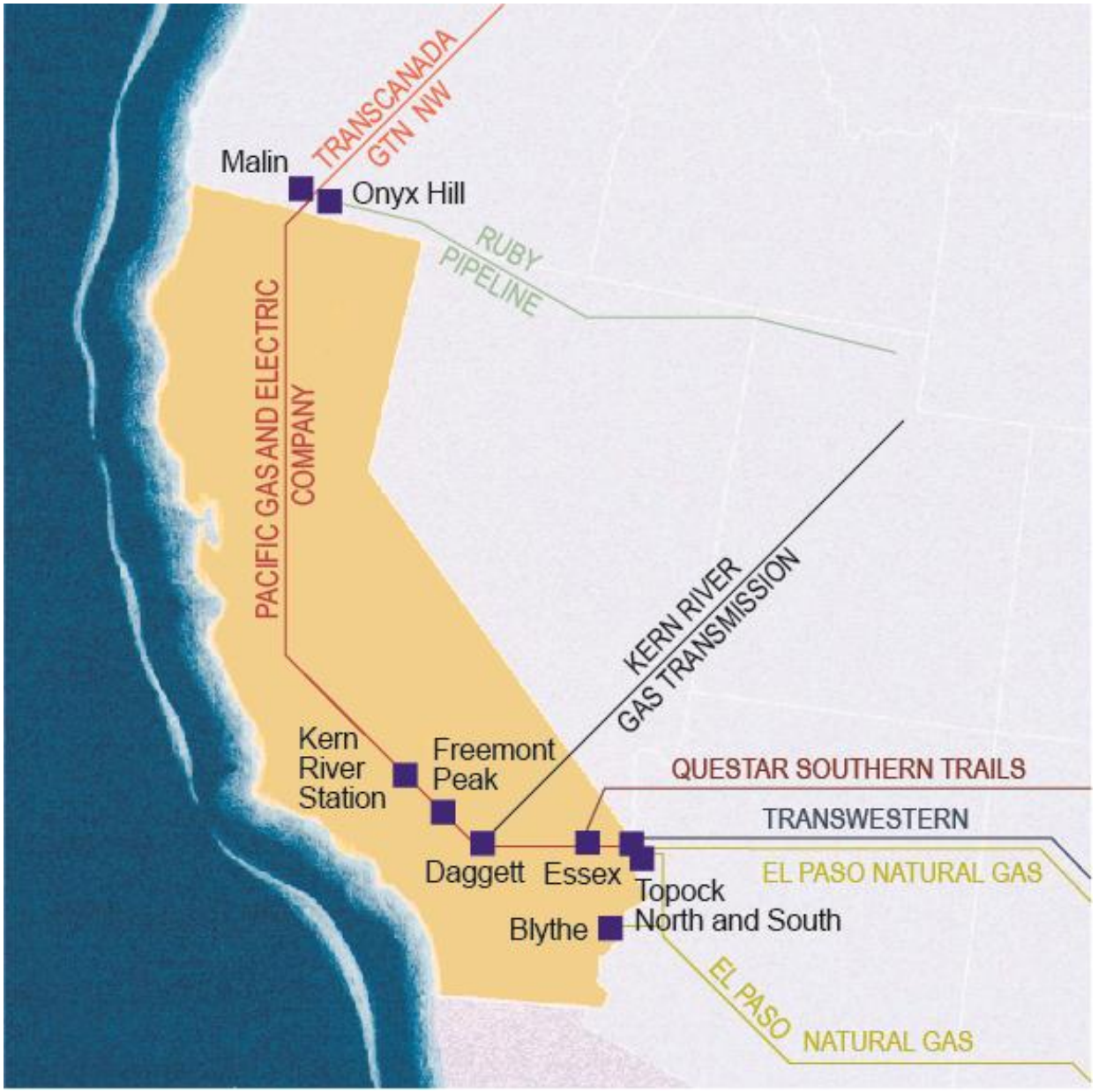
View from the left

View from the right

Los Medanos



Western Natural Gas Pipeline Interconnects



CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing document upon each person designated on the official service list in this proceeding, RM14-2-000, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure and the additional parties listed below:

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Dated at San Francisco, California, this 28th day of November, 2014.

/s/ Charles R. Middlekauff
Charles R. Middlekauff