SAFETY OMBUDSMAN

Virtual Townhall Meeting October 11, 2023
Annual Report Review

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Overview

1. Experience/Background
2. Safety Ombudsman Role
3. Work of the Safety Ombudsman
4. Work of the Well and Storage Operations Safety Committee (WSOC)
5. Recommendation for Improvement

Safety Ombudsman Role

Experience/Background of Steve Nowaczewski

- Education, Experience, Professional Associations
- Risk Management and Safety
- Industry Service – including API 1171 Development
- Consulting and Integrity Management Maturity Advocacy
- RCP history with SoCalGas

Safety Ombudsman Role

Key Elements of Role

- Safety/Transparency Advocate
- Totally Independent of SoCalGas
- Investigate and Respond to Safety/Integrity Concerns
- Public/Regulatory Interface
- Interface with SoCalGas Aliso Canyon Safety Committee

Work of the Safety Ombudsman

Quarterly WSOC Meetings

October 5, 2022 Virtual Public Meeting (presentation found at link below)

https://safetyombudsman.com/ombudsman-virtual-public-mtg-2022_9-9-22-3/

2022 Safety Ombudsman Reports (find reports through link below):

https://safetyombudsman.com/home/resources/

Concerns expressed by the public:

- Adequacy, effectiveness, and transparency around the fence-line methane monitoring system;

- Seismic event and fire event risk hazards relating to well failure and cascading events to the public; and

- Emergency response planning, coordination with local civil emergency responders, and transparency to the public on emergency response plans and emergency notification.

Work of the Safety Ombudsman

- CPUC and CalGEM Safety Inspections/Audits – CalGEM/PHMSA audit Feb 2023 – no findings of concern at the Aliso Canyon facility

- Fence Line Methane Monitoring System
  - Website: https://sem.secmcs.com/MethaneMonitoring/
  - 25 ppm averaged over 30 minutes
  - No Known Events this reporting period

- Safety-related Concerns/Complaints Submitted by the Public
    - No inquiries received over the past year

Work of the Safety Ombudsman – Data Requests

Safety Ombudsman Data Requests

- Data requests were formed to be responsive to public input at the October 5, 2022 annual meeting and to topics that came up during WSOC meetings
- Eight requests, including five primary requests (#14 through #18 inclusive) and three follow-up requests (#15A, #16A, #18A)
- The substance of each data request is included in the report, as are summaries and/or links to the SoCalGas response to each data request – however, I'll summarize each Data Request and response.

Work of the Safety Ombudsman – Data Requests

Data Request #14 (9/21/22)

- Requested a copy of what SoCalGas uses as a well handover process (as in ISO 16530).
- SoCalGas responded on 10/13/22 (dated 10/11/22), attaching STOR-002 O&M Request Work Instructions.

Summary opinion of the Ombudsman following DR#14 responses:

- Identified opportunities for improvement in STOR-002, (refer to Annual Report Number 4 – Recommendations for Improvements Related to Safety and Leak Prevention)

Work of the Safety Ombudsman – Data Requests

Data Request #15 – (10/21/22)

- Questioned the adequacy, effectiveness, reliability and availability, and transparency of the fence-line methane monitoring system (FLMM). The data provided by SoCalGas indicated that the FLMM system reliability is relatively high – information was available on the webpage ~99.7% of the time.
- SoCalGas reviews the system operation and its components for possible improvements.
- Data Request #15A (11/16/22) sought clarification on system fault modes and occurrences and detail on system reliability calculations and statistics.
- *DR#15 and #15A questions and responses, with spreadsheets and a summary presentation of the FLMM system provided by SoCalGas, are available by links in the report.*
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Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#15 and #15A responses:

The FLMM system at Aliso Canyon has high reliability, and SoCalGas demonstrated that it reviews the system for performance and potential improvements.

The Ombudsman recommends that SoCal track the reliability of safety systems:

1. Track FLMM daily percent availability and reliability, with down time linked to a causal factor such as maintenance, repair, humidity, beam block, other issue as identified, unknown.

2. Identify and track the percentage of time a monitoring station was on and reporting, off for routine planned/scheduled repair and/or maintenance, for non-routine or corrective (unplanned) repair and/or maintenance, and/or not reporting and awaiting investigation as to the cause of the status.

3. Extend the concept of reliability tracking to other safety systems - well safety valve reliability, well pressure/annulus pressure/flow monitoring equipment accuracy and reliability

Work of the Safety Ombudsman – Data Requests

Data Request #16 – (11/30/22)

- Questioned emergency response procedures, planning, coordination with local civil emergency responders, drills, and transparency to the public on emergency response plans and emergency notification.
- SoCalGas provided responses on January 12, 2023, with information sufficient, or better, to answer the Ombudsman's immediate questions in DR#16 – see links in the report to the many documents provided
- Data Request #16A (1/30/23) questioned SoCal on well flow potential and heat content estimation, emergency area/isolation area determination and planning, and actions taken by the company to internally recommended improvements after drills and reviews.
- *The DR#16 and #16A questions and responses, with links to individual documents are available in the report*

Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#16 and #16A responses:

SoCalGas provided documentation that the organization follows its emergency planning and response procedures, creates realistic drills involving geohazards and gas storage wells, and communicates with local civil emergency planning coordinators.

There are opportunities for improvement in the detail of gas storage emergency response and planning.

Discussion will be on the agenda for future WSOC meetings regarding how SoCalGas could identify flow capability of each well and implement improvements in emergency action plans for gas storage well incidents using heat flow, noise, pollutant flow, and precautionary distancing measures

Work of the Safety Ombudsman – Data Requests

Data Request #17 – (1/09/23) after review of the 2019 DRAFT Aliso Canyon Geologic, Seismologic, and Geomechanical Studies reports 1-10, performed pursuant to requirements made by CalGEM. *Reports are posted at https://www.conservation.ca.gov/calgem/Pages/AlisoCanyon.aspx*

- Questioned what risk management plans or actions SoCalGas had completed pursuant to the landslide and seismic-induced earth movement risk identified in the reports in general and at specific locations.
- Ombudsman questions focused on areas of general geo-hazard interest presented by the public during the October 2022 annual meeting.
- SoCalGas provided a response on February 17, 2023, answering only one question and deferring on the others due to legal/regulatory issues impeding the completion of the draft reports.

Summary opinion of the Ombudsman following DR#17 responses:

- SoCalGas responded to only one question in DR#17, so the Ombudsman followed with similar questions in DR#18 and DR#18A

Work of the Safety Ombudsman – Data Requests

Data Request #18 - (3/6/23)

- Questions following those in DR#17, as well as new questions about annulus gas monitoring as a follow-up to 2019-20 email inquiries by the Ombudsman.
- Data Request #18A (5/22/23) sought additional information and clarification pursuant to DR#18 questions and responses.
- DR#17, #18, and #18A relate to understanding the advance of SoCalGas' risk management efforts in Aliso Canyon – specifically the knowledge gained through ongoing monitoring, the preventive and mitigation efforts employed or planned, and the perceived efficacy and effectiveness of those P&M measures.
- *The DR #17, DR#18, and #18A questions and SoCalGas responses can be found by links in the report.*

Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#17, #18, #18A responses:

The 2019 DRAFT geohazard analyses commissioned by CalGEM provided significant information which SoCalGas could use to evaluate their current risk management treatments for those hazards at specific well locations or at the Aliso Canyon facility. Only one report has been approved as final.

Beyond the issue of the pace of SoCalGas' follow-up action to these reports, the answers to the Ombudsman's questions in DR 17, 18, 18A could provide the public with some understanding of the risk reduction achieved by SoCalGas since 2016 and the improving risk-informed discipline of the Company visible in its management of active hazards and threats.

The Ombudsman recognizes that risk of storage gas loss of containment and its consequential effects has been reduced at the Aliso Canyon facility in since 2016.

Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#17, #18, #18A responses:

Reduction in risk at the Aliso Canyon facility falls into three broad categories:

- Reduction in footprint (number of active wells and well sites)
  - o General reduction in environmental and safety impact potential
  - o Reduced reservoir pressure and volume (reduced consequence potential)
- Increased mechanical integrity and resilience of wells
  - o Design/materials improvements (liners, other tubulars, cement, wellhead)
  - o Two passive physical/technical barriers (tubulars)
  - o Additional wellhead barriers
  - o Treatment for prevention/mitigation of other hazards; plugged well integrity
- Increased human and organizational awareness and discipline
  - o High-quality procedural and engineering/material standards
  - o Remote/electronic/continuous monitoring, with alarm/warning management
  - o Additional downhole and wellhead testing, inspection, analysis
  - o WSOC and other aspects related to safety management
  - o SIMP organizational acumen

Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#17, #18, #18A responses:

At the Aliso Canyon facility:

54 wells have been plugged since late 2016 in accordance with CalGEM and PHMSA rules, essentially filling all voids with cement to provide zonal isolation. 60 injection/withdrawal (I/W) wells remain – an active well count reduction of 47%.

41 of 60 I/W wells have had complete new inner casing strings installed since 2016, and by the end of 2023 the plan is that 44 wells, 73% of the I/W wells, will have new inner casing strings. The reconfiguration of those 40+ wells has increased their mechanical strength.

Based on detailed information SoCalGas provided confidentially in response to DR #18A:

- an average 40% increase in casing collapse resistance (ranging from nil to 170%)
- an average 16% increase in casing internal yield strength (ranging from nil to 110%).
- In most wells worked on the past 6-7 years, the original production casing strings also had additional cement placed around the casing.

Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#17, #18, #18A responses:

Double passive barriers (additional casing and cement) in 41 wells re-worked to date provide an increase in overall resistance to earth movements, with verified mechanical properties and baseline integrity assessments. Wells retain the residual mechanical strength of the original production casing and add to that the strength of the new inner casing, which in most cases has substantially greater collapse resistance and internal yield strength than the original production casing.

Each well with a new inner string is more resistant to, and resilient against, the potential impact of earth mass movements due to seismic activity and/or landslides. The new well tubulars have greater mechanical strength than the original production casing, including greater collapse resistance, greater internal yield, and increased joint strength at the threaded connections.

The Ombudsman recommends that when the geohazard and well geomechanical reports are completed, the increased resistance and resilience of the dual-casing-string wells be modeled to show the before- and after-state of risk with respect to potential failure due to mass earth movements. Refer to Annual Report Number 4 – Recommendations for Improvements Related to Safety and Leak Prevention

Work of the Safety Ombudsman – Data Requests

Summary opinion of the Ombudsman following DR#17, #18, #18A responses:

The Ombudsman also notes that good regulation has compelled SoCal and other storage operators to baseline and re-assess well integrity, which increases risk recognition by revealing knowledge of current state as well as of time-dependent, time-independent, and design/as-built inherent threats to well integrity.

As of mid-2023, all Aliso wells have had 2nd-round assessments; 32 wells have had 3rd-round reassessments with an additional 3 in progress; and 2 wells have had 4th-round reassessments with 1 in progress.

In calendar year 2022, 17 wells had integrity reassessments. The 2023 work by mid-year (June/July) included 3 integrity reassessments completed and 5 in progress; 2 well plug and abandonments completed; and 2 new inner casing strings installed with 1 in progress.

Work of the WSOC

Key Elements

- Eight-Year Commitment
- Role: Safety Monitoring and Improvement Activities:
  - Quarterly Meetings
  - Focus on Well Integrity and Leak Prevention
  - Make Recommendations for Repairs/Improvements and Policies
  - Facilitate Role of and Work Cooperatively With Ombudsman
- WSOC Charter and Meetings

Work of the WSOC – WSOC Recommendations

- WSOC Recommendations this period
  - Procedural and documentation improvements for well barrier elements and their performance criteria, pursuant to review of ISO 16530
  - Material verification process and documentation and wellhead-lateral configuration re-design
  - Recommendations on human and organizational systems enhancement pursuant to audit of Gas Standard 224.119 Pressure Monitoring
    - Training, work management system task documentation and tracking, and other documentation

Work of the WSOC – Public Agency Interaction

- CPUC and CalGEM Safety Inspections
  - The WSOC is charged with reviewing the results of any CPUC and CalGEM safety inspections of the Facility. The February 2023 audit had no findings with respect to Aliso Canyon.
- CalGEM responses on requests for well inspection interval variances
  - 2nd and 3rd round well assessments provided evidence to suggest that the reassessment inspection period can be lengthened, and the Company submitted individual requests to CalGEM for such reassessment extensions for forty-six (46) wells at the Aliso Canyon facility.
  - As of mid-2023, SoCalGas received permission from CalGEM to extend the reassessment interval from 24 months to 50-60 months on 29 wells, all of which have had new inner strings of casing installed and cemented in place since the initial baseline inspections.
  - CalGEM decision is pending on an additional 11 wells.
  - CalGEM denied extension of reassessment intervals for 6 wells.

Work of the WSOC – Going Forward

- Ongoing safety culture improvement as part of overall SoCalGas Safety Culture Improvement Plan “Safety Forward”
- Implementation of additional procedural audits and/or SWOT exercise
- Inclusion of safety topic review and inclusion of review of wider storage industry events, such as from:
  - PHMSA incident reports
  - Major accident reports from NTSB, CSB, or other, particularly those focused on oil and gas well events

Recommendations for Improvements

Recommendations of the Safety Ombudsman for Safety Improvements at the Facility

- Part A: Four New Recommendations During the July 2021 – June 2022 Period
- Part B: Report on SoCalGas Progress in Responding to Recommendations Made in Prior Periods
  - B-1: recommendations made by the WSOC, closed
  - B-2: recommendations made by the Safety Ombudsman, closed
  - B-3: recommendations made by the Safety Ombudsman, open

Recommendations for Improvements

Safety Ombudsman Recommendations July 2022 – June 2023

- Improve the well handover process, which SoCalGas embeds in STOR-002 O&M Request Work Instructions
- Pursuant to Data Requests #15 and #15A regarding the fence-line methane monitoring system, track the reliability of safety systems
- Conduct a strengths-weaknesses-opportunities-threats (SWOT) exercise over the course of the 2023-2024 WSOC meetings (context/boundaries are the SoCalGas SIMP with respect to Aliso Canyon; the purpose of the SWOT would be to elicit WSOC recommendations for safety improvement at the facility.)
- Other WSOC improvements – including review of PHMSA incidents, major accident reports, and safety culture updates (previously addressed in review of the WSOC report)
- Document the risk reduction at the Aliso Canyon facility since 2016

Recommendations for Improvements

Safety Ombudsman Compendium of All Recommendations, Status and Progress Tracker, not including new recommendations made during 2022-2023

- Part B: Report on SoCalGas Progress in Responding to Recommendations Made in Prior Periods
  - B-1: recommendations made by the WSOC, 3 actions closed
  - B-2: recommendations made by the Safety Ombudsman, 6 actions closed
  - B-3: recommendations made by the Safety Ombudsman, 4 recommendations open

SoCalGas continues to progress in responding to the recommendations

Next Steps

- Review feedback from virtual public meeting
  - Incorporate recommendations for improving utility of future reports
- Ongoing attendance at WSOC Meetings
- Responding to issues/concerns posted to Safety Ombudsman Website – the link is on the next slide…

Questions?

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