



SAFETY OMBUDSMAN

**Virtual Townhall Meeting October 14, 2026
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. Recommendations 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 Well and Storage Operations Safety Committee

Work of the Safety Ombudsman

Participate in Quarterly WSOC Meetings

Prepare 2025-2026 Safety Ombudsman Reports (find reports through link below):

<https://safetyombudsman.com/home/annual-reports/>

October 15, 2025 Virtual Public Meeting (presentation found at link below)

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

One attendee provided positive feedback on SoCalGas progress and plans to install deeper set safety valves, but had follow-up questions on:

- SoCalGas' risk assessment process maturity and SoCalGas Position Paper S_POS.002,
- Depth of subsurface safety valve placement with respect to faults and with respect to design and reliability.

Work of the Safety Ombudsman – Data Request 24

Following up the 2025 meeting attendee's questions, I prepared Data Request (DR) #24 and submitted it to SoCalGas on November 20, 2025. DR #24 contains four (4) questions regarding:

- The status of Position Paper S_POS.002 relative to the progress of SoCalGas' risk assessment process.
- The subsurface safety valve system manufacturer's reliability information.
- The relative threat level of fault movement for faults deeper than the Younger Santa Susanna Fault.
- The nature/range of debris and deposits experienced in wells related to the flow composition and physical flow regime in Aliso Canyon wells.

SoCalGas responded on February 2, 2026. The link to DR24 and the SoCalGas responses is included in the report.

Work of the Safety Ombudsman – Data Request 24

The Ombudsman reviewed the SoCalGas responses to Data Request #24, including discussion with SoCalGas representatives at the March 19, 2026 WSOC meeting.

DR 24 Q1 - Update of Position Paper S_POS.002 “Employment of surface and subsurface automatic or remote actuated safety valves”

SoCalGas provided the latest version of the subject paper, dated 11/18/25. The paper addressed all SoCalGas storage facilities, contains the status of current/planned Aliso Canyon well Subsurface Safety Valve (SSSV) installations, includes a safety valve Decision Tree process flow chart, and a detailed data set of inputs to risk-based decision for Aliso Canyon wells.

The Ombudsman requested (in DR24A) that SoCalGas make minor edits to the Position Paper.



Work of the Safety Ombudsman – Data Request 24

DR 24 Q2: Manufacturer's safety valve system component reliability information.

SoCalGas provided Halliburton's document on tubing retrievable safety valve (TRSV) life estimate and reliability.

Some of the materials provided by Halliburton to SoCalGas were confusing or needed clarification, so the Ombudsman requested (in DR24A) that SoCalGas obtain that clarity from Halliburton.

Work of the Safety Ombudsman – Data Request 24

DR 24 Q3 - Fault movement threats for faults deeper than the Younger Santa Susanna Fault

SoCalGas addressed two groups of deep-seated faults, concluding that the potential threat caused by both groups is low.

- Reservoir boundary faults: Frew and Sub-Frew (west boundary, intersecting 15 wells combined), Ward (north boundary, intersecting 4 wells), and Roosa (north boundary of shallower Pliocene formations, intersecting 12 wells), which are not active and intersect fewer wells than the Santa Susana Faults, consequently posing a low threat.
- Northridge Blind Thrust Fault (NBTF): somewhat remote from the Aliso Canyon field and much deeper than the storage field, so the main threat related to this fault system is a cascading risk event of landslides.
- *DR24A questions were developed to clarify whether SoCalGas considered the NBTF potential threat low because of the assessed mitigation effects of SSSV already in place or is it low even prior to accounting for mitigation effects of SSSV?*



Work of the Safety Ombudsman – Data Request 24

DR 24 Q4 - Nature/range of debris and deposits related to the flow composition and physical flow regime in Aliso Canyon wells

SoCalGas responded that they have not observed significant solids collecting and/or causing functionality or performance problems with downhole well equipment.

Additionally, with respect to subsurface safety valve applications in Aliso Canyon wells, it is worth repeating the Ombudsman's comments in Annual Report Number 6 – Work of the Safety Ombudsman

Work of the Safety Ombudsman – Data Request 24A

The Ombudsman delivered Data Request #24A to SoCalGas on March 23, 2026, with three (3) questions to follow up on SoCal's responses to DR #24.

- Clarification, update, correction, and redaction of applicable parts of Position Paper S_POS.002, per the Ombudsman's review of DR #24 material provided by SoCalGas.
- Request for SoCalGas to direct questions to Halliburton to edit and clarify their safety valve reliability information provided in response to the original DR #24 question.
- The understanding of the threat level assessment related to the Northridge Blind Thrust Fault.

SoCalGas responded on June 24, 2026. DR #24A questions, SoCalGas responses and pertinent information supplied by SoCalGas can be found at the links found in the report.

Work of the Safety Ombudsman – Data Request 24A

DR 24A Q1 - Clarification, update, correction, and redaction of applicable parts of Position Paper S_POS.002, per the Ombudsman's review of DR #24 response material

SoCalGas provided an edited and redacted version of the Position Paper

SoCalGas explained that the risk of installing and servicing subsurface safety valves was considered but not included in the Decision Tree on page 3 to evaluate and prioritize installation, and that SoCalGas manages the associated risk by establishing comprehensive procedures and training affected personnel.

Work of the Safety Ombudsman – Data Request 24A

DR 24A Q2 - Request for SoCalGas to have Halliburton edit and clarify their safety valve reliability information provided in response to the original DR #24 question.

SoCalGas provided Halliburton's revised copies of the two reliability charts found in response to DR #24, as well as Halliburton's comments responsive to safety valve reliability and issues most often affecting safety valve reliability.

- The reliability curve and probabilistic projections are based on a 9-year study of installations in Gulf of Mexico wells.
- Reliability and failure contributors include: unacceptable flapper leak rate during closure; flapper closure malfunction; attempted hard closure during full flow; inadequate testing and maintenance; hydraulic leaks; control line faults; installation error or damage, and well conditions.
- WellStar® TRSV systems have been in service since 1996 with no improvements.
- NE™ TRSV systems have been in service since 2002 as a rod piston, non-elastomeric version of the WellStar®, but since 2011 with improved high-performance piston seals.



Work of the Safety Ombudsman – Data Request 24A

DR 24A Q3 - The understanding of the threat level assessment related to the Northridge Blind Thrust Fault

SoCalGas referred to the work and analyses conducted as part of the publicly available Aliso Canyon Geologic, Seismologic and Geomechanical Studies in 2019. SoCalGas rates as low the potential unmitigated threat related to movement on the Northridge Blind Thrust Fault (NBTF), due to its geological positioning several kilometers below the field and down-dip of the gas storage reservoir, making it an unviable pathway for gas migration.

Work of the Safety Ombudsman – Data Request 24A

DR 24A Q3 - The understanding of the threat level assessment related to the Northridge Blind Thrust Fault

- The 1994 Northridge earthquake shows that the relative risk of a NBTF-event to a well with and without a deep subsurface safety valve is essentially the same as the relative risk of a landslide-induced well-integrity event to a well with and without a subsurface safety valve. Northridge showed that the risk of well integrity resulting from a NBTF event is already very low at Aliso Canyon.
- Nonetheless, applying industry standard quantitative risk analysis practice, a well with a SSSV installed could have a NBTF-event relative risk reduction multiple of 0.1 to 0.01 compared to a well without a SSSV.
- Therefore, given the position of the NBTF relative to the Aliso Canyon Storage Gas Reservoir, the primary risk associated with the NBTF's activity is its ability to trigger secondary hazards like landslides as stated in AECOM "Probabilistic Fault Displacement Hazard Assessment."



Work of the Safety Ombudsman

Review with the WSOC the status of well integrity assessments and well workovers

18 workovers YTD 2026

56 wells plugged since late 2016 in accordance with CalGEM and PHMSA rules

3 well plugging jobs are in progress

55 active injection/withdrawal wells will remain upon completion of the 2026 work.

As of June 2026, 43 out of 58 wells have had new inner casing strings installed since 2016; this will be 40 of 55 after the plugging of the 3 wells this year.

CalGEM granted 83 reassessment extensions on 54 unique wells, with the reassessment interval reset from 24 months to as much as 84 months.

For 6 wells where reassessment extension requests had been denied, SoCalGas reworked 2 wells and reinspected 3 wells, subsequently receiving reassessment extension permission from CalGEM.

Aliso Canyon Subsurface Safety Valve Installations			
Well	Safety Valve Depth (ft., measured)	Status	Primary Threat Basis
Fernando Fee 33	367	Operational	Landslide Threat
Fernando Fee 34	489	Operational	Landslide Threat
Porter 24A	3360	Operational	Fault Movement Threat
Porter 50C	3199	Operational	Fault Movement Threat
Porter 69C	462	Operational	Landslide Threat
Porter 69F	468	Operational	Landslide Threat
Porter 69J	479	Operational	Landslide Threat
Standard Sesnon 9	457	Operational	Landslide Threat
Standard Sesnon 10	372	Operational	Landslide Threat
Standard Sesnon 29	374	Operational	Landslide Threat
Fernando Fee 32F	3530	Installed, out of service	Fault Movement Threat
Fernando Fee 35C	1712	Installed, out of service	Fault Movement Threat
Porter 72B	3237	Installed, out of service	Fault Movement Threat
Fernando Fee 32	+/- 3700	Planned	Fault Movement Threat
Fernando Fee 32A	+/- 3700	Planned	Fault Movement Threat
Fernando Fee 32B	+/- 3700	Planned	Fault Movement Threat
Fernando Fee 32G	+/- 3700	Planned	Fault Movement Threat
Fernando Fee 35A	+/- 3700	Planned	Fault Movement Threat
Porter 32	+/- 3700	Planned	Fault Movement Threat
Porter 32C	+/- 3700	Planned	Fault Movement Threat
Porter 42A	+/- 3700	Planned	Fault Movement Threat
Porter 50B	+/- 3700	Planned	Fault Movement Threat
Porter 68A	+/- 3700	Planned	Fault Movement Threat
Porter 69A	+/- 3700	Planned	Fault Movement Threat
Porter 69D	+/- 3700	Planned	Fault Movement Threat
Porter 72A	+/- 3700	Planned	Fault Movement Threat

Work of the Ombudsman – SSSV Status

13 Aliso Canyon wells have subsurface safety valves installed; 10 operational and 3 out of service for various work.

SoCalGas plans up to 13 additional installations in 2026-2027.



Work of the Ombudsman – CPUC/CalGEM Audits

SoCalGas submitted its latest RMP update to CalGEM on June 5, 2026.

CPUC and CalGEM Safety Inspections/Audits

- May 2025 CalGEM audit of the Aliso Canyon Facility - No findings against SoCalGas' storage integrity management program
- The Safety and Enforcement Division (SED) of CPUC conducted a General Order (GO) 112-F Comprehensive Operation and Maintenance Inspection audit on April 21 through 25, 2025, covering calendar years 2021 through 2024 and reviewing 77 Records questions, 7 Procedure questions, thirty-nine 39 Observation questions, and 27 Integrity Management questions.
- The SED found no unsatisfactory results, but identified three areas of concern

Work of the Safety Ombudsman

CPUC SED 2025 audit areas of concern:

Control panels in the Station's compressor room displaying a time that was ahead of the actual time.

- *SoCalGas corrected the time discrepancy and synchronized all systems with the corresponding PLCs (Programmable Logic Controllers).*

"Gas Velocities" records appeared to be based on assumptions; SED asked SoCalGas to clarify whether it is using API 14E erosion rate equations or another variant, and to review National Association of Corrosion Engineers (NACE) Technical Paper C2019-13206.

- *SoCalGas reviewed the paper and determined it is an opinion paper and therefore does not intend to utilize it when calculating gas velocities in the future.*

2022 Aboveground Pipeline inspection records were completed on time but missing internal checklists required by company procedures. This had been self-reported to SED.

- *SoCalGas rewrote the gas standard, included an aboveground pipeline inspection form, and retrained storage employees on completion of the checklist for each section.*



Work of the Safety Ombudsman

Fence Line Methane Monitoring System

- Website: [SoCalGas Aliso Canyon Infrared Fence-Line Methane Monitoring System](#)
- Reporting criteria: 25 ppm averaged over 30 minutes; no known events this reporting period

Safety-related Concerns/Complaints Submitted by the Public

- No inquiries received the past year



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 July 2025-June 2026

The WSOC agenda includes a review of well work and integrity assessments, and review of findings and responses to CalGEM and CPUC audits – these were covered in previous slides on the Work of the Ombudsman.

WSOC members participated in responding to Data Requests #24 and #24A

WSOC meeting safety messages this period included Journey Management, Cybersecurity, Well Safety Systems Training, review of a first-aid event during well work (on a well in another SoCalGas storage field), and review of a relief valve activation that occurred on January 27, 2026 at the Aliso Canyon Fernando-Fee 38 well site.

Work of the WSOC – FF38 relief valve incident review

March 2026 WSOC meeting review - summary of the Fernando-Fee 38 well site relief valve activation, investigation, findings, and response.

- During a safety system analysis, a relief valve unexpectedly activated, venting a small amount of natural gas. Following the release, Emergency Shutdown (ESD) handles were engaged to isolate three wells on the common pad and stop the release of gas. Valves could not be reset, and findings suggested hydrate formation due to rapid cooling or poor choke settings.
 - Methanol injection was installed upstream of the relief valve on January 30, 2026, to prevent hydrate formation during flow conditions.
 - The relief valve was removed, inspected, and tested, then reinstalled.
 - The system was repressurized, lockout devices removed, safety systems verified, and operational readiness confirmed prior to restarting well injection/withdrawal activity, with an incident review completed on February 2 to capture lessons learned and improvements.

Work of the WSOC – Safety Improvements to the Facility (June WSOC Meeting Discussion)

In the current deep-set SSSV designs, the control line currently terminates at the bottom of the tubing hanger; this could expose the equipment seals to pressure greater than the 5,000 psi wellhead rating, such as when re-opening a closed valve at maximum field pressure, given the depth of the safety valve and hydraulic gradient of the control fluid.

As an outcome of this finding:

- Future wellhead systems will be upgraded to 10,000 psi-rated equipment designed for continuous control line through the tubing hanger.
- Those wells already with SSSV will be reheaded when the next downhole work is performed.
- The change in design is expected to result in a robust safety factor and higher reliability of the subsurface safety valve system.

The picture provided by SoCalGas showing the current and proposed design changes is linked in the report.

Work of the WSOC – CalGEM Orders Fulfilled

On September 26, 2025, CalGEM notified SoCalGas that EO #1109 had been fulfilled.

CalGEM Executive Order #1109, issued in March 2016, required SoCalGas to:

- immediately initiate well integrity testing to assess the condition of the leaking well (SS-25) and surrounding wells,
- seal the SS-25 using approved plugging and abandonment procedures,
- conduct a comprehensive safety review of all wells at the facility to identify and address potential vulnerabilities,
- initiate enhanced monitoring and report to CalGEM on pressure-monitoring and well integrity test results, and
- comply with CalGEM technical and safety standards for well integrity, cementing, and isolation.

SoCalGas met the requirements of EO#1109 by developing the Storage Integrity Management Program and Risk Management Plan, and performing well workovers, inspections, and testing over the past ~ten years.

Work of the WSOC – CalGEM Orders Fulfilled

In the same September 26, 2025 resolution letter, CalGEM noted that SoCalGas fulfilled all requirements of EO #1118.

Executive Order #1118, issued in July 2017, required SoCalGas to:

- meet environmental and operational standards,
- monitor for methane leaks, monitor air quality,
- perform well integrity inspections and verifications, in order to resume and continue gas storage operations at Aliso Canyon, and
- prior to injections following the SS-25 well incident, conduct a downwind flight with an equipped aircraft to measure total site methane emissions during a two-week period, perform one (1) full facility leak survey, and report results to the CPUC and CalGEM.

Work of the WSOC – CalGEM Orders Fulfilled

Executive Order 1118 required that after gas injections resumed, SoCalGas was to:

- Complete a leak survey within 72 hours and report results to the CPUC and California Air Resources Board (CARB).
- Perform additional leak surveys after one month of injection and quarterly for one year (five total).
- Report daily reservoir pressure estimates, daily injection/withdrawal volumes, and average daily tubing/annulus pressures to the CPUC and CalGEM for the first 30 days.
- Submit a work plan for completing testing protocols or plugging abandoned wells and give monthly status updates to CalGEM.
- Address data gaps identified by CalGEM.
- Conduct two downwind methane emission flights within one week of each other, discontinuing such methane emission detection flights only if both initial flights show emissions below 250 kg CH₄/hour.

SoCalGas performed the actions required and will continue to gather routine data, although weekly reporting to CalGEM is no longer required.

Work of the WSOC – Regulatory Rules Changes

PHMSA: Direct Final Rule adopting the 2nd Edition of API 1171 with enforcement effective on January 1, 2027.

SoCalGas is updating the Storage Integrity Management Plan/Risk Management Plan and procedural Gas Standards to achieve compliance.

CalGEM: finalized regulations in July 2025 for Well Chemical Inventory & Root Cause Analysis Regulations (SB 463 passed in 2019), requiring operators to:

- maintain a Gas Storage Well Chemical Inventory of chemicals that could be emitted from each well in the event of a reportable leak and develop protocol for chemical inventorying and verification/documentation.
- update Risk Management and Emergency Response Plans, including corrosion risk evaluation and mitigation for storage wells and development of well-specific Well Control Plans based on updated Inflow Performance (IPR) Curves.

SoCalGas is in progress preparing the chemical inventories, updating RMP and ERP, and has tested twenty-four (24) wells and developed twenty-eight (28) IPR curves, expecting to complete this for all Aliso Canyon wells by YE 2027.

Recommendations for Improvements

Part I: Recommendations made by the WSOC - covered in a previous slide, and response to the recommendations coming out of the SWOT on Management of Change should be complete by YE 2026.

Part II: Recommendations by the Ombudsman

- Part A: No New Recommendations During the July 2025 – June 2026 Period
- Part B: Report on SoCalGas Progress in Responding to Recommendations Made in Prior Periods
 - B-1: Recommendations previously closed
 - B-2: Recommendations made by the Safety Ombudsman, progress this period
 - B-3: Recommendations made by the Safety Ombudsman, open

The Ombudsman maintains a Compendium of All Recommendations, Status and Progress Tracker (linked in the report)

Recommendations for Improvements, Part II, Subpart B

SoCalGas Progress in Responding to Prior Recommendations

- B-1: Closed in previous years – refer to Annual Report Number Six (linked in the report) twenty-four (24) recommendations previously closed
- B-2: Progress during this past period on recommendations made by the Ombudsman:
 - Recommendations to update/improve Emergency Response Plans –closed this past period, assisted by regulatory requirements pursuant to SB463).
 - Gas inventory assessment remains provisionally closed subject to additional review of work ongoing or recently completed
- B-3: Recommendations made by the Safety Ombudsman that remain open: Four (4) recommendations open

Recommendations for Improvements, Part II, Subpart B3

Four recommendations remain open:

- Review and continual improvement of human and organizational capacity and effectiveness with respect to the SoCalGas SIMP
- Adaptation of an ISO 16530-based well integrity management system (WIMS) incorporating well barrier element status and documentation
- Ongoing monitoring, logging, sampling, and characterization of well casing annulus conditions and fluids in the SS-25 area
- Reservoir integrity risk assessment, threat interactions involving geologic uncertainty and pressure-volume-gas inventory trends

SoCalGas continues to progress in responding to the recommendations

Next Period – Reservoir Integrity Emphasis

The Ombudsman requested that SoCalGas presentations for discussion at future WSOC meetings include topics in gas storage reservoir integrity.

The topic areas include:

- Gas storage inventory assessment
 - conformance to standards, requirements, recommendations
 - address of pressure-volume trends and uncertainties affecting results
- Plugged well and third-party well monitoring and risk assessment
 - identification and assessment of current state/condition
 - patrols, monitoring, response actions
- Reservoir integrity risk assessment
 - characterization of threats, threat interactions, and potential consequences
 - preventive and mitigative measures, application and effectiveness



Questions?

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