

SoCalGas-26

Exhibits to Prepared Sur-Reply Testimony of Amy Kitson (June 30, 2020)

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Ex. III-1



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

TABLE OF CONTENTS	SoCALGAS	SAFETY- PLAN.0
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SECTION	DESCRIPTION	REQUIRED ELEMENTS FROM CA Public Utilities Code §§ 956.5, 961, and 963
1	INTRODUCTION	961(b)(1-3)
2	EXECUTIVE OFFICER'S SAFETY PERFORMANCE EXPECTATIONS	961(b)(4)
3	PLAN DEVELOPMENT & IMPLEMENTATION	961(e)
4	SAFETY SYSTEMS	961(d)(1)
5	EMERGENCY RESPONSE	956.5, 961(d)(5,6,8)
6	STATE AND FEDERAL REGULATIONS	961(c)(d)(7,9)
7	CONTINUING OPERATIONS	961(d)(3,4,10)963(b)(3)
8	EMERGING ISSUES	961(d)(11)
A	APPENDIX – SAFETY POLICY DOCUMENTS	961 (a)

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

TABLE OF CONTENTS

SoCALGAS


SAFETY-
PLAN.0

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

INTRODUCTION	SoCALGAS: SAFETY-PLAN.1
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Table of Contents

1	PUBLIC UTILITIES CODE SECTIONS 961 AND 963 AND CPUC DECISION 12-04-010....	2
2	PURPOSE.....	2
3	SAFETY PLAN STRUCTURE.....	2
4	PROGRAM REVIEW AND MODIFICATIONS	3

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

INTRODUCTION

SoCalGas: SAFETY-
PLAN.1

1 PUBLIC UTILITIES CODE SECTIONS 956.5, 961, 963, AND CPUC DECISION 12-04-010

California Senate Bill 705 was signed into law on October 7, 2011, and codified as California Public Utilities Code Sections 961 and 963. Section 961 requires that each gas corporation in California develop a plan for the safe and reliable operation of its gas pipeline facility and requires that the California Public Utilities Commission (Commission) accept, modify, or reject the plan by year-end 2012. Section 963, among other things, establishes that it is the policy of the state that the Commission and each gas corporation place safety of the public and gas corporation employees as the top priority.

On April 19, 2012, the Commission approved Decision (D.)12-04-010 which amended the scope of the Commission's Pipeline Safety Rulemaking (R.11-02-019) to include complying with the requirements of Public Utilities Code Sections 961 and 963. The Commission directed each of the state's gas corporations to submit a proposed natural gas system operator safety plan (Safety Plan), with documentation of the workforce comment process described in the decision, by June 29, 2012.

In addition to PUC sections 961 and 963, the Utilities' Safety Plan addresses the requirements of Assembly Bill 56, chaptered on October 7, 2011, which codified Public Utilities Code Section 956.5. Section 956.5 requires operators to review, at least once each calendar year, emergency contingency plans with local fire departments having jurisdiction over the area where intrastate transmission and distribution lines are located.

2 PURPOSE

According to the Commission, "the rationale for developing a gas safety plan is to motivate a gas utility to reflect upon its existing methods and for it to change, to optimize, or to enhance the existing methods, ... and lessons learned from the San Bruno incident, as appropriate, to ensure that the gas utility has a prudent plan in place to protect public safety and worker safety." The gas system operator safety plans are to convey the "Executive Officer's" safety performance expectations, policy principles, and goals/objectives for a gas utility's safety performance.

SoCalGas has designed its Safety Plan to satisfy each of these directives, and to implement "the policy of the state that the commission and each gas corporation place safety of the public and gas corporation employees as the top priority."

3 SAFETY PLAN STRUCTURE

This Safety Plan conveys the safety performance expectations of SoCalGas' Senior Management Team, and describes all of the safety plans, programs, policies, standards, and procedures that are designed to accomplish those expectations. In the hierarchy of SoCalGas documents that communicate its safety program, this Safety Plan is at the top.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

INTRODUCTION

SoCalGas: SAFETY-
PLAN.1

Public Utilities Code Sections 961 and 963 require that the gas system operator safety plans establish how the utility will achieve certain specified goals, and the Commission has organized these goals into five overall categories: (1) safety systems, (2) emergency response, (3) state and federal regulations, (4) continuing operations, and (5) emerging issues. This Safety Plan follows this organizational structure as outlined by the Commission and is divided into sections corresponding to these five categories, with each section representing a required Safety Plan element or other significant element or aspect of the Safety Plan. The requirements of Code Section 956.5 are addressed within the category of emergency response.

SoCalGas has numerous existing safety programs, plans, and procedures in place that address specified infrastructure or areas of company activity. The intent of this Safety Plan is not to duplicate these existing safety program components, but to provide an overarching safety strategy that will encompass all the plans, programs, and policies, and affirm SoCalGas' commitment to safety.

The Appendix to this Safety Plan provides a listing of the safety program components discussed in the Plan.

4 PROGRAM REVIEW AND MODIFICATIONS

Public Utilities Code Section 961 establishes that gas corporations shall periodically review and update their gas system operator safety plans. This Safety Plan shall be reviewed at an annual frequency period not to exceed 15 months. The program owners must provide justification for any deviation from this review schedule.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

INTRODUCTION

SoCalGas: SAFETY-
PLAN.1

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EXECUTIVE OFFICER’S SAFETY PERFORMANCE EXPECTATIONS, POLICY PRINCIPLES, GOALS, AND OBJECTIVES	SoCALGAS: SAFETY- PLAN.2
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Table of Contents

1	INTRODUCTION	2
2	SENIOR MANAGEMENT TEAM SAFETY PERFORMANCE STATEMENT	2
3	POLICY PRINCIPLES AND PERFORMANCE EXPECTATIONS	3
4	GOALS AND OBJECTIVES	3
5	PROGRAM REVIEW AND MODIFICATIONS	4

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EXECUTIVE OFFICER'S SAFETY PERFORMANCE EXPECTATIONS, POLICY PRINCIPLES, GOALS, AND OBJECTIVES	SoCALGAS: SAFETY- PLAN.2
--	-----------------------------

1 INTRODUCTION

In D.12-04-010, the Commission reiterated the requirements of California Public Utilities Code §961 (b)(4). This section requires that the safety plan achieve the following:

§961(b)(4) "The commission shall require each gas corporation to periodically review and update the plan, and the commission shall review and accept, modify, or reject an updated plan at regular intervals thereafter. The commission, pursuant to Section 1701.1, shall determine whether a proceeding on a proposed update to a plan requires a hearing, consistent with subdivision (e)."

Section 3.1 of D.12-04-010 also requires that this Safety Plan "convey the Executive Officer's safety performance expectations, policy principles, and goals/objectives for the gas utility's safe performance."

This Section provides the safety performance expectations, policy principles, and goals/objectives for safe performance established by SoCalGas Senior Management Team.

2 SENIOR MANAGEMENT COMMITMENT TO SAFETY

At SoCalGas, the safety of our customers, employees, and communities has been and will be our top priority. This tradition of safety spans more than 140 years, and is the foundation for company programs, policies, procedures, guidelines, and best practices. Management's safety expectations can best be described by the following Commitment to Safety statement that every member of our Senior Management Team wholeheartedly endorses:

Southern California Gas Company's longstanding commitment to safety focuses on three primary areas – employee safety, customer safety and public safety. This safety focus is embedded in what we do and is the foundation for who we are – from initial employee training, to the installation, operation and maintenance of our utility infrastructure, and to our commitment to provide safe and reliable service to our customers.

-- SoCalGas' Commitment to Safety

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EXECUTIVE OFFICER'S SAFETY PERFORMANCE EXPECTATIONS, POLICY PRINCIPLES, GOALS, AND OBJECTIVES	SoCALGAS: SAFETY- PLAN.2
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3 POLICY PRINCIPLES AND PERFORMANCE EXPECTATIONS

SoCalGas' safety-focused culture and supporting organizational structure allow the company to be proactive and accountable in the safe delivery of natural gas and supporting services. The company continuously strives for a work environment where employees at all levels can raise pipeline infrastructure, customer safety, and employee safety concerns and offer suggestions for improvement. SoCalGas' safety performance will be regularly monitored and evaluated in accordance with all state and federal regulations. Additional performance metrics shall be developed and evaluated, as appropriate, to foster a culture of continuous safety improvement. These performance metrics shall be reviewed and communicated in accordance with the schedules identified in the specific policy, program, plan or other document incorporated as part of the Safety Plan.

In addition, SoCalGas shall monitor the U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) website for new regulations and advisory bulletins and act upon any applicable regulations and bulletins in a timely manner, and verify that changes in regulations are reflected in policies, standards, procedures and employee training. As part of its ongoing effort to implement a Pipeline Safety Management System (PSMS), as defined by API 1173, SoCalGas regularly assesses its safety culture and encourages two-way communication between employees and management as a means of identifying and managing safety risks. In addition to the reporting of pipeline and occupational safety incidents, management has created multiple methods for employees to report close calls/near misses.

At SoCalGas safety is a core value so we provide all employees with the training necessary to safely perform their job responsibilities. We further reinforce this principle by including safety performance measures in our employees' performance appraisals.

Safety is a core value not only for our employees, but also for the contractors we use to supplement our workforce. SoCalGas, through its Contractor Safety Management activities, monitors the occupational and pipeline safety records of its contractors and utilizes only those contractors that meet the Company's high safety standards. Through these activities, contractors are kept current on all relevant operational, regulatory, and procedural changes affecting their work. Two-way communication between contractor and Company is also encouraged in order to receive feedback on contractor-identified safety issues and to review lessons learned from root cause analysis related to near miss events and incidents.

4 GOALS AND OBJECTIVES

SoCalGas takes an integrated approach to pipeline integrity and safety, beginning with the design and construction of facilities and followed by continual evaluation and improvement of operation and maintenance activities, public communication and awareness, emergency response, safety programs and practices, the implementation of new technologies, defined procurement processes that facilitate materials traceability, and a workplace that encourages continual open and informal discussion of safety-related issues.

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EXECUTIVE OFFICER'S SAFETY PERFORMANCE EXPECTATIONS, POLICY PRINCIPLES, GOALS, AND OBJECTIVES	SoCalGas: SAFETY- PLAN.2
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Our goal is to have continual process improvements throughout our pipeline system and operations, to meet state and federal safety regulations, and to stay abreast of industry best practices.

5 PROGRAM REVIEW AND MODIFICATIONS

All components of this Safety Plan must be reviewed and updated per their scheduled review period listed in the following table:

Document Type	Review Cycle
Safety Plan	Annually (not to exceed 15 months)
Gas Standards	At least every 5 years
TIMP O&M Control Room Management	At least annually
DIMP	At least every 5 years
Form Instructions	Every 5 years
Environmental	Every 2 years
Information Bulletins	At least annually

If changes are needed, they shall be made as soon as practicable through the Request to Publish process, and not deferred until the next scheduled review.



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EXECUTIVE OFFICER'S SAFETY PERFORMANCE EXPECTATIONS, POLICY PRINCIPLES, GOALS, AND OBJECTIVES	SoCALGAS: SAFETY- PLAN.2
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This Safety Plan is Company policy. Each SoCalGas officer embraces and endorses the Company's commitment to safety and supports the Safety Plan.

I, the Vice President – Gas Engineering and System Integrity, affirm that the Safety Plan, [as approved and implemented, continues to reflect the commitment of the Company].

Dated: October 6, 2015

SOUTHERN CALIFORNIA GAS COMPANY

By: /s/ Douglas M. Schneider
Douglas M. Schneider
Vice President – Gas Engineering & System Integrity

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN


EXECUTIVE OFFICER'S SAFETY PERFORMANCE EXPECTATIONS, POLICY PRINCIPLES, GOALS, AND OBJECTIVES	SoCalGas: SAFETY- PLAN.2
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Brief: Addition of API 1173 requirements, emphasis of "Safety" as a core value, and add sources used to monitor for regulatory changes.

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Part of SDG&E O&M Plan:	No
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O&M 49 CFR Codes & Impacted Sections of Document:	
Part of Non-O&M Parts 191-193 Plan	No
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

PLAN DEVELOPMENT & IMPLEMENTATION	SoCALGAS: SAFETY- PLAN.3
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Table of Contents

1	CALIFORNIA PUBLIC UTILITIES CODE § 961 (e)	2
2	CPUC DIRECTIVES ON WORKFORCE PARTICIPATION	2
3	EMPLOYEE SAFETY PLAN CONTRIBUTION PROCESS	2
4	EXTERNAL STAKEHOLDER SAFETY PLAN CONTRIBUTION PROCESS	4

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

PLAN DEVELOPMENT & IMPLEMENTATION

SoCalGas: SAFETY-
PLAN.3

1 CALIFORNIA PUBLIC UTILITIES CODE § 961 (e)

In D.12-04-010, the Commission identified the topic of workforce participation in plan development to meet the requirements of California Public Utilities Code 961(e). This section requires that the safety plan achieve the following:

- § 961(e) “The Commission and gas corporation shall provide opportunities for meaningful, substantial, and ongoing participation by the gas corporation workforce in the development and implementation of the plan, with the objective of developing an industry wide culture of safety that will minimize accidents, explosions, fires, and dangerous conditions for the protection of the public and the gas corporation workforce.”

2 CPUC DIRECTIVES ON WORKFORCE PARTICIPATION

To comply with PUC 961(e) directives and General Order 112-F Subpart G Section 301, the Commission has explained that natural gas system operators need to take the following actions:

1. The operator must make its safety plan available to its workforce, and provide for comments and suggestions from the workforce;
2. Gas system operators shall retain a log of the comments and suggestions, including the disposition of the comment or suggestion, with a summary of the rationale for the disposition;
3. Gas system operators shall also inform their employees that any employee who perceives a breach of safety requirements may inform the Commission of the breach, and that the Commission will keep the identity of the employee confidential; and
4. Each gas operator shall provide its workforce with the address of the Director of the Commission’s Consumer Protection and Safety Division and the designation “Safety Breach Notification from Gas System Operator Employee–Confidentiality Requested” to seek confidential treatment.

3 EMPLOYEE SAFETY PLAN CONTRIBUTION PROCESS

Employees play a critical role in SoCalGas' pipeline safety activities and have been an important part in developing this Safety Plan. Going forward, SoCalGas will continue to gather regular and substantial safety-related input from its employees.

To promote a culture of trust and increase the likelihood of reporting known pipeline or occupational safety risks, the Company is committed to enabling its employees to participate in the continual improvement of this safety plan. The Natural Gas System Operator Safety Plan is posted on the Company intranet site for easy access by all employees. The intranet site includes a summary of the plan content, a link to the document, hotline phone number and address for direct



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

PLAN DEVELOPMENT & IMPLEMENTATION

SoCalGas: SAFETY-
PLAN.3

notification to the CPUC, and an electronic form for submitting pipeline and occupational safety risks and ideas for improvement. The purpose of the site is to provide employees a forum for reporting issues outside of the normal supervisor-reporting hierarchy. Employees can report anonymously if they desire.

Periodic broadcasts are made via Company communication channels to remind employees of the site's availability and the importance of reporting known issues and improvement ideas. The importance of reporting pipeline and occupational safety risks is included in employee training course materials.

The following outlines SoCalGas' process management for the gathering and analysis of future pipeline safety input:

- Meetings with employees will be scheduled as necessary to further examine and clarify any future input received and to make certain that we are addressing issues or concerns related to our commitment to safety.
- Employees can submit their suggestions via written notification, on-line, or by phone. The on-line input system provides employees with comprehensive input tracking from the employee who submitted the input to the appropriate process manager and back. This system provides the ability to give periodic updates to the employee as the investigation progresses. The input received is posted on the website along with the resolution to help communicate improvements or education to other employees. This system is being managed and monitored by a department head manager.
- When input is received, it is promptly assigned to the responsible staff member for thorough investigation and resolution. SoCalGas takes the receipt of input very seriously and acts with a sense of urgency in the investigation of all input received.
- The target timeframe for initially reviewing and assigning a suggestion is as soon as possible and no longer than 5 business days. During investigations, employees are often contacted for additional clarification and to determine the appropriate follow-up actions.
- This follow-up may simply include discussions with the employee who submitted the input to explain how the company is currently meeting or exceeding the objective of their suggestion. The follow-up could also entail the re-training of field personnel or the revision of training materials, best practices and/or gas standards.
- SoCalGas strives to determine disposition of all investigations as quickly as possible; however, the ultimate goal is to complete a thorough investigation which could mean that an issue will not find closure for several weeks as enhancements are planned and implemented. With that said, most suggestions will find closure in less than two weeks. The basis for accepting or rejecting a suggestion will be the extent to which the



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

PLAN DEVELOPMENT & IMPLEMENTATION

SoCALGAS: SAFETY-
PLAN.3

suggestion improves the safety of the pipeline, and assists us in meeting all regulatory requirements and industry best practices while maintaining optimal operating efficiencies for our customers.

- Employees will be periodically reminded and encouraged through various communication channels to submit their input through this process to ensure the company is capturing all ideas and suggestions related to pipeline safety.

The Safety Plan is available to all employees, and is stored online, reviewed and updated periodically.

4 EXTERNAL STAKEHOLDER SAFETY PLAN CONTRIBUTION PROCESS

To promote a culture of trust and increase the likelihood of reporting known pipeline or occupational safety risks, the Company is committed to enabling its contractors and the public to participate in the continual improvement of the Safety Plan.

Contact and communication with external stakeholders (e.g., public, first responders, public officials) is managed via the Public Awareness Plan.

The Contractor Safety Management program includes feedback from contractors regarding occupational and pipeline safety risks at SCG. Contractors are trained on the reporting policy and procedure.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

PLAN DEVELOPMENT & IMPLEMENTATION

SoCalGas: SAFETY-
PLAN.3

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Part of Non-O&M Parts 191-193 Plan	No
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Part of Transmission IMP (TIMP)	No
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

SAFETY SYSTEMS	SoCALGAS: SAFETY-PLAN.4
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Table of Contents

1	SAFETY SYSTEMS AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(1) and (d)(2).....	2
2	TRANSMISSION INTEGRITY MANAGEMENT PROGRAM	Error! Bookmark not defined.
3	DISTRIBUTION INTEGRITY MANAGEMENT PROGRAM.....	4
4	OPERATION AND MAINTENANCE PLAN.....	4
5	PIPELINE SAFETY ENHANCEMENT PLAN	5

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

SAFETY SYSTEMS	SoCalGas: SAFETY-PLAN.4
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1 SAFETY SYSTEMS AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(1) and (d)(2)

In D-12-04-010, the Commission identified the topic of safety systems to meet the requirements in California Public Utilities Code 961 (d)(1) and (d)(2). These sections require that the safety plan achieve the following:

- § 961(d)(1) Identify and minimize hazards and systemic risks in order to minimize accidents, explosions, fires, and dangerous conditions, and protect the public and gas corporation workforce.
- § 961(d)(2) Identify the safety-related systems that will be deployed to minimize hazards, including adequate documentation of the commission-regulated gas pipeline facility history and capability.

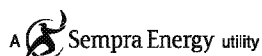
The following plans and programs are in place to identify and minimize hazards and systemic risks in the pipeline infrastructure, and promote public safety and property protection.

- Transmission Integrity Management Program
- Distribution Integrity Management Program
- Operation and Maintenance Plan

In addition, SoCalGas implemented its Pipeline Safety Enhancement Plan (PSEP) to address requirements for transmission infrastructure that are beyond current federal requirements and GO 112-E.

Each of these programs is subject to continual improvement efforts and changes are made when warranted to further protect the public and SoCalGas workforce.

Pipeline integrity risk evaluations are designed to improve pipeline safety performance and are conducted per the schedule listed in the TIMP and DIMP programs. Included in these risk assessments are lessons learned from internal and external gas pipeline incidents. Risk assessments are reviewed at least annually, and updated as warranted, using data and information gained from operations and maintenance, inspection and testing, integrity-related work, and incident investigations. Company-wide, risk to operations related to loss of experienced and knowledgeable employees is managed through resource allocation and may be supported by our Knowledge Management programs which work with local management to develop succession planning for critical job functions.



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

SAFETY SYSTEMS	SoCALGAS: SAFETY-PLAN.4
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2 TRANSMISSION INTEGRITY MANAGEMENT PROGRAM

The Transmission Integrity Management Program (TIMP) is an ongoing program that was developed in accordance with the requirements of the Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA), specifically Title 49 Code of Federal Regulations Part 192, Subpart O - Gas Transmission Pipeline Integrity Management.

The TIMP written plan describes how SoCalGas complies with the requirements of CFR 192 subpart O. The written plan outlines the approach to implementing the requirements of the Rule and the referenced industry standards, including ASME B31.8S and NACE SP0502-2008. The document includes a description of each required Program element and identifies or references the procedures and processes for completing those requirements. The TIMP written plan has sixteen chapters that are the policy documents for compliance with the gas transmission pipeline integrity requirements.

DOT HCA (covered segments) risk evaluations are designed to improve pipeline safety performance and are conducted per the schedule in the TIMP risk assessment requirements.

The TIMP is designed to provide assessments and integrity improvements on transmission pipelines by outlining responsible parties, timelines for each process element, incorporating lessons learned, and a best practices methodology. Processes are aimed at identifying threats through data gathering and routine testing, assessing materials integrity, and determining remediation, preventive and mitigation steps for those threats.

As part of this program, information concerning the pipeline infrastructure, operating environment and performance history is integrated into a broad evaluation of the pipeline and its environment. This information is analyzed for each pipeline segment being assessed and specific integrity-related work plans are developed.

SoCalGas employs the following pipeline integrity management activities to assess and evaluate pipelines in the system: in-line inspections, pressure testing, and direct assessment. Where ILI is one of the methods capable of assessing an identified threat, it is SoCalGas' preferred assessment method. These evaluations address the efficacy of the systems in place to maintain the safe operation of the transmission pipeline including corrosion control and damage prevention programs.

The TIMP and the related and referenced procedures identify and prescribe activities to minimize transmission systemic risks and document its history and capability.

The TIMP written plan is reviewed each calendar year as part of the continual improvement process, with modifications made as necessary.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

SAFETY SYSTEMS

SoCalGas: SAFETY-
PLAN.4

3 DISTRIBUTION INTEGRITY MANAGEMENT PROGRAM

The Distribution Integrity Management Program (DIMP) is an ongoing program that was developed in accordance with the requirements of the DOT and PHMSA, specifically Title 49 Code of Federal Regulations Part 192, Subpart P – Distribution Pipeline Integrity Management. SoCalGas published its DIMP written plan in August 2011. The program's purpose is to improve pipeline safety by having operators identify and reduce pipeline integrity risks on distribution pipelines.

SoCalGas' DIMP focuses on potential threats and measures designed to reduce the likelihood and consequences of pipeline failures. Specifically, it addresses system knowledge; threats; evaluation and ranking of risk; measures to address risks; performance measurement; results monitoring; effectiveness evaluation; periodic evaluation and improvement; and results reporting. SoCalGas' written DIMP plan has nine chapters and requires the integration of data from many sources for analysis and subsequent action based upon that analysis.

The DIMP includes certain activities SoCalGas performs, and it requires the continual development of a more formal and structured approach toward the company's traditional core regulatory pipeline integrity-related obligations.

The DIMP written plan and related and referenced procedures identify and prescribe activities to minimize systemic and localized risks to SoCalGas' distribution system and document relevant system information.

SoCalGas' DIMP is reviewed at a minimum every five calendar years as part of the periodic improvement process, with modifications being made whenever necessary.

4 OPERATION AND MAINTENANCE PLAN

SoCalGas Operation and Maintenance (O&M) plan is a compendium of over 140 policies that meet the requirements 49 CFR 192.605 "Procedural manual for operations, maintenance, and emergencies." This O&M plan includes policies that address:

- Operating, maintaining, and repairing the pipeline and components;
- Controlling corrosion;
- Availability of construction records, maps, and operating history;
- Start up and shut down of the pipeline;
- Maintenance and operation of compressor stations;
- Review of procedures to determine effectiveness and adequacy;
- Safety procedures for excavation; and
- Control room management.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

SAFETY SYSTEMS

SoCalGas: SAFETY-
PLAN.4

The O&M plan is reviewed annually to verify that the referenced documents containing policies and procedures remain in compliance with the requirements of the relevant sections of 49 CFR regulations. The policies and procedures referenced are updated throughout the year in response to new information or regulations, technology, or other items that drive improvement to the policy.

Individual documents referenced by the O&M plan undergo full functional reviews at least every five years. Training programs are reviewed in the same timeframe as associated gas standards so employees are aware of and perform tasks according to the current requirements. To help employees remain knowledgeable of the critical policies and procedures, including those related to safety, SoCalGas provides annual review training for all operating employees.

The documents referenced by the O&M plan identify and prescribe activities whose purpose it is to minimize pipeline systemic risks and document its history through meeting and documenting code/regulation compliance, ensuring system safety and operational excellence, minimizing the potential for and consequences associated with unplanned events such as equipment failure or operator error.

5 PIPELINE SAFETY ENHANCEMENT PLAN

SoCalGas submitted its Pipeline Safety Enhancement Plan (PSEP) with the Commission in August of 2011 in response to the Commission's directive that all gas corporations subject to the Commission's jurisdiction develop and implement a plan to replace or pressure test all transmission pipelines that have not been tested to modern standards. The Commission also required that gas corporations include in their safety enhancement plans proposals for automating shutoff valves.

The PSEP's key elements include:

- A two-phased approach and prioritization process for the pressure testing or replacement of transmission pipeline segments that were not tested to modern standards.
- Criteria for determining whether to pressure test or replace pipeline segments.
- A proposal for enhancing SoCalGas' valve infrastructure. This proposal includes installing additional remote control and automated shutoff valves, and installing supporting equipment and system features on transmission pipelines.

All testing, replacement, valve work and other infrastructure activities completed as part of the PSEP shall be completed in accordance with this Safety Plan.

PSEP also offers proposals to enhance the pipeline system beyond measures required by the Commission through retrofitting pipelines with existing and emerging technologies to provide



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

SAFETY SYSTEMS	SoCALGAS: SAFETY-PLAN.4
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advance warning of potential pipeline failure and decrease the time to identify, investigate, prevent, remedy or manage the effects of such an event, and it includes alternatives that can be adopted by the Commission that are designed to reduce costs for customers.

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SAFETY SYSTEMS


SoCalGas: SAFETY-
PLAN.4

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Brief: Incorporate language to satisfy API 1173 including references to pipeline integrity risk evaluations, lessons learned, and meeting compliance, safety, and minimizing equipment failure and operator error.

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGENCY RESPONSE	SoCalGas: SAFETY-PLAN.5
--------------------	-------------------------

Table of Contents

1	EMERGENCY RESPONSE AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(5), (d)(6) and (d)(8)	2
2	EMERGENCY RESPONSE PLAN	2

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGENCY RESPONSE	SoCalGas: SAFETY-PLAN.5
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1 EMERGENCY RESPONSE AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(5), (d)(6) and (d)(8)

In D.12-04-010, the Commission identified the topic of emergency response to meet the requirements of California Public Utilities Code 961 (d)(5), (d)(6) and (d)(8). These sections require that the Safety Plan achieve the following:

- § 961(d)(5) Provide for appropriate and effective system controls, with respect to both equipment and personnel procedures, to limit the damage from accidents, explosions, fires, and dangerous conditions.
- § 961(d)(6) Provide timely response to customer and employee reports of leaks and other hazardous conditions and emergency events, including disconnection, reconnection, and pilot lighting procedures.
- § 961(d)(8) Prepare for, or minimize damage from and respond to, earthquakes and other major events.

In response to the Safety Enforcement Division inquiry into options to implement Public Utilities Code §956.5, SoCalGas has included §956.5 as a requirement of the Safety Plan:

- § 956.5. Owners and operators of intrastate transmission and distribution lines, at least once each calendar year, shall meet with each local fire department having fire suppression responsibilities in the area where those lines are located to discuss and review contingency plans for emergencies involving the intrastate transmission and distribution lines within the jurisdiction of the local fire department.

SoCalGas has a number of programs, policies, standards and procedures in place so that the company and its employees are prepared to respond to emergencies. These activities are intended to limit damage from accidents and provide timely response to customer and employee reports of leaks, hazardous conditions, and emergency events such as earthquakes.

2 EMERGENCY RESPONSE PLAN

The Gas Emergency Response Plan documents how SoCalGas complies with the emergency response requirements specified by the Public Utilities Code 961 (d)(5), (6) and (8), as well as the emergency response procedures required by 49 CFR Part 192.615. This plan covers the following emergency response elements:

- SoCalGas' Emergency Response Organization, including positions and responsibilities of the Emergency Operations Center, Gas Emergency Centers, and Transmission Command Post;
- Emergency preparedness;



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGENCY RESPONSE

SoCalGas: SAFETY-
PLAN.5

- Continuity planning;
- Mutual assistance; and
- Plan maintenance.

The Plan incorporates by reference SoCalGas procedures and documents that collectively comply with the various requirements of 49 CFR Part 192.615 and components of API 1173 including:

- The responsibility of customer contact centers, which receive customer reports of emergencies and leaks;
- The responsibility of dispatch offices, which act as the central point for receiving and recording information on reportable incidents, emergencies, and natural disasters affecting the company, and which also process internal gas incident notifications; and
- The Emergency Incident Reporting System used to record reports of damage to SoCalGas pipelines or facilities and to log, track, and notify field personnel and others within the company about emergency situations.
- Establishing and maintaining liaison with appropriate fire departments

This Emergency Response Plan is designed to provide for the safety of customers, employees and communities and the protection of property in the event of a major emergency related to gas pipeline operations.

SoCalGas prepares and maintains written plans and standards that address emergency or disaster situations, including earthquake response. As part of these plans and standards, employees are trained and equipped to respond promptly; direct their actions toward protecting people first and then property; maintain gas service to customers where possible; and, restore the affected pipeline system and company operations to normal status following an emergency or disaster.

These plans and standards may include written gas-handling plans, alternative gas handling plans and various considerations when performing gas handling/pressure control, including the operation of critical valves, control equipment and instrumentation. Employees are to adhere to these plans and standards when performing these duties and to take precautions to prevent outages, over pressurization, errors in mapping or planning and other safety concerns. Employees performing specified tasks must be trained on the policies and procedures to complete their duties safely. Business Resumption plans address continuity planning to ensure organizational stability in the event of a major business disruption so that critical functions can continue during and after a disaster with minimal disruption.

Plans for coping with a major emergency include provisions for training; response and recovery; specific responsibility for on-call schedules and duties; inter-organizational assistance; coordination with, and notification of, governmental agencies; media contact; assignments to governmental emergency organizations; and activation of the company's regional Gas Emergency Centers.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGENCY RESPONSE

SoCalGas: SAFETY-
PLAN.5

SoCalGas' emergency management organization is modeled after the Standardized Emergency Management System (SEMS), which allows for a multi-level emergency response organization. This means that the severity of the incident determines the level of support and resources that are necessary to respond to the event.

SoCalGas has three levels of emergency management support:

- Base (field level) response for routine local emergencies or incidents involving a small number of customers;
- Gas Emergency Centers and Transmission Command Post, which are activated for larger emergencies that involve repair and restoration efforts as well as technical support, logistics, and communications activities; and
- an Emergency Operations Center, which is for large scale events that may involve a large number of customers across regions or an event that may require the coordination and communication with multiple internal and/or external organizations (such as significant earthquakes).


SoCalGas maintains four regional Gas Emergency Centers, a Transmission Command Post, and an Emergency Operations Center staffed with trained personnel to respond to and recover from major emergencies. SoCalGas also has a backup Emergency Operations Center in the event the main center becomes inoperative.

SoCalGas maintains and tests its emergency response plan and structure by conducting regular emergency preparedness drills and exercises to promote employee proficiency in emergency assignments and to validate the effectiveness of its emergency plans. These training exercises may include external agencies and cover a wide range of threats to employee, public, and pipeline safety. Adequacy of response is evaluated during these emergency exercises, lessons learned are identified and corrective actions are taken, which may include plan or process revisions. Emergency response plans and procedures are also evaluated as a component of an incident investigation, with lessons learned incorporated into plan or process revisions as needed.

SoCalGas has begun, and shall continue, to integrate elements of the Incident Command System (ICS) into the company's field response structure. The Incident Command System is a standardized approach to incident management that provides all responders an integrated organizational structure that matches the complexities and demands of the incident, and can expand or contract to meet incident needs. This integrated organizational structure outlines communication standards for inter-functional (i.e., Transmission, Distribution, etc.) and inter-agency (i.e., fire, law enforcement, Caltrans, etc.) cooperation during an emergency incident and responsibilities within the company.

In addition to Incident Command System training, the company provides "First Responder" training for field management personnel that may respond to emergencies.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGENCY RESPONSE	SoCALGAS: SAFETY-PLAN.5
---------------------------	--------------------------------

Plans for routine emergencies differ from a major emergency in that Company personnel respond and address the emergency with no or minimal interaction with other agencies. The Company responds immediately to all emergencies. In addition to the immediate response to emergencies, other potentially hazardous conditions reported to the Company are scheduled dependent upon the specific information reported to the Utility. Response times of less than four hours, less than 14 hours and same day have been established for these non-emergency conditions.

The individual procedures, policies and programs associated with this chapter are listed in the Appendix.

The appropriate level of leadership participates in and reviews the scheduling and findings of emergency preparedness activities. Emergency preparedness activities are conducted per the schedule published by Emergency Services

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGENCY RESPONSE

SoCalGas: SAFETY-
PLAN.5

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY-PLAN.6
-------------------------------	-------------------------

Table of Contents

1	STATE AND FEDERAL REGULATIONS AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(7), (d)(9) and (c).....	2
2	REGULATORY OVERSIGHT.....	2
3	COMPLIANCE WITH GENERAL ORDER 112-E	3

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY- PLAN.6
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1 STATE AND FEDERAL REGULATIONS AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(7), (d)(9) and (c)

In D.12-04-010, the Commission identified the topic of state and federal regulations to meet the requirements California Public Utilities Code 961 (c), (d)(7) and (d)(9). These sections require that the safety plan achieve the following:

- § 961(d)(7) Include appropriate protocols for determining maximum allowable operating pressures on relevant pipeline segments, including all necessary documentation affecting the calculation of maximum allowable operating pressures.
- § 961(d)(9) Meet or exceed the minimum standards for safe design, construction, installation, operation, and maintenance of gas transmission and distribution facilities prescribed by regulations issued by the United States Department of Transportation in Part 192 (commencing with Section 192.1) of Title 49 of the Code of Federal Regulations.
- § 961(c) The plan shall be consistent with best practices in the gas industry and with federal pipeline safety statutes as set forth in Chapter 601 (commencing with Section 60101) of Subtitle VIII of Title 49 of the United States Code and the regulations adopted by the United States Department of Transportation pursuant to those statutes.

This chapter provides how SoCalGas complies with these directives.

2 REGULATORY OVERSIGHT

SoCalGas' Transmission and Distribution pipelines and facilities are regulated by PHMSA on the federal level, and by the Commission at the state level. The Commission is a state partner of PHMSA and is certified by PHMSA for the *intrastate* regulatory, inspection, and enforcement responsibilities of the transportation of natural gas.

The State of California's rules governing the design, construction, testing, operation, and maintenance of gas transmission and distribution piping systems are specified in Commission's General Order 112-E.

The Commission has incorporated Title 49 of the Code of Federal Regulations (49 CFR), Parts 190, 191, 192, 193, and 199, which govern the design, construction, testing, operation, and maintenance of Gas Piping Systems into its General Order 112-E.

This Safety Plan and related documents shall remain consistent with industry best practice, General Order 112-E and the applicable Parts of Title 49 of the Code of Federal Regulations.

SoCalGas' gas standards, including O&M procedures, are developed to comply with federal and state pipeline safety regulations. To meet new laws, rules, and regulations, the Pipeline Safety and Compliance department is designated to monitor and track changes to legislation and regulatory requirements. When new regulations are adopted, the department coordinates the

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY-PLAN.6
--------------------------------------	--------------------------------

implementation of new requirements and documents them so that policies, standards, practices, and training materials are updated, as appropriate.

SoCalGas stays current with regulations and requirements by monitoring legislative and regulatory activities and participating in industry associations, such as the American Gas Association (AGA). As an example, some of the past activities SoCalGas has initiated from its participation in industry organizations can be seen in Figure A, at the end of this chapter.

The Company also updates procedures, standards and audit programs and keeps required documentation (e.g., leak survey records, patrols, cathodic protection reads, meter and regulation inspection forms, test data, and other documents) for a specified time period to demonstrate compliance.

SoCalGas will continue these activities to comply with all regulations and requirements.

3 COMPLIANCE WITH GENERAL ORDER 112-E

In accordance with General Order 112-E and by incorporation, 49 CFR Part 192, SoCalGas has implemented and follows policies, procedures and programs that govern the design, construction, installation, operation, maintenance and determination of maximum allowable operating pressure for gas transmission and distribution facilities. These policies, procedures and programs are updated in a timely manner as appropriate in response to changes in regulation, safety advisories, and other safety information.

The individual procedures, policies and programs associated with this Section are listed in the Appendix.

These policies, procedures and programs have been developed to comply with the code requirements and are summarized as follows:

- 3.1 **Design:** 49 CFR Part 192 Subparts B, C, and D specify the minimum requirements for the material selection and design of pipe and pipeline components. SoCalGas' transmission and distribution pipe and facilities are designed with approved materials that have sufficient wall thickness and/or adequate protection to withstand anticipated external pressures and loads that will be imposed on the pipe after installation. The pipe and facilities are also designed with materials of sufficient strength to contain internal pressures plus appropriate design and/or safety factors. Components, including valves, flanges, and fittings meet the minimum prescribed requirements specified in the regulations. The design also includes pressure relief or other protective devices to prevent accidental over pressurization as further described in the maintenance section. SoCalGas implements defined procurement processes that facilitate materials traceability.
- 3.2 **Construction:** 49 CFR Part 192 Subparts E, F, G and J specify the minimum requirements for the construction and testing of transmission and distribution facilities, including the welding and joining pipe and components as well as the protection of the pipe and facilities from

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCalGas: SAFETY-PLAN.6
-------------------------------	-------------------------

hazards such as unstable soil, landslides, and other hazards that may cause the pipe to move or sustain abnormal loads. SoCalGas' transmission and distribution pipe and facilities are to be constructed in accordance with these requirements. Where a contractor is used to supplement SoCalGas pipeline construction workforce, a contractor safety management program is in place to communicate regulatory requirements and monitor contractor's safety record. Construction practices and procedures are aligned where feasible to improve efficiency and effectiveness.

- 3.3 Installation: 49 CFR Part 192 Subpart H specifies the minimum requirements for the installation of distribution service lines, service regulators, and customer meters. These requirements include specifications pertaining to the location of this infrastructure, protection from damage, and valve requirements. SoCalGas' service lines, service regulators, and customer meters are to be installed in accordance with these requirements.
- 3.4 Maintenance: 49 CFR Part 192 Subparts M and I specify the minimum requirements for the maintenance of transmission and distribution pipe facilities along with the associated corrosion protection facilities. Maintenance activities include the patrolling of pipeline, performing leakage surveys, monitoring performance of corrosion protection systems, making repairs, inspection and testing of pressure limiting and regulating equipment, and valve and vault inspection and upkeep. SoCalGas maintains its pipelines and facilities in accordance with these requirements. SoCalGas' patrol, leak survey, pressure limiting, valve and vault maintenance activities are further explained as follows:
 - 3.4.1 Patrol: Pipeline patrols are performed to look for indications of pipeline leaks, missing pipeline markers, construction activity, right-of-way encroachment and other factors that may threaten the pipeline. These patrols are to be performed at specified frequencies dependent upon the type of facility and its location.
 - 3.4.2 Leak Survey: SoCalGas conducts leakage surveys of its pipelines at frequencies that are specified in the regulations. These surveys are typically conducted using combustible gas detectors. Leak indications are to be recorded and assigned a priority code based upon the concentration of gas recorded by the instrument as well as other relevant factors that may exist in proximity to its location. The highest priority leaks are to be continuously monitored and repaired promptly. Small leaks that pose little threat to the public are to be monitored and repaired based on operating conditions.
 - 3.4.3 Pressure Monitoring and Control: Each pipeline system receives supply from higher pressure pipelines connected to the integrated system. Equipment exists between systems to regulate and control the pressure in each pipeline. Failure of pressure control equipment could result in the accidental over-pressurization of pipelines not designed to withstand the higher pressure of the upstream system. Accordingly, the pipeline systems are to be equipped with appropriate secondary pressure relieving, regulating, or limiting devices that will activate in the event the primary pressure control device fails. The design and use of all gas pressure relieving devices are to conform to appropriate agency regulations and orders. These devices are to have

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY- PLAN.6
-------------------------------	-----------------------------

sufficient capacity and be set to prevent the over-pressurization of pipe and pipeline components commensurate with regulatory requirements.

Pressure relief devices at pressure limiting stations and pressure regulating stations must have sufficient capacity to protect the facilities to which they are connected. Each pressure limiting station, relief device (except rupture discs), signaling device, and pressure regulating station and its equipment must be inspected once per year. These inspections verify that the equipment is:

- In good mechanical condition;
- Adequate from the standpoint of capacity and reliability of operation for the service in which it is employed;
- Set to control or relieve at the correct pressure consistent with the pressure limits of applicable regulatory requirements; and
- Properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation.

Any defective or inadequate equipment found must be promptly repaired or replaced.

3.4.4 Corrosion Control: Requirements for the protection of metallic pipelines from external, internal and atmospheric corrosion are prescribed in Subpart I – Requirements for Corrosion Control. Corrosion Control Activities include:

- The use of protective coatings and paints to prevent a corrosive atmospheric or soil environment from coming in contact with the external steel surface
- For the external surface of buried steel, the use of Cathodic Protection (CP) systems. CP is a technology that uses direct electrical current to counteract the normal corrosion of a metal pipeline.
- Management of the composition of the gas in the pipeline to prevent the formation of a corrosive environment and prevent internal corrosion.

3.4.5 Valve Maintenance: SoCalGas performs maintenance and inspection activities on all valves that may be necessary for the safe operation of its natural gas system. These valves include system isolation valves, inlet and outlet valves to regulator stations, bridge approach valves and high pressure line sectionalizing valves. All identified valves are to be checked and serviced at least once each calendar year. Routine maintenance and inspection activities verify:

- Valve is not leaking
- Valve is properly identified;
- Valves are adequately lubricated; and
- Valves are operational.

Any issues requiring immediate action are to be addressed right away. All required

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY- PLAN.6
-------------------------------	-----------------------------

follow-up work is managed through the issuance of an appropriate work order to perform needed repair or maintenance activities.

- 3.4.6 **Vault Maintenance:** Underground vaults typically house pressure regulating or pressure limiting equipment. The purpose of the vault is to allow access to the equipment for inspection, maintenance, and repair activities. SoCalGas performs routine maintenance and inspection on all underground vaults. Vault maintenance normally coincides with the scheduled maintenance of the equipment housed within the vault. These inspections are to be completed once per year. Routine maintenance and inspection activities for underground vaults include:

- Proper operation of ventilation equipment, if so equipped;
- Structural condition of vault walls, floor, ladders, steps, handrails, etc.;
- Structural condition and operation of cover including hinges and locking devices; and
- Correct for any presence of water, trash or other foreign substances.

Any issues requiring immediate action are to be addressed right away. All required follow-up work is managed through the issuance of an appropriate work order to perform needed repair or maintenance activities.

- 3.5 **Operations:** 49 CFR Part 192 Subparts Land K specify the minimum requirements for the operation of transmission and distribution pipeline facilities. Operational activities are included in the O&M plan described in Chapter 4 and include the Emergency Response Plan described in Chapter 5 of this Safety Plan. The operation of the pipeline also includes requirements for a public awareness program, damage prevention program, control room management procedures, odorization of gas, identification of changes in population density along certain transmission lines, and the determination of maximum allowable operating pressure including requirements for increasing the maximum allowable operating pressure. SoCalGas operates its pipelines and facilities in accordance with these requirements:

- 3.5.1 **Public Awareness Program:** The main objective of the Public Awareness Program is to raise the awareness of the affected public and key stakeholders of the presence of pipelines and associated facilities in the communities where we serve and operate. A more informed public will contribute to a reduction in pipeline emergencies and releases.

The SoCalGas Public Awareness Program follows the general guidance provided in the American Petroleum Institute Recommended Practice 1162 - Public Awareness Programs for Pipeline Operators. Specifically, the program identifies the audiences to be considered for targeted communications, the frequency of messages, the messages to be delivered to each audience, the methods and vehicles for delivering the messages. Furthermore, SoCalGas has specific measures to evaluate the effectiveness of our program and materials. It also meets the requirements of API 1173 – Pipeline Safety Management System. Specifically, it identifies communications for sharing

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY- PLAN.6
-------------------------------	-----------------------------

pipeline safety risk information with those residing near the pipelines and defines a mechanism whereby the public can report pipeline safety risk issues to SoCalGas.

The following audiences are examples of our key stakeholders:

- Customers;
- Excavators and land developers;
- Public officials - school districts, city and county managers;
- Emergency officials;
- Residents and places of congregation along transmission lines;
- Residents within the distribution service territory; and
- Residents near compressor stations and underground natural gas storage fields.

Some of the key messages that the program educates on are the following:

- Use of the 811 one-call notification system prior to excavation and other damage prevention activities;
- Possible hazards associated with unintended releases from a gas pipeline facility;
- Physical indications of a pipeline release of gas;
- Public safety measures to be taken in the event of a pipeline gas release; and
- Procedures to report a pipeline release.

- 3.5.2 **Damage Prevention Program:** The purpose of the Damage Prevention Program is to avert gas incidents -- such as dig-ins to SoCalGas pipelines -- and thereby improve public safety and property protection through public education and outreach activities. SoCalGas continues to promote awareness of the Underground Service Alert (811 "call-before-you dig") system by reaching out to contractors and the general public through meetings, mailers, bill inserts, the company website and other methods, so that gas lines are properly marked before excavation activities. Pipeline markers are to be accurate and visible. Excavation activity includes excavation, blasting, boring, tunneling, backfilling, the removal of aboveground structures by both explosive or mechanical means, and other earth-moving operations.
- 3.5.3 **Control Room Management:** Gas Control monitors and/or controls pipeline facilities on a 24/7 basis. Gas Control personnel are Operator Qualified per 49 CFR 192 Subpart N and are to maintain pipeline pressures and gas flows within established safe limits while meeting customer supply demands.

In the event of an emergency, Gas Control personnel have authority and responsibility to maintain system integrity as they deem necessary using the resources available to them at any given time under both abnormal and emergency operating conditions. This includes alerting and directing field or storage personnel to take appropriate action when upsets, abnormal, or emergency conditions arise as well as having compressor stations, regulating stations, and other field locations

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCalGas: SAFETY-PLAN.6
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manned and active during abnormal conditions. The control room also has the authority to request assistance from our out-of-state suppliers to help in maintaining system integrity. In addition, given the nature of the emergency, control room personnel have the authority to activate and operate from our emergency back-up facility.

SoCalGas has a control room management program that is integrated with other operating and emergency procedures. Key elements of the control room management plan include:

- Definition of controllers' roles and responsibilities;
- Definition of information, tools, procedures, and processes controllers;
- A fatigue management program;
- An alarm management plan;
- A change management plan to address handling, approving, and implementing changes that affect the ability of Gas Operations Control to safely and effectively manage the flow of gas within the pipeline, including changes in field operations, facilities, and controlling and monitoring equipment;
- A means to incorporate operating experience into control room management procedures; and
- An established controller training program; compliance validation to meet federal and/or state agencies; and records and documentation that demonstrate compliance with plan mandates.

The Plan's requirements went into full effect in August 2012 and is reviewed and updated on an annual basis. SoCalGas will continue to take steps to meet plan requirements.

- 3.5.4 **Odorization:** In its native state natural gas is typically odorless. In compliance with regulations and as a primary safety measure, SoCalGas adds chemical compounds to the gas. These chemical compounds produce the distinctive odor associated with natural gas and serve as a means to detect a gas leak. Odor strength is to be maintained at a level so that gas may be readily detectable. The odor level is to be monitored at least monthly at representative locations for verification of odorization adequacy.
- 3.5.5 **Population Density:** 49 CFR 192 requires that changes in population density, known as Location Class, be monitored for certain transmission pipelines. The SoCalGas transmission pipeline system is modeled in a Geographic Information System (GIS). The GIS uses geographic data, aerial photography, data collected in the field, publically available data sets and the identification of building and dwelling points to determine class location. Maps with class designations are used by operations personnel to look for changed conditions. Observed changes are to be recorded by marking up or redlining a location class map or completing a form designed to record such changes.

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCALGAS: SAFETY- PLAN.6
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- 3.5.6 Maximum Allowable Operating Pressure: A maximum allowable operating pressure (MAOP) is established for each pipeline or piping system. The established MAOP cannot exceed the maximum pressure allowed by regulatory code as specified in 49 CFR §192.611 and 49 CFR §192.619 - 49 CFR §192.623 as applicable. Location class, design, testing and operating history are all factors that can limit the MAOP of a pipeline or system.
- 3.5.7 The Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 became Public Law 112-90 on January 3, 2012. This law, in part, requires gas transmission operators to verify records accurately reflect the physical and operational characteristics of transmission pipeline in Class 3 and Class 4 locations and Class 1 and Class 2 high-consequence areas and then confirm the established MAOP. SoCalGas successfully completed the records verification process and confirmed the established MAOP of its Transmission pipelines in Class 3 and Class 4 and Class 1 and Class 2 in high-consequence areas. The results have been submitted to PHMSA through the annual reporting process.

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCalGas: SAFETY-PLAN.6
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Figure A: Industry Participation

Figure A contains activities that SoCalGas adopted as a result of its participation in industry groups, specifically the American Gas Association (AGA). The activities listed in table below are items that SoCalGas helped shape as part of its industry affiliation and has adopted as part its programs and processes. Most of the activities are processes that have been initiated and implemented as a regular and routine element. The activities are noted as “adopted”, meaning the company has incorporated them as part of their normal course of business. The other activities are one-time events that were completed and are noted as “completed”. Details of those items can be obtained by consulting the responsible organization.

American Gas Association's Industry Actions	Implementation Type & Responsible Organization
Confirm the established MAOP of transmission pipelines	Completed Pipeline Integrity
Review and revise as necessary established construction procedures to provide for appropriate (risk-based) oversight of contractor installed pipeline facilities.	Adopted Gas Operation Services
Under DIMP, evaluate risk associated with trenchless pipeline techniques and implement initiatives to mitigate risks	Adopted Sewer Lateral Inspection Program Gas Operations Support
Under DIMP, identify distribution assets where increased leak surveys may be appropriate	Adopted Pipeline Integrity
Integrate applicable provisions of AGA's emergency response white paper & checklist into emergency response procedures	Adopted Emergency Services
Extend Operator Qualification program to include tasks related to new main & service line construction	Adopted Pipeline Safety & Compliance
Expand EFV installation beyond single family residential homes	Adopted Pipeline Integrity
Incorporate an Incident Command System (ICS) type of structure into emergency response protocols	Adopted Emergency Services
Extend transmission integrity management principles outside of HCAs using a risk-based approach	Adopted Pipeline Integrity
Implement applicable portions of AGA's technical guidance documents: 1) Oversight of new construction tasks to ensure quality; 2) Ways to improve engagement between operators & excavators	Adopted Gas Operations Services
Begin risk-based evaluation on the use of ASVs, RCVs or equivalent technology on transmission block valves in HCAs	Adopted Gas Engineering
Implement appropriate meter set protection practices identified through the Best Practices Program	Adopted Gas Infrastructure Protection Program (GIPP) Gas Operations Support



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

STATE AND FEDERAL REGULATIONS	SoCalGas: SAFETY-PLAN.6
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Part of Distribution IMP (DIMP)	No
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Impacts GO112E	No
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS

SoCALGAS: SAFETY-
PLAN.7

Table of Contents

1	CONTINUING OPERATIONS AND CALIFORNIA PUBLIC UTILITIES CODE § 963 (B)(3), 961 (D)(3), (D)(4), AND (D)(10)	2
2	SAFETY IS A CORE VALUE	2
3	SAFE AND RELIABLE STORAGE AND TRANSPORTATION	3
4	PATROL AND INSPECTION	4
5	SoCALGAS WORKFORCE SIZE, TRAINING AND QUALIFICATIONS	5
5.1	WORKFORCE SIZE	5
5.2	TRAINING	6
5.3	QUALIFICATION OF PIPELINE PERSONNEL	7
6	ANTI-DRUG AND ALCOHOL MISUSE PREVENTION PLAN	ERROR! BOOKMARK NOT DEFINED.

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS	SoCALGAS: SAFETY-PLAN.7
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1 CONTINUING OPERATIONS AND CALIFORNIA PUBLIC UTILITIES CODE § 963 (b)(3), 961 (d)(3), (d)(4), and (d)(10)

In D.12-04-010, the Commission identified the topic of continuing operations to meet the requirements in California Public Utilities §963 (b)(3), §961 (d)(3), (d)(4), and (d)(10). These sections require that SoCalGas' Safety Plan achieve the following:

- § 963(b)(3) It is the policy of the state and the commission and each gas corporation place safety of the public and gas corporation employees as the top priority. The commission shall take all reasonable and appropriate actions necessary to carry out the safety priority policy of this paragraph consistent with the principle of just and reasonable cost-based rates.
- § 961(d)(3) Provide adequate storage and transportation capacity to reliably and safely deliver gas to all customers consistent with rules authorized by the commission governing core and noncore reliability and curtailment including provisions for expansion, replacement, preventive maintenance, and reactive maintenance and repair of its commission-regulated gas pipeline facility.
- § 961(d)(4) Provide for effective patrol and inspection of the commission-regulated gas pipeline facility to detect leaks and other compromised facility conditions and to effect timely repairs.
- § 961(d)(10) Ensure an adequately sized, qualified, and properly trained gas corporation workforce to carry out the plan.

2 SAFETY IS A CORE VALUE

SoCalGas considers the health and safety of all employees and the general public to be its top priority. This core value is demonstrated through the following statements that describe our approach to safety at SoCalGas:

- Individual health and safety and the safety of others is not compromised. Safe work habits are the responsibility of every employee and the foundation of job performance evaluation.
- Occupational injuries and illnesses can be prevented. Identification and reporting of workplace hazards and potential hazards is the responsibility of every employee of SoCalGas. Job observations are implemented as part of our program to confirm that employees comply with safe and healthy work practices.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS

SoCalGas: SAFETY-
PLAN.7

- Management takes an active role in implementing SoCalGas' health and safety programs as stated in the Injury Illness Prevention Program (IIPP) and staying aware of related workplace injuries, near misses, and at-risk behaviors.
- SoCalGas performs formal investigations with root cause analysis and follow up on lessons learned for significant Company incidents and near misses.
- Management is responsible for providing a safe workplace and creating a safety culture that promotes safe behaviors and safeguards to prevent accidents and injuries to employees, contractors and the public. Employees work together to use equipment in accordance with job training and safety instructions.
- Safety culture is a key component in establishing a safe work environment. SoCalGas periodically assesses its safety culture to confirm the effectiveness of its safety programs.
- SoCalGas complies with applicable federal, state, and local occupational health and safety regulations and implements these through training, company standards, the IIPP, and safety lesson plans. Both pipeline and occupational safety are at the forefront of priorities for SoCalGas. Safety is a component of employee training programs and performance appraisals.

3 SAFE AND RELIABLE STORAGE AND TRANSPORTATION

SoCalGas has designed its integrated gas transportation and storage system to meet design standards established by the Commission for core and noncore customer service. The SoCalGas gas system is designed to provide service to core customers during a 1-in-35 year peak day condition, under which both firm and interruptible noncore transportation service is curtailed. The system is also designed to provide for continuous firm noncore transportation service under a 1-in-10 year cold day condition, during which only interruptible noncore transportation service is subject to curtailment. SoCalGas utilizes detailed hydraulic models of the gas system to evaluate its capacity to meet these design standards, and identify improvements as necessary. Both design standards are expected to occur during the winter operating season when core customers' gas usage is the greatest.

Information about transportation and storage capacities are available through the ENVOY electronic bulletin board. The link to the ENVOY bulletin board is located at:
<https://scgenvoy.sempra.com>

In accordance with SoCalGas' policies, the Gas Transmission Planning Department and Region Engineering Departments continuously monitor customer demand on SoCalGas' transmission and distribution system, both actual customer service requests and through the long-term demand forecast, and evaluates any changes in customer demand against the appropriate design standard



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS

SoCalGas: SAFETY-
PLAN.7

to insure adequate capacity is available to serve. Depending upon the customer class, SoCalGas has a variety of Commission-approved means to address any capacity deficiencies. When a deficiency is identified, possible solutions are considered, evaluated, and implemented according to SoCalGas rules and tariffs. For example, a facility improvement that is required to serve a single noncore customer and which provides no benefit to other customers is funded entirely by that customer.

Additionally, in D.06-09-039, the Commission established a common design standard for SoCalGas and Pacific Gas & Electric Company (PG&E) for “slack capacity” or reserve margin on their backbone transmission systems. Per this decision, the Gas Transmission Planning Department:

“plan and maintain intrastate natural gas backbone transmission systems sufficient to serve all system demand on an average day in a one-in-ten cold and dry-hydroelectric year.”
(D.06-09-039, Ordering Paragraph No. 1)

SoCalGas shall expand storage capacity and operational capability (inventory, injection and withdrawal) in the event the SoCalGas/SDG&E core customer reliability is in jeopardy without such an expansion.

Finally, SoCalGas continuously monitors its system to meet current customer demand. Per SoCalGas Rule 41, Utility System Operation, the mission of the Utility Gas System Operator is to maintain system reliability and integrity. This rule provides information on the responsibilities performed to maintain system reliability by each of the SoCalGas departments that contribute to the System Operator function.

SoCalGas will continue to perform operating and maintenance activities and make capital investments to support the company's pipeline system, maintain and enhance the operational efficiency and responsiveness of storage operations, and comply with applicable regulatory and environmental regulations.

4 PATROL AND INSPECTION

The patrol and inspection policies and programs discussed in Chapters 4 and 6 address the activities SoCalGas shall perform to detect leaks and other compromised facility conditions and then effect timely repair.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS

SoCALGAS: SAFETY-
PLAN.7

5 SoCALGAS WORKFORCE SIZE, TRAINING AND QUALIFICATIONS

5.1 Workforce Size

SoCalGas shall determine appropriate staffing levels to preserve the safety and integrity of its pipeline system.

Annual baseline employee staffing levels are determined during the annual business planning process and contracts are maintained with qualified service providers to complete work and address variability in work demand throughout the year. As part of the planning process local district management reviews its projected work and workforce to adequately fulfill safety, compliance, maintenance, and construction obligations. If local management cannot fulfill these obligations, they raise the need as part of the resource allocation and funding process. During the year, as resource vacancies occur or as work levels significantly change, local management reassesses the need for the workforce and submits a request to fill the vacancies or add to staff. Resource allocation decisions consider employee levels and contractor availability.

Verification of appropriate staffing levels is determined by monitoring specified performance metrics and workloads. These performance metrics include: meeting emergency response goals (A) response within 30/45 minutes) and compliance to distribution pipeline leakage code response times consistent with Company policy. The performance metrics used are reviewed monthly by Senior Management. If SoCalGas falls below performance goals, appropriate resource adjustments would be made.

Employees in safety-sensitive positions are trained to handle emergencies. Employees are cross-trained as needed in various assignments to perform a variety of duties that allow a flexible workforce to meet sudden changes in work demands. The company assesses its workforce requirements on an ongoing basis (such as an annual planning exercise) to develop hiring and development plans and budgets to supplement or replenish the workforce as necessary to sustain the safety and integrity of the pipeline system.

The Company uses contractors, as necessary and in compliance with bargaining agreements, so that sufficient overall resources are deployed to address maintenance and construction. SoCalGas shall continue to require that contractor employees undergo training and meet specific compliance requirements to perform work on company pipelines and facilities. Contractors shall be monitored to see that they perform their responsibilities consistent with company standards and contract requirements.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS

SoCALGAS: SAFETY-
PLAN.7

5.2 Training

Safety is rooted in all phases of field services training. It starts with the formalized training that employees receive when they begin their career, emphasized on the job, and then re-emphasized during training they receive as they advance to new jobs.

Training courses are delivered to each function/classification in all field job progressions and vary from two to seven weeks for entry-level positions. Courses are taught utilizing various training methods and delivery by a centralized field training team with most of the instructors having served as technicians at some point in their careers. These instructors convey consistent safety messages and confirm understanding of the classroom training by observing employees in simulated situations at SoCalGas' training complex in Pico Rivera.

Integrated in the training courses are the Operator Qualification tasks, as required by the DOT. The documentation for these qualifications and records are closely monitored and employees are re-trained, re-qualified or updated whenever significant changes occur in a task regulation or when they are required to re-qualify as prescribed by the DOT.

Emergency response is covered within the training courses for classifications that have any activities or functions in this area. The classifications include Lead Construction Technician, Energy Technician Residential and Distribution, Construction Technician, Pipeline Technician, and Dispatch Specialist. Employees are required to annually review policies and procedures so that they understand emergency response guidelines and procedures, including when to contact Corporate Security to address certain threats.

SoCalGas participates in industry forums, validates that training activities are consistent with regulatory requirements, and identifies when new training opportunities exist. SoCalGas has a training curriculum that tests employees' skills in identifying and repairing gas leaks and other real-life situations through simulation exercises. These exercises are also included in first responder training. In addition, the Company implemented a technical skills training class to help employees new to management become more effective in addressing these situations as supervisors and managers.

Training course materials are updated on a regular basis. Root causes of safety incidents, findings and near miss investigations are a significant part of course discussion/instruction in order to sustain and improve overall employee and system safety.

As part of the Company's continuing education effort, a hands-on training course for supervisors on high-pressure gas pipeline work has been developed and is being taught to new supervisors.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS

SoCALGAS: SAFETY-
PLAN.7

5.3 Qualification of Pipeline Personnel

All pipeline operators are required to have a written Operator Qualification program to establish general compliance policies for the DOT Operator Qualification Program as required by 49 Code of Federal Regulations 192.801 through 192.809, so that individuals (employees and contractors) performing DOT-covered tasks are qualified. The Company's Operator Qualification Program applies to all individuals who perform covered tasks, whether they are employed by the Company, a contractor, a sub-contractor or any other entity performing covered tasks of behalf of the Company. Such programs are reviewed by the OpQual and Industrial Design department prior to performing work on pipelines or pipeline facilities.

The Operator Qualification Program requires that employees are trained, initially qualified and subsequently re-qualified every five years. SoCalGas' training frequency conforms to these requirements and the results of the evaluations are recorded -- demonstrating employees' knowledge, skills and abilities of the job requirements and that they are qualified to perform the required tasks. If employees don't pass, they are not allowed to perform that activity until they have been successfully re-trained and re-qualified. Essentially, any employee who performs a covered task -- ranging from meter readers to customer services field, distribution and transmission personnel -- need to be operator-qualified.

The Operator Qualification Program also requires that contractors' knowledge, training and skills conform to the job requirements and that they are qualified to perform the required tasks. An external vendor who is one of the nation's leaders in regulatory compliance for Operator Qualification has been retained to provide training, testing, Operator Qualification, and record retention for our pipeline contractors.

6 ANTI-DRUG AND ALCOHOL MISUSE PREVENTION PLAN

The purpose of the Anti-Drug and Alcohol Misuse Prevention Plan is to prevent accidents that could result from the use of controlled substances and misuse of alcohol, thereby reducing fatalities, injuries and property damage. The Company's plan and policies are designed to comply with state and federal law.

If performing DOT-covered functions, employees undergo pre-employment drug and alcohol testing and are entered into the random drug testing program. Contractors shall also have an Anti-Drug and Alcohol Misuse Prevention Program or work with a third-party to enforce the program in compliance with DOT regulations, specifically, 49 CFR Part 40, Part 199 and/or Part 382. Contractors shall ensure their employees have a negative pre-employment test on file before their first performance of safety-sensitive functions and are entered in their (contractor's) random testing pool.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

CONTINUING OPERATIONS


SoCalGas: SAFETY-
PLAN.7

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Brief: Incorporate language to satisfy API 1173 including language regarding job observations, root cause analysis, training, and safety priorities. Elaborated on requirements of the Anti-Drug and Alcohol Program to meet DOT regulations. General edits to formatting and language enhancements.

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Part of Non-O&M Parts 191-193 Plan	No
Non-O&M 49 CFR Codes & Impacted Sections of Document	
Part of Distribution IMP (DIMP)	No
Part of Transmission IMP (TIMP)	No
Impacts GO112E	No
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGING ISSUES	SoCALGAS: SAFETY-PLAN.8
-----------------	-------------------------

Table of Contents

1	EMERGING ISSUES AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(11)	2
2	COLLABORATION WITH THE CALIFORNIA PUBLIC UTILITIES COMMISSION.....	2

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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGING ISSUES	SoCALGAS: SAFETY-PLAN.8
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1 EMERGING ISSUES AND CALIFORNIA PUBLIC UTILITIES CODE § 961 (d)(11)

In D.12-04-010, the Commission identified the topic of emerging issues to meet the requirements California Public Utilities 961 (d)(11). This section requires that the safety plan include the following:

- § 961(d)(11) Any additional matter that the commission determines should be included in the plan.

2 SOCALGAS AND EMERGING ISSUES

SoCalGas stays current on emerging issues within the industry through active participation in industry associations and open communication with legislative and regulatory groups. Chapter 6 of this Safety Plan identifies the on-going safety enhancement actions the industry has committed to and SoCalGas' targeted date of implementation.

SoCalGas is continuing to address the emerging issues of the grandfathering of provisions in 49 CFR Part 192 and the installation of remote-controlled and automatic shutoff valves as part of its Pipeline Safety Enhancement Plan as discussed in Chapter 4 of this Safety Plan. Similarly, SoCalGas is addressing the replacement of pipe, including polyethylene made with Aldyl-A resin, as part of its Distribution Integrity Management Program.

3 COLLABORATION WITH THE CALIFORNIA PUBLIC UTILITIES COMMISSION

SoCalGas shall continue to work in collaboration with the Commission and other regulatory authorities, and stay abreast of industry best practices in order to address those emerging issues that pose hazards and not yet within this Safety Plan. The most recent emerging issue was the changes to General Order 112, resulting in a new version entitled, General Order 112F. The revisions were adopted on June 2015, and will take effect on January 1, 2017. SoCalGas filed comments on the various proposals with the aim to improve pipeline safety and help shape General Order 112F. As an active participant throughout the process, SoCalGas filed specific comments that can be found at the following CPUC link—

<http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M077/K299/77299906.PDF>.

The regulatory front is not static. The GO-112E revisions were only one of several emerging issues. Several new issues have come to the forefront, which are as follow:

- Natural Gas Leakage
- Process Safety Management Systems
- Risk Management
 - Security Enhancement Measures on certain natural gas asset
 - Climate Change and Adaptation



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGING ISSUES

SoCalGas: SAFETY-
PLAN.8

Natural Gas Leakage Abatement

Rulemaking R.15-01-008 has commenced to carry out the intent of Senate Bill (SB) 1371. SB 1371 requires the adoption of rules and procedures to minimize natural gas leakage from Commission-regulated natural gas pipeline facilities consistent with Public Utilities Code Section 961(d), § 192.703(c) of Subpart M of Title 49 of the Code of Federal Regulation. The goal for the Commission through the rulemaking and in the spirit of SB 1371 is to reduce greenhouse gas emissions. SoCalGas has been an active participant in the rulemaking and have provided comments as well as meet the reporting requirements set forth under SB 1371. SoCalGas also held a technology workshop for all interested stakeholders to share information on best management practices and technology related to leakage abatement.

Documents filed under this proceeding can be found at the following web site:
<http://www.socalgas.com/regulatory/R1501008.shtml>.

Link to presentations from SoCalGas Hosted Technology Workshop:
<http://www.socalgas.com/regulatory/R1501008.shtml>

Process Safety Management

SoCalGas is implementing a Pipeline Safety Management System (PSMS) as defined by API 1173. Part of that effort incorporates SoCalGas long-standing approach to assess its safety culture and encourage two-way communication between employees and management as a means of identifying and managing safety risks. Additional details of its approach can be found in Chapter 2 of this Safety Plan.

Risk Management

Risk management, SoCalGas continues to work with the CPUC to develop and enhance its process to manage risk. SoCalGas is an active participant in the CPUC's proceedings on Risk Management under its application (A.15-05-004), which was filed in May 2015. Additionally SoCalGas has requested funding in its most recent General Rate Case¹ to further the development of its risk management processes and under the General Rate Case Policy Testimony of Ms. Diana Day, further details can be found.

Under the broad umbrella of risk management, SoCalGas is addressing certain risks that have emerged as industry specific issues—security enhancements and climate change.

¹ General Rate Case (GRC-2016) proceeding is A.14-11-004 and the various testimonies can be found at SoCalGas' website, <http://www.socalgas.com/regulatory/A1411004.shtml>.



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGING ISSUES

SoCALGAS: SAFETY-
PLAN.8

- Security Enhancement Measures on certain natural gas asset
SoCalGas is and continues to be an active participant on enhancing security measures for certain key natural gas facilities. This on-going process has been coordinated through Corporate Security based on the recommendations and guidelines of Transportation Security Administration (TSA) and information and intelligence provided by local law enforcement to identify and address potential threats to these facilities.

SoCalGas has already deployed certain measures since late 2014 and has requested funding in its most recent General Rate Case2 to enhance monitoring systems and external barrier changes (e.g. fencing).

Climate Change and Adaptation

Climate change is closely linked with key risks that could affect SoCalGas' ability to provide safe and reliable service. For example, a severe drought increases the risk of a wildfire, and sea level rise increases the risk of gas infrastructure failure. SoCalGas is working collaboratively with CPUC, US Forest Service, National Weather Service, CALFire, and other partners to create strategies for adaptation and resiliency. SoCalGas recently participated and presented at the CPUC and Energy CPUC and Energy Commission's Climate Adaptation workshop held on July 27. The presentation given by SoCalGas' executives is available on CPUC's website at:

[http://www.cpuc.ca.gov/PUC/energy/CPUC and Energy Commission to Hold Climate A
daptation Workshop.htm](http://www.cpuc.ca.gov/PUC/energy/CPUC%20and%20Energy%20Commission%20to%20Hold%20Climate%20Adaptation%20Workshop.htm)



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

EMERGING ISSUES

SoCalGas: SAFETY-
PLAN.8

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Part of SoCalGas O&M Plan:	No
Part of SDG&E O&M Plan:	No
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Part of Non-O&M Parts 191-193 Plan	No
Non-O&M 49 CFR Codes & Impacted Sections of Document	
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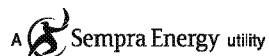
NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCalGas: APPENDIX.A
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1. NATURAL GAS SYSTEM OPERATOR SAFETY PLAN APPENDIX

- 1.1. In Decision (D.)12-04-010, the Commission stated gas operator safety plans “may reference existing components or include Exhibits or Attachments that cross-reference to other existing utility documentation.” SoCalGas has numerous existing safety programs, plans, and procedures in place that address specified infrastructure or areas of company activity. This Safety Plan provides an overarching safety strategy that encompasses the plans, programs, and policies referenced in this document and affirm SoCalGas’ commitment to safety. The following matrix is a guide to the documents making up these plans, programs, and policies. Documents have been identified by their policy number and title and cross-referenced to the Safety Plan chapter.

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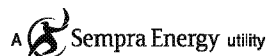
NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

1.2. List of Policy Documents By Chapter

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	100.0152	Self Audit Requirements - Gas Measurement (Distribution, Transmission & Storage)
4	Safety Systems	104.0001	Environmental Training
4	Safety Systems	104.0017	Pipeline Liquids - Field Handling
4	Safety Systems	104.06	Respiratory Protection Program
4	Safety Systems	107.0004	Material Evaluation and Implementation
4	Safety Systems	107.0324	General Operating Instructions for the Metrotech® Model 480B Pipe and Cable Locator - "Split Box"
4	Safety Systems	140.04	Condition/Location of Meter Installations and Report of Inaccessible/Removed Meters
4	Safety Systems	142.0065	Meter Set - Meter Turn-On
4	Safety Systems	142.0075	Closing Meters - Methods and Procedures
4	Safety Systems	142.01	Order Completion Schedule
4	Safety Systems	142.02	Leak Investigation - Customer Service
4	Safety Systems	142.5660	Purging Gas Meters and Customer Houelines
4	Safety Systems	151.0010	Environmental Inspections, Search Warrants, and Internal Notifications
4	Safety Systems	166.0015	Fire Prevention and Protection - Transmission and Storage
4	Safety Systems	166.0025	Prevention of Accidental Ignition of Natural Gas
4	Safety Systems	166.0055	Contractor Safety Observation Areas
4	Safety Systems	166.0076	Working in Flammable Atmospheres
4	Safety Systems	167.0100	Operator Qualification Program
4	Safety Systems	167.0125	Self-Audit Guidelines - Pipeline Integrity Program

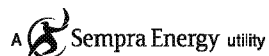


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	167.0200	Data Gathering and Integration
4	Safety Systems	167.0203	Threat Identification
4	Safety Systems	167.0204	Risk Assessment of High Consequence Areas
4	Safety Systems	167.0207	TIMP Risk Algorithm
4	Safety Systems	167.0208	Baseline and Reassessment Plan
4	Safety Systems	167.0209	External Corrosion Direct Assessment Procedure
4	Safety Systems	167.0210	In-Line Inspection Procedure
4	Safety Systems	167.0211	Bellhole Inspection Requirements
4	Safety Systems	167.0212	Casing Wax Fill
4	Safety Systems	167.0214	Preventive and Mitigative Measures
4	Safety Systems	167.0215	Continual Evaluation
4	Safety Systems	167.0216	Stress Corrosion Cracking Direct Assessment Procedure
4	Safety Systems	167.0218	Pipeline Cleaning Standard
4	Safety Systems	167.0220	In-Line Inspection Surveys Standard
4	Safety Systems	167.0224	Dry Gas - Internal Corrosion Direct Assessment
4	Safety Systems	167.0229	Internal Corrosion Management Plan
4	Safety Systems	167.0230	Internal Corrosion Design and Construction Considerations
4	Safety Systems	167.0232	Field Sampling and Analysis of Liquids and Solids/Sludge
4	Safety Systems	167.0235	Immediate Repair Conditions - Transmission Pipelines
4	Safety Systems	167.0236	Scheduling Remediation
4	Safety Systems	167.0240	Assessment of Pipeline Integrity Using Guided Wave UT
4	Safety Systems	167.0245	Global Positioning System (GPS) Process

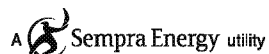


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	167.0246	GPS Control Survey
4	Safety Systems	167.0247	Aboveground Survey Plan
4	Safety Systems	167.0248	Alternating Current Attenuation Survey
4	Safety Systems	167.0249	Close Interval Survey
4	Safety Systems	167.0250	Voltage Gradient Survey
4	Safety Systems	167.0251	Soil Resistivity Survey
4	Safety Systems	167.0252	Inspection of Cased Pipe
4	Safety Systems	167.0260	Fiber Optic Cable Installation for Pipeline Monitoring
4	Safety Systems	167.04	Contractor Safety Program
4	Safety Systems	180.0003	Material Specifications and Purchase Descriptions
4	Safety Systems	180.0005	Steel Pipe - Selection Requirements
4	Safety Systems	180.0010	Steel Butt-Weld Fittings - Selection Guide
4	Safety Systems	180.0015	Wedding Bands, Reinforcing Sleeves and Canopies - Selection Guide
4	Safety Systems	180.0020	Flanges - Selection, Torque and Installation Requirements
4	Safety Systems	180.0030	Branch Connection, Steel - Selection Guide
4	Safety Systems	180.0035	Leak Repair Clamps and Sleeves - Selection Guide
4	Safety Systems	180.0040	Pressure Control Fittings - Selection Guide
4	Safety Systems	180.005	Steel Pipe Yield, Design Properties and Design Pressure Tables
4	Safety Systems	180.0085	Valve Usage and Selection Guide
4	Safety Systems	180.0100	Prefabricated Vaults - Design and Selection Guide
4	Safety Systems	182.0010	Request for Pipeline Design Assistance

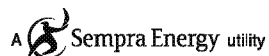


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	182.0040	Changing Maximum Allowable Operating Pressure and Maximum Operating Pressure
4	Safety Systems	182.0050	MAOP Evaluation of Corroded Pipe
4	Safety Systems	182.0055	Identification of Steel Pipe and Butt Weld Fittings
4	Safety Systems	182.0060	Service Risers
4	Safety Systems	182.0080	Casing Assemblies - Steel Carrier Pipe
4	Safety Systems	182.0087	Inspection of Pipeline Cable-Suspension Bridges
4	Safety Systems	182.0090	Designs for Pipelines in Bridges
4	Safety Systems	182.0093	Wear Pads and Bands for Steel Gas Piping
4	Safety Systems	182.0140	Polyethylene Plastic Pipe - General Application Requirements
4	Safety Systems	182.0148	Casing Assemblies - Plastic Carrier Pipe
4	Safety Systems	182.0150	Polyethylene (PE) Service Selection Guide
4	Safety Systems	182.0160	Purging Pipelines and Components
4	Safety Systems	182.0162	Purging and Locking Service Risers
4	Safety Systems	182.0165	Tap Requirements
4	Safety Systems	182.0170	Strength Testing - Pipelines and Facilities
4	Safety Systems	182.0185	Pressure Terminology and Establishment of Pressure Levels for Piping
4	Safety Systems	182.0190	Location Class - Determination and Changes
4	Safety Systems	182.0200	Design Factors for Steel Piping Systems
4	Safety Systems	183.0001	Emergency Planning - Government
4	Safety Systems	183.0015	Field Services Emergency Plans
4	Safety Systems	183.0017	Emergency Exercise
4	Safety Systems	183.0030	Contact with Fire and Police Departments and Public Agencies



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	183.0040	Natural Disaster or Major Emergency - Employee Instructions
4	Safety Systems	183.0075	Off-Hour Management Coverage - Headquarters and Region Operations
4	Safety Systems	183.01	Shutdown Procedures and Isolation Area Establishment for Distribution Pipeline Facilities
4	Safety Systems	183.0100	Emergency Incident Notifying
4	Safety Systems	183.0105	Incident Command System (ICS) for Emergency Incidents
4	Safety Systems	183.0110	Field Procedure - Emergency Incidents Transmission
4	Safety Systems	183.0120	Emergency Outage Procedure
4	Safety Systems	183.0130	Materials and Supplies for Emergency Situations
4	Safety Systems	183.0160	Message Center
4	Safety Systems	183.0165	Emergency Incident Reporting
4	Safety Systems	183.03	Field Guidelines - Emergency Incident Distribution / Customer Service
4	Safety Systems	183.05	Reports to the Message Center
4	Safety Systems	183.06	Region Reports of Safety-Related Pipeline Conditions
4	Safety Systems	183.07	Pipeline Incident Reports to CPUC and PHMSA; National Transportation Safety Board (NTSB) Accident Investigation
4	Safety Systems	183.08	Pipeline Safety Reports to CPUC and DOT
4	Safety Systems	184.0014	New Business Project Package Routing
4	Safety Systems	184.0015	Construction Planning for Mains and Supply Lines
4	Safety Systems	184.0016	Main Construction Project Package Routing
4	Safety Systems	184.0025	Services - Repair vs. Replace Decisions
4	Safety Systems	184.0031	Pressure Monitoring of Distribution Systems
4	Safety Systems	184.0060	General Construction Requirements for Distribution Service Lines

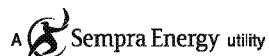


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	184.0075	Evaluation and Disposition of Inactive Services
4	Safety Systems	184.0080	Abandonment of Gas Services and Gas Light Tap Assemblies
4	Safety Systems	184.0085	Abandonment or Inactivation of Gas Distribution Pipelines
4	Safety Systems	184.0095	Polyethylene (PE) Pipe and Fittings - General Installation Requirements
4	Safety Systems	184.0115	Tapping/ Stopping PE Fittings
4	Safety Systems	184.0121	Service Riser Integrity Inspection
4	Safety Systems	184.0123	Composite Coating Repair for Anodeless Risers
4	Safety Systems	184.0124	Coring for Mini Riser Vault (MRV) Installation
4	Safety Systems	184.0130	Polyethylene Heater - Temperature Measurement and Adjustment
4	Safety Systems	184.0150	Leak Testing of Distribution Piping
4	Safety Systems	184.0170	Trenchless Construction Methods
4	Safety Systems	184.0175	Prevention of Damage to Subsurface Installations
4	Safety Systems	184.0200	Underground Service Alert and Temporary Marking
4	Safety Systems	184.0215	Annual Report of Leak Repairs on Federal Lands
4	Safety Systems	184.0235	Polyethylene (PE) Pipe Repair
4	Safety Systems	184.0275	Inspection Schedule - Regulator Station, Power Generating Plant Regulation Equipment Requirements
4	Safety Systems	184.03	Replacement Criteria for Distribution Mains and Services
4	Safety Systems	184.0300	Squeezing and Reopening Mains and Services
4	Safety Systems	184.0335	Steel Pipe Squeezers 6" through 12"
4	Safety Systems	184.0340	Squeezing Polyethylene (PE) Pipe - 1/2" Through 8"
4	Safety Systems	184.0355	Pressure Control Machines - 2" Through 12"

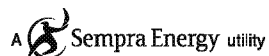


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	184.0360	Pressure Control - Fittings 2" and Under Pressure Limitations and Related Equipment
4	Safety Systems	184.0366	Pressure Control: Drilling Operations For DH-5 Drilling Machine
4	Safety Systems	184.0370	Pressure Control: Drilling Operations For D-5 Drilling Machine
4	Safety Systems	184.04	Supply Line Identification and Records
4	Safety Systems	184.0405	Pressure Control - Stop Bottom Outlet Fittings
4	Safety Systems	184.0450	Pressure Control - Completion Plugs 3/4" - 1-1/2"
4	Safety Systems	184.0455	Pressure Control - Completion Plugs - 2" - 3" - D-5 or DH-5
4	Safety Systems	184.0480	Pressure Control - Completion Plugs
4	Safety Systems	184.0575	Pressure Control: Stop Standard 2" Service Tee With D-5 Machine
4	Safety Systems	184.0585	Remove 1" Street Ell from a Service Clamp - Install a 1" Threaded Both Ends (TBE) Nipple in Clamp
4	Safety Systems	184.0590	Pressure Control Qualification Requirements
4	Safety Systems	184.06	Gas Handling and Pressure Control
4	Safety Systems	184.09	Prevention of Damage to Company Facilities
4	Safety Systems	184.12	Inspection of Pipelines on Bridges and Spans
4	Safety Systems	184.16	Valve Inspection and Maintenance - Distribution
4	Safety Systems	184.17	Temporary LNG Facility
4	Safety Systems	185.0001	Meter Locations
4	Safety Systems	185.0008	Meter Guard - Installation Requirements
4	Safety Systems	185.02	Pressure Regulation - Residential and Commercial
4	Safety Systems	185.0287	Over-Pressure/Under-Pressure Protection - Maintenance, Installation and Settings

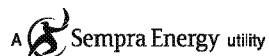


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	185.0300	MSA - Installing, Rebuilding and Inspections
4	Safety Systems	185.0474	Control Microsystems SCADAPACK
4	Safety Systems	186.0002	Design and Application of Cathodic Protection
4	Safety Systems	186.0005	Cathodic Protection - Mixed Piping System
4	Safety Systems	186.0015	Condition Assessment of Unprotected Distribution Steel Piping
4	Safety Systems	186.0035	Criteria for Cathodic Protection
4	Safety Systems	186.0036	100mV Polarization Criteria
4	Safety Systems	186.0040	Magnesium Anodes for Corrosion Control
4	Safety Systems	186.005	Cathodic Protection - Instruments and Testing Equipment
4	Safety Systems	186.0052	Copper Sulfate Electrode
4	Safety Systems	186.006	Selection and Installation of Rectifiers and Impressed Current Anodes
4	Safety Systems	186.0070	Insulating MSA's
4	Safety Systems	186.0075	Electrical Test Stations & Bond Assembly
4	Safety Systems	186.0100	Approved Protective Coatings for Below Ground Corrosion Control
4	Safety Systems	186.0102	Field Application of Fusion Bonded Epoxy to Joints and Field Repair of Fusion Bonded Epoxy Coating
4	Safety Systems	186.0103	External Surface Preparation and Field Applied Coatings for Buried Pipelines
4	Safety Systems	186.0104	Surface Preparation and Shop Applied Coating for General Steel (Primer and Topcoat)
4	Safety Systems	186.0106	External Surface Prep and Field-Applied Coating for Above Ground Pipe Spans
4	Safety Systems	186.0108	External Surface Preparation and Shop-Applied Coating for Steel Tanks and Vessels
4	Safety Systems	186.0109	Internal Coating of Tanks, Vessels, & Drip Legs
4	Safety Systems	186.0110	Field Tape Wrapping Requirements

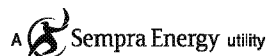


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	186.0111	Field Application of Grease Coating
4	Safety Systems	186.0112	External Surface Preparation and External Coating for New and Refurbished Storage Tanks and Pressure Vessels
4	Safety Systems	186.0116	External Surface Preparation and Field-Applied Coatings for New and Old Steel in a Marine Environment
4	Safety Systems	186.0117	External Surface Preparation and Shop-Applied Coating for High Corrosion Service Areas
4	Safety Systems	186.0120	Interference - Stray Electrical Current
4	Safety Systems	186.0135	Operation and Maintenance of Cathodic Protection Facilities
4	Safety Systems	186.0170	Record Keeping - Corrosion Control
4	Safety Systems	186.0180	Cathodic Protection Test Orders - Monitoring Isolated Facilities
4	Safety Systems	186.02	Cathodic Protection - Inspection of Exposed Pipe
4	Safety Systems	186.06	Cathodic Protection - Electrical Isolation
4	Safety Systems	186.07	Hot Line Insulating Sleeves
4	Safety Systems	186.09	Cathodic Protection - Casings
4	Safety Systems	187.0050	Cutting Into Gas Mains, MSAs and Abandoned Substructures - Safety Precautions
4	Safety Systems	187.0055	General Welding Requirements
4	Safety Systems	187.0056	Welding Field Guide
4	Safety Systems	187.0115	Fusion Requirements for Polyethylene Pipe
4	Safety Systems	187.0120	Fusing Socket Connections - Polyethylene (PE) Pipe
4	Safety Systems	187.0125	Electrofusion Process - General Instructions
4	Safety Systems	187.0126	Magic Box - 2"-4"
4	Safety Systems	187.0138	PE Saddle Fusions



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	187.0140	Transition Fittings
4	Safety Systems	187.0146	Excess Flow Valve (EFV) - Installation and Operation
4	Safety Systems	187.0155	Butt Fusing 2", 3" and 4" PE Pipe (Manual Machines)
4	Safety Systems	187.0158	4", 6" and 8" Polyethylene (PE) Butt Fusion (Hydraulic Machines)
4	Safety Systems	187.0175	Inspection and Testing of Welds on Company Steel Piping
4	Safety Systems	187.0180	Qualification and Re-Qualification of Welders
4	Safety Systems	187.0181	Qualification of Personnel - Polyethylene Pipe Joiners
4	Safety Systems	188.0001	Standard Specification for Natural and Substitute Fuel Gases
4	Safety Systems	189.0001	Odorization
4	Safety Systems	189.0010	Supplemental Odorization of Gas at Border Stations
4	Safety Systems	190	Operator Qualification Task Change Communication
4	Safety Systems	191.0020	Inspection of Construction Field Work
4	Safety Systems	191.0025	Scoring of Construction Work Inspected
4	Safety Systems	191.01	Investigation of Accidents and Pipeline Failures
4	Safety Systems	191.0210	Qualification of New Construction Contractors
4	Safety Systems	192.0010	Preparation of Construction Sketches
4	Safety Systems	192.0025	Map Maintenance Requirements for High Pressure Gas Lines
4	Safety Systems	192.0030	Completion Drawing Set Requirements for High Pressure Pipelines
4	Safety Systems	192.02	Procedure for HCA Segment Identification
4	Safety Systems	203.005	Self Audit Guidelines - Distribution
4	Safety Systems	203.007	Pipeline Patrol and Unstable Earth Self Audit
4	Safety Systems	203.008	Pipelines on Bridges and Spans Self-Audit

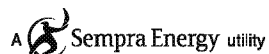


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	203.016	Leak Survey Self-Audit
4	Safety Systems	203.017	Valve Inspections and Maintenance Self-Audit
4	Safety Systems	2110	Management of Change for Gas Standards Related to Integrity Management Programs
4	Safety Systems	2111	Management of Change - Request & Approval
4	Safety Systems	2112	Pipeline Database Update
4	Safety Systems	223.0001	CPUC and PHMSA Notification of Major New and Upgraded Pipelines and Pressure Test Failures of Pipelines with MAOPs \geq 20% SMYS
4	Safety Systems	223.0002	Minimum Trench Requirements for Transmission Pipelines
4	Safety Systems	223.0030	Investigation of Failures on Distribution and Transmission Pipeline Facilities
4	Safety Systems	223.0031	Abnormal Operations - Transmission
4	Safety Systems	223.0065	Pipeline Patrol and Unstable Earth Inspections
4	Safety Systems	223.0075	Pipeline Markers
4	Safety Systems	223.0095	External and Internal Transmission Pipeline Inspection
4	Safety Systems	223.0100	Leakage Surveys
4	Safety Systems	223.0125	Leakage Classification and Mitigation Schedules
4	Safety Systems	223.0130	Abandonment, Conversion and Reinstatement of Transmission Pipelines
4	Safety Systems	223.0140	Excavating, Shoring and Sloping
4	Safety Systems	223.0145	Planning Shutdowns for Transmission and Storage
4	Safety Systems	223.0155	Planning Pipeline Blowdowns
4	Safety Systems	223.0177	Measurement of Remaining Wall Thickness
4	Safety Systems	223.0180	Repair of Defects in Steel Pressure Piping
4	Safety Systems	223.0183	Repair of Defects on an Operating Pipeline by Grinding

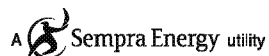


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	223.0185	Repair Leak on an Operating Pipeline With Band or Sleeve
4	Safety Systems	223.0188	Epoxy Grouted Non-Leaking Steel Sleeve Repairs - Above and Below Ground Piping
4	Safety Systems	223.0190	Repair of Non-Leaking Defects on an Operating Pipeline with a Band or Sleeve
4	Safety Systems	223.0195	Repair on Operating Pipelines Using a Welded Steel Patch
4	Safety Systems	223.0210	Vault Maintenance and Inspection
4	Safety Systems	223.0215	Valve Inspection and Maintenance - Transmission
4	Safety Systems	223.0230	Identification Numbers for Pipeline Valves - Transmission
4	Safety Systems	223.0233	Transmission Line Identification and Records
4	Safety Systems	223.0240	Compressor Station Emergency Shutdown Systems
4	Safety Systems	223.0250	Compressor Station Equipment - Isolation and Purging for Maintenance or Alterations
4	Safety Systems	223.0255	Testing and Maintaining Compressor Station Emergency Shutdown Systems
4	Safety Systems	223.0265	Identification Numbers for Station Valves
4	Safety Systems	223.0275	Main Reciprocating Gas Compressor Unit Operation - Transmission and Storage Operations
4	Safety Systems	223.0280	Main Reciprocating Gas Compressor Maintenance - Transmission and Storage Operations
4	Safety Systems	223.0315	Operation and Maintenance of Generator Units - Transmission and Storage Operations
4	Safety Systems	223.0325	Main Centrifugal Gas Compressor Unit Operation
4	Safety Systems	223.0330	Main Centrifugal Gas Compressor Unit Maintenance
4	Safety Systems	223.0340	Pressure Control Qualification - Transmission
4	Safety Systems	223.0345	Pressure Relief/Pressure Limiting Devices, Testing/Inspection
4	Safety Systems	223.0375	MAXIMO - Transmission and Storage Operations
4	Safety Systems	223.0400	Gas Detectors in Compressor Stations

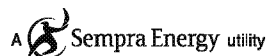


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

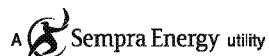
Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	223.0410	Requirements for Designing Pipelines to Accommodate Smart Pigs
4	Safety Systems	223.0415	Pipeline and Related Definitions
4	Safety Systems	3084	Corrosion Tests General Data Sheet
4	Safety Systems	3222	Design Data Sheet (DDS)
4	Safety Systems	3506	Notice of Shutdown / Operational Deviation
4	Safety Systems	3689	System Qualification Record
4	Safety Systems	4090	100mV Polarization Form
4	Safety Systems	4091	Wax Casing Data Collection Form
4	Safety Systems	5153	Pipeline Location Information
4	Safety Systems	5330	Operating and Maintenance Order (OMO)
4	Safety Systems	677-1	Pipeline Condition and Maintenance Report
4	Safety Systems	76-72	Odorant - 50/50 TBM/THT
4	Safety Systems	76-73	Thiophane Odorant
4	Safety Systems	ACF	Assessment Completion Form
4	Safety Systems	CRMP1	Control Room Management Plan
4	Safety Systems	CRMP6	Gas Control Management of Change
4	Safety Systems	F17-1	Annual Performance Measures
4	Safety Systems	F4-1	Threat Evaluation Form
4	Safety Systems	F8-1	Baseline Assessment Plan Revisions Log
4	Safety Systems	TIMP.0	Table of Contents
4	Safety Systems	TIMP.1	Introduction
4	Safety Systems	TIMP.10	Remediation



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCalGas: APPENDIX.A
---	-----------------------------

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	TIMP.11	Minimizing Environmental and Safety Risks
4	Safety Systems	TIMP.12	Preventive and Mitigative Measures
4	Safety Systems	TIMP.13	Continual Evaluation
4	Safety Systems	TIMP.14	Management of Change
4	Safety Systems	TIMP.15	Quality Assurance Plan
4	Safety Systems	TIMP.16	Record Keeping
4	Safety Systems	TIMP.17	Performance Plan
4	Safety Systems	TIMP.19	Communications Plan
4	Safety Systems	TIMP.20	Regulatory Interaction
4	Safety Systems	TIMP.3	HCA Identification
4	Safety Systems	TIMP.4	Data Gathering and Integration
4	Safety Systems	TIMP.5	Threat and Risk Assessment
4	Safety Systems	TIMP.8	Baseline Assessment Plan
4	Safety Systems	TIMP.9	Integrity Assessments
4	Safety Systems	TIMP.A	Terms, Definitions and Acronyms
4	Safety Systems	DIMP1	Introduction
4	Safety Systems	DIMP2	System Knowledge
4	Safety Systems	DIMP3	Threat Identification
4	Safety Systems	DIMP4	Evaluate and Rank Risk
4	Safety Systems	DIMP5	Identify and Implement Measures to Address Risk
4	Safety Systems	DIMP6	Measure Performance, Monitor Results and Evaluate Effectiveness
4	Safety Systems	DIMP8	Periodic Evaluation and Improvement

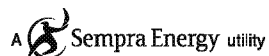


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
4	Safety Systems	DIMP9	Report Results
4	Safety Systems	DIMPA	Terms, Definitions and Acronyms
5	Emergency Response	142.01	Order Completion Schedule
5	Emergency Response	183.0001	Emergency Planning - Government
5	Emergency Response	183.0015	Field Services Emergency Plans
5	Emergency Response	183.0017	Emergency Exercise
5	Emergency Response	183.0035	Emergency Action and Fire Prevention Plan
5	Emergency Response	183.0075	Off-Hour Management Coverage - Headquarters and Region Operations
5	Emergency Response	183.01	Shutdown Procedures and Isolation Area Establishment for Distribution Pipeline Facilities
5	Emergency Response	183.0105	Incident Command System (ICS) for Emergency Incidents
5	Emergency Response	183.0165	Emergency Incident Reporting
5	Emergency Response	183.03	Field Guidelines - Emergency Incident Distribution / Customer Service
5	Emergency Response	183.05	Reports to the Message Center

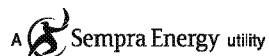


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
5	Emergency Response	183.06	Region Reports of Safety-Related Pipeline Conditions
5	Emergency Response	183.07	Pipeline Incident Reports to CPUC and PHMSA; National Transportation Safety Board (NTSB) Accident Investigation
5	Emergency Response	183.08	Pipeline Safety Reports to CPUC and DOT
5	Emergency Response	184.0335	Steel Pipe Squeezers 6" through 12"
5	Emergency Response	191.01	Investigation of Accidents and Pipeline Failures
5	Emergency Response	223.0001	CPUC and PHMSA Notification of Major New and Up-rated Pipelines and Pressure Test Failures of Pipelines with MAOPs=>20% SMYS
5	Emergency Response	01.010-I	Emergency Incidents/Local Instructions
5	Emergency Response	01.010-OC	Emergency Incidents/Local Instructions
5	Emergency Response	01.010-P	Emergency Incidents/Local Instructions
5	Emergency Response	10.010-COM	BRP - Dispatch/Arso
5	Emergency Response	10.020-COM	BRP - Customer Services, Distribution, and Meter & Regulation
5	Emergency Response	104.0030	Hazardous Waste Shipping
5	Emergency	104.0040	Hazardous Material Shipping

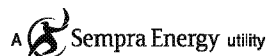


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
	Response		
5	Emergency Response	104.0150	Proposition 65 Compliance
5	Emergency Response	167.0200	Data Gathering and Integration
5	Emergency Response	167.0210	In-Line Inspection Procedure
5	Emergency Response	167.30	Lead and Metals in Surface Coatings: Hazard Compliance Program
5	Emergency Response	183.0030	Contact with Fire and Police Departments and Public Agencies
5	Emergency Response	183.0040	Natural Disaster or Major Emergency - Employee Instructions
5	Emergency Response	183.0100	Emergency Incident Notifying
5	Emergency Response	183.0110	Field Procedure - Emergency Incidents Transmission
5	Emergency Response	183.0120	Emergency Outage Procedure
5	Emergency Response	183.0130	Materials and Supplies for Emergency Situations
5	Emergency Response	183.0160	Message Center
5	Emergency Response	184.0250	Halt Tool - Gas Emergency Leak Clamp

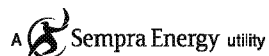


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
5	Emergency Response	OD7	Occupational Health and Safety
5	Emergency Response	OD8	The Gas Emergency Response Plan
5	Emergency Response	PA-1	Public Awareness Plan
5	Emergency Response	01.010-N	Emergency Incidents/Local Instructions
5	Emergency Response	184.0245	Leak Investigation - Distribution
5	Emergency Response	223.0145	Planning Shutdowns for Transmission and Storage
5	Emergency Response	167.0235	Immediate Repair Conditions - Transmission Pipelines
5	Emergency Response	166.0025	Prevention of Accidental Ignition
5	Emergency Response	223.0031	Abnormal Operations - Transmission
5	Emergency Response	104.0085	PCB Spill Clean-up and Decontamination
5	Emergency Response	104.02	Notification Requirements for Release/Spill Events
5	Emergency Response	1957	Gas Stub Tag

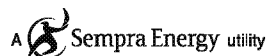


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	100.0152	Self Audit Requirements - Gas Measurement (Distribution, Transmission & Storage)
6	State and Federal Regulations	104.0220	Hydrostatic Test Water Management
6	State and Federal Regulations	104.06	Respiratory Protection Program
6	State and Federal Regulations	140.04	Condition/Location of Meter Installations and Report of Inaccessible/Removed Meters
6	State and Federal Regulations	142.0065	Meter Set - Meter Turn-On
6	State and Federal Regulations	142.0075	Closing Meters - Methods and Procedures
6	State and Federal Regulations	142.01	Order Completion Schedule
6	State and Federal Regulations	142.02	Leak Investigation - Customer Service
6	State and Federal Regulations	142.0275	Back Flow Protection - Regulators and Check Valves
6	State and Federal Regulations	142.5660	Purging Gas Meters and Customer Houselines
6	State and Federal Regulations	166.0015	Fire Prevention and Protection - Transmission and Storage

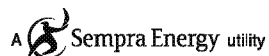


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	166.0025	Prevention of Accidental Ignition of Natural Gas
6	State and Federal Regulations	166.0076	Working in Flammable Atmospheres
6	State and Federal Regulations	167.0100	Operator Qualification Program
6	State and Federal Regulations	167.0200	Data Gathering and Integration
6	State and Federal Regulations	167.0211	Bellhole Inspection Requirements
6	State and Federal Regulations	167.0212	Casing Wax Fill
6	State and Federal Regulations	167.0229	Internal Corrosion Management Plan
6	State and Federal Regulations	167.0230	Internal Corrosion Design and Construction Considerations
6	State and Federal Regulations	167.0235	Immediate Repair Conditions - Transmission Pipelines
6	State and Federal Regulations	180.0005	Steel Pipe - Selection Requirements
6	State and Federal Regulations	180.0010	Steel Butt-Weld Fittings - Selection Guide

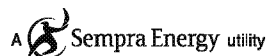


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	180.0015	Wedding Bands, Reinforcing Sleeves and Canopies - Selection Guide
6	State and Federal Regulations	180.0020	Flanges - Selection, Torque and Installation Requirements
6	State and Federal Regulations	180.0030	Branch Connection, Steel - Selection Guide
6	State and Federal Regulations	180.0035	Leak Repair Clamps and Sleeves - Selection Guide
6	State and Federal Regulations	180.0050	Control Piping
6	State and Federal Regulations	180.0085	Valve Usage and Selection Guide
6	State and Federal Regulations	180.0100	Prefabricated Vaults - Design and Selection Guide
6	State and Federal Regulations	182.0010	Request for Pipeline Design Assistance
6	State and Federal Regulations	182.0020	Electrical Facilities in Hazardous Areas
6	State and Federal Regulations	182.0040	Changing Maximum Allowable Operating Pressure and Maximum Operating Pressure
6	State and Federal Regulations	182.0050	MAOP Evaluation of Corroded Pipe

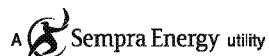


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	182.0055	Identification of Steel Pipe and Butt Weld Fittings
6	State and Federal Regulations	182.0070	Angles and Bends in Steel Piping
6	State and Federal Regulations	182.0080	Casing Assemblies - Steel Carrier Pipe
6	State and Federal Regulations	182.0087	Inspection of Pipeline Cable-Suspension Bridges
6	State and Federal Regulations	182.0090	Designs for Pipelines in Bridges
6	State and Federal Regulations	182.0093	Wear Pads and Bands for Steel Gas Piping
6	State and Federal Regulations	182.0130	Steel Service Design 61-1000 PSIG
6	State and Federal Regulations	182.0140	Polyethylene Plastic Pipe - General Application Requirements
6	State and Federal Regulations	182.0148	Casing Assemblies - Plastic Carrier Pipe
6	State and Federal Regulations	182.0150	Polyethylene (PE) Service Selection Guide
6	State and Federal Regulations	182.0160	Purging Pipelines and Components

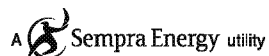


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	182.0162	Purging and Locking Service Risers
6	State and Federal Regulations	182.0165	Tap Requirements
6	State and Federal Regulations	182.0170	Strength Testing - Pipelines and Facilities
6	State and Federal Regulations	182.0185	Pressure Terminology and Establishment of Pressure Levels for Piping
6	State and Federal Regulations	182.0190	Location Class - Determination and Changes
6	State and Federal Regulations	182.0200	Design Factors for Steel Piping Systems
6	State and Federal Regulations	183.0001	Emergency Planning - Government
6	State and Federal Regulations	183.0015	Field Services Emergency Plans
6	State and Federal Regulations	183.0017	Emergency Exercise
6	State and Federal Regulations	183.0030	Contact with Fire and Police Departments and Public Agencies
6	State and Federal Regulations	183.0040	Natural Disaster or Major Emergency - Employee Instructions

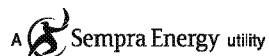


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	183.0075	Off-Hour Management Coverage - Headquarters and Region Operations
6	State and Federal Regulations	183.01	Shutdown Procedures and Isolation Area Establishment for Distribution Pipeline Facilities
6	State and Federal Regulations	183.0105	Incident Command System (ICS) for Emergency Incidents
6	State and Federal Regulations	183.0110	Field Procedure - Emergency Incidents Transmission
6	State and Federal Regulations	183.0120	Emergency Outage Procedure
6	State and Federal Regulations	183.0130	Materials and Supplies for Emergency Situations
6	State and Federal Regulations	183.0160	Message Center
6	State and Federal Regulations	183.0165	Emergency Incident Reporting
6	State and Federal Regulations	183.03	Field Guidelines - Emergency Incident Distribution / Customer Service
6	State and Federal Regulations	183.05	Reports to the Message Center
6	State and Federal Regulations	183.06	Region Reports of Safety-Related Pipeline Conditions

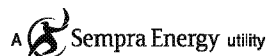


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	183.08	Pipeline Safety Reports to CPUC and DOT
6	State and Federal Regulations	184.0014	New Business Project Package Routing
6	State and Federal Regulations	184.0031	Pressure Monitoring of Distribution Systems
6	State and Federal Regulations	184.0035	Regulator Station Design and Planning
6	State and Federal Regulations	184.0050	General Construction Requirements for Distribution Mains
6	State and Federal Regulations	184.0055	Hand Backfill and Compaction Method
6	State and Federal Regulations	184.0060	General Construction Requirements for Distribution Service Lines
6	State and Federal Regulations	184.0075	Evaluation and Disposition of Inactive Services
6	State and Federal Regulations	184.0080	Abandonment of Gas Services and Gas Light Tap Assemblies
6	State and Federal Regulations	184.0085	Abandonment or Inactivation of Gas Distribution Pipelines
6	State and Federal Regulations	184.0090	Valve Selection and Installation - Services

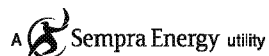


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	184.0095	Polyethylene (PE) Pipe and Fittings - General Installation Requirements
6	State and Federal Regulations	184.0105	Inserting PE Pipe - Main
6	State and Federal Regulations	184.011	Notification of Excavation and Construction Activities - Assembly Bill Number 1937/ PUC Code 955.5
6	State and Federal Regulations	184.0110	Inserting PE Pipe - Service Riser Adapter
6	State and Federal Regulations	184.0125	Locating Wire - Installation
6	State and Federal Regulations	184.0150	Leak Testing of Distribution Piping
6	State and Federal Regulations	184.0170	Trenchless Construction Methods
6	State and Federal Regulations	184.0200	Underground Service Alert and Temporary Marking
6	State and Federal Regulations	184.0235	Polyethylene (PE) Pipe Repair
6	State and Federal Regulations	184.0275	Inspection Schedule - Regulator Station, Power Generating Plant Regulation Equipment Requirements
6	State and Federal Regulations	184.03	Replacement Criteria for Distribution Mains and Services

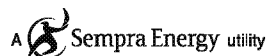


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	184.0355	Pressure Control Machines - 2" Through 12"
6	State and Federal Regulations	184.0360	Pressure Control - Fittings 2" and Under Pressure Limitations and Related Equipment
6	State and Federal Regulations	184.0366	Pressure Control: Drilling Operations For DH-5 Drilling Machine
6	State and Federal Regulations	184.0370	Pressure Control: Drilling Operations For D-5 Drilling Machine
6	State and Federal Regulations	184.04	Supply Line Identification and Records
6	State and Federal Regulations	184.0405	Pressure Control - Stop Bottom Outlet Fittings
6	State and Federal Regulations	184.0450	Pressure Control - Completion Plugs 3/4" - 1-1/2"
6	State and Federal Regulations	184.0455	Pressure Control - Completion Plugs - 2" - 3" - D-5 or DH-5
6	State and Federal Regulations	184.0480	Pressure Control - Completion Plugs
6	State and Federal Regulations	184.0575	Pressure Control: Stop Standard 2" Service Tee With D-5 Machine
6	State and Federal Regulations	184.0585	Remove 1" Street Ell from a Service Clamp - Install a 1" Threaded Both Ends (TBE) Nipple in Clamp

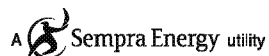


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	184.0585	Remove 1" Street Ell from a Service Clamp - Install a 1" Threaded Both Ends (TBE) Nipple in Clamp
6	State and Federal Regulations	184.0590	Pressure Control Qualification Requirements
6	State and Federal Regulations	184.06	Gas-Handling and Pressure Control
6	State and Federal Regulations	184.09	Prevention of Damage to Company Facilities
6	State and Federal Regulations	184.12	Inspection of Pipelines on Bridges and Spans
6	State and Federal Regulations	184.16	Valve Inspection and Maintenance - Distribution
6	State and Federal Regulations	185.0001	Meter Locations
6	State and Federal Regulations	185.0007	Curb Meter Box Installation
6	State and Federal Regulations	185.0008	Meter Guard - Installation Requirements
6	State and Federal Regulations	185.02	Pressure Regulation - Residential and Commercial
6	State and Federal Regulations	185.0287	Over-Pressure/Under-Pressure Protection - Maintenance, Installation and Settings



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	185.0300	MSA - Installing, Rebuilding and Inspections
6	State and Federal Regulations	186.0002	Design and Application of Cathodic Protection
6	State and Federal Regulations	186.0005	Cathodic Protection - Mixed Piping System
6	State and Federal Regulations	186.0015	Condition Assessment of Unprotected Distribution Steel Piping
6	State and Federal Regulations	186.0035	Criteria for Cathodic Protection
6	State and Federal Regulations	186.0036	100mV Polarization Criteria
6	State and Federal Regulations	186.0040	Magnesium Anodes for Corrosion Control
6	State and Federal Regulations	186.0070	Insulating MSA's
6	State and Federal Regulations	186.0075	Electrical Test Stations & Bond Assembly
6	State and Federal Regulations	186.0100	Approved Protective Coatings for Below Ground Corrosion Control
6	State and Federal Regulations	186.0102	Field Application of Fusion Bonded Epoxy to Joints and Field Repair of Fusion Bonded Epoxy Coating



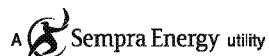
A Sempra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	186.0103	External Surface Preparation and Field Applied Coatings for Buried Pipelines
6	State and Federal Regulations	186.0106	External Surface Prep and Field-Applied Coating for Above Ground Pipe Spans
6	State and Federal Regulations	186.0108	External Surface Preparation and Shop-Applied Coating for Steel Tanks and Vessels
6	State and Federal Regulations	186.0109	Internal Coating of Tanks, Vessels, & Drip Legs
6	State and Federal Regulations	186.0110	Field Tape Wrapping Requirements
6	State and Federal Regulations	186.0111	Field Application of Grease Coating
6	State and Federal Regulations	186.0112	External Surface Preparation and External Coating for New and Refurbished Storage Tanks and Pressure Vessels
6	State and Federal Regulations	186.0116	External Surface Preparation and Field-Applied Coatings for New and Old Steel in a Marine Environment
6	State and Federal Regulations	186.0117	External Surface Preparation and Shop-Applied Coating for High Corrosion Service Areas
6	State and Federal Regulations	186.0120	Interference - Stray Electrical Current
6	State and Federal Regulations	186.0135	Operation and Maintenance of Cathodic Protection Facilities

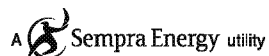


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	186.0170	Record Keeping - Corrosion Control
6	State and Federal Regulations	186.0180	Cathodic Protection Test Orders - Monitoring Isolated Facilities
6	State and Federal Regulations	186.02	Cathodic Protection - Inspection of Exposed Pipe
6	State and Federal Regulations	186.06	Cathodic Protection - Electrical Isolation
6	State and Federal Regulations	186.07	Hot Line Insulating Sleeves
6	State and Federal Regulations	186.09	Cathodic Protection - Casings
6	State and Federal Regulations	187.0055	General Welding Requirements
6	State and Federal Regulations	187.0056	Welding Field Guide
6	State and Federal Regulations	187.0120	Fusing Socket Connections - Polyethylene (PE) Pipe
6	State and Federal Regulations	187.0138	PE Saddle Fusions
6	State and Federal Regulations	187.0139	PE Fusion Card

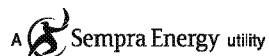


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	187.0145	Polyethylene Valve Installation
6	State and Federal Regulations	187.0146	Excess Flow Valve (EFV) - Installation and Operation
6	State and Federal Regulations	187.0155	Butt Fusing 2", 3" and 4" PE Pipe (Manual Machines)
6	State and Federal Regulations	187.0158	4", 6" and 8" Polyethylene (PE) Butt Fusion (Hydraulic Machines)
6	State and Federal Regulations	187.0175	Inspection and Testing of Welds on Company Steel Piping
6	State and Federal Regulations	187.0180	Qualification and Re-Qualification of Welders
6	State and Federal Regulations	187.0181	Qualification of Personnel - Polyethylene Pipe Joiners
6	State and Federal Regulations	187.0200	Radiographic Examination API 1104
6	State and Federal Regulations	187.0210	Service-To-Main Connection (SMC)
6	State and Federal Regulations	188.0001	Standard Specification for Natural and Substitute Fuel Gases
6	State and Federal Regulations	189.0001	Odorization

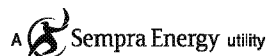


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	189.0010	Supplemental Odorization of Gas at Border Stations
6	State and Federal Regulations	190	Operator Qualification Task Change Communication
6	State and Federal Regulations	191.0020	Inspection of Construction Field Work
6	State and Federal Regulations	191.0025	Scoring of Construction Work Inspected
6	State and Federal Regulations	191.01	Investigation of Accidents and Pipeline Failures
6	State and Federal Regulations	192.0020	Preparation of Completion Sketch
6	State and Federal Regulations	203.005	Self Audit Guidelines - Distribution
6	State and Federal Regulations	203.007	Pipeline Patrol and Unstable Earth Self Audit
6	State and Federal Regulations	203.008	Pipelines on Bridges and Spans Self-Audit
6	State and Federal Regulations	203.016	Leak Survey Self-Audit
6	State and Federal Regulations	203.017	Valve Inspections and Maintenance Self-Audit

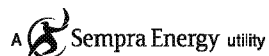


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	223.0002	Minimum Trench Requirements for Transmission Pipelines
6	State and Federal Regulations	223.0003	General Construction Requirements - Steel Transmission System
6	State and Federal Regulations	223.0030	Investigation of Failures on Distribution and Transmission Pipeline Facilities
6	State and Federal Regulations	223.0031	Abnormal Operations - Transmission
6	State and Federal Regulations	223.0065	Pipeline Patrol and Unstable Earth Inspections
6	State and Federal Regulations	223.0075	Pipeline Markers
6	State and Federal Regulations	223.0095	External and Internal Transmission Pipeline Inspection
6	State and Federal Regulations	223.0100	Leakage Surveys
6	State and Federal Regulations	223.0125	Leakage Classification and Mitigation Schedules
6	State and Federal Regulations	223.0125	Leakage Classification and Mitigation Schedules
6	State and Federal Regulations	223.0130	Abandonment, Conversion and Reinstatement of Transmission Pipelines

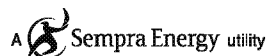


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

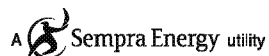
Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	223.0140	Excavating, Shoring and Sloping
6	State and Federal Regulations	223.0145	Planning Shutdowns for Transmission and Storage
6	State and Federal Regulations	223.0155	Planning Pipeline Blowdowns
6	State and Federal Regulations	223.0180	Repair of Defects in Steel Pressure Piping
6	State and Federal Regulations	223.0195	Repair on Operating Pipelines Using a Welded Steel Patch
6	State and Federal Regulations	223.0210	Vault Maintenance and Inspection
6	State and Federal Regulations	223.0215	Valve Inspection and Maintenance - Transmission
6	State and Federal Regulations	223.0230	Identification Numbers for Pipeline Valves - Transmission
6	State and Federal Regulations	223.0240	Compressor Station Emergency Shutdown Systems
6	State and Federal Regulations	223.0250	Compressor Station Equipment - Isolation and Purging for Maintenance or Alterations
6	State and Federal Regulations	223.0255	Testing and Maintaining Compressor Station Emergency Shutdown Systems



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
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Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	223.0275	Main Reciprocating Gas Compressor Unit Operation - Transmission and Storage Operations
6	State and Federal Regulations	223.0280	Main Reciprocating Gas Compressor Maintenance - Transmission and Storage Operations
6	State and Federal Regulations	223.0315	Operation and Maintenance of Generator Units - Transmission and Storage Operations
6	State and Federal Regulations	223.0325	Main Centrifugal Gas Compressor Unit Operation
6	State and Federal Regulations	223.0330	Main Centrifugal Gas Compressor Unit Maintenance
6	State and Federal Regulations	223.0340	Pressure Control Qualification - Transmission
6	State and Federal Regulations	223.0345	Pressure Relief/Pressure Limiting Devices, Testing/Inspection
6	State and Federal Regulations	223.0400	Gas Detectors in Compressor Stations
6	State and Federal Regulations	223.0410	Requirements for Designing Pipelines to Accommodate Smart Pigs
6	State and Federal Regulations	223.0415	Pipeline and Related Definitions
6	State and Federal Regulations	3222	Design Data Sheet (DDS)

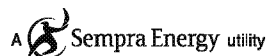


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
6	State and Federal Regulations	3506	Notice of Shutdown / Operational Deviation
6	State and Federal Regulations	CRMP1	Control Room Management Plan
6	State and Federal Regulations	CRMP6	Gas Control Management of Change
6	State and Federal Regulations	TIMP.17	Performance Plan
7	Continuing Operations	100.0152	Self Audit Requirements - Gas Measurement
7	Continuing Operations	104.0087	Crude Oil Contamination by PCB
7	Continuing Operations	104.0095	Hydrogen Sulfide Lead Acetate Tape Analyzer Maintenance
7	Continuing Operations	104.0150	Proposition 65 Compliance
7	Continuing Operations	104.0210	Industrial Waste Discharge to Sanitary Sewer
7	Continuing Operations	104.0220	Hydrostatic Test Water Management
7	Continuing Operations	104.06	Respiratory Protection Program

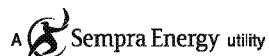


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	106.0063	Fire Extinguishing Equipment
7	Continuing Operations	142.0060	Service Policy
7	Continuing Operations	142.0275	Back Flow Protection - Regulators and Check Valves
7	Continuing Operations	142.1189	Premise Access
7	Continuing Operations	PA-1	Public Awareness Program
7	Continuing Operations	166.0032	Low-Voltage Electrical Safety Program
7	Continuing Operations	166.0055	Contractor Safety Observation Areas
7	Continuing Operations	166.09	Heat Illness Prevention for Outdoor Work
7	Continuing Operations	167.0100	Operator Qualification Program
7	Continuing Operations	167.0200	Data Gathering and Integration
7	Continuing Operations	167.0212	Casing Wax Fill

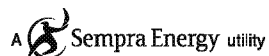


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	167.0214	Preventive and Mitigative Measures
7	Continuing Operations	167.0215	Continual Evaluation
7	Continuing Operations	167.0230	Internal Corrosion Design and Construction Considerations
7	Continuing Operations	167.0260	Fiber Optic Cable Installation for Pipeline Monitoring
7	Continuing Operations	167.04	Contractor Safety Program
7	Continuing Operations	180.0005	Steel Pipe - Selection Requirements
7	Continuing Operations	180.0010	Steel Butt-Weld Fittings - Selection Guide
7	Continuing Operations	180.0015	Wedding Bands, Reinforcing Sleeves and Canopies - Selection Guide
7	Continuing Operations	180.0020	Flanges - Selection, Torque and Installation Requirements
7	Continuing Operations	180.0030	Branch Connection, Steel - Selection Guide
7	Continuing Operations	180.0040	Pressure Control Fittings - Selection Guide

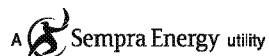


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	180.0050	Control Piping
7	Continuing Operations	180.0085	Valve Usage and Selection Guide
7	Continuing Operations	180.0090	Valve Casing Assembly - Selection Guide
7	Continuing Operations	180.0100	Prefabricated Vaults - Design and Selection Guide
7	Continuing Operations	182.0010	Request for Pipeline Design Assistance
7	Continuing Operations	182.0020	Electrical Facilities in Hazardous Areas
7	Continuing Operations	182.0040	Changing Maximum Allowable Operating Pressure and MOP
7	Continuing Operations	182.005	Service Pipe and Excess Flow Valve Sizing
7	Continuing Operations	182.0055	Identification of Steel Pipe and Butt Weld Fittings
7	Continuing Operations	182.0070	Angles and Bends in Steel Piping
7	Continuing Operations	182.0080	Casing Assemblies - Steel Carrier Pipe

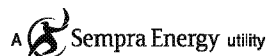


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	182.0085	Pipe End Closures
7	Continuing Operations	182.0090	Designs for Pipelines in Bridges
7	Continuing Operations	182.0093	Wear Pads and Bands for Steel Gas Piping
7	Continuing Operations	182.0125	Steel Service Design - 60 psig or less
7	Continuing Operations	182.0130	Steel Service Design 61-1000 PSIG
7	Continuing Operations	182.0140	Polyethylene Plastic Pipe - General Application Requirements
7	Continuing Operations	182.0148	Casing Assemblies - Plastic Carrier Pipe
7	Continuing Operations	182.0150	Polyethylene (PE) Service Selection Guide
7	Continuing Operations	182.0165	Tap Requirements
7	Continuing Operations	182.0170	Strength Testing - Pipelines and Facilities
7	Continuing Operations	182.0185	Pressure Terminology and Establishment of Pressure Levels for Piping

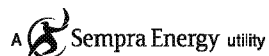


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	182.0190	Location Class - Determination and Changes
7	Continuing Operations	182.0200	Design Factors for Steel Piping Systems
7	Continuing Operations	183.0015	Field Services Emergency Plans
7	Continuing Operations	183.01	Shutdown Procedures and Isolation Area Establishment for Distribution Pipeline Facilities
7	Continuing Operations	183.0110	Field Procedure - Emergency Incidents Transmission
7	Continuing Operations	183.0160	Message Center
7	Continuing Operations	183.06	Region Reports of Safety-Related Pipeline Conditions
7	Continuing Operations	183.07	Pipeline Incident Reports to CPUC and PHMSA; National Transportation Safety Board (NTSB) Accident Investigation
7	Continuing Operations	183.08	Pipeline Safety Reports to CPUC and DOT
7	Continuing Operations	184.0035	Regulator Station Design and Planning
7	Continuing Operations	184.0050	General Construction Requirements for Distribution Mains

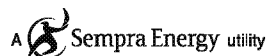


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	184.0055	Hand Backfill and Compaction Method
7	Continuing Operations	184.0060	General Construction Requirements for Distribution Service Lines
7	Continuing Operations	184.0090	Valve Selection and Installation - Services
7	Continuing Operations	184.0095	Polyethylene (PE) Pipe and Fittings - General Installation Requirements
7	Continuing Operations	184.0105	Inserting PE Pipe - Main
7	Continuing Operations	184.0110	Inserting PE Pipe - Service Riser Adapter
7	Continuing Operations	184.0125	Locating Wire - Installation
7	Continuing Operations	184.0150	Leak Testing of Distribution Piping
7	Continuing Operations	184.0170	Trenchless Construction Methods
7	Continuing Operations	184.0235	Polyethylene (PE) Pipe Repair
7	Continuing Operations	184.0240	PE Tapping Tee and Service Saddle Repair

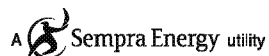


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	184.09	Prevention of Damage to Company Facilities
7	Continuing Operations	184.12	Inspection of Pipelines on Bridges and Spans
7	Continuing Operations	184.17	Temporary LNG Facility
7	Continuing Operations	185.0001	Meter Locations
7	Continuing Operations	185.0005	Curb Meter Box - Installation Requirements
7	Continuing Operations	185.0007	Curb Meter Box Installation
7	Continuing Operations	185.0008	Meter Guard - Installation Requirements
7	Continuing Operations	185.0010	MSA Standard Designs and Selection Chart
7	Continuing Operations	185.02	Pressure Regulation - Residential and Commercial
7	Continuing Operations	185.0287	Over-Pressure/Under-Pressure Protection - Maintenance, Installation and Settings
7	Continuing Operations	185.0300	MSA - Installing, Rebuilding and Inspections

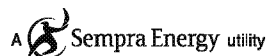


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	185.0560	Pressure Regulation Overpressure Protection
7	Continuing Operations	186.0002	Design and Application of Cathodic Protection
7	Continuing Operations	186.0035	Criteria for Cathodic Protection
7	Continuing Operations	186.0036	100mV Polarization Criteria
7	Continuing Operations	186.0040	Magnesium Anodes for Corrosion Control
7	Continuing Operations	186.0075	Electrical Test Stations & Bond Assembly
7	Continuing Operations	186.0090	Corrosion Control of Underground Hazardous Substance Storage Tanks
7	Continuing Operations	186.0103	External Surface Preparation and Field Applied Coatings for Buried Pipelines
7	Continuing Operations	186.0135	Operation and Maintenance of Cathodic Protection Facilities
7	Continuing Operations	186.0170	Record Keeping - Corrosion Control
7	Continuing Operations	186.0190	Induced High Voltage Alternating Current (HVAC) on Pipelines

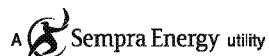


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	186.09	Cathodic Protection - Casings
7	Continuing Operations	187.0050	Cutting Into Gas Mains, MSAs and Abandoned Substructures
7	Continuing Operations	187.0055	General Welding Requirements
7	Continuing Operations	187.0056	Welding Field Guide
7	Continuing Operations	187.0115	Fusion Requirements for Polyethylene Pipe
7	Continuing Operations	187.0120	Fusing Socket Connections - Polyethylene (PE) Pipe
7	Continuing Operations	187.0125	Electrofusion Process - General Instructions
7	Continuing Operations	187.0138	PE Saddle Fusions
7	Continuing Operations	187.0139	PE Fusion Card
7	Continuing Operations	187.0145	Polyethylene Valve Installation
7	Continuing Operations	187.0146	Excess Flow Valve (EFV) - Installation and Operation



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	187.0155	Butt Fusing 2", 3" and 4" PE Pipe (Manual Machines)
7	Continuing Operations	187.0158	4", 6" and 8" Polyethylene (PE) Butt Fusion (Hydraulic Machines)
7	Continuing Operations	187.0175	Inspection and Testing of Welds on Company Steel Piping
7	Continuing Operations	187.0180	Qualification and Re-Qualification of Welders
7	Continuing Operations	187.0181	Qualification of Personnel - Polyethylene Pipe Joiners
7	Continuing Operations	187.0200	Radiographic Examination API 1104
7	Continuing Operations	187.0210	Service-To-Main Connection (SMC)
7	Continuing Operations	189.01	Odorization - Roles and Responsibilities
7	Continuing Operations	191.0020	Inspection of Construction Field Work
7	Continuing Operations	191.0025	Scoring of Construction Work Inspected
7	Continuing Operations	191.01	Investigation of Accidents and Pipeline Failures



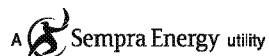
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	191.0210	Qualification of New Construction Contractors
7	Continuing Operations	192.0025	Map Maintenance Requirements for High Pressure Gas Lines
7	Continuing Operations	192.0030	Completion Drawing Set Requirements for High Pressure Pipelines
7	Continuing Operations	223.0002	Minimum Trench Requirements for Transmission Pipelines
7	Continuing Operations	223.0003	General Construction Requirements - Steel Transmission System
7	Continuing Operations	223.0030	Investigation of Failures on Distribution and Transmission Pipeline Facilities
7	Continuing Operations	223.0065	Pipeline Patrol and Unstable Earth Inspections
7	Continuing Operations	223.0075	Pipeline Markers
7	Continuing Operations	223.0095	External and Internal Transmission Pipeline Inspection
7	Continuing Operations	223.0100	Leakage Surveys
7	Continuing Operations	223.0125	Leakage Classification and Mitigation Schedules

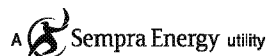


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	223.0130	Abandonment, Conversion and Reinstatement of Transmission Pipelines
7	Continuing Operations	223.0145	Planning Shutdowns for Transmission and Storage
7	Continuing Operations	223.0180	Repair of Defects in Steel Pressure Piping
7	Continuing Operations	223.0215	Valve Inspection and Maintenance - Transmission
7	Continuing Operations	223.0255	Testing and Maintaining Compressor Station Emergency Shutdown Systems
7	Continuing Operations	223.0275	Main Reciprocating Gas Compressor Unit Operation
7	Continuing Operations	223.0280	Main Reciprocating Gas Compressor Maintenance
7	Continuing Operations	223.0315	Operation and Maintenance of Generator Units
7	Continuing Operations	223.0345	Pressure Relief/Pressure Limiting Devices, Testing/Inspection
7	Continuing Operations	223.0375	MAXIMO - Transmission and Storage Operations
7	Continuing Operations	223.0400	Gas Detectors in Compressor Stations



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	223.0410	Requirements for Designing Pipelines to Accommodate Smart Pigs
7	Continuing Operations	223.0415	Pipeline and Related Definitions
7	Continuing Operations	224.0015	Security and Accounting - Underground Storage Field Production Fluids
7	Continuing Operations	224.0030	Well Operations - Well Kill
7	Continuing Operations	224.02	Operation of Underground Storage Wells
7	Continuing Operations	224.070	Gas Inventory - Monitoring, Verification and Reporting
7	Continuing Operations	3222	Design Data Sheet (DDS)
7	Continuing Operations	40-00	Polyethylene Pipe and Tubing
7	Continuing Operations	41-06.1	Pipe - Steel, Grades A25 through X70
7	Continuing Operations	50-15	Pipe Nipples
7	Continuing Operations	52-65	Fittings - Threaded, Malleable Iron, Class 150 and 300



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	52-80	Couplings - Electrofusion, Polyethylene
7	Continuing Operations	52-82	FITTINGS, BUTT TYPE, POLYETHYLENE HEAT FUSION
7	Continuing Operations	52-96	Fittings - Butt Weld Steel
7	Continuing Operations	54-17	Flanges and Flanged Fittings
7	Continuing Operations	54-17.1	Cast Iron Flanges
7	Continuing Operations	56-40	Stop Cocks
7	Continuing Operations	56-70.1	Risers - Service, Anodeless
7	Continuing Operations	57-15	Canopies, High Pressure
7	Continuing Operations	58-08	Excess Flow Valve Assemblies
7	Continuing Operations	58-10	Valves - Thermoplastic
7	Continuing Operations	58-15.2	Valves; Ball, Steel Floating



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	58-70	Valves - Plug, Lubricated, Positive Shut-Off
7	Continuing Operations	58-82	Valves - Ball, Steel, Trunnion Mounted
7	Continuing Operations	58-96.6	Valve - Relief, Large
7	Continuing Operations	70-45	Regulator - Service, Standard Pressure
7	Continuing Operations	70-47	Regulators - High Pressure Spring Loaded
7	Continuing Operations	76-95	Pressure Vessels
7	Continuing Operations	78-01	Meters - Diaphragm
7	Continuing Operations	78-02	Meters - Rotary
7	Continuing Operations	IIPP.01	IIPP-Table of Contents
7	Continuing Operations	IIPP.02	IIPP-Introduction
7	Continuing Operations	IIPP.1	Injury and Illness Prevention Program



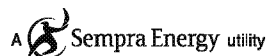
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	IIPP.10	IIPP-Safety Meetings
7	Continuing Operations	IIPP.11	IIPP-Best Safety Practices
7	Continuing Operations	IIPP.2	IIPP-Supervisor Responsibilities
7	Continuing Operations	IIPP.2	IIPP-Supervisor Responsibilities
7	Continuing Operations	IIPP.3	IIPP-Records
7	Continuing Operations	IIPP.4	IIPP-Employee Responsibilities
7	Continuing Operations	IIPP.4	IIPP-Employee Responsibilities
7	Continuing Operations	IIPP.5	IIPP-Communications
7	Continuing Operations	IIPP.6	IIPP-Corrective Actions
7	Continuing Operations	IIPP.7	IIPP-Appendices
7	Continuing Operations	IIPP.7	IIPP-Appendices

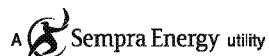


NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCALGAS: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	IIPP.8	IIPP-Local Safety Plans
7	Continuing Operations	OD7	Occupational Health and Safety (Organizational Document)
7	Continuing Operations	QUALPROG	Quality Program Manual for Owner-User Inspection of Air Tanks
7	Continuing Operations	104.071	Draeger Pac® 7000 Personal Gas Monitor
7	Continuing Operations	107.0293	RMLD - Remote Methane Leak Detector
7	Continuing Operations	107.0296	Sensit G2 Multigas Detector and SMART-CAL Equipment Operations and Maintenance Procedures
7	Continuing Operations	107.0298	GMI GT Instrument Operation and Maintenance Procedure
7	Continuing Operations	142.0146	Fumigation Close and Back-On Orders
7	Continuing Operations	142.5660	Purging Gas Meters and Customer Houelines
7	Continuing Operations	167.0211	Bellhole Inspection Requirements
7	Continuing Operations	167.0212	Casing Wax Fill



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	167.0229	Internal Corrosion Management Plan
7	Continuing Operations	167.0235	Immediate Repair Conditions - Transmission Pipelines
7	Continuing Operations	167.0247	Aboveground Survey Plan
7	Continuing Operations	167.0248	Alternating Current Attenuation Survey
7	Continuing Operations	167.0249	Close Interval Survey
7	Continuing Operations	182.0050	MAOP Evaluation of Corroded Pipe
7	Continuing Operations	182.0162	Purging and Locking Service Risers
7	Continuing Operations	183.03	Field Guidelines - Emergency Incident Distribution / Customer Service
7	Continuing Operations	184.0031	Pressure Monitoring of Distribution Systems
7	Continuing Operations	184.0080	Abandonment of Gas Services and Gas Light Tap Assemblies
7	Continuing Operations	184.0085	Abandonment or Inactivation of Gas Distribution Pipelines



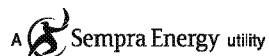
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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

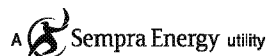
Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	184.011	Notification of Excavation and Construction Activities - Assembly Bill Number 1937/ PUC Code 955.5
7	Continuing Operations	184.0130	Polyethylene Heater - Temperature Measurement and Adjustment
7	Continuing Operations	184.0233	Mechanical Tapping Tee Inspection
7	Continuing Operations	184.0335	Steel Pipe Squeezers 6" through 12"
7	Continuing Operations	184.0368	Pressure Control - TD Williamson Unit1200
7	Continuing Operations	184.09	Prevention of Damage to Company Facilities
7	Continuing Operations	184.16	Valve Inspection and Maintenance - Distribution
7	Continuing Operations	186.0005	Cathodic Protection - Mixed Piping System
7	Continuing Operations	186.006	Selection and Installation of Rectifiers and Impressed Current Anodes
7	Continuing Operations	186.0100	Approved Protective Coatings for Below Ground Corrosion Control
7	Continuing Operations	186.0102	Field Application of Fusion Bonded Epoxy to Joints and Field Repair of Fusion Bonded Epoxy Coating



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCalGas: APPENDIX.A
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Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	186.0104	Surface Preparation and Shop Applied Coating for General Steel (Primer and Topcoat)
7	Continuing Operations	186.0106	External Surface Prep and Field-Applied Coating for Above Ground Pipe Spans
7	Continuing Operations	186.0110	Field Tape Wrapping Requirements
7	Continuing Operations	186.0111	Field Application of Grease Coating
7	Continuing Operations	186.0116	External Surface Preparation and Field-Applied Coatings for New and Old Steel in a Marine Environment
7	Continuing Operations	186.0117	External Surface Preparation and Shop-Applied Coating for High Corrosion Service Areas
7	Continuing Operations	186.0120	Interference - Stray Electrical Current
7	Continuing Operations	186.02	Cathodic Protection - Inspection of Exposed Pipe
7	Continuing Operations	186.06	Cathodic Protection - Electrical Isolation
7	Continuing Operations	187.0126	Magic Box - 2"-4"
7	Continuing Operations	187.0170	Connect Copper Wire To Steel Pipe - Pin Brazing, Thermite Welding and Braze Welding Processes



NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCalGas: APPENDIX.A
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Chapter Number	Chapter Title	Policy	Policy Title
7	Continuing Operations	189.0001	Odorization
7	Continuing Operations	189.0002	ODORIZATION-YZ NJEX Odorant Injection System Maintenance
7	Continuing Operations	189.005	Operation of Odorometer and Odorator
7	Continuing Operations	189.0056	Odor Conditioning of New Customer-Owned Pipelines - Size 4 Meter (AC630) and Larger
7	Continuing Operations	223.0104	Optical Methane Detector Operation and Maintenance
7	Continuing Operations	223.0181	Repair of Defects on Operating Pipelines Using Abandon Nipple
7	Continuing Operations	223.0183	Repair of Defects on an Operating Pipeline by Grinding
7	Continuing Operations	223.0190	Repair of Non-Leaking Defects on an Operating Pipeline with a Band or Sleeve
7	Continuing Operations	184.0245	Leak Investigation - Distribution
7	Continuing Operations	184.0443	Pressure Control - 2", 3" and 4" Top Half Fitting



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
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1.3. Policy Document – Safety Plan Matrix

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
01.010-I	Emergency Incidents/Local Instructions		X		
01.010-N	Emergency Incidents/Local Instructions		X		
01.010-OC	Emergency Incidents/Local Instructions		X		
01.010-P	Emergency Incidents/Local Instructions		X		
10.010-COM	BRP - Dispatch/Arso		X		
10.020-COM	BRP - Customer Services, Distribution, and Meter & Regulation		X		
100.0152	Self Audit Requirements - Gas Measurement (Distribution, Transmission & Storage)	X		X	X
104.0001	Environmental Training	X			
104.0017	Pipeline Liquids - Field Handling	X			
104.0030	Hazardous Waste Shipping		X		
104.0040	Hazardous Material Shipping		X		
104.0085	PCB Spill Clean-up and Decontamination		X		
104.0087	Crude Oil Contamination by PCB				X
104.0095	Hydrogen Sulfide Lead Acetate Tape Analyzer Maintenance				X
104.0150	Proposition 65 Compliance		X		X
104.02	Notification Requirements for Release/Spill Events		X		
104.0210	Industrial Waste Discharge to Sanitary Sewer				X
104.0220	Hydrostatic Test Water Management			X	X
104.06	Respiratory Protection Program	X		X	X
104.071	Draeger Pac® 7000 Personal Gas Monitor				X
106.0063	Fire Extinguishing Equipment				X
107.0004	Material Evaluation and Implementation	X			
107.0293	RMLD - Remote Methane Leak Detector				X
107.0296	Sensit G2 Multigas Detector and SMART-CAL Equipment Operations and Maintenance Procedures				X
107.0298	GMI GT Instrument Operation and Maintenance Procedure				X
107.0324	General Operating Instructions for the Metrotech® Model 480B Pipe and Cable Locator - "Split Box"	X			
140.04	Condition/Location of Meter Installations and Report of Inaccessible/Removed Meters	X		X	
142.0060	Service Policy				X
142.0065	Meter Set - Meter Turn-On	X		X	



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
142.0075	Closing Meters - Methods and Procedures	X		X	
142.01	Order Completion Schedule	X	X	X	
142.0146	Fumigation Close and Back-On Orders				X
142.02	Leak Investigation - Customer Service	X		X	
142.0275	Back Flow Protection - Regulators and Check Valves			X	X
142.1189	Premise Access				X
142.5660	Purging Gas Meters and Customer Houelines	X		X	X
151.0010	Environmental Inspections, Search Warrants, and Internal Notifications	X			
166.0015	Fire Prevention and Protection - Transmission and Storage	X		X	
166.0025	Prevention of Accidental Ignition of Natural Gas	X	X	X	
166.0032	Low-Voltage Electrical Safety Program				X
166.0055	Contractor Safety Observation Areas	X			X
166.0076	Working in Flammable Atmospheres	X		X	
166.09	Heat Illness Prevention for Outdoor Work				X
167.0100	Operator Qualification Program	X		X	X
167.0125	Self-Audit Guidelines - Pipeline Integrity Program	X			
167.0200	Data Gathering and Integration	X	X	X	X
167.0203	Threat Identification	X			
167.0204	Risk Assessment of High Consequence Areas	X			
167.0207	TIMP Risk Algorithm	X			
167.0208	Baseline and Reassessment Plan	X			
167.0209	External Corrosion Direct Assessment Procedure	X			
167.0210	In-Line Inspection Procedure	X	X		
167.0211	Bellhole Inspection Requirements	X		X	X
167.0212	Casing Wax Fill	X		X	X
167.0214	Preventive and Mitigative Measures	X			X
167.0215	Continual Evaluation	X			X
167.0216	Stress Corrosion Cracking Direct Assessment Procedure	X			
167.0218	Pipeline Cleaning Standard	X			
167.0220	In-Line Inspection Surveys Standard	X			
167.0224	Dry Gas - Internal Corrosion Direct Assessment	X			
167.0229	Internal Corrosion Management Plan	X		X	X



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
167.0230	Internal Corrosion Design and Construction Considerations	X		X	X
167.0232	Field Sampling and Analysis of Liquids and Solids/Sludge	X			
167.0235	Immediate Repair Conditions - Transmission Pipelines	X	X	X	X
167.0236	Scheduling Remediation	X			
167.0240	Assessment of Pipeline Integrity Using Guided Wave UT	X			
167.0245	Global Positioning System (GPS) Process	X			
167.0246	GPS Control Survey	X			
167.0247	Aboveground Survey Plan	X			X
167.0248	Alternating Current Attenuation Survey	X			X
167.0249	Close Interval Survey	X			X
167.0250	Voltage Gradient Survey	X			
167.0251	Soil Resistivity Survey	X			
167.0252	Inspection of Cased Pipe	X			
167.0260	Fiber Optic Cable Installation for Pipeline Monitoring	X			X
167.04	Contractor Safety Program	X			X
167.30	Lead and Metals in Surface Coatings: Hazard Compliance Program		X		
180.0003	Material Specifications and Purchase Descriptions	X			
180.0005	Steel Pipe - Selection Requirements	X		X	X
180.0010	Steel Butt-Weld Fittings - Selection Guide	X		X	X
180.0015	Wedding Bands, Reinforcing Sleeves and Canopies - Selection Guide	X		X	X
180.0020	Flanges - Selection, Torque and Installation Requirements	X		X	X
180.0030	Branch Connection, Steel - Selection Guide	X		X	X
180.0035	Leak Repair Clamps and Sleeves - Selection Guide	X		X	
180.0040	Pressure Control Fittings - Selection Guide	X			X
180.005	Steel Pipe Yield, Design Properties and Design Pressure Tables	X			
180.0050	Control Piping			X	X
180.0085	Valve Usage and Selection Guide	X		X	X
180.0090	Valve Casing Assembly - Selection Guide				X
180.0100	Prefabricated Vaults - Design and Selection Guide	X		X	X
182.0010	Request for Pipeline Design Assistance	X		X	X
182.0020	Electrical Facilities in Hazardous Areas			X	X
182.0040	Changing Maximum Allowable Operating Pressure and Maximum	X		X	X



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
	Operating Pressure				
182.005	Service Pipe and Excess Flow Valve Sizing				X
182.0050	MAOP Evaluation of Corroded Pipe	X		X	X
182.0055	Identification of Steel Pipe and Butt Weld Fittings	X		X	X
182.0060	Service Risers	X			
182.0070	Angles and Bends in Steel Piping			X	X
182.0080	Casing Assemblies - Steel Carrier Pipe	X		X	X
182.0085	Pipe End Closures				X
182.0087	Inspection of Pipeline Cable-Suspension Bridges	X		X	
182.0090	Designs for Pipelines in Bridges	X		X	X
182.0093	Wear Pads and Bands for Steel Gas Piping	X		X	X
182.0125	Steel Service Design - 60 psig or less				X
182.0130	Steel Service Design 61-1000 PSIG			X	X
182.0140	Polyethylene Plastic Pipe - General Application Requirements	X		X	X
182.0148	Casing Assemblies - Plastic Carrier Pipe	X		X	X
182.0150	Polyethylene (PE) Service Selection Guide	X		X	X
182.0160	Purging Pipelines and Components	X		X	
182.0162	Purging and Locking Service Risers	X		X	X
182.0165	Tap Requirements	X		X	X
182.0170	Strength Testing - Pipelines and Facilities	X		X	X
182.0185	Pressure Terminology and Establishment of Pressure Levels for Piping	X		X	X
182.0190	Location Class - Determination and Changes	X		X	X
182.0200	Design Factors for Steel Piping Systems	X		X	X
183.0001	Emergency Planning - Government	X	X	X	
183.0015	Field Services Emergency Plans	X	X	X	X
183.0017	Emergency Exercise	X	X	X	
183.0030	Contact with Fire and Police Departments and Public Agencies	X	X	X	
183.0035	Emergency Action and Fire Prevention Plan		X		
183.0040	Natural Disaster or Major Emergency - Employee Instructions	X	X	X	
183.0075	Off-Hour Management Coverage - Headquarters and Region Operations	X	X	X	
183.01	Shutdown Procedures and Isolation Area Establishment for	X	X	X	X



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
	Distribution Pipeline Facilities				
183.0100	Emergency Incident Notifying	X	X		
183.0105	Incident Command System (ICS) for Emergency Incidents	X	X	X	
183.0110	Field Procedure - Emergency Incidents Transmission	X	X	X	X
183.0120	Emergency Outage Procedure	X	X	X	
183.0130	Materials and Supplies for Emergency Situations	X	X	X	
183.0160	Message Center	X	X	X	X
183.0165	Emergency Incident Reporting	X	X	X	
183.03	Field Guidelines - Emergency Incident Distribution / Customer Service	X	X	X	X
183.05	Reports to the Message Center	X	X	X	
183.06	Region Reports of Safety-Related Pipeline Conditions	X	X	X	X
183.07	Pipeline Incident Reports to CPUC and PHMSA; National Transportation Safety Board (NTSB) Accident Investigation	X	X		X
183.08	Pipeline Safety Reports to CPUC and DOT	X	X	X	X
184.0014	New Business Project Package Routing	X		X	
184.0015	Construction Planning for Mains and Supply Lines	X			
184.0016	Main Construction Project Package Routing	X			
184.0025	Services - Repair vs. Replace Decisions	X			
184.0031	Pressure Monitoring of Distribution Systems	X		X	X
184.0035	Regulator Station Design and Planning			X	X
184.0050	General Construction Requirements for Distribution Mains			X	X
184.0055	Hand Backfill and Compaction Method			X	X
184.0060	General Construction Requirements for Distribution Service Lines	X		X	X
184.0075	Evaluation and Disposition of Inactive Services	X		X	
184.0080	Abandonment of Gas Services and Gas Light Tap Assemblies	X		X	X
184.0085	Abandonment or Inactivation of Gas Distribution Pipelines	X		X	X
184.0090	Valve Selection and Installation - Services			X	X
184.0095	Polyethylene (PE) Pipe and Fittings - General Installation Requirements	X		X	X
184.0105	Inserting PE Pipe - Main			X	X
184.011	Notification of Excavation and Construction Activities - Assembly Bill Number 1937/ PUC Code 955.5			X	X



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
184.0110	Inserting PE Pipe - Service Riser Adapter			X	X
184.0115	Tapping/ Stopping PE Fittings	X			
184.0121	Service Riser Integrity Inspection	X			
184.0123	Composite Coating Repair for Anodeless Risers	X			
184.0124	Coring for Mini Riser Vault (MRV) Installation	X			
184.0125	Locating Wire - Installation			X	X
184.0130	Polyethylene Heater - Temperature Measurement and Adjustment	X			X
184.0150	Leak Testing of Distribution Piping	X		X	X
184.0170	Trenchless Construction Methods	X		X	X
184.0175	Prevention of Damage to Subsurface Installations	X			
184.0200	Underground Service Alert and Temporary Marking	X		X	
184.0215	Annual Report of Leak Repairs on Federal Lands	X			
184.0233	Mechanical Tapping Tee Inspection				X
184.0235	Polyethylene (PE) Pipe Repair	X		X	X
184.0240	PE Tapping Tee and Service Saddle Repair				X
184.0245	Leak Investigation - Distribution		X		X
184.0250	Halt Tool - Gas Emergency Leak Clamp		X		
184.0275	Inspection Schedule - Regulator Station, Power Generating Plant Regulation Equipment Requirements	X		X	
184.03	Replacement Criteria for Distribution Mains and Services	X		X	
184.0300	Squeezing and Reopening Mains and Services	X			
184.0335	Steel Pipe Squeezers 6" through 12"	X	X		X
184.0340	Squeezing Polyethylene (PE) Pipe - 1/2" Through 8"	X			
184.0355	Pressure Control Machines - 2" Through 12"	X		X	
184.0360	Pressure Control - Fittings 2" and Under Pressure Limitations and Related Equipment	X		X	
184.0366	Pressure Control: Drilling Operations For DH-5 Drilling Machine	X		X	
184.0368	Pressure Control - TD Williamson Unit1200				X
184.0370	Pressure Control: Drilling Operations For D-5 Drilling Machine	X		X	
184.04	Supply Line Identification and Records	X		X	
184.0405	Pressure Control - Stop Bottom Outlet Fittings	X		X	
184.0443	Pressure Control - 2", 3" and 4" Top Half Fitting				X
184.0450	Pressure Control - Completion Plugs 3/4" - 1-1/2"	X		X	



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
184.0455	Pressure Control - Completion Plugs - 2" - 3" - D-5 or DH-5	X		X	
184.0480	Pressure Control - Completion Plugs	X		X	
184.0575	Pressure Control: Stop Standard 2" Service Tee With D-5 Machine	X		X	
184.0585	Remove 1" Street Ell from a Service Clamp - Install a 1" Threaded Both Ends (TBE) Nipple in Clamp	X		X	
184.0590	Pressure Control Qualification Requirements	X		X	
184.06	Gas-Handling and Pressure Control	X		X	
184.09	Prevention of Damage to Company Facilities	X		X	X
184.12	Inspection of Pipelines on Bridges and Spans	X		X	X
184.16	Valve Inspection and Maintenance - Distribution	X		X	X
184.17	Temporary LNG Facility	X			X
185.0001	Meter Locations	X		X	X
185.0005	Curb Meter Box - Installation Requirements				X
185.0007	Curb Meter Box Installation			X	X
185.0008	Meter Guard - Installation Requirements	X		X	X
185.0010	MSA Standard Designs and Selection Chart				X
185.02	Pressure Regulation - Residential and Commercial	X		X	X
185.0287	Over-Pressure/Under-Pressure Protection - Maintenance, Installation and Settings	X		X	X
185.0300	MSA - Installing, Rebuilding and Inspections	X		X	X
185.0474	Control Microsystems SCADAPACK	X			
185.0560	Pressure Regulation Overpressure Protection				X
186.0002	Design and Application of Cathodic Protection	X		X	X
186.0005	Cathodic Protection - Mixed Piping System	X		X	X
186.0015	Condition Assessment of Unprotected Distribution Steel Piping	X		X	
186.0035	Criteria for Cathodic Protection	X		X	X
186.0036	100mV Polarization Criteria	X		X	X
186.0040	Magnesium Anodes for Corrosion Control	X		X	X
186.005	Cathodic Protection - Instruments and Testing Equipment	X			
186.0052	Copper Sulfate Electrode	X			
186.006	Selection and Installation of Rectifiers and Impressed Current Anodes	X			X
186.0070	Insulating MSA's	X		X	



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
186.0075	Electrical Test Stations & Bond Assembly	X		X	X
186.0090	Corrosion Control of Underground Hazardous Substance Storage Tanks				X
186.0100	Approved Protective Coatings for Below Ground Corrosion Control	X		X	X
186.0102	Field Application of Fusion Bonded Epoxy to Joints and Field Repair of Fusion Bonded Epoxy Coating	X		X	X
186.0103	External Surface Preparation and Field Applied Coatings for Buried Pipelines	X		X	X
186.0104	Surface Preparation and Shop Applied Coating for General Steel (Primer and Topcoat)	X			X
186.0106	External Surface Prep and Field-Applied Coating for Above Ground Pipe Spans	X		X	X
186.0108	External Surface Preparation and Shop-Applied Coating for Steel Tanks and Vessels	X		X	
186.0109	Internal Coating of Tanks, Vessels, & Drip Legs	X		X	
186.0110	Field Tape Wrapping Requirements	X		X	X
186.0111	Field Application of Grease Coating	X		X	X
186.0112	External Surface Preparation and External Coating for New and Refurbished Storage Tanks and Pressure Vessels	X		X	
186.0116	External Surface Preparation and Field-Applied Coatings for New and Old Steel in a Marine Environment	X		X	X
186.0117	External Surface Preparation and Shop-Applied Coating for High Corrosion Service Areas	X		X	X
186.0120	Interference - Stray Electrical Current	X		X	X
186.0135	Operation and Maintenance of Cathodic Protection Facilities	X		X	X
186.0170	Record Keeping - Corrosion Control	X		X	X
186.0180	Cathodic Protection Test Orders - Monitoring Isolated Facilities	X		X	
186.0190	Induced High Voltage Alternating Current (HVAC) on Pipelines				X
186.02	Cathodic Protection - Inspection of Exposed Pipe	X		X	X
186.06	Cathodic Protection - Electrical Isolation	X		X	X
186.07	Hot Line Insulating Sleeves	X		X	
186.09	Cathodic Protection - Casings	X		X	X
187.0050	Cutting Into Gas Mains, MSAs and Abandoned Substructures - Safety Precautions	X			X
187.0055	General Welding Requirements	X		X	X



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCalGas: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
187.0056	Welding Field Guide	X		X	X
187.0115	Fusion Requirements for Polyethylene Pipe	X			X
187.0120	Fusing Socket Connections - Polyethylene (PE) Pipe	X		X	X
187.0125	Electrofusion Process - General Instructions	X			X
187.0126	Magic Box - 2"-4"	X			X
187.0138	PE Saddle Fusions	X		X	X
187.0139	PE Fusion Card			X	X
187.0140	Transition Fittings	X			
187.0145	Polyethylene Valve Installation			X	X
187.0146	Excess Flow Valve (EFV) - Installation and Operation	X		X	X
187.0155	Butt Fusing 2", 3" and 4" PE Pipe (Manual Machines)	X		X	X
187.0158	4", 6" and 8" Polyethylene (PE) Butt Fusion (Hydraulic Machines)	X		X	X
187.0170	Connect Copper Wire To Steel Pipe - Pin Brazing, Thermite Welding and Braze Welding Processes				X
187.0175	Inspection and Testing of Welds on Company Steel Piping	X		X	X
187.0180	Qualification and Re-Qualification of Welders	X		X	X
187.0181	Qualification of Personnel - Polyethylene Pipe Joiners	X		X	X
187.0200	Radiographic Examination API 1104			X	X
187.0210	Service-To-Main Connection (SMC)			X	X
188.0001	Standard Specification for Natural and Substitute Fuel Gases	X		X	
189.0001	Odorization	X		X	X
189.0002	ODORIZATION-YZ NJEX Odorant Injection System Maintenance				X
189.0010	Supplemental Odorization of Gas at Border Stations	X		X	
189.005	Operation of Odorometer and Odorator				X
189.0056	Odor Conditioning of New Customer-Owned Pipelines - Size 4 Meter (AC630) and Larger				X
189.01	Odorization - Roles and Responsibilities				X
190	Operator Qualification Task Change Communication	X		X	
191.0020	Inspection of Construction Field Work	X		X	X
191.0025	Scoring of Construction Work Inspected	X		X	X
191.01	Investigation of Accidents and Pipeline Failures	X	X	X	X
191.0210	Qualification of New Construction Contractors	X			X
192.0010	Preparation of Construction Sketches	X			



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
192.0020	Preparation of Completion Sketch			X	
192.0025	Map Maintenance Requirements for High Pressure Gas Lines	X			X
192.0030	Completion Drawing Set Requirements for High Pressure Pipelines	X			X
192.02	Procedure for HCA Segment Identification	X			
1957	Gas Stub Tag		X		
203.005	Self Audit Guidelines - Distribution	X		X	
203.007	Pipeline Patrol and Unstable Earth Self Audit	X		X	
203.008	Pipelines on Bridges and Spans Self-Audit	X		X	
203.016	Leak Survey Self-Audit	X		X	
203.017	Valve Inspections and Maintenance Self-Audit	X		X	
2110	Management of Change for Gas Standards Related to Integrity Management Programs	X			
2111	Management of Change - Request & Approval	X			
2112	Pipeline Database Update	X			
223.0001	CPUC and PHMSA Notification of Major New and Upgraded Pipelines and Pressure Test Failures of Pipelines with MAOPs \geq 20% SMYS	X	X		
223.0002	Minimum Trench Requirements for Transmission Pipelines	X		X	X
223.0003	General Construction Requirements - Steel Transmission System			X	X
223.0030	Investigation of Failures on Distribution and Transmission Pipeline Facilities	X		X	X
223.0031	Abnormal Operations - Transmission	X	X	X	
223.0065	Pipeline Patrol and Unstable Earth Inspections	X		X	X
223.0075	Pipeline Markers	X		X	X
223.0095	External and Internal Transmission Pipeline Inspection	X		X	X
223.0100	Leakage Surveys	X		X	X
223.0104	Optical Methane Detector Operation and Maintenance				X
223.0125	Leakage Classification and Mitigation Schedules	X		X	X
223.0130	Abandonment, Conversion and Reinstatement of Transmission Pipelines	X		X	X
223.0140	Excavating, Shoring and Sloping	X		X	
223.0145	Planning Shutdowns for Transmission and Storage	X	X	X	X
223.0155	Planning Pipeline Blowdowns	X		X	
223.0177	Measurement of Remaining Wall Thickness	X			



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
223.0180	Repair of Defects in Steel Pressure Piping	X		X	X
223.0181	Repair of Defects on Operating Pipelines Using Abandon Nipple				X
223.0183	Repair of Defects on an Operating Pipeline by Grinding	X			X
223.0185	Repair Leak on an Operating Pipeline With Band or Sleeve	X			
223.0188	Epoxy Grouted Non-Leaking Steel Sleeve Repairs - Above and Below Ground Piping	X			
223.0190	Repair of Non-Leaking Defects on an Operating Pipeline with a Band or Sleeve	X			X
223.0195	Repair on Operating Pipelines Using a Welded Steel Patch	X		X	
223.0210	Vault Maintenance and Inspection	X		X	
223.0215	Valve Inspection and Maintenance - Transmission	X		X	X
223.0230	Identification Numbers for Pipeline Valves - Transmission	X		X	
223.0233	Transmission Line Identification and Records	X			
223.0240	Compressor Station Emergency Shutdown Systems	X		X	
223.0250	Compressor Station Equipment - Isolation and Purging for Maintenance or Alterations	X		X	
223.0255	Testing and Maintaining Compressor Station Emergency Shutdown Systems	X		X	X
223.0265	Identification Numbers for Station Valves	X			
223.0275	Main Reciprocating Gas Compressor Unit Operation - Transmission and Storage Operations	X		X	X
223.0280	Main Reciprocating Gas Compressor Maintenance - Transmission and Storage Operations	X		X	X
223.0315	Operation and Maintenance of Generator Units - Transmission and Storage Operations	X		X	X
223.0325	Main Centrifugal Gas Compressor Unit Operation	X		X	
223.0330	Main Centrifugal Gas Compressor Unit Maintenance	X		X	
223.0340	Pressure Control Qualification - Transmission	X		X	
223.0345	Pressure Relief/Pressure Limiting Devices, Testing/Inspection	X		X	X
223.0375	MAXIMO - Transmission and Storage Operations	X			X
223.0400	Gas Detectors in Compressor Stations	X		X	X
223.0410	Requirements for Designing Pipelines to Accommodate Smart Pigs	X		X	X
223.0415	Pipeline and Related Definitions	X		X	X
224.0015	Security and Accounting - Underground Storage Field Production				X



A Semptra Energy utility

NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCalGas: APPENDIX.A
---	-----------------------------

Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
	Fluids				
224.0030	Well Operations - Well Kill				X
224.02	Operation of Underground Storage Wells				X
224.070	Gas Inventory - Monitoring, Verification and Reporting				X
3084	Corrosion Tests General Data Sheet	X			
3222	Design Data Sheet (DDS)	X		X	X
3506	Notice of Shutdown / Operational Deviation	X		X	
3689	System Qualification Record	X			
40-00	Polyethylene Pipe and Tubing				X
4090	100mV Polarization Form	X			
4091	Wax Casing Data Collection Form	X			
41-06.1	Pipe - Steel, Grades A25 through X70				X
50-15	Pipe Nipples				X
5153	Pipeline Location Information	X			
52-65	Fittings - Threaded, Malleable Iron, Class 150 and 300				X
52-80	Couplings - Electrofusion, Polyethylene				X
52-82	FITTINGS, BUTT TYPE, POLYETHYLENE HEAT FUSION				X
52-96	Fittings - Butt Weld Steel				X
5330	Operating and Maintenance Order (OMO)	X			
54-17	Flanges and Flanged Fittings				X
54-17.1	Cast Iron Flanges				X
56-40	Stop Cocks				X
56-70.1	Risers - Service, Anodeless				X
57-15	Canopies, High Pressure				X
58-08	Excess Flow Valve Assemblies				X
58-10	Valves - Thermoplastic				X
58-15.2	Valves; Ball, Steel Floating				X
58-70	Valves - Plug, Lubricated, Positive Shut-Off				X
58-82	Valves - Ball, Steel, Trunnion Mounted				X
58-96.6	Valve - Relief, Large				X
677-1	Pipeline Condition and Maintenance Report	X			
70-45	Regulator - Service, Standard Pressure				X



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
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Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
70-47	Regulators - High Pressure Spring Loaded				X
76-72	Odorant - 50/50 TBM/THT	X			
76-73	Thiophane Odorant	X			
76-95	Pressure Vessels				X
78-01	Meters - Diaphragm				X
78-02	Meters - Rotary				X
ACF	Assessment Completion Form	X			
CRMP1	Control Room Management Plan	X		X	
CRMP6	Gas Control Management of Change	X		X	
DIMP1	Introduction	X			
DIMP2	System Knowledge	X			
DIMP3	Threat Identification	X			
DIMP4	Evaluate and Rank Risk	X			
DIMP5	Identify and Implement Measures to Address Risk	X			
DIMP6	Measure Performance, Monitor Results and Evaluate Effectiveness	X			
DIMP8	Periodic Evaluation and Improvement	X			
DIMP9	Report Results	X			
DIMPA	Terms, Definitions and Acronyms	X			
F17-1	Annual Performance Measures	X			
F4-1	Threat Evaluation Form	X			
F8-1	Baseline Assessment Plan Revisions Log	X			
IIPP.01	IIPP-Table of Contents				X
IIPP.02	IIPP-Introduction				X
IIPP.1	Injury and Illness Prevention Program				X
IIPP.10	IIPP-Safety Meetings				X
IIPP.11	IIPP-Best Safety Practices				X
IIPP.2	IIPP-Supervisor Responsibilities				X
IIPP.3	IIPP-Records				X
IIPP.4	IIPP-Employee Responsibilities				X
IIPP.5	IIPP-Communications				X
IIPP.6	IIPP-Corrective Actions				X
IIPP.7	IIPP-Appendices				X



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS	SoCALGAS: APPENDIX.A
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Pipeline Safety Plan Chapter (See 1.3. "List of Policy Documents By Chapter" for the Policy Title)					
Policy	Title	4	5	6	7
IIPP.8	IIPP-Local Safety Plans				X
OD7	Occupational Health and Safety		X		X
OD8	The Gas Emergency Response Plan		X		
PA-1	Public Awareness Plan		X		X
QUALPROG	Quality Program Manual for Owner-User Inspection of Air Tanks				X
TIMP.0	Table of Contents	X			
TIMP.1	Introduction	X			
TIMP.10	Remediation	X			
TIMP.11	Minimizing Environmental and Safety Risks	X			
TIMP.12	Preventive and Mitigative Measures	X			
TIMP.13	Continual Evaluation	X			
TIMP.14	Management of Change	X			
TIMP.15	Quality Assurance Plan	X			
TIMP.16	Record Keeping	X			
TIMP.17	Performance Plan	X		X	
TIMP.19	Communications Plan	X			
TIMP.20	Regulatory Interaction	X			
TIMP.3	HCA Identification	X			
TIMP.4	Data Gathering and Integration	X			
TIMP.5	Threat and Risk Assessment	X			
TIMP.8	Baseline Assessment Plan	X			
TIMP.9	Integrity Assessments	X			
TIMP.A	Terms, Definitions and Acronyms	X			



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NATURAL GAS SYSTEM OPERATOR SAFETY PLAN

APPENDIX – SAFETY POLICY DOCUMENTS

SoCalGas: APPENDIX.A

NOTE: Do not alter or add any content from this page down; the following content is automatically generated.

Brief: The list of documents in the Appendix was updated to remove documents that have been merged or canceled and to add any new documents that have been created and should be included as references in the relevant Safety Plan chapter.

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Impacts GO112E	No
GO112E Codes & Impacted Sections of Document	
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Ex. III-2

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



June 28, 2013

Subject: Filing of Gas Safety Plans

Dear Mr. Lane,

The Safety and Enforcement Division, Gas Safety and Reliability (GSRB) has reviewed the revisions made to Southern California Gas Company's Safety Plan to resolve all deficiencies per the requirements of Ordering Paragraph 3 (OP.3) of Commission Decision 12-12-009.

Based on its review, GSRB believes the revisions adequately address the deficiencies and that your company may now file its revised Safety Plan with all the required company official's and management signatures. As a reminder, a separate table summarizing the changes made with the following information must be included in the final filing:

PU Code section	Requirement	GSRB's initial review of Safety Plan if it complies with this Section of the PU Code (Y or N)	GSRB Reviewer's Comments during the initial review	Specific section in the REVISED Safety Plan that addresses revisions made to meet the PU Code Section	Summary of the REVISED Safety Plan that addresses this PU Code Section
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Should you have any questions related to this matter, please contact Aimee Cauguiran at (415) 703-2055 or by e-mail at aimee.cauguiran@cpuc.ca.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mike Robertson".

Michael Robertson, Program Manager
Gas Safety and Reliability Branch

Ex. III-3

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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PURPOSE **Gas Storage Operations monitors, verifies, and reports the gas inventory in underground Storage Reservoirs by following the methods identified in this gas standard. The Process describes inventory verification’s role in helping to affirm overall Reservoir integrity.**

1. POLICY AND SCOPE

- 1.1. This standard applies to all gas Storage Reservoirs, gas injection/withdrawal/observation Wells which are completed in the storage zone area of review, and non-storage zone Observation Wells that are used to monitor Reservoir integrity.
- 1.2. Storage Operations require monitoring and inventory verification for safe long-term management of Underground Gas Storage operations. While no single method can be used to precisely monitor and verify the gas inventory in underground Storage Reservoirs, the three engineering methods in general use are summarized in Section 4.4, herein. By combining and analyzing available field data – specifically Wellhead pressure data, metered injection and withdrawal volumes and other data, verification of storage gas volume is possible. Based on the analysis outlined in this standard, gas volume changes or losses are recognized, estimated and reported.
- 1.3. Work performed under this standard will, at the minimum, meet the standards set forth in the pertinent regulations and industry standards including, but not limited to:

State Codes:

- •California Code of Regulations, Title 14. Natural Resources, Division 2. Department of Conservation, Chapter 4. Development, Regulation, and Conservation of Oil and Gas Resources, Subchapter 1. Onshore Well Regulations, Article 5. Requirements for Underground Gas Storage Projects.

Federal Codes:

- Code of Federal Regulations (CFR) Chapter 49, Part 192, Subpart 192.12, Underground Natural Gas Storage Facilities.

Recommended Standards:

- American Petroleum Institute (API) Recommended Practice (RP) 1171: Functional Integrity of Natural Gas in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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2. RESPONSIBILITIES AND QUALIFICATIONS

2.1. Responsibilities

Underground Storage periodically conducts Reservoir shut-ins to obtain Wellhead shut-in pressure data for inventory verification and for facilities modification, maintenance, and repair. Shut-in periods are scheduled to allow Reservoir pressures to begin to stabilize so that Wellhead shut-in pressure data may be obtained for inventory verification analysis.

2.1.1. Reservoir Engineering Team Lead

- 2.1.1.1. Overall responsibility for the policy regarding Reservoir integrity and the inventory assessment.
- 2.1.1.2. Review and interpret adopted rules and regulations related to Reservoir integrity monitoring and field inventory verification.
- 2.1.1.3. Review and approve contractor qualifications.
- 2.1.1.4. Oversees the preparation of the field inventory verification report. This report summarizes the Total Inventory which is the sum of the estimated remaining gas at the time of conversion, cushion gas, and working gas.
- 2.1.1.5. Oversees corrective action resulting from discrepancies identified in the field inventory verification report.
- 2.1.1.6. Submit on a yearly basis reservoir integrity and material balance support data to DOGGR.

2.1.2. Storage Field Engineer

- 2.1.2.1. Coordinates shut-in scheduling with Gas Control and Aboveground Storage.
- 2.1.2.2. Obtains the required information during the shut-in period.
- 2.1.2.3. Analyzes the pressure data, determines Average Reservoir Pressure, and prepares the field inventory verification report.

2.1.3. Gas Storage Specialist

- 2.1.3.1. Responsible for conducting bottom hole pressure surveys as directed by the Storage Field Engineer.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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2.1.4. Measurement, Regulation and Control (MRC) Group

2.1.4.1. Where applicable, provides the Storage Field Engineer with recalculated inventory volume for inventory verification.

2.1.4.2. MRC Group conducts an audit of the measurement systems when there is a discrepancy as described in Section 4.5.4.1.

2.1.5. Sempra Energy Audit Services periodically requests to witness data gathering procedures during reservoir shut-ins for inventory verification. Audit Services notifies the Reservoir Engineering Team Lead, who then provides a schedule of reservoir shut-ins planned to Audit Services and a contact for each of the shut-ins. Audit Services Manager notifies the Reservoir Engineering Team Lead which of the shut-ins they wish to witness, and the Reservoir Engineering Team Lead notifies the responsible Storage Field Engineer.

2.2. Qualifications

Details concerning qualifications of personnel supporting this standard are more fully described in the [Manual SIMP.8, Quality Assurance Plan](#).

3. DEFINITIONS

See definitions in [Manual SIMP.A, Terms, Definitions and Acronyms](#) for the defined terms listed in this section.

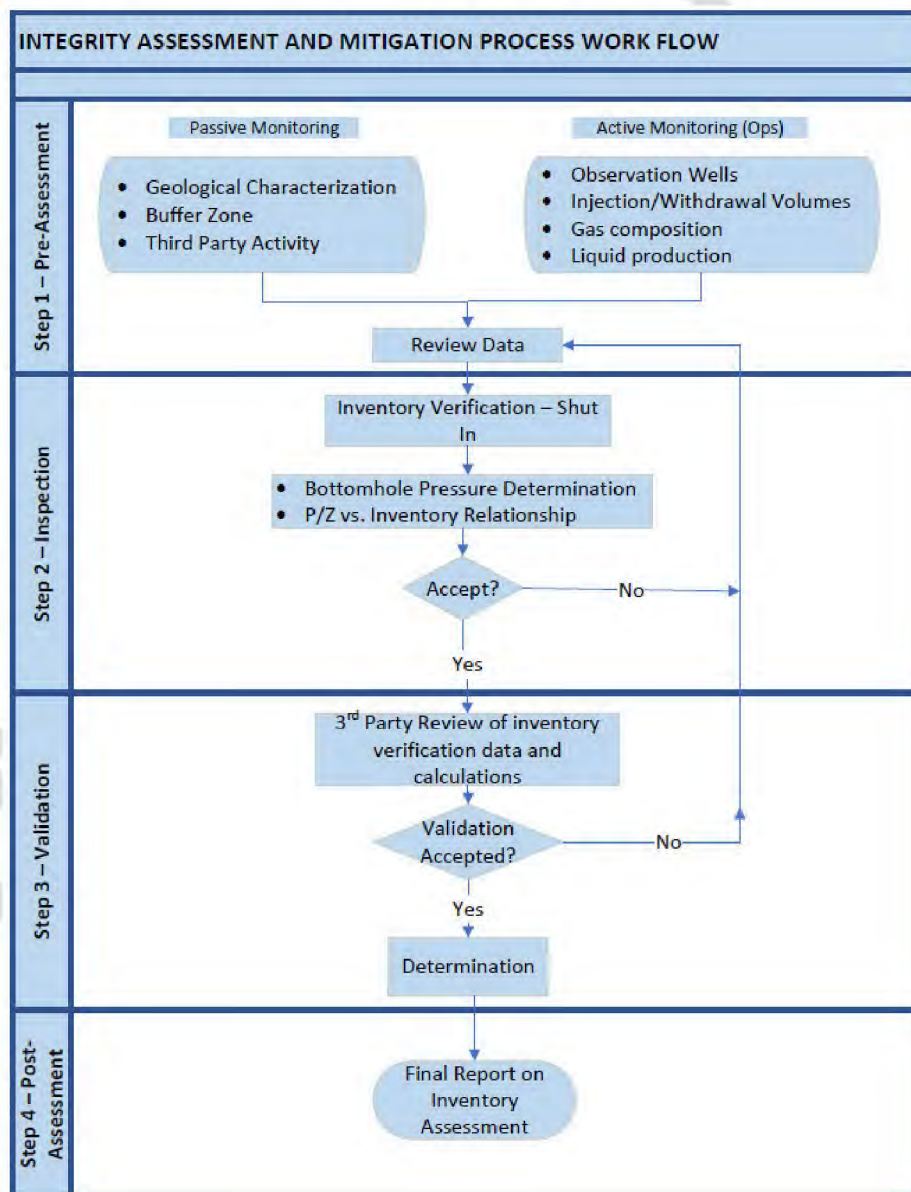
This volume is categorized as follows:

- 3.1. Area of Review (AOR)
- 3.2. Blowdown
- 3.3. Buffer Zone
- 3.4. Cushion Gas
- 3.5. Key Indicator Well
- 3.6. Native Gas
- 3.7. Total Storage Inventory [Total Inventory]
- 3.8. Underground Gas Storage Project
- 3.9. Working Gas

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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4. PROCEDURE

SoCalGas follows a four-step process for assessing reservoir integrity: Pre-assessment, Inspection, Validation and Post-assessment, as shown on flowchart below.



Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Pre-assessment includes a review of the data acquired by both active and passive monitoring methods at the storage field. The inspection consists in a field shut-in, during which bottomhole well pressures are acquired, and a pressure-inventory relationship is determined by SoCalGas Reservoir Engineering group. For each field, the validation step consists in a review of the shut-in data and pressure calculations by a 3rd party SME, taking place no less than every 2 years, or at times when Measurement Audits are triggered (Section 4.5.4). Finally, the post-assessment step is accomplished by releasing a final report on inventory assessment (Appendix B) and communicating the report to DOGGR.

When gas storage operations are initiated in a depleted oil or gas reservoir, there is an initial gas content in the reservoir prior to injection which consists of remaining native gas. This native gas content is generally composed of any remaining native gas in dry gas reservoirs, and both free gas and solution gas in the case of a depleted oil reservoir, which functions as base, or cushion gas. Additional gas is added to the cushion gas by injection, and the combination comprises the Total Cushion Gas. Working Gas is then injected into the reservoir and this combined total is defined as Total Storage Inventory.

Each storage field shall conduct a semi-annual low and high inventory shut in to obtain a representative reservoir pressure at low and high inventories. The reported inventory for each storage field is evaluated by conducting a shut in and using the methodologies outlined in this gas standard. Reservoir injection and withdrawal operations are suspended to achieve a high- or low-inventory shut-in. High or low-pressure shut-ins will typically be performed semi-annually on all active or operational storage fields, for the purpose of tracking and determining the extent of gas volume changes, if any, from the storage reservoirs. Shut-ins may be performed more frequently at the request of the responsible Storage Field Engineer, the Reservoir Engineering Team Lead and/or the Director of Underground Storage.

A report is prepared that summarizes the results of the inventory verification process, any recommended adjustments to gas inventory accounting records, and any recommended corrective actions. This report may be used as supporting documentation for submittal of material balance data to DOGGR (See Appendix B for report template). **Once the field is shut-in for inventory purposes, it may only be interrupted by a formal authorization from the Vice President of Gas Transmission and Storage.** The report is prepared under the direction of the Reservoir Engineering Team Lead and approved by the Underground Gas Storage Director.

4.1. Reservoir Integrity

4.1.1. Geological Characterization

- 4.1.1.1. Reservoir Engineering reviews and updates reservoir geological characterizations and mapping as new data become available or if there is evidence of changes in the location of gas or in the level of pressure in the reservoir to identify the limits of the gas and any spill points.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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4.1.2. Buffer Zone

- 4.1.2.1. Reservoir Engineering should review both the lateral and vertical components of the buffer zone as additional geologic or operational data become available, to determine if the boundaries continue to protect the integrity of the reservoir.

4.1.3. Third-party Activity

- 4.1.3.1. Reservoir Engineering should monitor for third-party activity that could compromise the integrity of the storage reservoir. Such activities can include drilling, completion, plugging and abandonment, production, mining, or other site-specific activities. Reservoir Engineering should determine P&M measures and contact the third-party or regulatory agencies to foster implementation of those P&M measures.
- 4.1.3.2. New third-party wells located within the lateral and vertical buffer zone should be drilled and completed in a manner to isolate the storage reservoir as recommended by Reservoir Engineering.
- 4.1.3.3. Third-party wells located within the lateral and vertical buffer zone being plugged and abandoned by the third party should be plugged in a manner to isolate the storage reservoir and protect its integrity.

NOTE A written agreement stating Reservoir Engineering's requirements for protecting the storage reservoir is sometimes negotiated with third parties actively drilling or producing within the reservoir area and buffer zone.

4.1.4. Observation Wells

- 4.1.4.1. Reservoir Engineering uses observation wells around, above, or below the reservoir to monitor pathways of potential communication and/or migration.

4.1.5. Injection and Withdrawal Volumes

- 4.1.5.1. Reservoir Engineering monitors injection and withdrawal volumes at each storage reservoir to assist in evaluating reservoir integrity.

4.1.6. Gas Composition analysis is performed per [GS 224.113](#) *Gas Sampling – Underground Storage*.

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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4.2. Monitoring

4.2.1. Monitoring of the storage reservoir inventory helps ensure the reservoir functions according to design. The semi-annual reservoir shut-in data and material balance analysis verify whether the gas inventory is present and available for delivery. Effective monitoring requires a thorough understanding of the reservoir system. This system is defined as the reservoir rock and wellbores, which respond to pressure changes as a result of gas injection and withdrawal.

4.2.2. Reservoir integrity monitoring is conducted in both storage and non-storage zone wells and at surface observation points.

4.2.2.1. Storage Zone Wells

4.2.2.1.1. Surface pressures on each well are measured electronically in real time, using permanently installed pressure transmitters. These include tubing pressure, casing pressure and annuli pressures. The mode of well operation (injection, withdrawal or shut-in) is also noted in real time. Note that the DOGGR requires a monthly well pressure reading be submitted as part of the monthly production report.

4.2.2.1.2. Pressure thresholds are set on tubing casing and annulus in each storage field to enable detection of anomalous pressure per [GS 224.119, Pressure Monitoring – Storage Wells and Reservoirs](#).

4.2.2.1.3. Wellhead inspections are performed monthly. Leaks detected are reported and resolved appropriately per [GS 224.110, Wellsite Security and Safety](#).

4.2.2.1.4. SoCalGas conducts daily leak inspections of all storage gas wells. Leaks detected are reported and resolved appropriately per [GS 224.110, Wellsite Security and Safety](#).

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

4.2.2.1.5. Subsurface noise/temperature surveys are conducted on each well of the Underground Gas Storage Project in accordance with DOGGR issued Project Approval Letter for each of the storage fields.

4.2.2.1.6. Key indicator wells are used to monitor reservoir pressure. When practicable, one or more wells completed in the gas storage zone are selected for key indicator well purposes. These wells are not used for injection and may be put on withdrawal only for peak load conditions. Surface pressures on each well are measured electronically in real time using permanently installed pressure transmitters. The pressure data from the key indicator wells are maintained in a database (PI) and are available for trending and further analysis.

4.2.2.2. Non-storage Zone Wells

These non-storage zone wells are separate from the storage zone and do not impact storage operations.

Non-storage zone wells monitored include both Company wells and wells owned by others in overlying and underlying zones within the Area of Review of the storage reservoir and observation wells, where applicable. These wells are categorized as follows:

4.2.2.2.1. Non-storage zone pressure observation wells are located in overlying and underlying permeable formations, or adjacent to the storage reservoir but across assumed confining boundaries, such as faults, permeability pinch-outs, below the gas-liquid contact or beyond the spill point of the storage zone's confining structure. Although normally static, these wells may have artificial lift mechanisms for removal of gas and fluids.

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

- 4.2.2.2.2. Non-storage zone gas collection wells are located where known gas migration from the storage zone is intercepted and collected. These wells are normally equipped with operating artificial lift mechanisms so that both liquids and gas can be produced, causing a pressure sink in the reservoir near the wellbore.
- 4.2.2.2.3. If pressure communication in non-storage zone wells is suspected, a review of the production records of wells operated by other producers in either overlying zones or in adjacent fields shall be made by reviewing production reports from these operators.
- 4.2.2.2.4. Non-storage Zone Observation Wells
- Surface pressures on each non-storage zone observation well are measured electronically in real time, using permanently installed pressure transmitters. These include tubing pressure, casing pressure and annuli pressures.
 - The pressure data from the non-storage zone observation wells are maintained in a database (PI) and are available for trending and further analysis.
 - If pressure thresholds are exceeded, notifications are issued per [GS 224.119, Pressure Monitoring – Storage Wells and Reservoirs](#), and an attempt may be made to produce the well. Produced gas is sampled and analyzed for both hydrocarbon and helium content. Compositional monitoring shall be performed on the production from non-storage zone observation wells.

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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4.3. Bottom-hole Pressure Determination

4.3.1. Each of the three major methods used to verify gas storage inventory, as explained in Section 4.4., requires the determination of bottom-hole pressures. The method used to determine bottom-hole pressure must be consistent from year to year. The bottom-hole pressure is calculated from the shut-in wellhead pressure. In instances where standing liquid is suspected in the wellbore, a bottom-hole survey may be run. For wells completed in the storage zone and having full gas columns, the bottom-hole pressure is calculated from the equation:

$$P_{BHP} = P_{WH} \exp\left(\frac{0.01875 \times SG \times D}{Z_{avg} T_{avg}}\right)$$

Where:

P_{BHP} = Bottom-hole pressure, psia.

P_{WH} = Wellhead pressure, psia.

SG = Gas specific gravity.

D = True vertical depth in feet.

T_{avg} = Average wellbore temperature between surface and bottom-hole, degrees Rankine.

Z_{avg} = Average gas compressibility factor from charts, tables or computer programs (dependent on P_{avg} , T_{avg} and gas gravity).

P_{avg} = Average pressure between surface and bottom-hole, psia or

$$P_{avg} = (P_{BHP} + P_{WH}) / 2$$

NOTE: The above equation could yield incorrect results if the well exhibits a significant fluid level.

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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4.4. Inventory Verification – Shut In

4.4.1. The three methods listed below may be used for inventory verification purposes.

4.4.1.1. Method 1: Calculation of gas content based on volumetric data and Average Reservoir Pressure. Volumetric Determination is explained in Applied Petroleum Reservoir Engineering by Craft, B. C. and Hawkins, M. F.; Englewood Cliffs, N.J.: Prentice- Hall, 1959.

4.4.1.2. Method 2: Calculation of effective gas content using the simple gas material balance, hysteresis curve, and P/Z curve methods. Material Balance is explained in Natural Gas Engineering by Ikoku, C. V.; Tulsa, Oklahoma: Penn Well Publishing, 1980.

4.4.1.3. Method 3: Verification of storage inventory by comparing measured reservoir pressures with calculated pressures obtained using the single cell material balance or reservoir simulation methods. Numerical Simulation or Reservoir Modeling is explained in Modern Reservoir Engineering —A Simulation Approach by Crichlow, H. B.; Englewood Cliffs, N.J.: Prentice- Hall, 1977 and the Intercomp Beta II User Manual.

4.4.2. The most common inventory verification method used in mature gas storage projects that are known to have effective geologic closure is the hysteresis curve or P/Z versus inventory plot. Where applicable, it is important for the Storage Field Engineer to obtain the inventory volume recalculated by Measurement, Regulation and Control (MRC). This inventory number will be used in the P/Z vs. Inventory plot. Typically, it is adjusted biennially for known gas losses and liquid production. A deviation from the expected P/Z vs. inventory relationship may warrant further investigation.

4.4.2.1. Gas blowdowns for maintenance work, instrument gas, gas used as fuel and other associated gas losses are tracked and recorded as they occur and inventory is adjusted accordingly.

4.4.2.2. Recommended shut-in time durations for effective reservoir stabilization are listed below. There may be times when these recommended shut-in times might not be achieved due to demands on the gas system.

4.4.2.2.1. Aliso Canyon - 14 days

4.4.2.2.2. Honor Rancho - 12 days

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

4.4.2.2.3. Goleta - 5 days

4.4.2.2.4. Playa del Rey - 4 days

4.4.3. Data collected during a shut-in period includes wellhead pressure measurements which are converted to a bottom-hole or reservoir pressure. Shut-in wellhead pressure readings are obtained electronically in real time, using permanently installed calibrated pressure transmitters, calibrated electronic hand gauges, or in some instances, calibrated dead-weight gauges. Sempra Energy Audit Services or a designated representative can witness the gathering of data when a shut-in is conducted. If wellbore liquids are suspected to be present in the wellbore of a well, an adjustment to the wellhead pressure may be made to account for same. Gas gravity and composition is determined using gas samples collected from the field withdrawal meter runs.

4.4.4. Wellhead pressure data collected is used in the methods described below.

4.4.5. Method 1: Calculation of gas content based on volumetric data and Average Reservoir Pressure from shut-in.

4.4.5.1. Average Reservoir Pressures used in this calculation are obtained during shut-in periods. Reservoir pore volume available for gas storage is calculated from either geologic information, material balances using production and pressure information obtained during primary field production, or in some cases from pressure and production data obtained during gas storage operations. Elements of these calculations are described below.

4.4.5.2. Average Reservoir Pressures are calculated according to set criteria for each storage reservoir. The method for each field shall remain consistent from year to year. The method of calculation specific to each field are as follows:

4.4.5.2.1. The Average Reservoir Pressure for Honor Rancho, La Goleta, and Playa del Rey are determined by calculating the arithmetic average of the bottom-hole pressure in the storage zone wells. In these fields the pressure of each well is measured or computed at a specified subsea datum approximately at the midpoint of the zone. The datum and reservoir temperature used for these fields are as follows:

- Honor Rancho - 8,300 feet subsea, 190°F

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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- La Goleta - 4,200 feet subsea, 150°F
- Playa del Rey - 6,100 feet subsea, 210°F
- A volumetrically weighted Average Reservoir Pressure is used for Aliso Canyon. The pressures in this field are computed at a specified subsea depth approximately at the midpoint of the zone. The datum depth for this field and the reservoir temperature are as follows:
 - ◆ Aliso Canyon - 5,400 feet subsea, 180°F

4.4.5.3. Reservoir pore volume calculated from geologic information uses data obtained during the drilling and completion of the well, such as electric logs or core information along with the estimated areal extent of the reservoir to calculate the total pore volume of the reservoir. These calculations are based on the following equations:

4.4.5.4. Gas reservoirs

4.4.5.4.1. Equation: $V = Ah\phi (1-S_w)$

Where:

V = Reservoir gas pore volume in cubic feet

A = Gas zone area in square feet

h = Average gas zone thickness in feet determined from electric logs or cores

ϕ = Porosity fraction determined from porosity logs or core analysis

S_w = Water saturation from log, core analysis

4.4.5.5. Oil reservoirs

4.4.5.5.1. Equation: $V = Ah\phi (1-S_w) + A_I h_I \phi (1-S_{Iw}-S_o)$

Where:

A = Primary storage zone area in square feet

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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A_1 = Secondary storage zone area in square feet

h_1 = Average secondary gas zone thickness in feet

S_o = Residual oil saturation

4.4.5.5.2. In most portions of an oil zone storage reservoir, oil saturation is determined from core analysis or can be considered equivalent to residual oil saturation and can be estimated from the 16" normal resistivity curve using the following relationships.

Equation: Residual oil saturation = $(1 - S_{xo})$

$$S_{xo} = \sqrt{\frac{R_{mf}}{R_{xo} \times \phi^2}}$$

Where:

R_{xo} = Resistivity of 16" normal or resistivity of flushed zone.

S_{xo} = Water saturation of mud filtrate within the flushed zone.

ϕ = Porosity

R_{mf} = Resistivity of mud filtrate.

4.4.5.6. Gas reservoir pore volume calculated using material balance equations:

These calculations utilize production and pressure data in the following equations:

4.4.5.6.1. Equation for constant volume gas reservoirs using primary production:

$$V = \frac{P_{sc} G_p T}{T_{sc}} \times \left(\frac{1}{\frac{P_i}{Z_i} - \frac{P_f}{Z_f}} \right)$$

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Where water production and influx are assumed negligible and where:

$V =$ Gas pore volume in reservoir cubic feet.

$P_{sc} =$ 14.7 psia

$G_p =$ Gas produced in standard cubic feet.

$T =$ Reservoir temperature in degrees Rankin ($^{\circ}\text{R}$).

$R_{sc} =$ 520 $^{\circ}\text{R}$

$P_i =$ Initial pressure, psia.

$P_f =$ Final pressure, psia.

$Z_i =$ Initial gas compressibility factor.

$Z_f =$ Final gas compressibility factor.

4.4.5.6.2.

Equation for constant volume gas reservoirs using storage production

$$V = \frac{P_{sc} G_p T}{T_{sc}} \times \left(\frac{1}{\frac{P_1}{Z_1} - \frac{P_2}{Z_2}} \right)$$

Where water production and influx are assumed negligible

$G_p =$ SCF of gas produced or injected between pressure points P_1 and P_2 .

P_1 and $P_2 =$ The first and second stabilized Average Reservoir Pressures bounding the production or injection period considered.

Z_1 and $Z_2 =$ Gas compressibility factors for P_1 and P_2 .

$T =$ Reservoir temperature in degrees Rankine

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

4.4.5.7. Method 2: Oil reservoirs pore volume calculations

4.4.5.7.1. Equation: The ‘Reservoir Gas Pore Volume’ is equal to the ‘Original Storage Zone Pore Volume’ plus the ‘Secondary Storage zone Pore Volume’ plus the ‘Space created by Water Production’.

Or:

$$V = GB_{gi} = (NB_{oi} - (N - N_p)B_o) + W_pB_w$$

Where:

G = Original gas volume, standard cubic feet (determined from either geologic data or an appropriate form of the material balance equation).

B_{gi} = Gas formation volume factor in reservoir cubic feet per standard cubic feet at discovery pressure.

N = Initial oil in place in stock tank barrels (determined from either geologic data or an appropriated form of the material balance equation).

N_p = Cumulative oil production in stock tank barrels.

B_{oi} = Oil formation volume factor in reservoir cubic feet per stock tank barrel at discovery pressure.

B_o = Oil formation volume factor at existing pressure in reservoir cubic feet per stock tank barrel.

W_p = Water production in stock tank barrels.

B_w = Water formation volume factor, reservoir cubic feet per stock tank barrel (approximates 5.615).

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

4.4.5.7.2. Simplifying assumptions used in the above equation are that no storage gas goes into solution in the oil and that there is no water influx into the storage reservoir. These simplifying assumptions are seldom true. However, the equation can be modified based on a judgment of the volume of gas which may go into solution in the reservoir oil and a judgment of aquifer activity surrounding the storage reservoir. When modified by these judgment factors, the equation provides a method for approximating a limit for the reservoir gas pore volume available for storage operations. An upper limit is established when it is assumed that all the residual oil is re-saturated with gas. Generally, only a fraction of the oil becomes saturated and so the calculation has little usage beyond setting limits.

4.4.5.7.3. The values of G and N are not generally expected to be obtained with an accuracy greater than +/- 20%. However, this is not a major drawback since the methods are used to establish guidelines and set limits.

4.4.5.8. Calculation of gas content.

4.4.5.8.1. After the gas pore volume has been calculated, or approximated, by one of the methods indicated above, the gas content at the measured reservoir pressure is determined using the gas law as follows:

$$PV = ZNRT$$

Where:

P = Average Reservoir Pressure, psia

V = Pore volume in cubic feet

T = Temperature of reservoir, ($^{\circ}\text{F} + 460$) degrees Rankine

Z = Compressibility factor, dependent on P , T , and gas gravity, from charts or tables.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

$N =$ pound moles (where one pound mole
=379.41 cubic feet @ 60°F and 14.7 psia).

$R =$ 10.735 universal gas constant for above
units.

Solving for gas content;

$$Volume(mscf) = \frac{(0.03533)PV}{ZT}$$

4.4.6. Method 2: Calculation of effective gas content using the simple gas material balance and hysteresis curve (P/Z curve) methods.

4.4.6.1. Pressure changes, with rapid gas injection or withdrawal during selected operating periods, can show the relationship between effective gas content and the storage inventory. Effective gas content is the gas which, within a given time, causes a measurable pressure response to injection or withdrawal operations. Not all gas in the reservoir yields such a response within the confines of a typical storage operating cycle. The difference between effective gas content at a given pressure (P_1) and the metered inventory is non-effective gas. Part of this non-effective gas can be due to the lack of pressure equilibrium within the reservoir. Any gas migration out of the storage reservoir, any operational losses attributable to blow-downs, vents, or minor leaks that are not estimated and accounted for, and measurement error contribute to non-effective gas. Either one of the two equations, or the graphical solutions presented below are used to calculate the effective gas content.

4.4.6.1.1. Calculations with negligible water movement are made using the following equation:

Effective Gas Content at P_1 ,

$$Q_1 = \left(\frac{\Delta Q}{\frac{P_1}{Z_1} - \frac{P_2}{Z_2}} \right) \times \frac{P_1}{Z_1}$$

Where:

$P_1 =$ Pressure at the first operational point
considered.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

P_2 = Pressure at the second operational point considered.

Q_1 = Net storage volume at the first operational point considered.

ΔQ = The net change in gas inventory between the two operational points considered.

4.4.6.1.2. Calculations with significant water movement of a known rate are made using the following equations:

$$Q_1 = \left(\Delta Q - \left(W_e \times \frac{P_2}{14.7} \times \frac{520}{T_R} \times \frac{1}{Z_R} \right) \right) \frac{\frac{P_1}{Z_1}}{\left(\frac{P_1}{Z_1} - \frac{P_2}{Z_2} \right)}$$

Where terms are defined as above, and where:

W_e = Water influx in cubic feet.

T_R = Reservoir temperature, degrees Rankine.

Z_R = Z at T_R and P_2 .

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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4.4.7. Graphical solutions

4.4.7.1. The hysteresis curve is a plot of reservoir pressure versus storage inventory. This curve utilizes the compressibility factor of non-ideal gas. It is most effective in a constant volume reservoir since it assumes no water movement into or away from the storage reservoir; and no movement of gas into or out of solution in the reservoir oil. The hysteresis curve is a qualitative/quantitative tool for inventory verification when a storage field is operated in a consistent manner and storage cycle volumes are relatively consistent over time. Under these conditions, aquifer movement and movement of gas into and out of solution is relatively constant and effectively drops from the equation. When a new storage field is developed and placed into service or the capacity or maximum pressure of an existing field is increased, a plot of the storage reservoir pressure versus inventory relationship shall be compared to reservoir pressure versus gas-in-place (or equivalent gas-in-place) conditions at the time the reservoir was discovered to assess whether all of the metered storage inventory is contained and accounted for in the reservoir.

4.5. Reporting Gas Inventory Losses

4.5.1. Calculated operational losses

4.5.1.1. Gas losses due to compressor, piping system, well blowdowns, and wireline surveys are calculated by Storage Operations personnel. Gas losses due to well kills and well work overs are calculated by the Storage Field Engineers

4.5.1.2. Gas losses determined above are gathered by Storage Operations and reported to Measurement monthly, who makes the appropriate adjustments to inventory.

4.5.2. Fugitive losses from well and surface facilities. Some small losses from valves, compressors, field piping, threaded well casing connections and well casing mechanical devices such as cementing stage collars, and some small casing leaks are inherent to Storage Field Operations. Fugitive emissions from each field are calculated monthly by the Air Quality Specialist who reports to Operations for inclusion in the inventory reports sent to Measurement.

4.5.3. Reservoir losses

4.5.3.1. Reservoir losses are categorized as those associated with wells completed in the storage reservoir and general reservoir losses.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Quantification of reservoir losses utilizes industry accepted methods of inventory verification. Estimates are made using engineering judgment and reporting is made as losses occur.

4.5.3.1.1. Losses associated with the wells completed in the storage reservoir include losses through failures in the cement between the cap rock and well casing.

4.5.3.1.2. General reservoir losses include losses through abandoned wells or breakdown of some portion of the trapping mechanism.

4.5.4. Gas storage field measurement audits

4.5.4.1. When Storage Engineering identifies a consistent discrepancy in the pressure or P/Z versus Inventory relationship of 5% of the working gas volume or more at a storage field that cannot be explained by known leaks such as gas vented to the atmosphere, liquid production or other reservoir changes, they request an audit of the gas measurement systems at the storage field by the Measurement, Regulation and Control (MRC) group of Gas Engineering (see Appendix A for Audit Process Workflow). If no issues are found with measurements, additional diagnostic investigations will be undertaken to determine whether there are any integrity issues with the storage injection, withdrawal and observation wells in the field. These investigations may include but are not limited to pressures on individual wells including annulus pressure, downhole integrity logs, tracer surveys, pressure tests, monitor 3rd party drilling, gas production, and wellhead pressure readings.

4.5.4.2. MRC investigates the following parameters with assistance from Storage personnel.

4.5.4.2.1. MRC Design Team obtains the most current drawings and block flow diagrams for the storage field.

4.5.4.2.2. MRC Design and Storage Field personnel inspect the facility to determine the accuracy of current drawings.

4.5.4.2.3. MRC Design and Storage Field personnel identify any changes in metering or gas processes that have occurred since the drawings were last issued.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
---	-------------	----------------

- 4.5.4.3. MRC reviews Storage Field Ledger calculations in order to verify they agree with updated drawings and block flow diagrams. MRC documents any errors found in the Ledger formulas and advises Measurement Data Operations (MDO) of any required Ledger formula revisions.
- 4.5.4.4. MRC in conjunction with the drawing confirmation prepares a list of the meters, instrument configuration and associated transducer ranges.
- 4.5.4.4.1. MRC compares this listing to information in the Measurement Collection System (MCS) for those sites that MCS re-calculates the volumes and notes any discrepancies and impact of those discrepancies on measurement accuracy.
- 4.5.4.4.2. MRC compares information in the Instrument Configuration for those site where the Scada Pack calculates the volumes and notes any discrepancies and impact of those discrepancies on measurement accuracy.
- 4.5.4.5. MRC Measurement Technology reviews Storage Field calibration and meter inspection results to verify adherence to the Gas Standards and System Instructions listed below. Any discrepancies or errors will be documented and impact on measurement noted.
- [Standard 223.0360](#), *Instrument Maintenance and Metering Devices – Storage Field and Transmission Facilities*
 - [Standard 185.0455](#), *Flow Measuring Devices – Field Maintenance*
 - [Standard 185.0475](#), *Orifice Meters and Orifice Plates - Field Inspection and Maintenance*
 - [Form 4682-B](#), *Orifice Meter Order*
 - [Standard 185.0452](#), *Daniel Ultrasonic Meter - Operation and Maintenance*
 - [Standard 185.0425](#), *Rotary Meters – Installation, Field Maintenance, Inspection and Repair*
 - [Standard 185.0530](#), *Turbine Meters - Operation, Maintenance*
 - [Standard 185.0474](#), *Control Microsystems SCADAPACK*

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

- [Standard 185.0457](#), *Totalflow Inspection and Calibration Requirements for 6610, 6413, 6713 & X-Series*
- [Standard 185.0458](#), *Totalflow Inspection and Calibration Requirements for 6611, 6414, 6714 & X-Series*
- [Standard 185.0515](#), *Temperature Devices – Maintenance*

4.5.4.6. Storage Field Orifice Meter or Ultrasonic Meter (USM) inspections will be witnessed by MRC Measurement Technology to confirm conformance to applicable Gas Standards listed in Section 4.5.4.5. A borescope inspection may be recommended if metering inspection results warrant further investigation.

4.5.4.7. MRC Measurement Technology to review the last 12 months of MCS Hourly data for each Storage Field Meter on the Ledger to verify meters are operating within their minimum and maximum ranges.

4.5.4.7.1. Verify operating Orifice Differential Pressure (DP) are 9" w.c. or greater on average, Beta ratio within the range of 0.2 to 0.6 and orifice plate thickness and bevels in accordance with AGA 3.

4.5.4.7.2. MRC Measurement Technology will also review borescope inspection results. Impact on measurement accuracy will be noted for any negative findings.

4.5.4.8. MRC Measurement Technology to issue final report to Storage Field, MRC and MDO summarizing all findings, quantifying all measurement errors and detailing any revisions required to MCS Ledgers or Company Drawings.

4.5.4.8.1. Report will also recommend any follow-up actions required by Storage Field, MRC Design or MDO.

4.5.4.9. The final report results are sent to the following individuals:

- Director of Aboveground Storage
- Director of Underground Storage
- Reservoir Engineering Team Lead
- Storage Operations Manager

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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- Measurement Regulation and Control (MRC) Manager
- Measurement Data Operations (MDO) Supervisor
- Storage Technical Services Manager (TSM)

5. EXCEPTION PROCEDURE

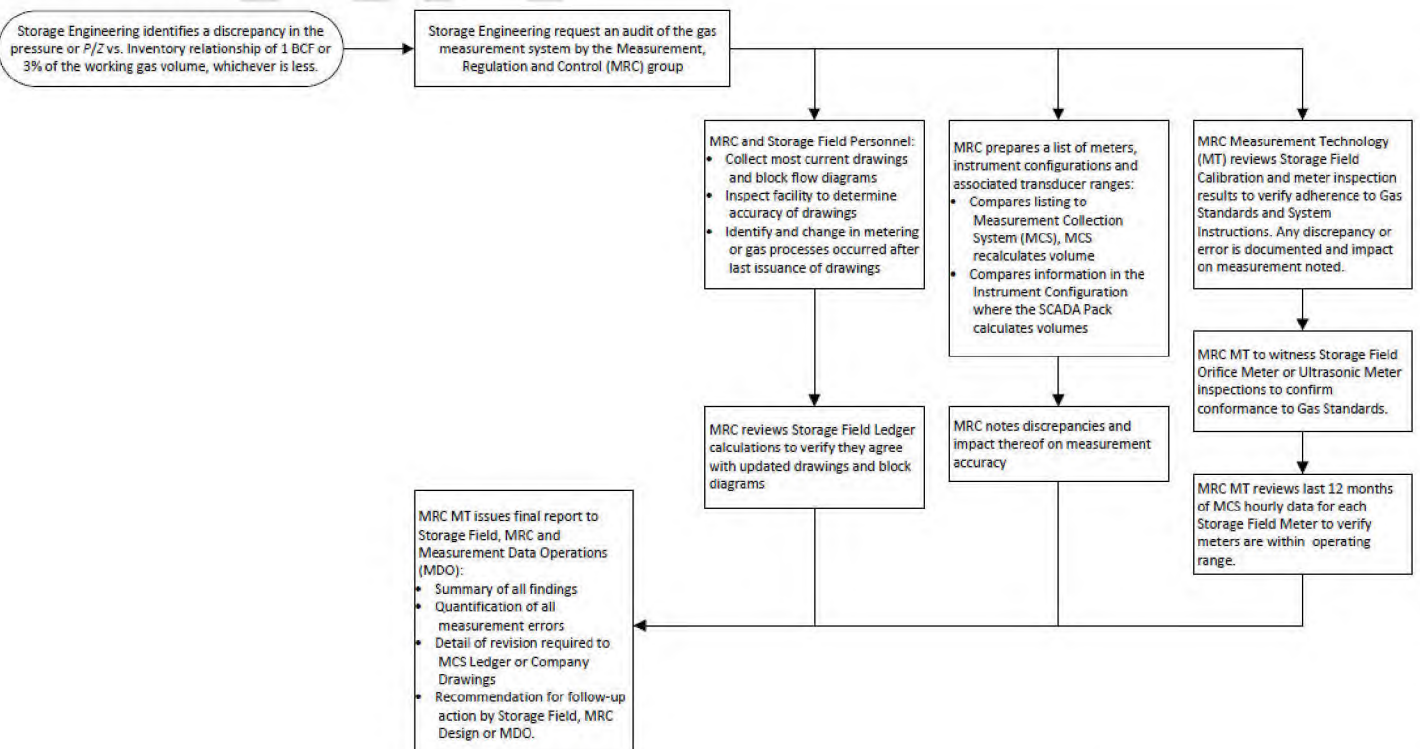
(See [GS 182.0004](#), *Exception Procedure for Company Operations Standards*)

- 5.1. An exception to this standard shall be considered only after practical solutions have been exhausted. Safety issues shall be given primary consideration, while adhering to governing codes before an approval of an exception is granted.
- 5.2. An exception from a standard shall not be allowed unless [GS 182.0004](#), *Exception Procedure for Company Operations Standards*, is followed and approval is given by those as required by 182.0004.

6. RECORDS

- 6.1. SoCalGas shall maintain storage inventory assessment records for the life of the facility plus five years.
 - 6.1.1. Inventory Assessment and Verification Report

Appendix A. Gas Measurement Audit Process Workflow



Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Appendix B. Inventory Verification Report Template

[DATE]



DRAFT – STORAGE FIELD XYZ – [DATE] HIGH/LOW INVENTORY VERIFICATION REPORT
UNDERGROUND STORAGE RESERVOIR MANAGEMENT

Company Operations Standard

Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

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Introduction: This portion of the report introduces the storage field, the parameters of the shut-in (duration, start and end dates, high or low if any) that is being reported on and the various gas standards requirements (GS 224.002 and GS 224.070) this report is responding to.

Method

- Method used (e.g., hysteresis curve method).
- Verified inventory at the time of the shut-in (as of EOB last day of injection/withdrawal prior to shut-in).
- Pressure acquisition methods (e.g., downhole pressure surveys, surface pressure measurement, real time pressure monitoring system).
- Plot of Wellhead Pressure vs. Time, illustrating stabilization of pressure as shut-in progressed (see Figure 1).
- When available, Bottomhole pressure surveys, and plot vs. Time. If Bottomhole pressure are calculated based on surface pressure measurement, provide calculation example.
- Weighted reservoir pressure calculation.
- Explanation of the P/Z vs. Inventory, expected result, and treatment of deviations.

Results

Provide brief comments on the observed result of the shut-in and any follow-up action when deviations from hysteresis curves have been observed and documented.



Company Operations Standard
Gas Standard
Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
--	------	---------

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Attachments:

Table 1 – Static Wellhead Pressures (P_{wh})	3
Table 2 – Historic P/z vs. Inventory Data	4
Figure 1 – Average Shut-In Wellhead Pressure (P_{wh}) vs. Time	5
Figure 2 - Average Shut-In Bottomhole Pressure (P_{bth}) vs. Time	5
Figure 3 – Field Hysteresis Curve – P/z vs. Inventory	6
Figure 4 - High Inventory, P/z vs. Time	6

NOTE: Data presented in the following is made up for the purpose of illustration for this template.

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Table 1 - Static Wellhead Pressures (P_{wh})

Date	1/1/2012	8/1/2012	3/2/2013
Well			
GasWell 1	1815	1200	1837
GasWell 2	1712	1150	1742
GasWell 3	1842	1250	1872

Table 2 - Historic P/z vs. Inventory Data

Date	Z-Factor	P (psia)	P/z	Inventory (Bcf)
1/1/2012	0.9812	1789.667	1824.0	31.2
8/1/2012	0.9305	1200	1289.6	11.5
3/2/2013	0.9821	1817	1850.1	31.3
7/15/2014	0.9298	1180.667	1269.8	11.4
9/1/2018	0.9851	1843	1870.9	30.5

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Figure 1 – Average Shut-In Wellhead Pressure (P_{wh}) vs. Time

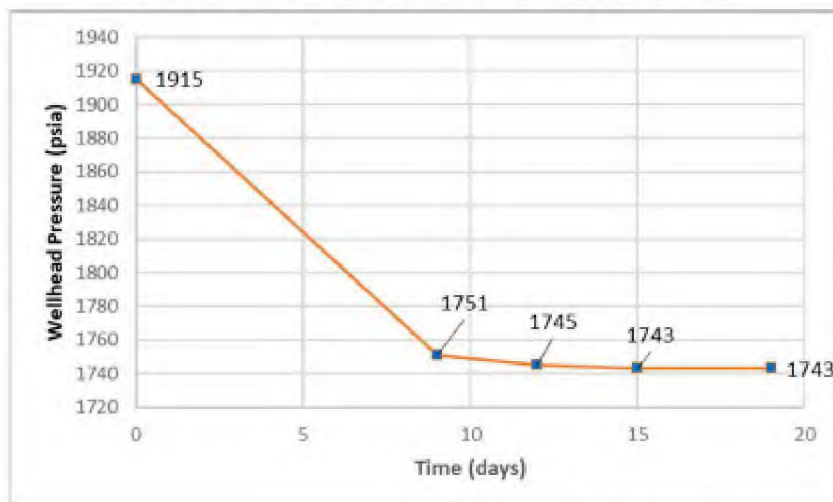
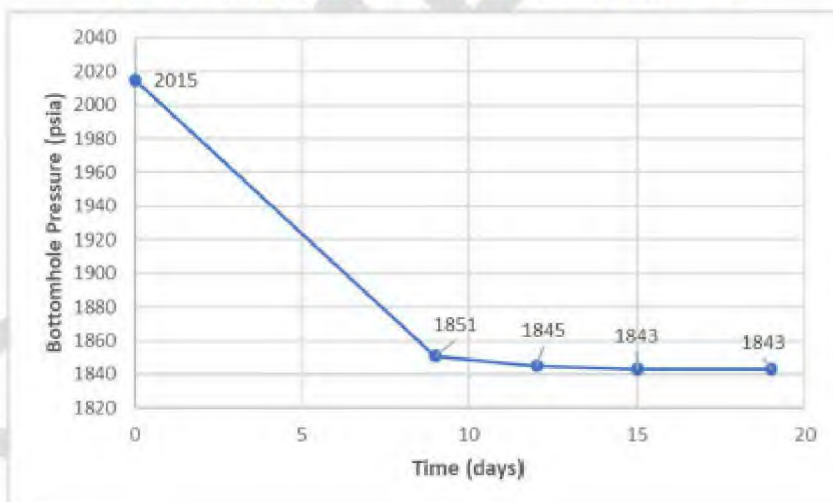


Figure 2 - Average Shut-In Bottomhole Pressure (P_{bth}) vs. Time



Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Figure 3 - Field Hysteresis Curve - P/z vs. Inventory

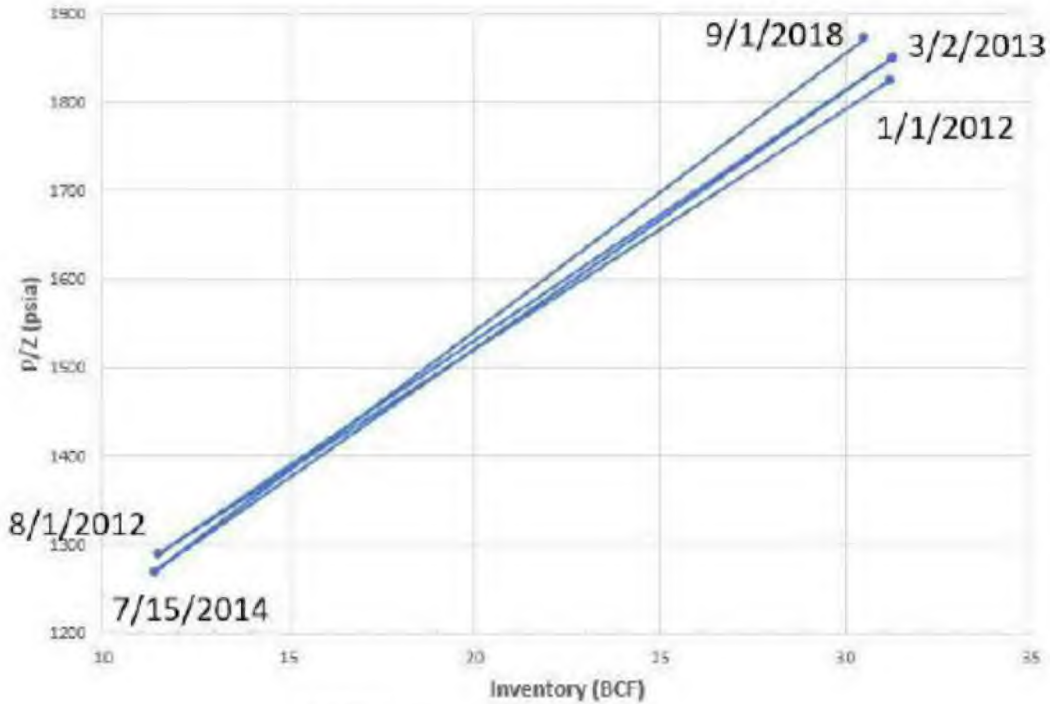
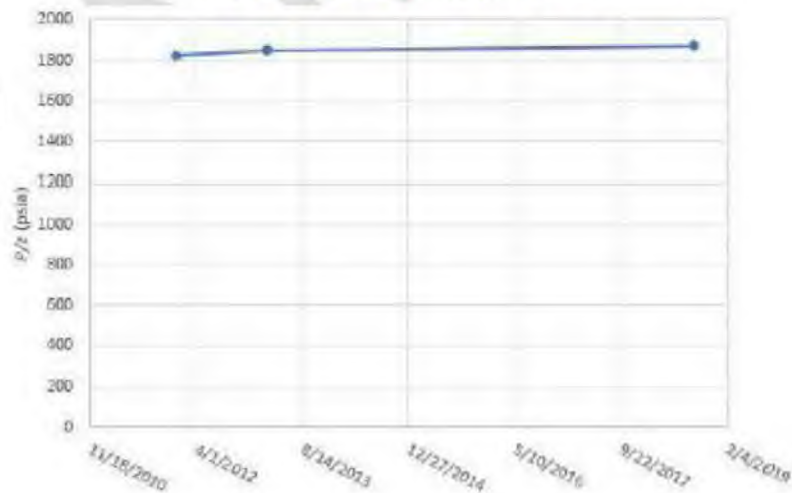


Figure 4 - High Inventory, P/z vs. Time



**Company Operations Standard
Gas Standard
Gas Operations**

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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Gas Standard

Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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NOTE: Do not alter or add any content from this page down; the following content is automatically generated.
<p>Brief: SECTION 1.3 Revised with reference to the new DOGGR regulations.</p> <p>SECTION 2.1.1.6 - Added responsibility for the Reservoir Engineering Team Lead to submit on a yearly basis reservoir integrity and material balance support data to DOGGR.</p> <p>SECTION 2.1.4 - Added responsibility for the MRC Group where applicable, to provide the Storage Field Engineer with recalculated inventory volume for inventory verification.</p> <p>SECTION 3 - Added the terms "Blowdown" and "Underground Storage Project".</p> <p>SECTION 4 - Added introduction paragraph and Integrity Assessment and Mitigation Process Work Flow to address recommendations from the 2018 SIMP mock audit. Changed shut in frequency to be performed semiannually. Added statement to use the shut in report to be used as supporting documentation for submittal of material balance data to DOGGR (to address 1726.7(b)(1)).</p> <p>SECTION 4.2.1 - Changed shut in frequency to be performed semiannually.</p> <p>SECTION 4.2.2.1.5 - Revised to include "...of the Underground Gas Storage Project in accordance with DOGGR issued Project Approval Letter for each.."</p> <p>SECTION 4.3.1 - Replaced "...from shut in to shut in.." with "...from year to year..".</p> <p>SECTION 4.4.2 - Added statement "Where applicable, it is important for the Storage Field Engineer to obtain the inventory volume recalculated by the Measurement, Regulation and Control (MRC). This inventory number will be used in the P/Z vs. Inventory plot."</p> <p>SECTION 4.4.5.2 - Replaced "...from shut in to shut in.." with "...from year to year..".</p> <p>SECTION 4.5.4 - Replace "...1 BCF or 3%.." with "5%"; added reference to Appendix A.</p> <p>SECTION 5.2 - Revised to be aligned with the most current version of the gas standard template.</p> <p>SECTION 6.1.1 Added Inventory Assessment and Verification Report to the records section.</p> <p>APPENDIX A - Added Gas Measurement Audit Process Workflow.</p> <p>APPENDIX B - Added Inventory Verification Report Template.</p>

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Impacts GO112F	No

Company Operations Standard Gas Standard Gas Operations

Reservoir Integrity and Inventory Assessment	SCG:	224.070
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GO112F Codes & Impacted Sections of Document	
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