



Central Valley Gas Storage

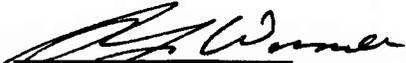
POLICY AND PROCEDURE

Policy # 1 Revision #2

Prepared by: John Boehme

Effective Date: March 15, 2017

Approved by:


Southern Company Gas V.P. Storage
and Peaking Operations

Approved by:


CVGS President

Title: **OPERATOR SAFETY PLAN**

Purpose:

The objective of Central Valley Gas Storage, LLC, ("Company") is to operate the business in a safe and reliable manner and in compliance with applicable laws, rules and regulations. The purpose of this policy is:

- (1) to clearly state that the safety of the public and the Company workforce is the top priority,
- (2) to ensure that the Company Operator Safety Plan ("Plan") is fully understood by its employees and is reviewed and updated at regular intervals, and
- (3) to provide opportunities for meaningful, substantial, and ongoing participation by Company employees in the development and implementation of the Plan, with the objective of developing a culture of safety that strives to prevent accidents, explosions, fires, and dangerous conditions for the protection of the public and the Company workforce.

Scope:

This policy and procedure applies to the Company.

Policy:

The Company places the safety of the public and its workforce as its top priority. The Company endeavors to design, construct, install, operate, and maintain its gas pipeline facilities at standards that meet or exceed the requirements of California Public Utility Commission General Order 112-F ("G.O. 112-F"), which references and adopts regulations issued by the United States Department of Transportation in part 192 of Title 49 of the Code of Federal Regulations ("part 192"). The Company will implement the following measures with respect to complying with and maintaining this Plan:

- The Company shall ensure an adequately sized, trained, and qualified workforce, to comply with the Plan and other regulatory requirements, and shall retain records that can be utilized to perform an analysis that evaluates resources dedicated to employee safety training and operational training. The analysis shall demonstrate the priority placed by the Company on the safety of the public, its workforce, and the surrounding environment.
- The Company will compare Company's Operations, training, and staffing requirements to other affiliated Southern Company Gas storage companies. Incidents and/or near misses encountered at any affiliated Southern Company Gas storage company facility will be investigated and reports will be distributed to all the other facilities to minimize the potential for similar events occurring at the other facilities.
- Upon employment, each Company employee shall be provided access to the Plan documents.
- Each Company employee shall have access to the annual safety report filed by the Company.
- The Company shall accept and appropriately evaluate workforce suggestions to revise the Plan. The Company shall retain a log of employee suggestions with respect to the Plan including the disposition of the suggestion and the rationale for the disposition.
- The Company shall hold meetings on a planned and scheduled basis with its workforce to review the Plan and discuss appropriate modifications.
- The Company shall review and make an update with appropriate modifications to its Plan at least once each calendar year. The Company shall maintain a record of revisions documenting changes made to the Plan.
- As part of its calendar year Plan review, the Company shall include the following measures to ensure that the Plan reflects updated versions of safety regulations and industry best practices:
 - A full review of G.O. 112-F requirements in effect at the time of the calendar year Plan review, including part 192 regulations, to make certain that the Company's Plan is updated to reflect any changes in regulatory requirements.
 - A review of United States Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) advisory bulletins since the most recent Plan review to determine additional items that should be changed.
 - Inclusion of any industry best practices discovered through Southern Company Gas' participation in American Gas Association committees related to safe operation of gas storage facilities since the most recent Plan review.
 - A review of California Public Utility Commission Orders for which the Company has been notified by the CPUC that revise or update pipeline safety regulatory requirements since the most recent Plan review to determine additional items that should be changed.

To ensure that CVGS evaluates its Plan to determine whether it conforms with or differs from industry trends for similar operations, the findings from these measures will be evaluated against current operations, maintenance, and emergency response processes, procedures, and standards documented in the Plan. Based on the evaluation, CVGS will either modify its Plan to conform with the findings, or in cases where Company processes or procedures shall differ, CVGS will document why they differ.

- The Company shall inform its employees that any employee who perceives a breach of safety requirements may inform the CPUC of the breach on a confidential basis and the Company shall provide information on how to contact the CPUC with a confidential safety breach notification.
- Modified versions of the Plan shall be filed with the CPUC as appropriate unless otherwise directed by the CPUC.

Revision History: *(Document policy amendments using a revision history chart)*

Revision	Date	Description of changes	Requested By
1	06/28/13	Added measures for workforce analysis. Specified timing for review and update. Added measures for reviewing industry best practices and regulation updates and evaluating whether the Plan conforms to industry trends.	John Boehme
1	03/15/17	Updated CPUC G.O. Reference to 112-F. Changed corporate references as necessary. Updated with new Officer review and signature.	John Boehme

P.U. Code Section 961 Cross Reference Table

P.U. Code Sections	CVGS Safety Plan Location (Appendix number, Section Heading, page number, etc.)
961 (b) (3)	Entire Plan submitted to SED; implemented per Central Valley Gas Storage Policy #1.
961 (b) (4)	Central Valley Gas Storage Policy #1 specifies review and modification. Going forward, reviewed plan will be submitted to SED annually as requested by SED.
961 (c)	CVGS Operations and Maintenance (O&M) plan, CVGS Emergency Response Plan (ERP), CVGS Operator Qualification (OQ) plan and the CVGS Integrity Management (IM) plan. In addition, Central Valley Gas Storage Policy #1 specifies measures that CVGS includes in its scheduled Safety Plan review to ensure that the Safety Plan reflects updated versions of safety regulations and industry best practices.
961 (d) (1)	Appendix I, including the PHA
961 (d) (2)	Appendix II
961 (d) (3)	Appendix VI
961 (d) (4)	O&M plan
961 (d) (5)	Appendix II addresses equipment. O&M plan (Section 17.08) and ERP have procedures responsive to this requirement. Personnel are qualified per the OQ plan.
961 (d) (6)	ERP contains procedures for responding to the types of hazardous conditions pertinent to gas storage and transmission operations. CVGS will not be involved in disconnection, reconnection or pilot lighting since it does not have any retail customers.
961 (d) (7)	Appendix III
961 (d) (8)	ERP, in particular the tab containing the 'Emergency Response for Natural Disasters'
961 (d) (9)	Central Valley Gas Storage Policy #1 states that CVGS endeavors to design, construct, install, operate, and maintain its gas pipeline facilities at standards that meet or exceed the requirements of CPUC General Order 112-F, which references and adopts the cited U.S. DOT regulations
961 (d) (10) & 963 (b) (3)	Central Valley Gas Storage Policy #1 states that CVGS will ensure an adequately sized, trained, and qualified workforce, to comply with the Plan and other regulatory requirements.
961 (d) (11)	The Commission requested inclusion of the CVGS Valve Location Plan. CVGS elected to include its Hazardous Substances Control plan, Worker Health and Safety plan, Fire Prevention and Management plan and also the Gas Storage Risk Management Plan that CVGS submitted to DOGGR in 2016.
961 (e)	Central Valley Gas Storage Policy #1

CVGS Gas Safety Plan – 2017 Version – Contents and pdf files

1. Central Valley Gas Storage Policy #1 – Operator Safety Plan, as approved by the President of CVGS and the Vice President of Storage and Peaking Operations for Southern Company Gas, who is responsible for managing CVGS operations.
2. The current CVGS Operations and Maintenance Plan. This plan has 18 sections, each of which has been e-mailed to you as a separate document (Tabs 1-18) along with a document containing introductory items including the cover page and the table of contents. (19 pdf files in total)
3. The current CVGS Emergency Response Plan. This plan has 4 parts, each of which has been e-mailed to you as a separate document along with a document containing the cover page and the table of contents. (5 pdf files in total)
4. The current CVGS Operator Qualification Program (Revision 5), which also is used by other Southern Company Gas-owned storage facilities. This plan has a main program document and 6 Exhibits, each of which has been e-mailed to you as a separate document. (7 pdf files in total)
5. The current CVGS Integrity Management Plan. This version of the plan is from 2014 and it includes documentation of the High Consequence Area (“HCA”) survey conducted in November 2016. CVGS currently has no covered segments and no HCAs located along its transmission pipelines. The Integrity Management Plan specifies in Element #1 on page 17 that CVGS is not required to develop an integrity management plan if there are no HCAs on its system. However CVGS is required to complete an evaluation once each calendar year to determine if any HCAs have been added. The documents being submitted, therefore, are the 2016 HCA survey indicating no HCAs and the plan that CVGS would follow in the event that a new HCA were to exist. The document is too large to submit as a single pdf, so it is being provided in 2 parts. (2 pdf files in total)
6. The current CVGS Hazardous Substances Control Plan (1 pdf).
7. The current CVGS Worker Health and Safety Plan (1 pdf).
8. The current CVGS Fire Prevention and Management Plan (1 pdf).
9. The current CVGS Valve Location Plan (1pdf).
10. The Gas Storage Risk Management Plan that CVGS submitted to the California Department of Conservation’s Division of Oil, Gas, and Geothermal Resources (DOGGR) in 2016.



CVGS Gas Safety Plan – 2017 Version – Contents and pdf files (continued)

11. Appendices documenting CVGS practices and design features for quick reference in reviewing compliance with the requirements of Section 961, subdivision (d)
 - I. Measures CVGS has undertaken to identify and minimize risks. The Process Hazard Analysis referenced in Appendix I also is attached, (2 pdf files in total)
 - II. CVGS Safety-Related Systems (1 pdf)
 - III. CVGS' MAOP Determination (1 pdf)
 - IV. Overview of CVGS Design Standards (1 pdf)
 - V. CVGS Staffing, Qualifications and Training (1 pdf)
 - VI. CVGS Transportation and Storage Capacity Adequacy (1 pdf)
12. California P.U. Code Section 961 Cross Reference Table (1 pdf)



Appendix I.

Central Valley Gas Storage Measures to Identify and Minimize Risks:

A design stage Process Hazard Analysis (PHA) review of the preliminary design by EN Engineering (ENE) of the planned Central Valley Gas Storage (CVGS) facility was conducted and led by a third party on September 15, 16, and 17, 2010 in accordance with ENE's and CVGS's internal risk guidelines, to identify potential deviations from process design, maintenance, inspections, or operating practices which could lead to fires, explosions, or other events which could lead to personnel injury, equipment damage, or environmental impact, especially those involving high pressure natural gas releases. The PHA also addressed significant operability issues such as scenarios which could lead to a unit shutdown. The "What -If" methodology was used in this PHA.

The design stage PHA is included in this Appendix.

Prior to completion of construction and facility commissioning, a second PHA was conducted during May and June 2012. The intent of this PHA was to revalidate the design stage PHA, and to cover changes in original design following the design stage PHA. This PHA was conducted using both the "What-If" and "Haz-Op" methodologies.

A Pre-startup Safety Review (PSSR) was conducted prior to completion of putting the facilities in service to ensure that all safety and design requirements have been met.

Appendix II.

Central Valley Gas Storage Safety-Related Systems:

CVGS is protecting employees, the public, and the environment through use of modern gas control systems that enhance operational efficiencies and provide for greater safety. Primary control room equipment includes a state of the art automated Human Machine Interface (HMI) control system, personal computers, and programmable logic controllers, which provide automation of control and monitoring functions. Specific safety features of the project are listed below. **Additional details regarding these systems, including design documents, are available upon request.**

Monitoring/Detection/Automated Shut-Down Systems:

- Gas, fire, and vibration detection systems monitor equipment inside the compressor building and are able to both alarm or if needed, safely shut down equipment automatically if the alarm and/or shutdown set-points of each system are met. An automatic call-out system is used to contact personnel in emergencies.
 - The gas detection system will alarm if the atmosphere in the building reaches 20% of the lower explosive limit (LEL). The system will shut down all compressors, actuate valves to a closed position and vent all gas piping within the building at 40% LEL.
 - The fire detection system (infrared sensors) will shut down all compressors and block and vent all gas piping within the building, should one of seven sensors in the compressor building pick up an indication of a flame or fire.
 - Vibration sensors (accelerometers) are installed on each gas compressor/engine and will alarm and automatically shut down the unit if vibration exceeds a preset level. The alarm setpoint is 0.6 thousandths of an inch per sec² of acceleration (mils) and the shutdown setpoint is 0.8 mils.

- Flow, temperature, and pressure are monitored at the compressor station, well pad sites, and the PG&E Line 400/401 interconnection. In addition to being monitored and controlled by local programmable logic controllers (PLC), the station PLC and the HMI control system prevent overpressure of the facilities, the entire system is designed with pressure monitor valves and relief valves to provide redundant overpressure protection.
 - Valves that control the flow of gas into and out of the compressor station and the meter station have pneumatic and/or electric actuators installed, allowing them to be remotely operated from the control room, locally at the valve, or automatically in the event of an emergency shutdown (ESD). During an ESD these valves block off the compressor station from the main 24-inch pipeline, wells, and 16-inch gathering pipelines, and the entire compressor station is vented. Also, in the event of an immediate loss of pipeline pressure, on the 24-inch mainline, these valves will actuate to the closed position to block off the affected area.
 - Gas flows and pressures are measured at each of the storage wells and signaled back to the control room to allow proper monitoring of the characteristics and performance of the gas storage reservoir. This information provides instantaneous inventory data to enable proper reservoir management and underground placement of the gas.

- At the PG&E meter station, a gas chromatograph and a moisture analyzer monitors gas composition, ensuring that the gas delivered to or received by PG&E meets both PG&E's and CVGS's quality specifications. In addition, a chromatograph and moisture analyzers at the CVGS compressor station will monitor gas composition being received by or delivered to PG&E, to verify gas quality meets both parties' quality specifications.
 - If either parties' equipment indicates that the gas is out of specification, notice will be provided immediately by one party to the other. Both parties have the right to refuse gas from the other, upon notice of gas being out of specification, until the issue is resolved to the satisfaction of the party that gave notice.

Other Project Design-Related Safety Features:

- Fire prevention and response measures in the compressor station include smoking area restrictions and work area restrictions, as well as the fire detection equipment in the compressor building.
 - Dry chemical fire extinguishers are placed at appropriate locations at the compressor facility, meter station and well pad.
 - In the event of a fire, the most effective means of control is to block in and vent the gas from the facility or affected area. The Operations staff will be trained to respond accordingly.
- The compressor station, meter station, pipelines and the Well Pad piping and well casings are cathodically protected against corrosion.
- All CVGS pipelines are identified in compliance with regulations issued by the United States Department of Transportation (DOT) and administered by the California Public Utility Commission (CPUC). Aboveground markers are placed along the pipeline corridor, within the line of sight, identifying the type of utility, listing the 811 national one-call number, and a 24-Hour number to call in case of emergency.
- Relief valves and key safety valves (those facilitating remote operation and emergency shutdown) are inspected and maintained in compliance with regulations issued by the DOT and the CPUC. CVGS maintains inspection and maintenance records for regulatory review.

Appendix III.

Central Valley Gas Storage MAOP Determination:

CVGS follows appropriate protocols for determining the Maximum Allowable Operating Pressure (MAOP) on its pipeline segments. Specifically, in its pipeline design CVGS complies with the regulations issued by the U.S. Department of Transportation (DOT) in part 192 of Title 49 of the Code of Federal Regulations.

The table below lists the MAOP and design pressure calculations at various sections of the 24" pipeline between the CVGS compressor facility and the PG&E interconnect and the two 16" pipelines between the compressor facility and the well pad. The MAOP of the 24" pipeline is 1100 pounds per square inch (psi) and the MAOP of the 16" pipelines is 1456 psi.

CVGS pipelines are almost entirely in Class 1 locations. More stringent (lower) design factors are used in sections that cross or encroach on the rights-of way of hard-surface public roads and railroads. The California Department of Transportation required a design factor of 0.5 in granting a permit to cross the right-of way of Interstate Highway 5 and the same pipe segment crosses a railroad right-of-way. CVGS decided to design certain sections with a Class 3 design factor as noted below.

The table shows design factors for CVGS pipeline segments by location category, size, the yield strength of the steel, the wall thickness of the installed pipe, the design pressure calculated using the formula specified in 49 CFR sections 192.105 and the MAOP CVGS has assigned the segment. In all cases, the MAOP assigned by CVGS is lower than the design pressure calculated by the formula.

Category\1	Design Factor	Outside Diameter (in)	Yield Strength (psi)	Installed WT	Calculated Design Pressure \4	MAOP (psig)
Location Class 1	0.72	24	65,300	0.312	1,222	1,100
	0.72	16	52,000	0.500	2,340	1,456
Road Crossings in Location Class 1	0.60	24	65,300	0.406	1,325	1,100
Location Class 3 \2	0.50	24	65,300	0.438	1,191	1,100
	0.50	16	52,000	0.500	1,625	1,456
I-5 HDD - Caltrans Permit \3	0.50	24	65,300	0.406	1,105	1,100

Notes:

- 1) Class location determined in accordance with 49 CFR 192.5
- 2) Location Class 3 pipe is installed from the south fence of the compressor station to a point south of Southam Road due to truck repair facility in the immediate vicinity.
- 3) Caltrans permit for I-5 crossing requires a design factor of 0.5 equivalent to a Location Class 3
- 4) Design pressure is calculated using the Barlow formula in accordance with 49 CFR 192 .105.

Appendix VI.

Central Valley Gas Storage Transportation and Storage Capacity Adequacy:

Overview:

CVGS has been granted a Certificate of Public Convenience and Necessity pursuant to Commission Decision No. 10-10-001 (“Decision”) to construct and operate the Project, an underground natural gas storage facility in Colusa County, California described by its certificate application. The Project, as described, achieves injection and withdrawal rates of up to 300 million cubic feet per day from a facility that has storage capacity of 11 billion cubic feet (Bcf), with an additional 1.4 Bcf of base gas to achieve the design withdrawal rate. The Decision authorized CVGS to charge market-based rates for gas storage services.

CVGS is committed to providing adequate storage capacity, as well as transportation capacity on CVGS’ pipeline connecting the storage facility with Pacific Gas & Electric’s transmission pipeline, to reliably and safely receive, inject, store, and deliver gas for all CVGS storage customers within its certificated limits consistent with rules authorized by the Commission governing independent storage providers, preventative maintenance, and reactive maintenance and repair of Commission regulated gas pipeline facilities.

Capacity Management:

CVGS tracks and manages its natural gas storage and its CVGS pipeline transportation commitments to its storage customers. Through process described below, CVGS is able to assure that it is capable of satisfying such commitments in a safe and reliable manner and ensure that the CVGS facility is not overcommitted. The process includes the use of adequate systems and qualified personnel to operate and maintain CVGS’ natural gas storage and pipeline transportation infrastructure consistent with its Decision and the Commission’s regulations throughout the operating year and under peak load conditions.

- CVGS, through its automated nomination system, tracks storage inventory, injection volumes and withdrawal volumes on a daily basis. The system also tracks base gas and balancing volumes between CVGS and Pacific Gas & Electric.
 - The nomination system tracks daily inventory by service, by customer and also limits customers’ nominations to their contractual rights, absent contract overrun authorized by the CVGS commercial staff and entered into the system.
- These items are monitored by the CVGS commercial staff responsible for managing contracts with CVGS customers for market-based rate storage services and compared with the limits on the certificated injection, withdrawal and storage capacity of the field.
 - Available capacity may be lower than certificated limits on any given day due to equipment being unavailable or limitations due to remaining reservoir space. As the facility fills, ability to withdraw increases, but injection capability is reduced. As the facility empties, ability to inject increases, while ability to withdraw reduces.
- The CVGS commercial staff does not enter into customer contracts that provide contractual rights exceeding available capacity and does not authorize overrun volumes that would exceed available capacity.

- CVGS management receives inventory information on a daily basis and reviews inventory, availability, and contracted volumes for CVGS on a regular, scheduled basis.

Since initiating operations in 2012, CVGS has not curtailed a customer's contractual rights due to issues with CVGS infrastructure or maintenance.